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ATHLETIC PARTICIPATION AND ITS
EFFECT ON THE EATING BEHAVIORS
OF COLLEGE WOMEN

By

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ABSTRACT

In Western culture, the ideal woman's figure has become increasingly thin. Attaining this ideal is often a lifelong pursuit for many women, and the behaviors in which they engage, such as dieting and excessive exercising, become socially accepted as normal. In the athletic arena, a thin figure is often crucial to successful performance. In a society in which disordered eating has become normalized, some female athletes have been known to turn to these behaviors in an effort to maintain a figure that they hope will enhance their athletic performance. However, the number of female athletes who engage in these types of behaviors are often overestimated by an uninformed public.

The purpose of this study was to investigate athletic participation and the development of disordered eating behaviors in women by comparing collegiate varsity athletes and the general university population on three variables: disordered eating behaviors and the associated psychological variables of body satisfaction and self-esteem. Further, possible differences between athletes who participate in sports in which a lean figure is conducive to success and sports in which a lean figure is not conducive to success were also investigated for these three variables. As disordered eating includes many types of behavior, a disordered eating continuum was used to illustrate. Three existing inventories designed to measure eating behaviors, body satisfaction, and self-esteem, respectively, were distributed to college women at a Division I university in the southeastern United States.

Chi-square analysis and analysis of variance were used to evaluate the collected data. The results indicated that athletes in this study did not report eating behaviors that were significantly different than the non-athletes, nor were there differences between the "lean" sport athletes and the "nonlean" sport athletes. On the variables of body satisfaction and self-esteem,

there was no difference between the athletes and non-athletes in terms of self-esteem, however athletes reported significantly more satisfaction with their bodies. In comparing the “lean” sport athletes and “nonlean” sport athletes, there were no significant differences on the variables of body satisfaction and self-esteem. Finally, there was a significant difference between the body satisfaction and self-esteem scores of the “eating disordered” and “non eating disordered” groups; those who did report eating disordered behaviors had less body satisfaction and more self-esteem than those that did not.

CHAPTER ONE

INTRODUCTION

Societal norms play an integral role in the development of the beliefs and associated behaviors of the individuals who live within each society. These values have a significant impact on the development of the ideal human figure, particularly for women. In Western culture, the ideal woman's figure has become increasingly thin. Further, this unattainable norm is promoted by the media into all aspects of life. This has led to the inevitable development of dissatisfaction with body image. With the concurrent cultural obsession with food, the number of women who choose to use disordered eating behaviors in an attempt to conform to these conflicting norms has greatly increased (Lucas, Crowson, O'Fallon, & Melton, 1999). Attaining the "thin ideal" is often a lifelong pursuit, and the eating behaviors in which many women engage, such as dieting, become socially accepted as "normal" eating (Kalodner & Scarano, 1992).

In the athletic arena, a thin figure is often key to successful performance for women. In a society in which disordered eating has become normalized, some female athletes have been known to turn to these behaviors in an effort to maintain a figure that they hope will enhance their athletic performance. In reality, however, disordered eating behaviors are harmful to the body and have lasting detrimental effects, both physical and mental, particularly when sustained on a long-term basis. Accordingly, research into the causation, prevention, and treatment of these behaviors is an important endeavor.

The purpose of this study was to investigate athletic participation and the development of disordered eating behaviors in women by comparing collegiate varsity athletes and the general

university population on three variables: disordered eating behavior, body satisfaction, and self-esteem. Further, possible differences between athletes who participate in sports in which a lean figure is conducive to success and sports in which a lean figure is not conducive to success were also investigated for these three variables. As disordered eating includes many types of behavior, a disordered eating continuum was used to illustrate this relationship (See Figure 1). This continuum recognizes several subclinical eating disorders in addition to clinically diagnosable disorders such as anorexia nervosa and bulimia nervosa (Petrie, 1993).

Lastly, this study explored the relationship between disordered eating behaviors and the two psychological variables of body satisfaction and self-esteem, in an attempt to determine if the motivation behind disordered eating is internal or external. If individuals who reported disordered eating behaviors reported lower levels of body satisfaction and self-esteem, motivation was considered internal. However, if body satisfaction and self-esteem were not significantly related to disordered eating behaviors, motivation was likely attributed to outside or external pressures. This determination is important when developing intervention programs.

The concept of an eating disorders continuum is important as there are many individuals who present eating disordered behaviors without meeting the full DSM-IV criteria associated with anorexia nervosa and bulimia nervosa. These behaviors often result in outcomes that are harmful to both physical and mental health, and can easily develop into a clinical disorder if preventative measures are not implemented. Athletes in particular are vulnerable to disordered eating behaviors, as body size and weight are paramount to success in sport. Coaches, athletes and trainers should be aware of these issues and will benefit from this type of research.

While a fair amount of research has been done on athletic involvement and the development of disordered eating, there have been few studies which have done so using the concept of a disordered eating continuum. The few studies that have used the disordered eating continuum have done so using only a select group of athletes, which limits the generalizability of the results. For example, Petrie (1993) included only college gymnasts. In contrast, the present study included participants from a variety of sports who were classified into two categories for purposes of comparison, those who compete in “lean” sports and those who compete in “nonlean” sports.

Continued research into the existence of an eating disorders continuum is important as there are many individuals who present eating disordered behaviors without meeting the full DSM-IV criteria associated with anorexia nervosa and bulimia nervosa. These behaviors are extremely harmful and can easily develop into a clinical disorder if preventative measures are not implemented. Athletes in particular can be vulnerable, as the body is paramount to success in sport. Coaches and trainers should be aware of these issues and will benefit from this type of research by becoming more informed, and better prepared to lead and advise their athletes.

Finally, this study attempted to counteract the negative beliefs that sport participation in general puts individuals at risk for developing disordered eating behaviors.

CHAPTER TWO

REVIEW OF LITERATURE

In Western society, the prevalence of disordered eating behaviors in women has greatly increased in recent years, concurrent with the decreasing size of the ideal figure (Lucas, Crowson, O'Fallon & Melton, 1999). In an effort to determine specific casual factors associated with this trend, a significant amount of empirical research has been done on the development of disordered eating in recent years (Alex, 1996; Black & Burckes-Miller, 1988; Harris & Greco, 1990; Hausenblas, 1998; Parker, Lambert, & Burlingame, 1994; Shelby, 2000; Smolak, Murnen, & Ruble, 2000; Sundgot-Borgen, 1994a; Thompson & Sherman, 1999; Warren, Stanton, & Blessing, 1990; Wilkins, 1995; Wilkins, Boland, & Albinson, 1991). In addition to the identification of other predisposing variables, participation in athletics has been identified as a correlate of the developing disordered eating. However, sport has been shown to be a deterrent to the development of disordered eating, as well.

Eating Disorders vs. Disordered Eating

A clarification of the differences between clinically diagnosed eating disorders and the general concept of disordered eating is of importance. There are three primary types of clinical eating disorders as defined by the Diagnostic and Statistical Manual of Mental Disorders, or DSM-IV (American Psychiatric Association [APA], 1994): anorexia nervosa, bulimia nervosa, and eating disorders not otherwise specified. Each disorder has specific diagnostic criteria, both behavioral and psychological, that must be met. The criteria for anorexia nervosa are: (1) refusal to maintain body weight (less than 85% of expected body weight); (2) intense fear of gaining

weight; (3) body image disturbance or denial of low body weight; (4) amenorrhea, or absence of at least three consecutive menstrual cycles (APA, 1994). There are two specific types of anorexia: Restricting, in which the individual does not engage in binge eating or purging; and Binge-Eating/Purging, in which the individual does engage in these behaviors (APA, 1994). Individuals with anorexia nervosa use their bodies as a tool in an attempt to maintain a perceived sense of control over their lives; weight loss indicates a sense of success while weight gain results in a sense of failure (Robert-McComb, 2001).

Bulimia nervosa is more common than anorexia nervosa and has the following diagnostic characteristics as listed in the DSM-IV: (1) recurrent episodes of binge eating; (2) recurrent inappropriate compensatory behavior to prevent weight gain, such as self-induced vomiting, misuse of laxatives or other medications, fasting, or excessive exercise; (3) the binge eating and inappropriate behaviors both occur, on average, at least twice a week for three months; (4) self-evaluation is unduly influenced by body shape and weight; (5) the disturbance does not occur during episodes of anorexia nervosa (APA, 1994). The two types of bulimia nervosa are Purging, in which the individual uses self-induced vomiting and/or misuse of laxatives; and Non-purging, in which the individual uses other types of compensatory behavior such as fasting or excessive exercise (APA, 1994). Individuals with bulimia nervosa are characterized as having less self-control and have learned to ignore the sensations of hunger and fullness. Along with a preoccupation with weight, these characteristics lead to uncontrolled eating episodes followed by purging behaviors (Roberts-McComb, 2001).

There are six types of eating behaviors described as an Eating Disorder, Not Otherwise Specified, or ED-NOS, in the DSM-IV. These behaviors meet some, but not all of the criteria for either anorexia nervosa or bulimia nervosa, and are as follows: (1) For females, all of the criteria for anorexia nervosa are met, except for absence of a menstrual cycle; (2) All of the criteria of anorexia nervosa are met, except that, despite significant weight loss, the individual's weight is in the normal range; (3) All of the criteria of bulimia nervosa are met, except that the binge-eating/purging behaviors occur less than twice a week for three months; (4) Regular use of inappropriate compensatory behavior by an individual of normal weight after eating small amounts of food (i.e. no bingeing behavior); (5) Repeatedly chewing and spitting out, but not

swallowing, large amounts of food; (6) Binge eating disorder (i.e. binge eating with no purging behaviors) (APA, 1994). Because the diagnostic criteria for these disorders are not as stringent as those for anorexia nervosa and bulimia nervosa, many more individuals fall into this category. However, while these individuals may have less behavioral characteristics, it is important to reiterate that clinically diagnosed eating disorders are considered psychological disorders. All individuals who are diagnosed with anorexia, bulimia or ED-NOS must present the required psychological components in addition to the associated behaviors.

While a relatively small portion of the general population can be considered as having a clinical eating disorder, a cultural preoccupation with food and the concurrent acceptance of a “thin ideal” as the cultural norm, has led to the development of a new set of eating behaviors, commonly referred to as disordered eating. Disordered eating can be defined as “a wide spectrum of harmful and often ineffective eating behaviors used in attempts to lose weight or achieve a lean appearance” (ACSM, 1997, p. i). Individuals who present disordered eating behaviors are considered to have subclinical eating disorders. While some of these behaviors are described as clinical disorders under ED-NOS in the DSM-IV, Fairburn and Garner (1986) clarify this by differentiating between two types of nonspecified eating disorders, atypical and subthreshold. Atypical refers to individuals who exhibit one or more, but not all, disordered eating criteria. For example, individuals who may binge, but not purge; those who purge, but do not binge; and chronic dieters. Subthreshold refers to persons who meet all of the criteria, but not to sufficient severity (Fairburn & Garner, 1986). An individual who meets all the criteria for anorexia nervosa, but maintains a body weight of less than 90% of expected weight would fall into this category. In addition, individuals with disordered eating do not present all of the psychological characteristics associated with clinical eating disorders.

Accordingly, the prevalence of disordered eating is much greater than that of clinically diagnosed eating disorders. It has been estimated that the majority (64-68%) of college-aged women exhibit some intermediate form of disordered eating behavior (Hesse-Biber, 1989; Mintz & Betz, 1988). Further, it has been proposed that the current social acceptance of the chronic dieter has led even “normal” eating behaviors to consist of disordered aspects. For example, in an article which focuses on preventative measures for disordered eating, Kalodner and Scarano

(1992) included a specific section on interventions for “normal” eaters, stating that, “it seems as though ‘normal’ eating with its emphasis on weight control, may actually be quite abnormal” (p. 35). This is true particularly in the sport community, where athletes often adhere to a special diet during training.

Eating Disorder Continuum

In light of this research, the concept of a disordered eating continuum has been proposed (Mintz & Betz, 1988) that ranges from normal eating behavior to the clinically diagnosed eating disorders of anorexia nervosa and bulimia nervosa. Most importantly, several intermediate categories of eating behavior are recognized: chronic dieting, bingeing, purging, and subthreshold bulimia. These intermediate diagnoses have the following criteria: chronic dieting, food restriction with no bingeing or purging behaviors; bingeing, binge eating with no food restriction or purging behaviors; purging, purging behavior with no food restriction or binge eating; and subthreshold bulimia, engages in food restriction, binge eating and purging, but not to the extent required for bulimia nervosa. In an initial investigation into the validity of the disordered eating continuum, Mintz and Betz (1988) evaluated a sample of college women on several measures including eating behaviors, body satisfaction, self-esteem and internalization of social norms. The results revealed that only 33% of the sample could be considered a “normal” eater, while 64% fell into one of the four intermediary categories. In addition, the distribution of the sample across the six categories supported the continuum model. When focusing on psychological characteristics (body satisfaction, self-esteem and internalization of social norms), a similar trend emerged. It is important to determine if these psychological variables associated with disordered eating also exist on a continuum, as mental factors are often the determining factor in differentiating between clinical eating disorders and intermediate forms of eating behaviors. This sample clearly supported the continuum hypothesis both behaviorally and psychologically.

While much of the literature has supported the concept of an eating disorder continuum, (Hay & Fairburn, 1996; Podar, Hannus, & Allik, 1999; Hesse-Biber, 1989; Mangrum, 1997; Petrie, 1993; Tylka & Subich, 1999) many of the studies have not included all six categories defined by Mintz and Betz (1988). Hay and Fairburn (1996) investigated women with

characteristics of bulimia nervosa. They categorized participants into three categories: most severe, intermediate severity and least severe. Similarly, Podar and colleagues (1999) also grouped participants into three level of severity: normal eating, dieting/food restricting, and diagnosable eating disorder. In addition to behavioral differences, scores on personality inventories also represented a continuum. Specifically, the eating-disordered group reported significantly higher neuroticism scores than the food restricting group, which in turn, scored higher than the normal eaters group. Along the same lines, Mangrum (1997) differentiated between four subtypes of eating: normal/unrestrained eaters, restrained eaters, distressed restrained eaters, and clinically eating disordered. Again supporting the continuum hypothesis, distressed restrained eaters displayed greater psychopathology and personality disorder traits, along with more disordered eating symptoms, than the restrained and unrestrained groups. Additionally, the distressed restrained group was more similar to the clinically eating disordered group on the same variables. Finally, Hesse-Biber (1989) considered another variable in determining intermediary groups, the individual's concern about their pattern of behavior. Accordingly, five categories were developed including ideal, dieters, pre-syndrome, at-risk, and problem eaters. The first two groups were considered in the “normal” eating range, and exhibited only dieting or no symptoms. The last three groups were considered “problematic,” and exhibited increasingly more eating disordered behaviors along with a concern about these behaviors. Considering only behavior indices in sample of college aged women, the results revealed that while the majority of participants fell within the pre-syndrome and at-risk categories, the overall distribution of participants did support the eating disorder continuum.

Tylka and Subich (1999) cited the continuum proposed by Mintz and Betz (1998) as the basis for their study, but chose to combine the four intermediate behaviors of dieter/restrictor, binger, purger and subthreshold bulimia into one category entitled the “symptomatic” group. Normal eaters were labeled as “asymptomatic” and the two groups were compared with the “eating disordered” group on several psychological components including body satisfaction, personality characteristics (including Neuroticism) and dieting locus of control (which refers to an individual's belief in her ability to control her weight). Both Neuroticism and dieting locus of control were found to vary along the three groups, supporting the eating disorder continuum. In

terms of body dissatisfaction, the symptomatic and clinical groups scored significantly higher than the asymptomatic group, but were not significantly different from each other. This may be due to the fact that the four intermediary groups were treated as one. However, overall, body dissatisfaction did increase along the proposed continuum.

One study that did use the six eating disorder categories proposed by Mintz and Betz (1988) was conducted by Petrie (1993). This study extended the continuum research in two ways. First, Excessive Exerciser was added as a separate intermediary category and defined as a individual who engages in excessive exercise, but not binge eating, purging, or dieting/fasting. Secondly, the sample was drawn from the population of college gymnasts, extending the continuum hypothesis into the athletic arena. Comparing the results to Mintz and Betz's 1988 study, the prevalence of intermediary disordered eating behaviors in female college gymnasts (61.3%) was similar to that found in the normal female college population (64%). However, the percentage of gymnasts with clinical eating disorders (16.6%) was higher than that of the normal college population (3.1%). Results from the psychological indices supported the continuum hypothesis as well. It should be noted that 18% of gymnasts fell into the added category of Excessive Exerciser. Scores of these individuals indicated that they may be psychologically different from those in the other categories. This is important when attempting to determine if Excessive Exerciser is truly a unique category along the eating disorder continuum.

Whereas all previous studies in this area focused on women, a study done solely with men did not support the eating disorder continuum (Tylka & Subich, 2002). The authors proposed that this was due to the fact that the measurements that have been developed to diagnose disordered eating are geared towards women. An item from the Eating Disorders Inventory-2 (Garner, 1991) illustrates this phenomenon: "I think that my thighs are too large." While women are usually dissatisfied with their bodies because they think they are too large, men have the opposite thought processes. Men often strive for a muscular, or larger, physical ideal. Further investigation into disordered eating in men is clearly contingent upon the development of more appropriate instruments.

It is important to determine if the psychological variables associated with disordered eating, such as body image, self-esteem and internalization of the thin ideal, also exist on a

continuum, as mental factors are often the key in diagnosing clinical eating disorders and differentiating between intermediate forms of eating behaviors. Accordingly, this study will measure level of body image satisfaction and self-esteem in addition to eating behaviors.

Body Image and General Risk Factors

Studies investigating eating disorders and disordered eating have attempted to identify risk factors that can lead to the development of this behavior. Perfectionist behavior, low self-esteem, overconcern with body weight and appearance, inadequate coping skills, need for control, high distress levels and a strong need for social approval are just a few of these factors (Robert-McComb, 2001). Sundgot-Borgen (1994b) grouped risk factors into four main areas: genetic influence, biological mechanisms, psychological mechanisms and social factors. Gender, age, ethnic background, and socio-economic status fall under genetic influence; body type is considered a biological mechanism; body image, self-esteem, and self-efficacy make up the psychological mechanisms; and media influence, harmful norms, peer group influence and teasing are considered social factors. In this model, all of the above variables are considered to have the same influence on the development of disordered eating behaviors. However, it has been proposed that body image satisfaction has received the most empirical support as a predisposing factor to the development of disordered eating (Kalondner & Scarano, 1992; Mazzeo, 1999; Thompson, Coovert, & Stormer, 1999; Williamson et al., 1995). In fact, many of the above-mentioned variables have been shown to be predictors of body image and body satisfaction itself. These factors then influence disordered eating by way of an individual's body image. Without body image dissatisfaction, disordered eating behaviors do not develop. According to Polivy and Herman (2002), body image dissatisfaction is “a necessary factor in the emergence of eating disorders” (p.194). It is for this reason that body image is investigated in more depth here.

According to Slade (1991), body image was first defined by Schilder in 1935 as “the picture of our own body which we form in our mind, that is to say the way in which the body appears to ourselves” (p. 497). More recently, it has been defined as “the cognitive experience of the physical self” (West-Smith, 1997, p. 2423) and the “perception or attitude one has

regarding the appearance of his or her body” (Garber, 1999, p. 3555). Body image is often thought to have two main parts, a perceptual component, measured by the accuracy of the estimation of one's body size, and an attitudinal component, measured by the feelings towards one's body (Slade, 1991). Morrison (1999) took this idea further by defining body-image evaluation, as thoughts or beliefs about the body, and body-image investment, as behaviors performed to make the body to conform to these beliefs. Clearly, body image is composed of the beliefs which one holds about one's body. But how are these beliefs derived? How does one develop body image?

Several theories have been asserted to describe the relationship between outside forces and body image development. Sociocultural theory suggests that the unrealistic thin ideals that are conveyed by the media contribute to the development of negative evaluations of the body, and, in turn, negative body image (Morrison, 1998). The closely related social comparison theory proposes that evaluations about current body image are made by making comparisons with universalistic targets, such as celebrities and magazine models (Morrison, 1998). Conflicting results were found for the support of these theories. While Morrison's (1998) study found little support for either theory, Mecedá (1996) claimed that it was “difficult to encourage rejection of potential social comparison models” (p. 2220), citing that body image decreased when women were forced to compare their appearance to the media ideal.

Paxton, Schultz, Wertheim, and Muir (1999) proposed that friendship and peer groups influence body image development, particularly in adolescent girls. After accounting for individual factors, the results indicated that friend communication (talk about weight and concerns with thinness) had a significant impact on the development of body image. Further, there tend to be friendship-group norms on eating behaviors and body image concerns. Combining these results with sociocultural theory and social comparison theory, it seems that the influence of peer group affiliation plays a role in how female adolescents internalize the thin ideal promoted by social norms.

Regardless of the specific way in which one's body image is formed, the implications of how society reacts to the appearance of an individual are monumental. Beauty certainly has social benefits. According to Lavin and Cash (1999), “good-looking people may enjoy certain

advantages in life, compared with less attractive individuals, who may be penalized” (p. 52). Further, Henderson-King and Henderson-King (1997) stated that “social rewards are clearly influenced by individuals' physical attractiveness” (p. 400). With these profound statements in mind, the investigation of body image takes on a more significant social connotation.

Many theorists have proposed that media has a significant effect on the development of body image (Borzekowski, Robinson and Killen, 2000; Botta, 1999; Brewis, 1999; Garber, 1999; Madej, 1998; Lavin & Cash, 2001; Ogden & Elder, 1998; Pinhas, Toner, Ali, Garfinkel, & Stuckless, 1999; Reed, 1998; Tiggemann & Pickering, 1996). Societal values have a significant impact on the development of the ideal human figure, for men and women, and media is the catalyst which brings these values and images into our lives. Unfortunately, the media often promotes an unattainable norm, which can lead to the development of a negative body image. This can be seen in the waif-like female figure currently promoted as desirable.

In addressing this issue further, Wegner, Hartmann, & Geist (2000), proposed that viewing magazine photos which promoted a thin ideal would increase body dissatisfaction and heighten body self-consciousness in a sample of college women. The results showed that the participants in the experimental group had increased self-consciousness and were more aware of social comparisons made between their figure and the thin ideal indicating that media does have an effect on body image. Botta (1999) investigated the effects of television media on the body image development of adolescent girls. The results of this study also suggest that media has a negative impact on body image by endorsing a thin, unrealistic ideal body image for women. However, the way in which the subjects processed these images (identified as body image processing) had a greater impact than simply how often they were viewed, suggesting that there are outside factors which mediate the effect that the media has on body image.

Support for these findings can be found in the existing literature (Heinberg & Thompson, 1995; Pinhas et al., 1999; Reed, 1998). Heinberg and Thompson (1995) reported that female participants with high levels of body dissatisfaction experienced an increase in distress after viewing videos featuring a thin ideal. Perhaps more importantly, this same group improved in mood and body satisfaction after viewing videos that did not focus on the thin ideal. Along the same lines, Reed (1998) found that media images promoting a thin ideal had an effect on body

image perception only in women who had been diagnosed with eating disorders. The male sample and women who did not have eating disorders were not affected by these images. Similarly, Pinhas et al. (1999) found that women who scored higher on the Eating Disorders Inventory (EDI) were more vulnerable to thin ideal media images, suggesting that preoccupation with physical appearance in any form allows women to be more susceptible to social pressures to be thin. These differences may be contributed to mediating factors in body image processing that are unique to individuals with eating disorders. However, Lavin and Cash (2001) reported that women who are simply more invested in their appearance are more affected by these stereotyped media images.

Henderson-King and Henderson-King (1997) proposed that there are four factors that mediate the effect of media on body image development: self-monitoring (physical appearance vs. inner beauty), weight, sexual attractiveness and physical condition. To investigate these factors, female participants in an experimental group viewed magazine photos and listened to a conversation, both of which promoted a thin ideal and addressed weight in a negative way. A control group was exposed to media that did not promote a thin ideal. Women who were concerned with physical appearance and social acceptance were positively affected by the magazine images (i.e. they felt better about themselves), but negatively affected by the conversation. Women who were more motivated by inner beauty were not affected by either stimulus. It seems that there are many factors which can mediate the effects of media suggestion, and women are not uniformly influenced by media images.

Contradicting these findings, Garber (1999) reported no relationship between the viewing of television images which promote a thin ideal and negative body image. This was attributed to the fact that body image is an ingrained trait that is not easily manipulated. Yet, Garber's (1999) study did report a negative relationship between reading fashion magazines and body image. Along the same lines, Borzekowski et al. (2000) found that total media did not influence the importance of appearance or weight concerns in adolescent females. However, a correlation was found between these concerns and music videos. Madej (1998) also claimed that media images did not have an effect on body image. Instead, the development of body image perception was contributed to the differences between self-reported actual weight and desired weight. Further,

media exposure was not found to have an effect on the body image of men and women of Samoan decent (Brewis, 1999). This may be due to differing cultural norms which do not promote a thin ideal.

As mentioned earlier, cultural ideals have a profound effect on the development of body image. Accordingly, a review of research which investigates body image dissatisfaction and various sociocultural factors, such as race and ethnicity, is relevant. Ogden and Elder (1998) investigated the mother-daughter relationship in terms of body image and eating behaviors as well as differences between Asian and Caucasian women. While no support was found for the mother-daughter relationship, differences were found cross-culturally. White participants preferred a thinner ideal and reported more food consumption restrictions than their Asian counterparts. In fact, White daughters reported the highest body dissatisfaction scores. This may be due to the fact that the majority of media images promoting thinness are of young, White women. Meceda (1996) also reported significant differences along racial lines. Women of color reported lower levels of body image disturbance than White women. Research focusing on Iranian participants had similar results. Both Iranian men and women experienced a more positive body satisfaction than their American counterparts (Akiba, 1998). As the access to any kind of media in Iran is severely restricted, the author speculated that body esteem seems to be associated with the availability of “body conscious” information (Akiba, 1998, p.540). However, the male participants scored higher than the female participants in both countries, indicating that women are more concerned with their appearance than men in both cultures.

While these findings are compelling, other studies focusing on cultural influences on body satisfaction found contradictory results. Dittrich (1998) reported that body image dissatisfaction occurs cross-culturally as well as socioeconomically; body dissatisfaction crosses racial and social boundaries. The internalization of the thin ideal was found to be the most significant predictor of disordered body image, regardless of cultural background. Those who had not internalized the thin ideal reported less body image disturbance. Supporting this finding, Thomas (1989) attributed moderate findings between self-esteem and body satisfaction in Black women to the fact that these women may not have internalized a thin ideal. This was attributed

to the racial background of the participants. However, in this sample, the perception of significant others was found to be the strongest predictor of body satisfaction.

Body Image and Athletic Involvement

Tiggemann (2001) investigated several types of life concerns and leisure activities and their impact on body image dissatisfaction and self-esteem in adolescent girls. The life concerns investigated in this study included Slimness, Physical Attractiveness, Intelligence, Academic Success and Sporting Success. Slimness was found to be the single major predictor of body dissatisfaction. However, sport participation was associated with higher self-esteem and lower body dissatisfaction. In addition, Tiggemann (2001) reported that sport participation may protect against the development of self-objectification, which occurs when women view themselves in terms of an observer's perspective.

As Tiggemann's (2001) results suggest, participation in sport can lead to increased self-esteem and body image, or greater satisfaction with one's current physique. Accordingly, there has been abundant research investigating this relationship (DiNucci, Finkenber, McCune, McCune, & Mayo, 1994; Hoganbraun, 1998; Richman & Shafer, 2000; Snyder & Kivlin, 1975; West-Smith, 1997). However, these studies have found conflicting results. Hoganbraun (1998) focused on the overall psychological well-being in a sample of pre-adolescent girls. She reported a significant difference between athletes and nonathletes on measures of self-esteem (in terms of how one feel about one's behavior) and body image (in terms of fitness readiness). Those girls participating in sports had more positive results on both measures. Focusing on female college students, Richman and Shafer (2000) proposed that sport participation in high school will have a positive impact on girls' self-esteem in college. However, the authors specified that this will only occur if participation in sport impacts the sport-related parts of self-esteem, namely, body image, physical competence, and gender flexibility. The results of the study revealed that sport participation does have a positive effect on body image, physical competencies and gender flexibility, thereby increasing self-esteem. Novick (1998) also examined the effects of sport on self-esteem, body image and gender role orientation in college-aged female students. However, in addition to investigating the effect of sport

participation, subjects who participated in extracurricular activities other than sports were also included. In this sample college women who participated in sport had higher body esteem than those who did not participate in sport.

In addition to investigating the effect of general sport participation on body image in general, Snyder and Kivlin (1975) proposed that there would be a difference by type of sport. After supporting previous research by reporting a positive relationship between overall athletic participation and psychological well-being, they looked possible differences between a sample of female gymnasts and basketball players. While they reported that gymnasts posted higher scores on measures of psychological well-being, the difference was not statistically significant. Further, both groups registered equally positive body image scores. These findings caused the authors to speculate that these athletes viewed their bodies in terms of how they are used in their respective sport and not by the thin ideal promoted by social norms. DiNucci and colleagues (1994) also investigated possible differences in the body esteem of athletes by type of sport. Their results support those of Snyder and Kivlin (1975); while differences were found between the athlete and nonathlete samples, no difference was found between women who participated in basketball, softball and volleyball, respectively.

Other research that focused on specific sports and the development of body image also acknowledges the performance component (Pierce & Daleng, 1998; Ziegler, Khoo, Sherr, Nelson, Larson & Drewnowski, 1998). In investigating elite female dancers, Pierce and Daleng (1998) state that dancers could be particularly susceptible to body image distortion as there is an expectation of physical performance in addition to an “aesthetic ideal” (p. 769). Accordingly, the dancers in their study reported significant differences in current and ideal body ratings, indicating the presence of body image distortion. However, a more poignant example of the pressures of performance can be found in a study focusing on elite figure skaters. Ziegler et al. (1998) reported that both male and female figure skaters desired to lose weight, even though they were generally satisfied with their body shape and physical attractiveness, and perceived themselves as underweight. Clearly, this sample differs from the general population in that negative body image and the fear of being overweight were not the main motivators of desired

weight loss. This led to authors to conclude that the dieting behaviors of these athletes were “simply mandated by the unique demands of this particular sport” (p. 426).

In one of the few studies focusing solely on male athletes, Huddy and Cash (1997) looked at the body image attitudes of male marathon runners. They proposed that marathon runners would score higher on two dimensions of body image: the evaluative dimension, measured by satisfaction with appearance, fitness or health; and the investment dimension, which pertains to the “cognitive and behavioral importance one places on these physical attributes” (p. 229). Their results revealed that the runners had more favorable scores on the evaluative dimension for appearance, fitness and health. Though on the investment dimension, the runners scored higher only on the fitness and health attributes; they were not as invested in their appearance. However, overall, the male marathon runners in this sample had a more positive body image than their nonathletic counterparts.

While societal norms of thinness will undoubtedly have an effect on the body image development of athletes, participation in sport appears to mediate some of these messages. Further, performance demands that are unique to each sport may cause differences in specific behavior related to body image. Those athletes who participate in sports in which a thin physique enhances performance may feel more pressure to maintain a smaller figure than those athletes participating in sports where a svelte figure is not beneficial, regardless of aesthetic considerations.

Self-Esteem

Of the many factors that have been investigated in relation to disordered eating, self-esteem has been one of the most common (Cervera et al., 2003; Croll, Neumark-Sztainer, Story, & Ireland, 2002; Ghaderi, 2003, Gual et al., 2002). Self-esteem has been defined by Rosenberg (1965) as “a positive or negative attitude toward a particular object, namely, the self... High self-esteem, as reflected in our scale items, expresses the feeling that one is ‘good enough.’ The individual simply feels that he is a person of worth” (p. 30). While self-esteem has been conceptualized as both a trait and state-like process, studies conducted by Trzesniewski, Donnellan, and Robins (2003) on the stability of self-esteem revealed that it is relatively stable

over time and should be regarded as a trait-like construct. The authors liken self-esteem to personality traits in that they show similar levels of stability. Given these findings, it seems reasonable to assume that self-esteem is stable enough to have a significant influence over behavior.

Cervera and colleagues (2003) focused on self-esteem and perfectionism as predictors of disordered eating behavior in a sample of Spanish women. Using self-report questionnaires and psychiatrist interviews, the authors conducted a longitudinal study by evaluating subjects at baseline and at an eighteen-month follow up. The results revealed a negative relationship between self-esteem and incidence of disordered eating; girls who were identified as eating disordered at follow-up reported significantly lower self-esteem at baseline. Further, participants who reported the highest levels of self-esteem had a 69% relative reduction in the risk of developing disordered eating behaviors. These authors manipulated this data further by considering the effect of self-esteem and perfectionism together (Gual et al., 2002). The sample was divided into four groups, or quartiles, based on self-esteem scores. Quartile One consisted of women who reported the lowest self-esteem while Quartile Four consisted of women who reported the highest levels of self-esteem. The same was done with perfectionism scores. Participants were then placed in one of sixteen categories based on both their self-esteem and perfectionism scores, and the prevalence of disordered eating in each group was calculated. The women that scored the lowest on self-esteem and highest on perfectionism were fourteen times more likely to develop disordered eating behaviors than those who scored highest on self-esteem and lowest on perfectionism. These findings indicate that while self-esteem in and of itself is a significant risk factor, when it is combined with the effects of other risk factors, the outcome can be extremely detrimental.

In another longitudinal study (Ghaderi, 2003), self-esteem, social support, coping technique, and body concern were investigated as risk factors for the development of disordered eating. Baseline data was collected from a sample of 807 women, ranging in age from 18-32 years, using self-report questionnaires. Follow-up data was collected two years after baseline using the same instruments. Information gathered from baseline was used to determine risk factors while the information gathered at the two-year follow-up was used to determine level of

disordered eating. Causal modeling was used to develop a structural model which indicated that low self-esteem, low social support from the family, high use of escape coping techniques, and high levels of body concern are risk factors that can be casually linked to the development of disordered eating behaviors.

Croll and associates (2002) investigated both risk and protective factors related to disordered eating in an adolescent sample. Girls in ninth and twelfth grades completed self-report survey that included questions regarding disordered eating behaviors, socioeconomic factors, behavioral factors (such as cigarette smoking and alcohol consumption), and personal factors (such as self-esteem and appearance concerns). The results indicated that 55% of the girls in this sample engaged in disordered eating behaviors. Further, these participants scored significantly lower on self-esteem measures. Conversely, participants who reported no aberrant eating behaviors scored significantly higher on self-esteem measures. These findings lead the authors to conclude that not only is low self-esteem a risk factor, but high self-esteem is a protective factor.

In the previous studies, self-esteem was investigated as a global construct. However, there are many authors who believe that self-esteem consists of several different domains, one of which is related to body and appearance (Bardone, Perez, Abramson, & Joiner, in press; Geller, Zaitsoff, & Srikameswaran, 2002; Mendelson, McLaren, Gauvin, & Steiger, 2002; Tchanturia, Troop, & Katzman, 2002). If this theory is correct, it is important, then, to determine what portion of global self-esteem is based on body and appearance. The Shape and Weight-Based Self-Esteem Inventory (Geller, Johnston, & Madsen, 1997) was developed specifically for this purpose. Participants are asked to divide a circle into pieces such that each piece reflects the importance of nine possible pre-listed attributes. These attributes include school/work, face, body, personality, friendship, intimate relationships, personal development, competence other than school/work and other. In a sample of high school girls, “body” ranked third as the most important determinant of overall self-esteem, behind “friendships” and “personality,” respectively (Geller et al., 2002). In fact, 20.8% of participants ranked “body” as the most important factor in determining their overall self-esteem. Further investigation into the eating behaviors of this sample revealed that basing self-esteem on body and weight characteristics was

related to an increase in disordered eating behaviors and lower global self-esteem. Tchanturia and colleagues (2002) used the Shape and Weight-Based Self-Esteem Inventory in a study focusing on women of Eastern European descent. While the degree to which overall self-esteem was based on weight and shape was lower than in Western samples, those women who did base self-esteem on weight and shape reported more disordered eating symptoms.

Mendelson and associates (2002) also investigated the relationship between body esteem and global self-esteem, but did so using a diagnosed clinical sample and a nonclinical sample. Specifically, this study attempted to determine to what extent body esteem predicts global self-esteem. To do so, a hierarchical regression was used with global self-esteem as the outcome variable, and body esteem and participant status (i.e. eating disordered vs. non eating disordered) as the predictor variables. The results indicated a positive relationship between body esteem attribution and self-esteem in women with eating disorders. In the nonclinical sample, this relationship was not significant. These findings suggest that body esteem is more central to overall self-esteem in women with eating disorders than for women who do not engage in disordered eating behaviors.

While many authors have proposed that self-esteem is a multidimensional construct in that it consists of several domains (i.e. appearance, social skills, career success), self-esteem has also been conceptualized as multidimensional in terms of the way in which it is experienced. These theorists state that self-esteem has two dimensions, self-liking and self-competence (Tafarodi & Swann, 1995; Bardone et al., in press). Self-liking refers to feelings of social worth and likeability; self-competence refers to an overall sense of capability and effectiveness (Trafordi & Swann, 1995). It is important to emphasize that these dimensions are inherently different than the domains of self-esteem discussed previously. As Bardone (in press) states, “self-competence and self-liking are conceptualized as global measures (i.e. not-domain specific) that together make up global self-esteem” (p. 5).

It has been proposed that self-competence and self-liking have different relationships with disordered eating behaviors, specifically those symptoms associated with bulimia. By collecting data at baseline and at an eleven-week follow up, Bardone and colleagues (in press) investigated the relationship between self-competence and self-liking and change in bulimic

symptoms in a sample of college women. Self-report questionnaires revealed a negative relationship between both dimensions of self-esteem and bulimic symptoms; lower scores on self-competence and self-liking were associated with higher levels of disordered eating. Further, while both dimensions were found to be significant in predicting symptomology, self-competence was more powerful in predicting change in bulimic behaviors. Due to this finding, the authors suggest that self-liking may be more contributory to other stages of bulimia.

As stated previously, self-esteem is an important factor in the development of disordered eating behaviors. While low self-esteem has been shown to be a risk factor, high self-esteem has been highlighted as a protective factor (Croll et al, 2002). Proponents of participation in organized sport have claimed that athletic involvement can improve self-esteem (Richman & Shaffer, 2000; Smith, 1994). If this theory is correct, sport participation could prove to be a catalyst in reducing the development of disordered eating behaviors by increasing self-esteem.

Disordered Eating and Athletic Involvement

It has been proposed that involvement in athletics can increase an individual's risk of developing disordered eating (Alex, 1996; Black & Burckes-Miller, 1988; Harris & Greco, 1990; Hausenblas, 1998; Parker, Lambert, & Burlingame, 1994; Shelby, 2000; Smolak, Murnen, & Ruble, 2000; Sundgot-Borgen, 1994a; Thompson & Sherman, 1999; Warren, Stanton, & Blessing, 1990; Wilkins, 1995; Wilkins, Boland, & Albinson, 1991). While some of these studies supported this hypothesis (Alex, 1996; Black & Burckes-Miller, 1988; Thompson & Sherman, 1999), many others have found that athletic involvement per se does not put individuals at risk (Harris & Greco, 1990; Hausenblas, 1998; Parker et al., 1994; Shelby, 2000; Warren et al., 1990; Wilkins, 1995), and may even serve as a “protective factor” to the development of disordered eating (Smolak, 2000; Wilkins, 1995; Wilkins et al., 1991).

In investigating female runners as compared to a group of eating-disordered women, Parker and colleagues (1994) found that the collegiate female runners scored significantly lower than the eating-disordered group on scales specifically designed to determine level of psychopathology related to eating disorders. Of four groups tested, runners with normal eating, runners with disordered eating, nonathletes with normal eating and the eating-disordered group,

only the latter group reported psychopathology scores consistent with diagnosable eating disorders. Similarly, Harris and Greco (1990) found that while college-aged female gymnasts were concerned with their weight and body appearance, they did not engage in pathological weight loss methods. In addition, those women competing at elite levels had less body dissatisfaction than those competing at lower levels. The authors proposed that these gymnasts may have a natural body type that is predisposed to the ideal body type for their chosen sport. Finally, Hausenblas (1998) conducted a meta-analysis on studies that compared athlete and nonathlete samples and found that female athletes are not at a greater risk for developing eating disorders as compared to nonathletes and female clinical populations.

Wilkins and colleagues (1991) investigated collegiate athletes as compared to a nonathletic sample and found that athletes scored more positively than their nonathletic counterparts. Athletes had higher self-esteem, less body dissatisfaction, and were less likely to perceive themselves as overweight. Further, athletes indicated less disturbed behavior on measurements of disordered eating. A meta-analysis by Smolak (2000) confirmed many of these findings; athletes overall showed less body dissatisfaction. However, athletes who participated in sports which emphasize a thin, or lean, “ideal” body type may be more at risk for developing disordered eating behaviors. While swimmers, gymnasts and runners scored equally to nonathletes, indicating no difference in behavior, dancers and cheerleaders did present more eating disordered behaviors. In contrast, athletes who participated in sports that do not emphasize a lean body type scored better than nonathletes, indicating a “protective effect” (Smolak, 2000).

As Smolak's meta-analysis suggests, type of sport may be an important variable in determining if athletes will develop disordered eating. When investigating type of sport, sports are usually dichotomized, with one grouping of sports considered “at-risk” and the other grouping “not at risk” (Ciervo, 1998; Dale & Landers, 1999; Parker et al., 1990; Sundgot-Borgen, 1994a). More specifically, sports which are weight-class dependent, such as wrestling; have an aesthetic component, such as figure skating; or favor a lean body type, such as running, are compared to sports in which body type is not as crucial to success, such as basketball, hockey, golf or tennis. Ciervo (1998) defined at-risk sports as cross-country,

gymnastics, swimming and diving, while grouping basketball, crew, fencing, golf, lacrosse, soccer, softball, track & field, field hockey and tennis in the non at-risk category. Whereas the athlete sample in general reported less disordered eating thoughts and behaviors than a nonathlete control group, within the athlete sample, those individuals who participated in at-risk sports had more disordered eating symptoms than those in non at-risk sports. Similarly, Sundgot-Borgen (1994a) found that disordered eating was more prevalent in athletes who participated in aesthetic (diving, figure skating, gymnastics, dance) and weight-dependant (judo, karate, wrestling) sports as compared to athletes in technical, endurance, power and ball/team sports.

In contrast to these findings, Parker and colleagues (1990) reported that cross-country runners and gymnasts did not present more eating disordered symptomology than an athlete control group (basketball, golf, swimming, tennis, volleyball) and a nonathlete control group. In fact, the nonathlete control group reported the greatest body dissatisfaction of all groups. Further, all athletes, regardless of sport, fell into the normal range in terms of body mass index and eating behavior. Dale and Landers (1999) also found that athletes in a weight-dependent sport did not develop eating disordered behavior; wrestlers at the high school level did not present behaviors and attitudes that are consistent with bulimia nervosa as compared to a nonathlete sample.

Many of the discrepancies in the research which focuses on type of sport may be attributed to the fact that classification of sport as at-risk or not at-risk is left to the discretion of the researcher. The development of a standard classification system would be helpful in addressing this problem. The American College of Sports Medicine (1997) has differentiated five categories of at-risk sports: (1) Sports in which performance is objectively scored - dance, figure skating, diving, aerobics; (2) Endurance sports emphasizing low body weight - distance running, cycling, cross-country skiing; (3) Sports requiring body contour-revealing clothing - volleyball, swimming, diving, track, cheerleading, cross-country running; (4) Sports using weight categories - horse racing, wrestling, judo, rowing; (5) Sports emphasizing a prepubertal body type for success - gymnastics, figure skating, diving. While several sports fall into more than one category, this classification system may be a beginning in the development of a more standard measure.

Sport-specific Risk Factors and Disorders

Given the research in this area, it is clear that there are many variables which must be taken into consideration when evaluating the role of sport participation in the development of disordered eating (Berry & Howe, 2000; Sundgot-Borgen, 1994b; Williamson et al., 1995). Berry and Howe (2000) proposed that social pressure, self-esteem, body image and competition anxiety are the main predictors of disordered eating in female athletes. In investigating women who were currently participating on a collegiate varsity athletic team, the authors found that all four factors were significantly correlated with unhealthy eating behaviors. These findings were true across type of sport as well, indicating that all athletes who are exposed to these risk factors are equally susceptible to disordered eating. As mentioned earlier, body image, or body dissatisfaction, is often considered to have more influence in the development of disordered eating than other factors. Williamson and colleagues (1995) investigated this concept by proposing that body image is a mediating variable for other potential risk factors such as social influence, performance anxiety and appraisal of athletic achievement. Results indicated that body image, or body concern, was a mediating variable for the three other factors. These findings suggest that disordered eating behavior will only develop if the athlete is over concerned with body shape, or has a negative body image, even if other risk factors are present. After conducting a meta-analysis of studies which investigated both general and sport-specific risk factors, Sundgot-Borgen (1994b) developed an inclusive model of variables that influence the development of disordered eating. General risk factors are grouped into four main categories, genetic influence, biological factors, psychological mechanisms, and social factors, and are listed as “predisposing factors.” Sport-specific risk factors are grouped into two categories, High Risk and Low Risk. High Risk factors are as follows: (1) recommendation to lose weight, or dieting, without guidance; (2) start of sport specific training at an early age; (3) start of dieting at an early age; (4) low acceptance of puberty, from a performance perspective; (5) sudden increase in training volume; (6) injury; and (7) loss of coach. Accordingly, the Low Risk factors are: (1) recommendation to lose weight, or dieting, with guidance; (2) start of sport specific training at a later age; (3) start of dieting at a later age; (4) high acceptance of puberty, from a performance

perspective. This model indicates that eating disordered behavior will develop only when general, predisposing factors, such that the athlete is considered vulnerable, are coupled with high risk sport-specific factors. Interestingly, this model includes body image in the general category of psychological mechanisms and not as a separate mediating variable.

In investigating the relationship between the development and identification of disordered eating characteristics and successful participation in athletics, some have suggested that the two are surprisingly similar (Thompson & Sherman, 1999). Not only does this imply causation in the relationship, but it also makes identification of possible at-risk athletes more difficult. Thomson and Sherman discuss this relationship in their article *“Good athlete” traits and characteristics of anorexia nervosa: Are they similar?* They define six pairs of characteristics that they believe are similar, the first for success in athletics and the latter for anorexia nervosa: mental toughness/asceticism; commitment to training/excessive exercise; pursuit of excellence/perfectionism; coachability/overcompliance; unselfishness/selflessness; and performance despite pain/denial of discomfort. When reviewing these pairs of characteristics, it is difficult not to see the parallels. It is not surprising that disordered eating has become an important topic of discussion in the study of sport. The prevalence of disordered eating cannot be overlooked, as the last twenty years has seen subclinical eating disorders specific to sport emerge.

Two subclinical eating disorders that are specific to athletes have been defined in the literature, Anorexia Athletica and the Female Athlete Triad. The term Anorexia Athletica was first introduced by Puglise (1983) and more clearly defined with diagnostic criteria by Sundgot-Borgen (1994). These criteria are similar to that of anorexia nervosa, but are not as stringent and are more cognizant of an athlete's training schedule. For example, individuals with anorexia athletica engage in excessive exercise that is in addition to their normal training. Other diagnostic criteria for anorexia athletica are categorized as absolute criteria and relative criteria. Absolute criteria is: (1) refusal to maintain body weight, less than 95% of expected body weight; (2) excessive fear of becoming obese; (3) restriction of food intake, less than 1200 kcal/day; and (4) absence of other medical illness. Relative criteria include: (1) distorted body image; (2) amenorrhea, in females; (3) purging behaviors, such as self-induced vomiting or misuse of

laxatives; (4) binge eating; and (5) gastrointestinal complaints (Sundgot-Borgen, 1994). Some athletes with anorexia athletica may also be diagnosed with a more clinical disorder under the DSM-IV's ED-NOS. In the present study, anorexia athletica is added to the eating disorders continuum as a fifth intermediary disordered eating behavior.

The Female Athlete Triad incorporates three components, two of which are symptoms of anorexia athletica, disordered eating and amenorrhea. The third component in the Triad is essentially a complication of the first two: osteoporosis. Disordered eating and lack of nutrition leads to the postponement of cessation of the menstrual cycles, which in turn results in the decreased production of ovarian hormone and estrogen; the primary cause of premenopausal osteoporosis is the decreased production of ovarian hormone and estrogen (ACSM, 1997). Clearly, the Female Athlete Triad is a dangerous and harmful cycle. Not only does it decrease athletic performance in terms of lack of endurance and muscle response, but it also increases the risk of injury due to decreased bone density.

Previous literature has supported the notion of an eating disorders continuum (Hay & Fairburn, 1996; Podar, Hannus, & Allik, 1999; Hesse-Biber, 1989; Mangrum, 1997; Petrie, 1993; Tylka & Subich, 1999). However, only Petrie (1993) did so using a sample of athletes, college gymnasts. The concept of a continuum has not been investigated using a sample of athletes from many different types of sport. While many studies have found that involvement in athletics can increase an individual's risk of developing eating disordered behaviors (Alex, 1996; Black & Burckes-Miller, 1988; Thompson & Sherman, 1999), other studies have reported that this is not the case (Harris & Greco, 1990; Hausenblas, 1998; Parker et al., 1994; Shelby, 2000; Warren et al., 1990; Wilkins, 1995). Further study into this area must be done in attempt to clarify these conflicting findings.

Body image dissatisfaction is a necessary factor in the development of disordered eating behaviors (Polivy & Herman, 2002), and has been shown to be a mediating variable for other risk factors in athletes (Williamson et al., 1995). Self-esteem has also been shown to have a negative relationship with the development of disordered eating behaviors (Cervera et al., 2003; Croll et al., 2002; Ghaderi, 2003). This study will attempt to determine if the psychological variables of body satisfaction and self-esteem also exist in relation to a disordered eating

continuum. This distinction is important, as mental factors are often key in diagnosing clinical eating disorders and differentiating between intermediary forms of behaviors.

Purpose of the Study

While research focusing on the many factors that can lead to the development of disordered eating is important, this study attempted to investigate only one variable that is unique to the athletic environment, type of sport. Moreover, the concept of an eating disorder continuum was used in this investigation, in lieu of the dichotomy of “healthy eating” versus “eating disorder.” As disordered eating includes many types of behavior, a disordered eating continuum was used to illustrate this relationship. This continuum recognizes several subclinical eating disorders in addition to clinically diagnosable disorders such as anorexia nervosa and bulimia nervosa.

The purpose of this study was to investigate athletic involvement and the development of disordered eating in women; specifically, to determine if there is a difference between collegiate varsity athletes and the general university population. Additionally, it focused on differences between those who participate in sports in which a lean figure is conducive to success and sports in which a lean figure is not conducive to success. Significant differences between college-aged female athletes and nonathletes on the disordered eating continuum were not predicted. The two groups were expected to present similar symptomology which are reflective of the female college population as a whole. Similarly, differences in the eating behavior of the “athlete” group by type of sport were not predicted. Specifically, those athletes participating in “lean” sports were expected to report the same disordered eating behaviors than those in “nonlean” sports. With regard to body satisfaction and self-esteem, it was proposed that those individuals with eating disordered symptoms will present higher levels of pathology than those without eating disordered symptoms. These propositions were based on previous studies which reported similar results (Hausenblas, 1998; Parker, Lambert, & Burlingame, 1994; Petrie, 1993; Shelby, 2000; Warren, Stanton, & Blessing, 1990; Wilkins, 1995).

Research Questions and Hypotheses

The following research questions and hypotheses were proposed:

1. Will there be a difference in disordered eating behaviors and corresponding psychological variables between female athletes and nonathletes as illustrated by a disordered eating continuum?

H1: Female athletes and nonathletes will be distributed similarly along a disordered eating continuum as measured by the EDE-Q4.

H2: Female athletes and nonathletes will be distributed similarly in terms of body satisfaction and self-esteem as measured by the Body Dissatisfaction Scale of the EDI, and the Rosenberg Self-Esteem Scale.

2. Will there be a difference in disordered eating behaviors by type of sport as illustrated by a disordered eating continuum and associated psychological variables?

H3: Athletes in “lean” sports and “nonlean” sports will be distributed similarly along a disordered eating continuum as measured by the EDE-Q4.

H4: Athletes in “lean” and “nonlean” sports will be distributed similarly in terms of body satisfaction and self-esteem as measured by the Body Dissatisfaction Scale of the EDI and Rosenberg Self-Esteem Scale.

3. Will there be a relationship between eating behaviors and the associated psychological variables of body satisfaction and self-esteem?

H5: Individuals who do exhibit disordered eating behaviors will report less body satisfaction and lower self-esteem than individuals who do not exhibit disordered eating behaviors, as measured by the Body Dissatisfaction Scale of the EDI and the Rosenberg Self-Esteem Scale.

CHAPTER THREE

METHODOLOGY

Participants

The sample for this study consisted of 200 female athletes and nonathletes who were currently attending a major Southeastern university. Women who were competing on an NCAA Division I varsity athletic team were considered “athletes” for this study. Participants for the “nonathlete” sample were drawn from an introductory undergraduate psychology course. The “athlete” sample was further differentiated based on the type of sport in which the individual participated: sports in which a lean body type is conducive to performance, or “lean” sports, and sports in which a lean body type is not conducive to performance, or “nonlean” sports. For this study cross country, diving, and swimming were considered “lean” sports, and basketball, golf, soccer, and tennis were considered “nonlean” sports.

Instrumentation

Three existing paper and pencil inventories were used to complete this study, including the Eating Disorder Examination Questionnaire, the Rosenberg Self-Esteem Scale, and the Body Dissatisfaction Scale of the Eating Disorder Inventory. Three additional questions pertaining to height, present weight, and desired weight were also included (see Appendix A). In addition to the scoring procedures that are specific to each inventory, participants who fell into the “symptomatic” category as defined by the Eating Disorder Examination Questionnaire were

further classified using criteria that were produced in the development of the eating disorders continuum.

Eating Disorder Examination Questionnaire (EDE-Q4)

The EDE-Q4 is a self-report version of the Eating Disorder Examination, which is an investigator-based interview developed by Fairburn and Cooper (1993; See Appendix B). It consists of 36 items that assess eating behaviors and feelings related to one's body, and requires five to ten minutes to complete. Questions are presented in one of two formats: Likert scale, or dichotomous (yes/no) with an open-ended follow up question. Likert scale questions include "How dissatisfied have you felt about your weight?" and "How concerned have you been about other people seeing you eat?" An example of a dichotomous, open-ended follow-up item would be: "Have you exercised hard as a means to control your shape or weight?" (Yes/No); "How many times have you done this over the past four weeks?"

The EDE-Q4 evaluates both behavioral and psychological aspects of eating. The items of the EDE-Q4 can be divided into five groups: Diagnostic Items, the Shape Concern subscale, the Weight Concern subscale, the Restraint subscale, and the Eating Concern subscale. Diagnostic items focus on the specific behaviors that are associated with disordered eating. The four subscales focus on distinct aspects of eating disorder psychopathology. Subscale scores are obtained by summing the scores on each item in a particular subscale and dividing by the number of items. Both types of items are used to classify respondents into categories based on DSM-IV criteria for eating disorders.

Test-retest reliability for the four EDE subscales has been reported for this measure (Luce & Crowther, 1999). Testing over a two-week period revealed Pearson correlations of .81, .94, .92, and .87 for Restraint, Shape Concern, Weight Concern, and Eating Concern, respectively. Further, internal consistency was reported to be above .80 for all four subscales. Statistically significant correlations were also reported for diagnostic items. Pearson correlation coefficients for Binge Eating, Self-Induced Vomiting, Laxative Misuse, and Diuretic Misuse were reported as .68, .92, .65, and .54, respectively. All were found significant at the $p < .001$ level.

The EDE-Q4 was chosen for this study because it differentiates between those individuals who have diagnosable eating disorders, those who only exhibit some eating

disordered symptoms, and those who have no disordered eating behaviors. This type of differentiation is important when investigating disordered eating as a continuum of behaviors.

Rosenberg Self-Esteem Scale

The Rosenberg Self-Esteem Scale (Rosenberg, 1965) measures an individual's level of self-acceptance using ten statements such as "I feel that I have a number of good qualities" on a Likert scale response system (See Appendix C). The individual indicates how much they agree with each statement on a scale of one to four, with one indicating "strongly agree" and four indicating "strongly disagree." To score the items, a value is assigned to each response. For items one, two, four, six and seven, "strongly agree" receives a value of three and "strongly disagree" receives a value of zero. Items three, five, eight, nine, and ten are scored in the opposite way, with "strongly agree" receiving a value of zero and "strongly disagree" receiving a value of three. Total scores then range from zero to thirty; a higher score indicates low self-esteem.

As one of the most widely used self-esteem scales in the study of social science, the Rosenberg Self-Esteem Scale has high reliability. Test-retest correlations range from .82 to .88 and Cronbach's alpha from various samples has been reported as ranging from .77 to .88 (Blascovich & Tomaka, 1993). Internal consistency has been reported as .93 (Mendelson et al., 2002).

Body Dissatisfaction Subscale of the Eating Disorder Inventory

The Body Dissatisfaction Subscale from the EDI (Garner, Olmstead, & Polivy, 1983) is a nine-item scale designed to measure satisfaction/dissatisfaction with one's body (See Appendix D). The participant is asked to rate level of satisfaction with the size and shape of his or her body using a six-point Likert scale. Higher scores indicate more body dissatisfaction. The EDI is a 64-item scale which examines features and behaviors that are associated with the eating disorders anorexia nervosa and bulimia nervosa. This instrument is based on the assumption that disordered eating is multidimensional, and therefore consists of eight subscales, including Drive for Thinness, Bulimia, Body Dissatisfaction, Ineffectiveness, Perfectionism, Interpersonal Distrust, Interoceptive Awareness, and Maturity Fears. Espelage and associates (2003) tested the

internal consistency of the EDI and reported Cronbach's alphas for the eight subscales ranging from .80 to .92, with the Body Dissatisfaction Subscale reporting .92.

Eating Disorders Continuum Criteria

This study employed criteria that were developed from an eating disorders continuum presented by Mintz and Betz (1988). This continuum defines several types of clinical and subclinical disordered eating while acknowledging intermediate eating behaviors (See Figure 1). The clinical diagnoses are Bulimia Nervosa and Anorexia Nervosa. The subclinical eating behaviors include, Dieting/Restricting, Excessive Exercising, Binge Eating, and Subthreshold Bulimia. In addition, for this study, the subclinical eating disorder Anorexia Athletica was placed along the eating disorders continuum (See Figure 2). Based on her responses on the EDE-Q4, Body Dissatisfaction Scale of the EDI, and the Rosenberg Self-Esteem scale, each participant will be placed in one of eight categories (see Appendix E). The criteria for each of these categories are as follows.

Normal

Eating behavior in which the individual exhibits no binge eating, purging behaviors, no fasting or dieting, and no excessive exercising.

Dieting/Restricting

A disordered eating behavior in which the individual restricts food intake but does not excessively exercise, binge, purge, or meet the criteria for anorexia athletica.

Excessive Exercising

A disordered eating behavior in which the individual uses excessive exercise to rid the body of calories from ingested food, but does not actively restrict food intake, binge, purge, or meet the criteria for anorexia athletica.

Binge Eating

A disordered eating behavior in which the individual consumes an amount of food within a discrete period of time (e.g., any two-hour period), that is definitely larger than most people would eat in a similar period of time (DSM-IV,

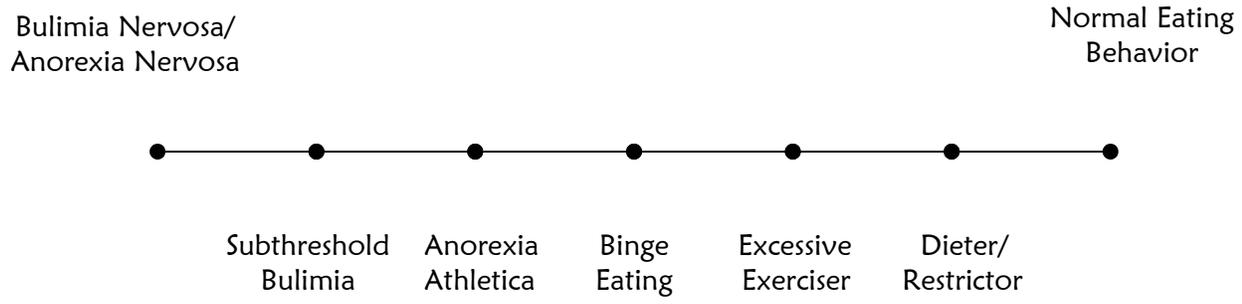


Figure 1. Eating Disorder Continuum.



Figure 2. Eating Disorder Continuum with Five Sample Subjects.

1994), but does not engage in compensatory behaviors, restrict food intake, or meet the criteria for anorexia athletica.

Anorexia Athletica

A subclinical eating disorder that has the following diagnostic criteria: weight loss resulting in 95% of expected body weight, intense fear of gaining weight, restriction of food intake, and an absence of another medical disorder. Additional symptoms include one or all of the following: compulsive exercise, distorted body image, menstrual dysfunction, delayed puberty, binge eating, purging behaviors and gastrointestinal complaints (Sungdot-Borgen, 1994b)

Subthreshold Bulimia

A subclinical eating disorder in which the individual engages in all the behaviors associated with bulimia, but not to the level of severity required for the clinical diagnosis of bulimia nervosa (Fairburn & Cooper, 1983).

Anorexia Nervosa

A clinical eating disorder that has the following diagnostic criteria: refusal to maintain body weight resulting in a body weight of less than 85% of expected; intense fear of gaining weight; disturbance in the way body weight or shape is experienced; and the absence of a menstrual cycle. Weight loss is accomplished through dieting, fasting and excessive exercise (DSM-IV, 1994).

Bulimia Nervosa

A clinical eating disorder that has the following diagnostic criteria: recurrent episodes of binge eating and subsequent inappropriate compensatory behavior in order to prevent weight gain occurring for at least twice a week for three months; self-evaluation that is unduly influenced by body shape and weight; and disturbance that does not occur during episodes of anorexia nervosa. Inappropriate compensatory behaviors include self-induced vomiting; misuse of laxatives, diuretics,

enemas, or other medications; fasting; or excessive exercise (DSM-IV, 1994).

Procedure

After obtaining approval from the Florida State University Internal Review Board, the researcher contacted the coach of each women's varsity team to obtain permission to attend a team practice, at which time the data for this study was collected. Each athlete was asked to read a consent form, which contained information regarding the purpose of this study, assurance of anonymity, and any risks or benefits that may be associated with this research, before completing the study questionnaire. Assurance of anonymity was of increased importance in this study, as participants may not have felt comfortable answering questions pertaining to their eating behaviors truthfully. The completed questionnaires were then returned directly to the researcher. Each athlete who correctly completed a questionnaire was considered a participant for this study. The athletes were then classified as participating in either a "lean" or "nonlean" sport. Swimming, diving, and cross-country were considered "lean" sports. Basketball, soccer, tennis and golf were considered "nonlean" sports. The nonathlete sample was obtained by distributing the study questionnaire and consent form to fifty-one female students in an undergraduate psychology class. Again, the consent form and study questionnaires was distributed by and returned directly to the researcher.

Data Analysis

Several different types of data analysis were used to address the hypotheses that were proposed in this study. Research Question One investigated the differences between the "athlete" and "nonathlete" groups as measured by distribution along a continuum. Hypothesis One focused on eating behavior. A chi-square was used to determine what percentage of the athletes and nonathletes fall into each predetermined category on the eating disorders continuum in terms of eating behavior. Hypothesis Two focused on the psychological variables of body image and self-esteem. As these characteristics were measured using continuous variables, a two-way ANOVA was used to determine the way in which the participants were distributed.

Research Question Two focused on the differences between athletes in “lean” sports and athletes in “nonlean” sports. Hypothesis Three stated that these two groups would be distributed similarly in terms of eating behaviors. A chi-square test was used to determine the number of participants who fell into each category on the eating disorders continuum. Hypothesis Four stated that the two groups would be similar in terms of body image and self-esteem. A two-way ANOVA was used to investigate this statement.

Research Question Three investigated the relationship between eating behaviors and the psychological variables of body image satisfaction and self-esteem. Hypothesis Five stated that the participants who did exhibit disordered eating behaviors will report less body satisfaction and self-esteem than participants who do not exhibit disordered eating behaviors. An ANOVA was used to determine the existence of this relationship.

Tabulation of Survey Instrument

The Eating Disorder Examination Questionnaire, Rosenberg Self-Esteem Scale, and Body Dissatisfaction Scale of the Eating Disorder Inventory were used to collect data for this study. The three instruments were presented in a continuous format, with the questions enumerated from one to sixty-one (see Appendix A). In tabulating the data collected from these surveys, participants were classified using the following criteria. Subsets of each variable were coded and entered into a database using the SPSS statistical package. Pertinent variables included Fear of Gaining Weight, Body Shape Disturbance, Compensatory Behavior, Episodes of Binge Eating (Bulimia Nervosa), Episodes of Binge Eating (Subthreshold Bulimia), Restriction of Food Intake, and Body Mass Index. These variables were then used to classify participants into one of seven categories: Anorexia Nervosa/Bulimia Nervosa, Subthreshold Bulimia, Anorexia Athletica, Binge Eating, Excessive Exerciser, Dieter/Restrictor, or Normal (see Appendix E). Participants were then classified by athlete/nonathlete status. The “athlete” group was further differentiated by type of sport. Lastly, a general Disordered Eating variable was coded to indicate which participants did or did not report disordered eating behaviors.

To determine Fear of Gaining Weight, participants who answered either “4,” “5,” or “6” to Question 12 were coded as a “1,” or as having an intense fear of gaining weight. All other respondents were classified as “0.” Body Shape Disturbance was determined by using each

participant's answers to Questions 13, 32, and 33. All participants who answered "4," "5," or "6" to each of these questions were coded as a "1." Again, all other respondents were classified as "0." Participants' responses to several questions were used to determine Compensatory Behavior. Those participants who answered "Yes" to Question 21, 23, 25, or 27 and "more than 8" to Questions 22, 24, 26, or 28 were coded as "1," or engaging in compensatory behaviors at least twice a week. All other respondents were classified as "0." Those participants who responded "Yes" to Question 16 and "more than 8" to Questions 17 and 18 were coded as a "1" for Episodes of Binge Eating (Bulimia Nervosa). Those participants who responded "Yes" to Question 16 but "less than 7" for Questions 17 and 18 were coded "1" for Episodes of Binge Eating (Subthreshold Bulimia). All other participants were coded as "0," or not having episodes of binge eating. Restriction of Food Intake was determined using the Restraint Subscale of the EDE-Q4. The Restraint Subscale consisted of Questions 1, 2, 3, 4, and 5. A score of 15 or above on the Restraint Subscale was treated as "restricting food intake," while a score of 14 or below was treated as "not restricting food intake." Finally, Body Mass Index was calculated using the following standardized formula: $(\text{weight in pounds} \times .4536) / [(\text{height in inches} \times .0254)^2]$.

Participants who were currently participating on a varsity athletic team were treated as "athletes." Participants who were drawn from an undergraduate psychology class were treated as "nonathletes." In terms of the Type of Sport variable, participants from the "athlete" sample who were competing in diving, cross country, or swimming were classified as a "lean" sport; participants from the "athlete" sample who were competing in basketball, golf, tennis, or soccer were classified as a "nonlean" sport. The Disordered Eating variable was included to simplify the analysis for Hypothesis Five, which stated that individuals who exhibit disordered eating behavior will report lower levels of self-esteem and body satisfaction than those individuals who do not exhibit disordered eating behavior. Each respondent was assigned a number of zero or one. Those participants who were classified as "normal" on the eating disorder continuum were considered not to have disordered eating behaviors, and were assigned a "0." Those participants who fell in to the other six categories on the continuum were considered to have disordered eating behaviors, and were assigned a "1." Using this method, the various categories of eating behavior used in the majority of this study were condensed into two.

CHAPTER FOUR

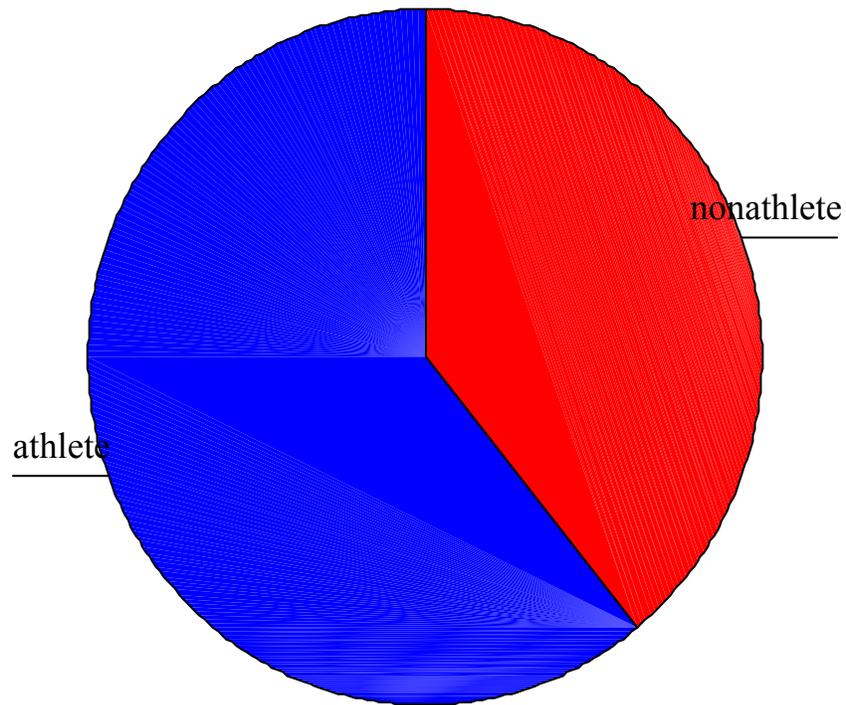
RESULTS

Descriptive Statistics

A total of 138 participants were involved in this study. All were women who were currently attending a large, Southeastern university. The sample consisted of 84 athletes (60.9%) and 54 (39.1%) nonathletes (see Figure 3). Within the athlete group, 39 participants were identified as “lean” sport athletes, and 45 participants were identified as “nonlean” sport athletes (see Figure 4). The sample was further differentiated into seven pre-determined categories based on reported eating behaviors (see Figure 5). The distribution of the sample by eating behavior for those subjects engaging in athletic participation was as follows: 1.2 % were classified as Anorexia Nervosa/Bulimia Nervosa, 1.2 %, were classified as Subthreshold Bulimia, 0% were classified as Anorexia Athletica, 2.4 % were classified as Binge Eating, 32.1% were classified as Excessive Exerciser, 14.3% were classified as Dieter/Restrictor, and 48.8% were classified as Normal. Similarly, the distribution for those in the “nonathlete” sample was: 0% for Anorexia Nervosa, 1.9% for Bulimia Nervosa, 9.3% for Subthreshold Bulimia, 0% for Anorexia Athletica, 1.9% for Binge Eating, 40.7% for Excessive Exerciser, 14.8% for Dieter/Restrictor, and 31.5% for Normal (see Figure 6). As the Anorexia Athletica group had zero participants, it was not included in the subsequent analysis.

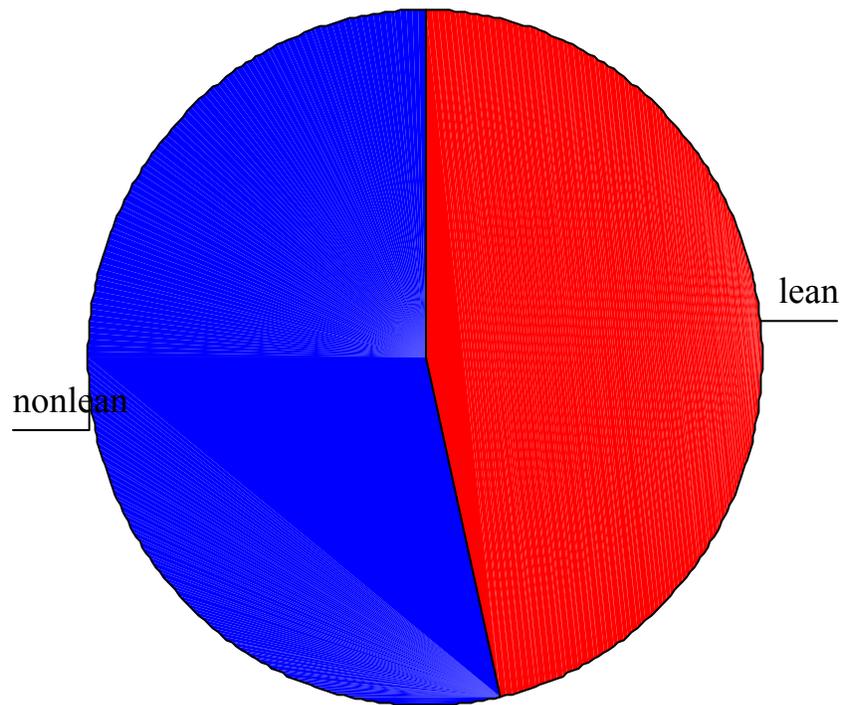
Inferential Statistics

A chi-square analysis was then performed to determine if the “athlete” and “nonathlete” groups, and the “lean” and “nonlean” groups within the athlete sample, were distributed similarly across the seven categories of the eating disorders continuum used in this study. Table 1



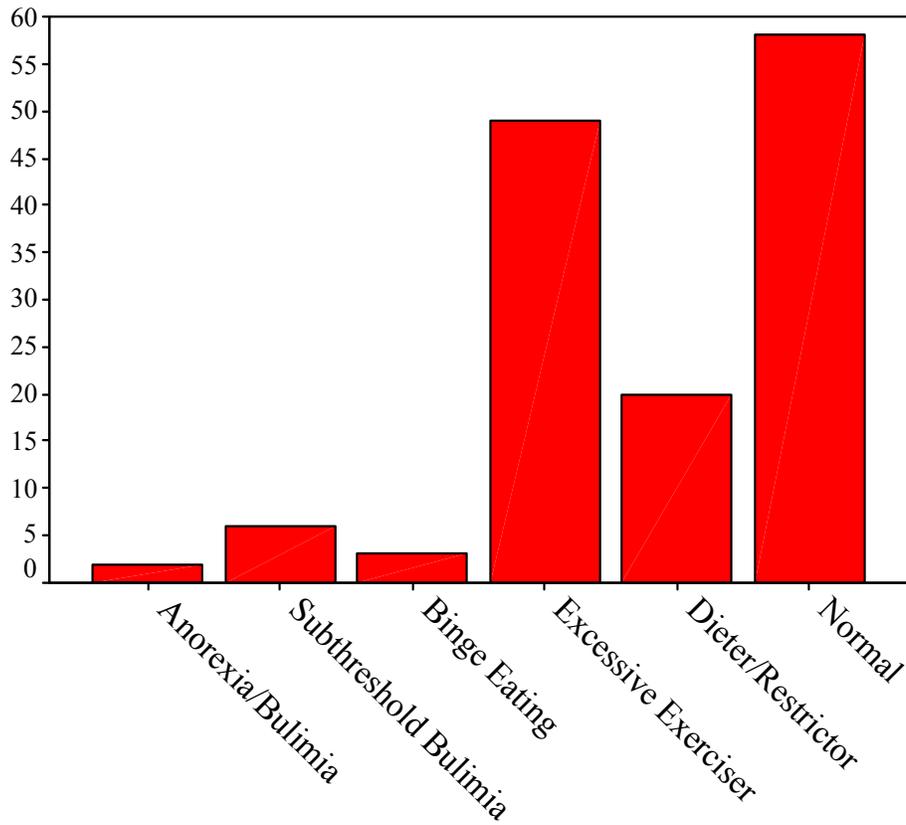
Athlete Status	Frequency	Percent
Athlete	84	39.1
Nonathlete	54	60.9
Total	138	100.0

Figure 3: Distribution of Participants by Athlete Status.



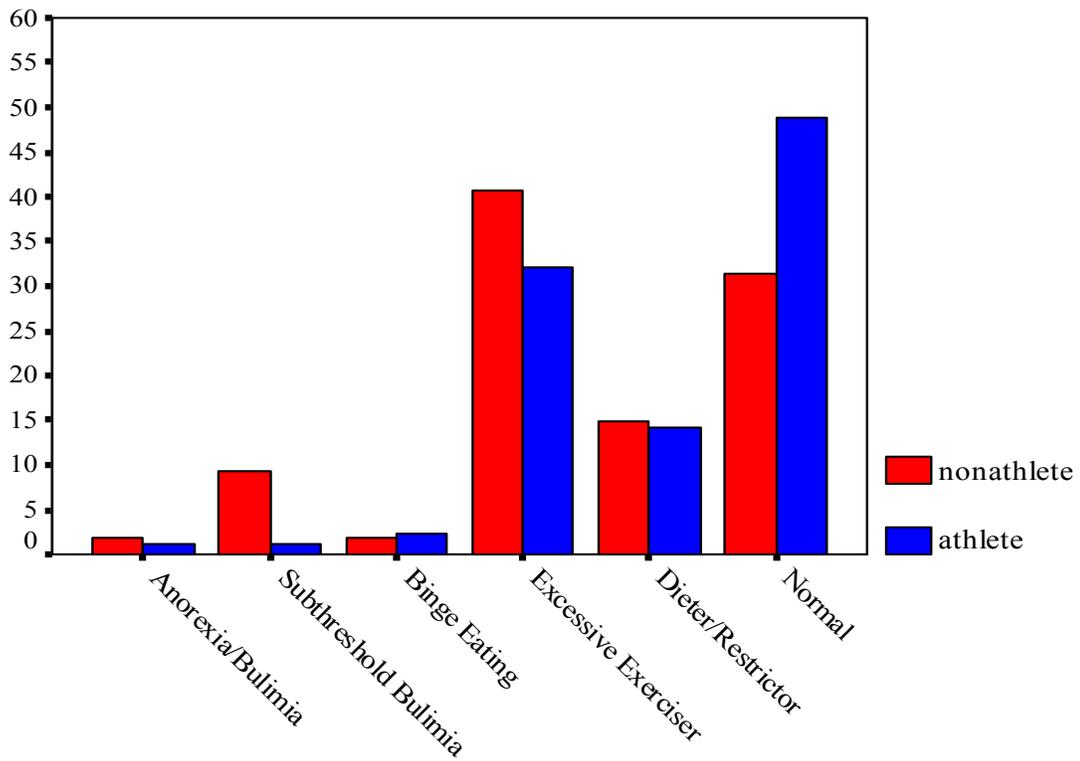
Type of Sport	Frequency	Percent
Lean	39	46.4
Nonlean	45	53.6
Total	84	100.0

Figure 4: Distribution of Athlete Sample by Type of Sport.



Type of Eating Behavior	Frequency	Percent
Anorexia/ Bulimia Nervosa	2	1.4
Subthreshold Bulimia	6	4.3
Anorexia Athletica	0	0.0
Binge Eating	3	2.2
Excessive Exerciser	49	35.5
Dieter/Restrictor	20	14.5
Normal	58	42.0
Total	138	100.0

Figure 5: Distribution of Participants by Type of Eating Behavior.



Type of Eating Behavior

Type of Eating Behavior	Athlete		Nonathlete	
	Frequency	Percent	Frequency	Percent
Anorexia/Bulimia Nervosa	1	1.2	1	1.9
Subthreshold Bulimia	1	1.2	5	9.3
Anorexia Athletica	0	0.0	0	0.0
Binge Eating	2	2.4	1	1.9
Excessive Exerciser	27	32.1	22	40.7
Dieter/Restrictor	12	14.3	8	14.8
Normal	41	48.8	17	31.5
Total	84	100.0	54	100.0

Figure 6: Distribution of Participants by Type of Eating Behavior and Athlete Status.

indicates that there were no significant differences in the distribution of the “athlete” and “nonathlete” groups ($\chi^2 = 8.102$; $df = 5$; $p = .210$) or in the distribution of the “lean” and “nonlean” groups ($\chi^2 = 7.896$; $df = 5$; $p = .223$).

A one-way analysis of variance (ANOVA) was implemented to investigate the “athlete” and “nonathlete” groups in terms of body satisfaction and self-esteem. The results indicated that there were significant differences between the groups in terms of body satisfaction ($F = 9.562$; $df = 137$; $p = .002$), but there were no significant differences between the groups in terms of self-esteem ($F = 9.270$; $df = 137$; $p = .337$). Table 2 illustrates these relationships. A one-way ANOVA was also used to investigate the “lean” and “nonlean” groups in terms of body satisfaction ($F = .980$; $df = 82$; $p = .325$) and self-esteem ($F = .377$; $df = 82$; $p = .541$). These two groups were distributed similarly, as indicated by the results, illustrated in Figure 7 and Table 3.

Finally, a third one-way ANOVA was used to investigate the relationship between disordered eating behavior and the psychological variables of body satisfaction and self-esteem. The results indicated that there is a significant difference between the level of body satisfaction experienced by individuals who do report disordered eating behaviors and that experienced by individuals who do not report disordered eating behaviors ($F = 35.460$; $df = 136$; $p = .000$). The same is true for the variable of self-esteem ($F = 9.147$; $df = 136$; $p = .003$). Table 4 illustrates these relationships.

Research Questions and Hypotheses

Three research questions and five hypotheses were proposed to investigate the theoretical proposition in this study. Research Question One asked:

1. Will there be a difference in disordered eating behaviors and corresponding psychological variables between female athletes and nonathletes as illustrated by an eating disorders continuum?

Two hypotheses were developed to answer this question. Hypothesis One stated:

- H1: Female athletes and nonathletes will be distributed similarly along an eating disorders continuum.

Table 1: Results of Chi-Square for Type of Eating Behavior by Athlete Status and Type of Sport.

Chi- Square

Type of Eating Behavior	Athlete Status	Type of Sport
Chi-Square	8.102*	7.896*
df	5	5

* for significance at the .05 level, χ^2 should be greater than or equal to 11.07.

Table 2: Results of ANOVA for Body Satisfaction and Self-Esteem by Athlete Status.

ANOVA

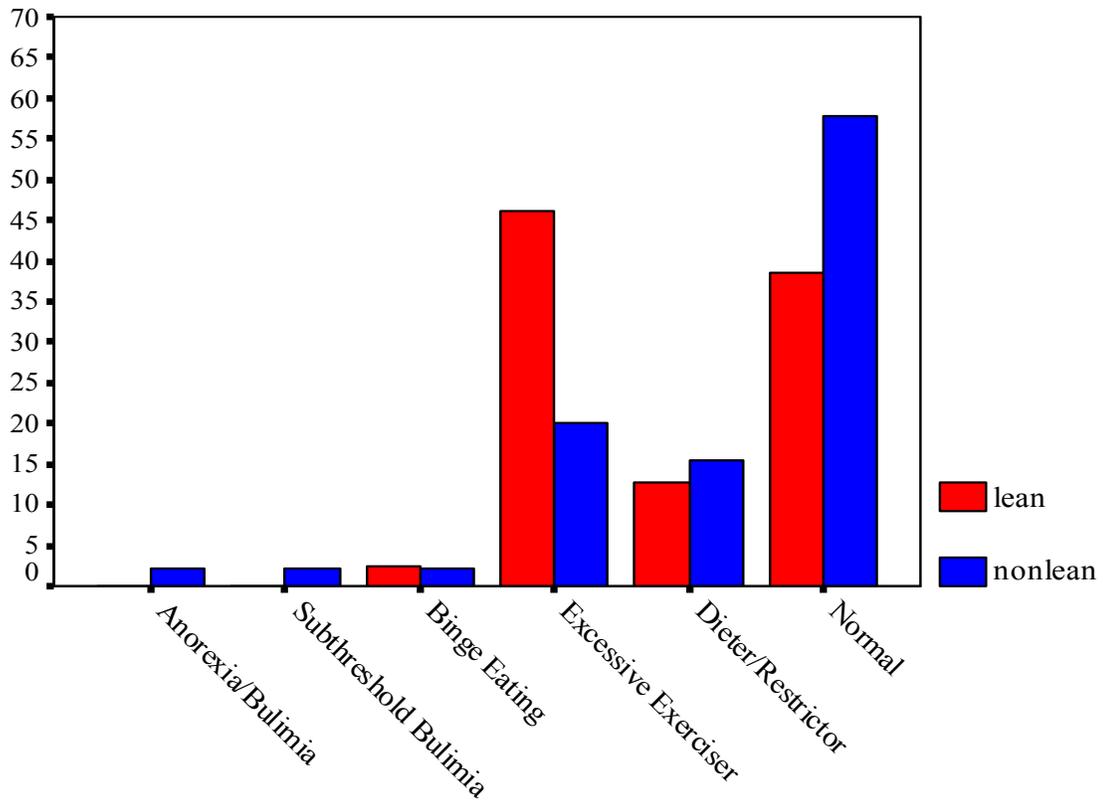
Body Satisfaction

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1054.986	1	1054.986	9.562	.002
Within Groups	15004.319	136	110.326		
Total	16059.304	137			

ANOVA

Self-Esteem

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	25.204	1	25.204	9.270	.337
Within Groups	3698.601	136	27.196		
Total	3723.804	137			



Type of Eating Behavior

	Lean		Nonlean	
	Frequency	Percent	Frequency	Percent
Anorexia/ Bulimia Nervosa	0	0.0	1	2.2
Subthreshold Bulimia	0	0.0	1	2.2
Anorexia Athletica	0	0.0	0	0.0
Binge Eating	1	2.6	1	2.2
Excessive Exerciser	18	46.2	9	20.0
Dieter/Restrictor	5	12.8	7	15.6
Normal	15	38.5	26	57.8
Total	39	100.0	45	100.0

Figure 7: Distribution of Athlete Sample by Type of Eating Behavior and Type of Sport.

Table 3: Results of ANOVA for Body Satisfaction and Self-Esteem by Type of Sport.

ANOVA

Body Satisfaction

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	109.785	1	109.785	.980	.325
Within Groups	9185.774	82	112.022		
Total	9295.560	83			

ANOVA

Self-Esteem

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	9.964	1	9.964	.377	.541
Within Groups	2166.988	82	26.427		
Total	2176.952	83			

Table 4: Results of ANOVA for Body Satisfaction and Self-Esteem by Level of Disordered Eating.

ANOVA

Body Satisfaction

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3321.285	1	3321.285	35.460	.000
Within Groups	12738.019	136	93.662		
Total	16059.304	137			

ANOVA

Self-Esteem

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	234.662	1	234.662	9.147	.003
Within Groups	3489.143	136	25.655		
Total	3723.804	137			

The results supported the first hypothesis. The chi-square analysis revealed no significant differences in the distribution of “athlete” and “nonathlete” groups ($\chi^2 = 8.102$; $df = 5$) along the seven categories that made up the eating disorders continuum for this study. Therefore, it can be concluded that the two groups are distributed similarly, confirming Hypothesis One.

To address the psychological variables of body satisfaction and self-esteem, Hypothesis Two proposed:

H2: Female athletes and nonathletes will be distributed similarly in terms of body satisfaction and self-esteem.

Hypothesis Two was only partially supported by the results. There was not a significant difference between the two groups in terms of self-esteem ($F = 9.270$; $df = 137$; $p = .337$), supporting the hypothesis that the groups were distributed similarly. However, there was a significant difference between the groups in terms of body satisfaction ($F = 9.562$; $df = 137$; $p .002$), which did not support the hypothesis. Athletes reported more satisfaction with their bodies than their nonathletic counterparts.

Research Question Two addressed the effect of sport type on eating behaviors, body satisfaction, and self-esteem:

2. Will there be a difference in disordered eating behaviors, as illustrated by an eating disorders continuum, and associated variables of body satisfaction and self-esteem by type of sport?

Two hypotheses were developed to answer Research Question Two. Hypothesis Three addressed eating behaviors:

H3: Athletes in “lean” sports and “nonlean” sports will be distributed similarly along an eating disorders continuum.

The results supported Hypothesis Three. Again, a chi-square analysis indicated that there were no significant differences between athletes who participated in a sport in which a lean figure is conducive to success and athletes who participated in a sport in which a lean figure is not conducive to success ($\chi^2 = 7.896$; $df = 5$). These results indicate that the two groups are, in fact,

distributed similarly across the seven categories that made up the eating disorder continuum used in this study, supporting the third hypothesis.

Hypothesis Four was proposed to address the variables of body satisfaction and self-esteem:

H4: Athletes in “lean” and “nonlean” sports will be distributed similarly in terms of body satisfaction and self-esteem.

Hypothesis Four was supported by the results. There was no significant difference between the “lean” and “nonlean” groups in terms of body satisfaction ($F = .980$; $df = 82$; $p = .325$) or self-esteem ($F = .377$; $df = 82$; $p = .541$), indicating that the groups are distributed similarly (see Table 4).

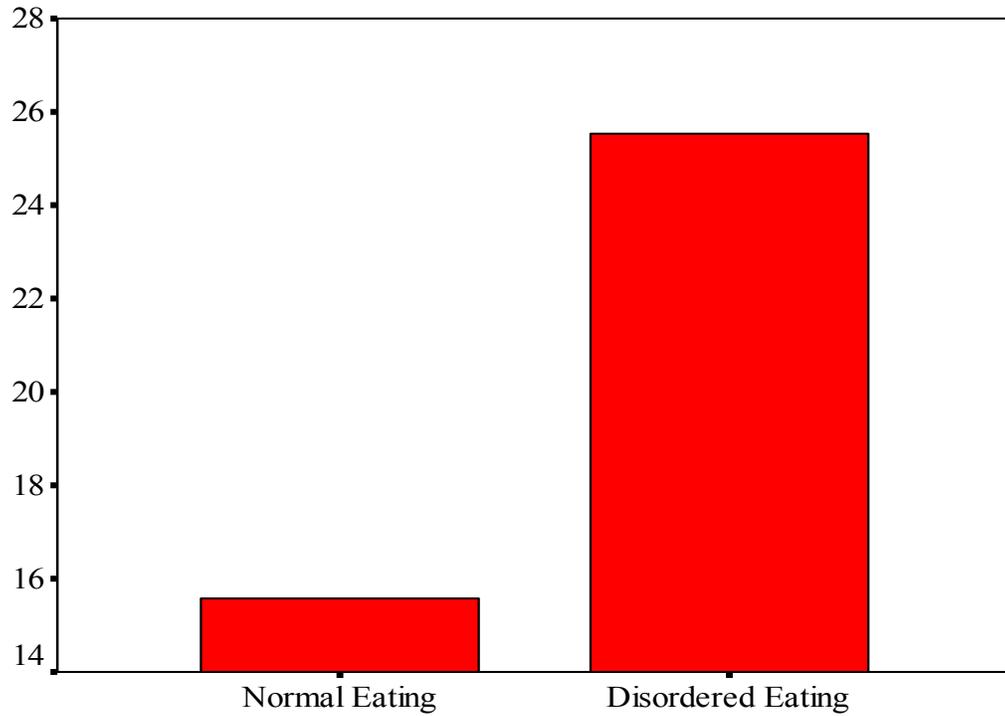
Research Question Three investigated the relationship between eating behaviors and body satisfaction and self-esteem:

3. Will there be a relationship between eating behaviors and the associated psychological variables of body satisfaction and self-esteem?

Hypothesis Five stated:

H5: Individuals who do exhibit disordered eating behaviors will report less body satisfaction and lower self-esteem than individuals who do not exhibit disordered eating behaviors.

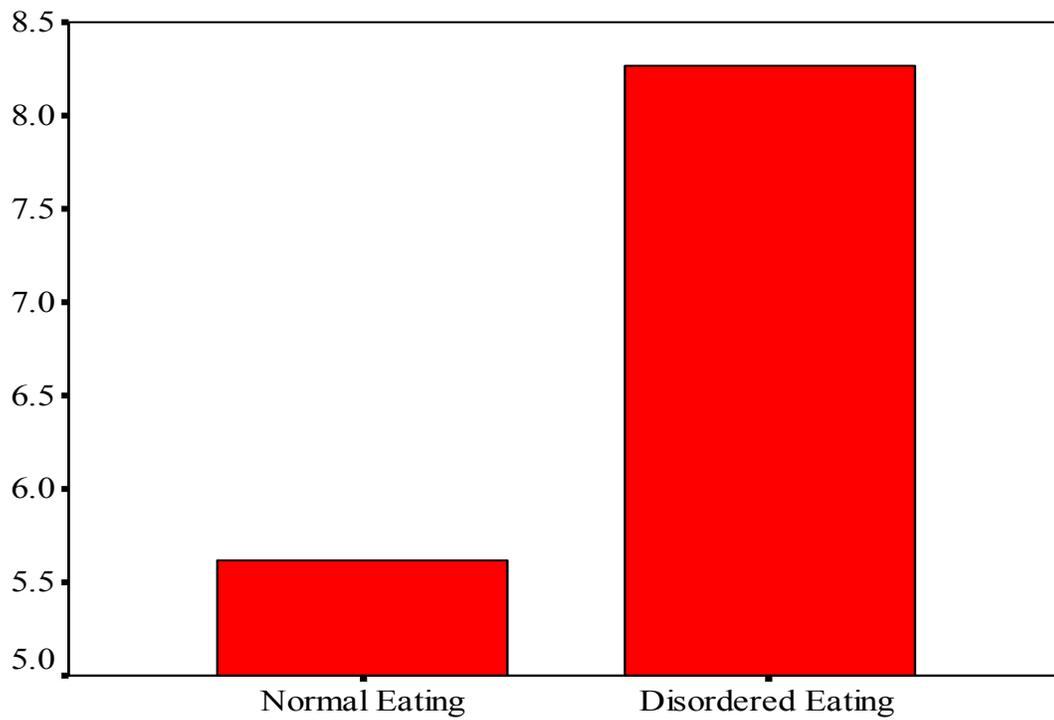
The results supported Hypothesis Five. Table 4 indicates that there was a significant difference in the body satisfaction ($F = 35.460$; $df = 136$; $p = .000$) and self-esteem ($F = 9.147$; $df = 136$; $p = .003$) scores of the “eating disordered” and “non eating disordered” groups. To determine the direction of the difference, the mean of each group was compared for both body satisfaction (see Figure 8) and self-esteem (see Figure 9). These results show that those college women with disordered eating behaviors experience less body satisfaction and self-esteem than those women without disordered eating behaviors, and that this difference is statistically significant.



Body Satisfaction			
	Mean	N	Std. Deviation
Normal Eating	15.59	58	9.83
Disordered Eating	25.53*	80	9.57
Total	21.35	138	10.83

*Higher scores indicate less body satisfaction

Figure 8: Results of Comparison of Means for Body Satisfaction by Level of Disordered Eating.



Self-Esteem			
	Mean	N	Std. Deviation
Normal Eating	5.62	58	4.68
Disordered Eating	8.26*	80	5.33
Total	7.15	138	5.21

*Higher scores indicates low self-esteem

Figure 9: Results of Comparison of Means for Self-Esteem by Level of Disordered Eating.

CHAPTER FIVE

SUMMARY, DISCUSSION, AND CONCLUSIONS

Summary and Discussion of the Findings

Researchers investigating athletic involvement and disordered eating behaviors in women have found conflicting results. While some studies have found that participation in athletics does increase an individual's risk for developing disordered eating (Alex, 1996; Black & Burckes-Miller, 1988; Thompson & Sherman, 1999), others have found that this is not the case (Harris & Greco, 1990; Hausenblas, 1998; Parker et al., 1994; Shelby, 2000; Warren et al., 1990; Wilkins, 1995). The results of this study support the research which indicates that those individuals who are involved in athletics do not report higher levels of disordered eating behavior. The athletes in this study did not report eating behaviors that were significantly different than those participants who were not involved in athletics.

Satisfaction with body image (Kalondner & Scarano, 1992; Mazzeo, 1999; Thompson, Coovert, & Stormer, 1999; Williamson et al., 1995) and self-esteem (Cervera et al., 2003; Croll, Neumark-Sztainer, Story, & Ireland, 2002; Ghaderi, 2003, Gual et al., 2002) are two psychological variables that have been shown to be related to disordered eating behaviors. In this study, it was found that those women who did report disordered eating behaviors had significantly different body satisfaction and self-esteem scores than those women who did not report disordered eating behaviors. Specifically, women with disordered eating behaviors reported less body satisfaction and less overall self-esteem than women with no disordered eating behaviors. The fact that this relationship between behavior and psychological variables exists, suggests that the motivation for these behaviors is internal. This is important factor in designing intervention and treatment programs.

The effect of athletic participation on body satisfaction and self-esteem has also been the subject of much empirical research (DiNucci, et al., 1994; Hoganbraun, 1998; Richman & Shafer, 2000; Snyder & Kivlin, 1975; West-Smith, 1997). In this sample, participation in

athletics was not related to level of overall self-esteem; there was no significant difference between the “athlete” and “nonathlete” groups in terms of this variable. However, there was difference in terms of body satisfaction. Athletes reported significantly lower body satisfaction scores, indicating that they were significantly more satisfied with their bodies than the nonathletes.

Type of sport was also investigated as a variable in this study. Previous studies have found that athletes who compete in sports which favor a lean body type report more disordered eating behaviors (Ciervo, 1998; Sundgot-Borgen, 1994a) than those who compete in sports which do not favor a lean body type, while other studies found that there were no differences by type of sport (Parker et al., 1990). The athletes who participated in this study did not report statistically significant differences in their eating behaviors by type of sport. Those athletes involved in “lean” sports did not have more disordered eating behaviors than those involved in “nonlean” sports. Existing literature that has focused on body satisfaction and type of sport has also found conflicting results (DiNucci et al., 1994; Snyder & Kivlin, 1975). The results of the current study indicate that athletes in “lean” and “nonlean” sports have similar levels of body satisfaction and overall self-esteem.

The existence of a disordered eating continuum has been supported in previous research (Hay & Fairburn, 1996; Podar, Hannus, & Allik, 1999; Hesse-Biber, 1989; Mangrum, 1997; Petrie, 1993; Tylka & Subich, 1999). However, only one study used a sample that consisted of athletes (Petrie, 1993). This study extended these findings by using a sample that consisted of both athletes and nonathletes, and by including an additional variable, type of sport. The results indicated that the “athlete” and “nonathlete” groups were distributed similarly across the seven categories that made up the eating disorders continuum for this study. In addition, the “lean” and “nonlean” groups were distributed similarly along the eating disorders continuum. In this sample, those athletes competing in “lean” sports did not exhibit more eating disordered behaviors than those in “nonlean” sports.

It should be reiterated that the data collected for this study were self-reported. It is possible that obtaining information through the interview method would have helped to eliminate this limitation, as questions could have been more tailored to each subject. However, it would

have also reduced the anonymity enjoyed by the participants. In addition, an interview format would not have guaranteed that the participants would have been more truthful.

Conclusions

The following conclusions were drawn based on the results of this study.

1. There is not a significant difference between the eating behaviors of female collegiate varsity athletes and the general female university population.
2. The concept of a disordered eating continuum is valid. There are many college-aged women who exhibit behaviors which are not diagnosable as a clinical eating disorder, but are not classified as normal.
3. There is not a significant difference in the overall self-esteem levels of female collegiate varsity athletes and the general female university population.
4. There is a significant difference in the way body satisfaction is experienced by female collegiate varsity athletes and the general female university population.
5. Athletes have significantly higher levels of body satisfaction than nonathletes.
6. Athletes who compete in sports in which a lean body is conducive to success do not have more disordered eating behaviors than athletes who compete in sports in which a lean figure is not conducive to success.
7. Athletes competing in “lean” sports have similar body satisfaction and self-esteem scores to those athletes competing in “nonlean” sports.
8. Women who report disordered eating behavior have less self-esteem and body satisfaction than women who do not report disordered eating behavior.

Implications for Sport Psychology

In competitive athletics, a lean body type is often crucial to successful performance, especially for women. Female athletes are also influenced by societal values, which often promote a thin figure as ideal for women, outside the athletic arena. In addition, behaviors that can be harmful to the body, such as dieting and over-exercising, have become socially acceptable and are considered “normal.” It is important that empirical research be done, so that sport psychologists can be made aware of these issues when working with female athletes. However,

the assumption that athletes engage in more disordered eating behaviors than the general population can also be harmful. These types of beliefs can be damaging to the sport industry, in that they infer that participation in sport leads to the development of disordered eating. This study was designed to add to existing literature in this area, and has the following implications for sport psychology in general.

1. Those sport professionals who work closely with athletes should be made aware of the large number of athletes who over-exercise and restrict food intake. Healthy eating behaviors should be encouraged to address these behaviors so that they do not become more severe.
2. Sport professionals working in any capacity can use this information to justify the statement that athletic participation per se does not translate into an increase in disordered eating behaviors. The stereotyped image of the starving female athlete continues to be contradicted with empirical data.
3. Psychologists working with athletes can highlight the positive benefits of sport participation, in that athletes report more body satisfaction than those not participating in sport. This type of confidence can lead to more self-assurance in other areas of life.
4. The results of this study indicate that the psychological variables of body satisfaction and self-esteem are related to eating behavior, suggesting that motivation is internal. Sport psychologists can use this information when treating athletes with disordered eating.

Implications for Universities

College women and universities, in both an athletic and non-athletic capacity, can benefit from this type of research. Specific implications include the following,

1. In this study, college women, both athlete and nonathlete, presented eating behaviors that are considered unhealthy. It is important for university administrators to continue to educate the female population in health and nutrition, and address the issue of dieting as “normal” behavior.
2. Coaches and trainers can use these results to design appropriate training diets and workout schedules so that athletes can be encouraged to engage in healthy eating.

3. College students can benefit from this research as well. Many women may not realize the harmful nature of their actions. Again, food restriction and compensatory behavior has become normalized in our society.

Recommendations for Future Research

While the present study made an addition to the body of knowledge that is based on empirical data in the sport psychology literature, future research must be conducted to further these findings.

1. The participants in this study self-reported their eating behaviors and feelings towards body satisfaction and self-esteem. Collecting data in a more personal manner should be pursued in the future in an effort to determine if there is a difference in the amount of information that participants will disclose.
2. This study was limited to one geographical area, a Division I university in the southeastern United States. Future research must include sample data from other regional and national locations.
3. As research that is based on a disordered eating continuum and includes participants from different types of sport is scarce, additional research focusing on this aspect should be conducted.
4. The participants in this study were women at the college level. Similar research that investigates the eating behavior and related psychological variables of girls at the high school would be interesting to pursue.

APPENDIX A

Study Questionnaire

INSTRUCTIONS: The following questions are concerned with the PAST THREE MONTHS. Please read each questions carefully and fill in the circle which corresponds to the appropriate number on the right. Please answer all the questions.

ON HOW MANY DAYS DURING THE MONTH...	No days	1-5 days	6-12 days	13-15 days	16-22 days	23-27 days	Every day
1. ...Have you been deliberately <u>trying</u> to limit the amount of food you eat to influence your weight or shape?	<input type="radio"/>						
2. ...Have you gone for long periods of time (8 hours or more) without eating anything to influence your weight or shape?	<input type="radio"/>						
3. ...Have you <u>tried</u> to avoid eating any foods which you like in order to influence your shape or weight?	<input type="radio"/>						
4. ...Have you tried to follow definite rules regarding your eating in order to influence your shape or weight; for example, a calorie limit, a set amount of food, or rules about what or when you should eat?	<input type="radio"/>						
5. ...Have you wanted your stomach to be empty?	<input type="radio"/>						
6. ...Has thinking about food or its calorie content made it much more difficult to concentrate on things you are interested in; for example read, watch TV, or follow a conversation?	<input type="radio"/>						
7. ...Have you been afraid of losing control over eating?	<input type="radio"/>						
8. ...Have you had episodes of binge-eating?	<input type="radio"/>						
9. ...Have you eaten in secret? (Do not count binges.)	<input type="radio"/>						
10. ...Have you definitely wanted your stomach to be flat?	<input type="radio"/>						
11. ...Has thinking about shape or weight made it more difficult to concentrate on things you are interested in; for example, read, watch TV, or follow a conversation?	<input type="radio"/>						
12. ...Have you had a definite fear that you might gain weight or become fat?	<input type="radio"/>						
13. ...Have you felt fat?	<input type="radio"/>						
14. ...Have you had a strong desire to lose weight?	<input type="radio"/>						

DURING A MONTH'S TIME

15. On what proportion of times that you have eaten have you felt guilty because of the effect on your shape or weight? (Do not count binges.)
- None of the time
 - A few of the times
 - Less than half of the times
 - Half the times
 - More than half the times
 - Most of the time
 - Every time

16. Over the past month have there been any times when you have felt that you have eaten what other people would regard as an unusually large amount of food given the circumstances?

- No
- Yes

17. How many such episodes have you had over the past four weeks?

--	--

18. During how many of these episodes of overeating did you have a sense of having lost control over your eating?

--	--

19. Have you had other episodes of eating in which you have had a sense of having lost control and eaten too much, but have not eaten an unusually large amount of food given the circumstances?

- No Yes

20. How many such episodes have you had over the past four weeks?

--	--

21. Over the past month have you made yourself sick (vomit) as a means of controlling your shape or weight?

- No Yes

22. How many times have you done this over the past four weeks?

--	--

23. Have you taken laxatives as a means of controlling your shape or weight?

- No Yes

24. How many times have you done this over the past four weeks?

--	--

25. Have you taken diuretics (water tablets) as a means of controlling your shape or weight?

- No Yes

26. How many times have you done this over the past four weeks?

--	--

27. Have you exercised hard as a means of controlling your shape or weight?

- No Yes

28. How many times have you done this over the past four weeks?

--	--

29. Have you missed any periods over the past three months?

- No Yes

30. How many periods have you had?

--	--

31. Are you taking birth control?

- No Yes

OVER THE PAST MONTH...	Not at all	Slightly	Moderately	Markedly
32. ...Has your weight influenced how you think about (judge) yourself as a person?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
33. ...Has your shape influenced how you think about (judge) yourself as a person?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
34. ...How much would it upset you if you had to weight yourself once a week for the next four weeks?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
35. ...How dissatisfied have you felt about your weight?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
36. ...How dissatisfied have you felt about your shape?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
37. ...How concerned have you been about other people seeing you eat?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
38. ...How uncomfortable have you felt seeing your body; for example, in the mirror, in window reflections, while undressing or taking a bath or shower?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
39. ...How uncomfortable have you felt about others seeing your body; for example, in communal changing rooms, when swimming or wearing tight clothes?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

IN GENERAL...

	Never	Rarely	Sometimes	Frequently	Usually	Always
40. I think that my stomach is too big.	<input type="radio"/>					
41. I think that my thighs are too large.	<input type="radio"/>					
42. I think that my stomach is just the right size.	<input type="radio"/>					
43. I feel satisfied with the shape of my body.	<input type="radio"/>					
44. I like the shape of my buttocks.	<input type="radio"/>					
45. I think that my hips are too big.	<input type="radio"/>					
46. I think that my thighs are just the right size.	<input type="radio"/>					
47. I think that my buttocks are too large.	<input type="radio"/>					
48. I think that my hips are just the right size.	<input type="radio"/>					

	Strongly Agree	Agree	Disagree	Strongly Disagree
49. I feel that I am a person of worth, equal with others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
50. I feel that I have a number of good qualities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
51. All in all, I am inclined to feel that I am a failure.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
52. I am able to do things as well as most other people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
53. I feel I do not have much to be proud of.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
54. I take a positive attitude towards myself.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
55. On the whole, I am satisfied with myself.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
56. I wish I could have more respect for myself.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
57. I feel useless at times.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
58. At times, I feel I am no good at all.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

59. Present height (in inches) (5 feet = 60 inches)

60. Present weight (in pounds)

61. Desired weight (in pounds)

APPENDIX B

Eating Disorder Examination Questionnaire

EDE-Q4

INSTRUCTIONS: The following questions are concerned with the PAST THREE MONTHS. Please read each questions carefully and fill in the circle which corresponds to the appropriate number on the right. Please answer all the questions.

ON HOW MANY DAYS DURING THE MONTH...	No days	1-5 days	6-12 days	13-15 days	16-22 days	23-27 days	Every day
1. ...Have you been deliberately <u>trying</u> to limit the amount of food you eat to influence your weight or shape?	<input type="radio"/>						
2. ...Have you gone for long periods of time (8 hours or more) without eating anything to influence your weight or shape?	<input type="radio"/>						
3. ...Have you <u>tried</u> to avoid eating any foods which you like in order to influence your shape or weight?	<input type="radio"/>						
4. ...Have you tried to follow definite rules regarding your eating in order to influence your shape or weight; for example, a calorie limit, a set amount of food, or rules about what or when you should eat?	<input type="radio"/>						
5. ...Have you wanted your stomach to be empty?	<input type="radio"/>						
6. ...Has thinking about food or its calorie content made it much more difficult to concentrate on things you are interested in; for example read, watch TV, or follow a conversation?	<input type="radio"/>						
7. ...Have you been afraid of losing control over eating?	<input type="radio"/>						
8. ...Have you had episodes of binge-eating?	<input type="radio"/>						
9. ...Have you eaten in secret? (Do not count binges.)	<input type="radio"/>						
10. ...Have you definitely wanted your stomach to be flat?	<input type="radio"/>						
11. ...Has thinking about shape or weight made it more difficult to concentrate on things you are interested in; for example, read, watch TV, or follow a conversation?	<input type="radio"/>						
12. ...Have you had a definite fear that you might gain weight or become fat?	<input type="radio"/>						
13. ...Have you felt fat?	<input type="radio"/>						
14. ...Have you had a strong desire to lose weight?	<input type="radio"/>						

DURING A MONTH'S TIME...

15. On what proportion of times that you have eaten have you felt guilty because of the effect on your shape or weight? (Do not count binges.)
- None of the time Half the times Every time
 A few of the times More than half the times
 Less than half of the times Most of the time

16. Over the past month have there been any times when you have felt that you have eaten what other people would regard as an unusually large amount of food given the circumstances?

- No Yes

17. How many such episodes have you had over the past four weeks?

--	--

18. During how many of these episodes of overeating did you have a sense of having lost control over your eating?

--	--

19. Have you had other episodes of eating in which you have had a sense of having lost control and eaten too much, but have not eaten an unusually large amount of food given the circumstances?

- No Yes

20. How many such episodes have you had over the past four weeks?

--	--

21. Over the past month have you made yourself sick (vomit) as a means of controlling your shape or weight?

- No Yes

22. How many times have you done this over the past four weeks?

--	--

23. Have you taken laxatives as a means of controlling your shape or weight?

- No Yes

24. How many times have you done this over the past four weeks?

--	--

25. Have you taken diuretics (water tablets) as a means of controlling your shape or weight?

- No Yes

26. How many times have you done this over the past four weeks?

--	--

27. Have you exercised hard as a means of controlling your shape or weight?

28. How many times have you done this over the past four weeks?

--	--

OVER THE PAST MONTH...

Not at all Slightly Moderately Markedly

29. ...Has your weight influenced how you think about (judge) yourself as a person?

-

30. ...Has your shape influenced how you think about (judge) yourself as a person?

-

31. ...How much would it upset you if you had to weight yourself once a week for the next four weeks?

-

32. ...How dissatisfied have you felt about your weight?

-

33. ...How dissatisfied have you felt about your shape?

-

34. ...How concerned have you been about other people seeing you eat?

-

35. ...How uncomfortable have you felt seeing your body; for example, in the mirror, in window reflections, while undressing or taking a bath or shower?

-

36. ...How uncomfortable have you felt about others seeing your body; for example, in communal changing rooms, when swimming or wearing tight clothes?

-

APPENDIX C

Body Dissatisfaction Scale of the EDI

Body Dissatisfaction Subscale of the EDI

Please answer the following questions using the scale provided.

	Never	Rarely	Sometimes	Frequently	Usually	Always
1. I think that my stomach is too big.	<input type="radio"/>					
2. I think that my thighs are too large.	<input type="radio"/>					
3. I think that my stomach is just the right size.	<input type="radio"/>					
4. I feel satisfied with the shape of my body.	<input type="radio"/>					
5. I like the shape of my buttocks.	<input type="radio"/>					
6. I think that my hips are too big.	<input type="radio"/>					
7. I think that my thighs are just the right size.	<input type="radio"/>					
8. I think that my buttocks are too large.	<input type="radio"/>					
9. I think that my hips are just the right size.	<input type="radio"/>					

APPENDIX D

Rosenberg Self-Esteem Scale

Rosenberg Self-Esteem Scale

Please answer the following questions using the scale provided.

	Strongly Agree	Agree	Disagree	Strongly Disagree
1. I feel that I am a person of worth, at least equal with others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I feel that I have a number of good qualities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. All in all, I am inclined to feel that I am a failure.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I am able to do things as well as most other people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I feel I do not have much to be proud of.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I take a positive attitude towards myself.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. On the whole, I am satisfied with myself.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. I wish I could have more respect for myself.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. I feel useless at times.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. At times I think I am no good at all.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

APPENDIX E

Eating Disorders Continuum Classification Criteria

EATING DISORDER CONTINUUM CRITERIA

Based on responses on the EDE-Q4

Criteria for Anorexia Nervosa

#	Criteria	Definition
1	Body weight is less than 85% of expected	BMI is below 15% of expected weight
2	Intense fear of gaining weight	Question 12 rated as 4, 5, or 6
3	Disturbance in the way body shape or weight is experienced	Questions 32, & 33 rated as 4, 5, or 6
4	Absence of menstrual cycle	Question 29 = Yes; 30 = 0 Question 31 = No

Criteria for Bulimia Nervosa

#	Criteria	Definition
1	Recurrent episodes of binge eating at least twice a week	Question 16 = Yes Question 17 & 18 ≥ 8
2	Recurrent compensatory behaviors at least twice a week	Questions 21, 23, 25, or 27 = Yes Questions 22, 24, 26, 28 ≥ 8
3	Self-evaluation the is unduly influenced by body shape or weight	Questions 32 & 33 rated as 4, 5, or 6
4	Disturbance does not occur during episodes of AN	Criteria for AN are not met

Criteria for Subthreshold Bulimia

#	Criteria	Definition
1	Recurrent episodes of binge eating less than twice a week	Question 16 = Yes Question 17 & 18 ≤ 7
2	Recurrent compensatory behaviors less than twice a week	Questions 21, 23, 25, or 27 = Yes Questions 22, 24, 26, 28 ≤ 7
3	Self-evaluation the is unduly influenced by body shape or weight	Questions 32 & 33 rated as 4, 5, or 6
4	Disturbance does not occur during episodes of AN	Criteria for AN are not met

Criteria for Anorexia Athletica

#	Criteria	Definition
1	Participation in competitive sport	“Athlete” status
2	Weight loss resulting in 95% of expected body weight	BMI of 5% less than expected
3	Intense fear of gaining weight	Question 12 rated as 4, 5, or 6
4	Restricts food intake	Restraint Subscale ≥ 11

Criteria for Binge Eating

#	Criteria	Definition
1	Recurrent episodes of binge eating at least twice a week	Question 16 = Yes Question 17 & 18 ≥ 8
2	Does not engage in compensatory behaviors	Questions 21, 23, 25, or 27 = No
3	Does not restrict food intake	Restraint Subscale ≤ 10

Criteria for Excessive Exerciser

#	Criteria	Definition
1	Uses excessive exercising as a compensatory behavior	Question 27 = Yes Question 28 ≥ 8
2	Does not binge, purge, use diuretics, or laxatives	Question 8 = 0 Questions 21, 23 & 25 = No
3	Does not restrict food intake	Does not meet criteria for Dieter/Restrictor

Criteria for Dieter/Restrictor

#	Criteria	Definition
1	Restricts food intake	Restraint Subscale ≥ 10
2	Does not engage in compensatory behaviors	Questions 21, 23, 25, or 27 = No
3	Does not engage in binge eating	Question 8 ≤ 2

Criteria for Normal

#	Criteria	Definition
1	Does not restrict food intake	Does not meet criteria for Dieter/Restrictor
2	Does not engage in compensatory behaviors	Questions 21, 23, 25, or 27 = No
3	Does not engage in binge eating	Question 8 ≤ 2

APPENDIX F

Athlete Consent to Participate

By reading this cover page, I consent to be a participant in the research project entitled “Athletic Involvement and Eating Behaviors in College Women.”

The research is being conducted by Lindsay Hanson, who is a student at Florida State University. I understand that the purpose of her research is to better understand the relationship between athletic involvement and eating behaviors in college women. I understand that if I participate in the project, I will be asked questions about my eating behaviors, body satisfaction and overall self-esteem.

I understand that I will be asked to fill out a paper and pencil questionnaire. The total time commitment will be about 30 minutes. Any questions I may have regarding the survey or the research in general will be answered by Lindsay Hanson.

I understand that I must be at least 18 years of age to participate in this study.

I understand that my participation is completely voluntary and I may stop participation at any time. All my answers will be kept confidential to the extent allowed by law and my name will not appear on any of the results.

I understand that there are few, if any, risks associated with participation in this study. I also understand that there are benefits for participating in this research project. My own awareness about my body self-concept and general eating behaviors will be increased. In addition, I will be providing professionals, school administrators and other community leaders with valuable information that can be used to evaluate the impact of athletic participation on the eating behaviors of college-aged women.

I understand that this consent can be withdrawn at any time without prejudice, penalty or loss of benefits to which I am otherwise entitled. I have been given the right to ask any questions concerning the study. These questions have been answered to my satisfaction. If I have any further questions about my rights as a subject/participant in this research, or if I feel I have been placed at risk, I can contact the Chair of the Human Subjects Committee, Institutional Review Board, through the Vice President for the Office of Research at (850) 644-8633. I also understand that I may contact Lindsay Hanson, Florida State University, Department of Sport Psychology, (850) 322-7929, for answers to questions about this research or my rights.

APPENDIX G

Nonathlete Consent to Participate

By reading this cover page, I consent to be a participant in the research project entitled “Athletic Involvement and Eating Behaviors in College Women.”

The research is being conducted by Lindsay Hanson, who is a student at Florida State University. I understand that the purpose of her research is to better understand the relationship between athletic involvement and eating behaviors in college women. I understand that if I participate in the project, I will be asked questions about my eating behaviors, body satisfaction and overall self-esteem.

I understand that I will be asked to fill out a paper and pencil questionnaire. The total time commitment will be about 30 minutes. Any questions I may have regarding the survey or the research in general will be answered by Lindsay Hanson. I also understand that I am participating in this study in conjunction with my enrollment in Introduction to Psychology (PSY 2012), and will receive the appropriate credit for the class after completing this questionnaire.

I understand that I must be at least 18 years of age to participate in this study.

I understand that my participation is completely voluntary and I may stop participation at any time. All my answers will be kept confidential to the extent allowed by law and my name will not appear on any of the results.

I understand that there are few, if any, risks associated with participation in this study. I also understand that there are benefits for participating in this research project. My own awareness about my body self-concept and general eating behaviors will be increased. In addition, I will be providing professionals, school administrators and other community leaders with valuable information that can be used to evaluate the impact of athletic participation on the eating behaviors of college-aged women.

I understand that this consent can be withdrawn at any time without prejudice, penalty or loss of benefits to which I am otherwise entitled. I have been given the right to ask any questions concerning the study. These questions have been answered to my satisfaction. If I have any further questions about my rights as a subject/participant in this research, or if I feel I have been placed at risk, I can contact the Chair of the Human Subjects Committee, Institutional Review Board, through the Vice President for the Office of Research at (850) 644-8633. I also understand that I may contact Lindsay Hanson, Florida State University, Department of Sport Psychology, (850) 322-7929, for answers to questions about this research or my rights.

APPENDIX H

Debriefing Page/Summary of Research

Athletic Involvement and Eating Behaviors in College Women

Lindsay Hanson, M.S.

Thank you for taking the time to participate in this study. I am conducting this research to investigate eating behaviors in college women, specifically, the effects of athletic participation on eating behavior. The athletic community has often been criticized for encouraging female athletes to practice unhealthy eating behaviors. However, many of these claims have not been based on fact. I would like to determine if the eating behaviors of college athletes are, in fact, different than those of college women who do not participate in a varsity sport. To complete my study, I am surveying a sample of undergraduate women and a sample of varsity athletes here at Florida State University. I will then compare the two groups on three related variables - eating behaviors, body satisfaction, and overall self-esteem - to see if there are differences. It is my hope that the results of this study will reveal that eating behaviors of female college athletes and nonathletes are more similar than they are different.

APPENDIX I

Letter to Varsity Coaches



College of Education • Tallahassee, Florida 32306-4280
Department of Physical Education
(850) 644-4813
FAX: (850) 644-0975

September 15, 2003

Patrick Baker
FSU Women's Soccer
Seminole Soccer Complex
385 Chieftan Way
Tallahassee, FL 32306

Dear Coach Baker,

I am a graduate student in the Department of Sport Psychology at Florida State University, and currently conducting a research study to investigate the eating behaviors of college women. In particular, I am interested in the effects of athletic participation on these types of behaviors. To complete this study, I would like to survey a sample of varsity athletes here at Florida State. I am contacting the coach of each women's varsity team in an effort to do so.

Enclosed please find a copy of the study questionnaire. It includes questions about eating behaviors, body satisfaction, and overall self-esteem, and takes approximately 20 minutes to complete. This questionnaire, and the study itself, has already been approved by the Florida State University Human Subjects Committee. Participants' names will not be recorded and all information will be kept confidential.

I realize that your time, and that of your athletes, is very important. If possible, I would like to attend a team practice or meeting and distribute the questionnaires at that time. My schedule is extremely flexible and can be available at a time that is most convenient for you. However, I would like to have this portion of my study completed by the end of September.

I will follow up with you regarding this research study via telephone within the next week. If you have any questions before that time, I can be reached at 850-322-7929. I look forward to speaking with you.

Sincerely,

Lindsay Hanson, M.S.
Department of Sport Psychology
Florida State University

APPENDIX J

Florida State University
Internal Review Board Approval Letter



Office of the Vice President
For Research
Tallahassee, Florida 32306-2763
(850) 644-8673 · FAX (850) 644-4392

APPROVAL MEMORANDUM

Human Subjects Committee

Date: 7/2/2003

Lindsay Hanson
3934 Paces Court
Tallahassee, FL 32311

Dept.: **Sport Psychology**

From: **David Quadagno, Chair**

Re: **Use of Human Subjects in Research**
Athletic Involvement and Its Relationship to Eating Behaviors in College Women

The forms that you submitted to this office in regard to the use of human subjects in the proposal referenced above have been reviewed by the Secretary, the Chair, and two members of the Human Subjects Committee. Your project is determined to be exempt per 45 CFR § 46.101(b) 2 and has been approved by an accelerated review process.

The Human Subjects Committee has not evaluated your proposal for scientific merit, except to weigh the risk to the human participants and the aspects of the proposal related to potential risk and benefit. This approval does not replace any departmental or other approvals, which may be required.

If the project has not been completed by **7/1/2004** you must request renewed approval for continuation of the project.

You are advised that any change in protocol in this project must be approved by resubmission of the project to the Committee for approval. Also, the principal investigator must promptly report, in writing, any unexpected problems causing risks to research subjects or others.

By copy of this memorandum, the chairman of your department and/or your major professor is reminded that he/she is responsible for being informed concerning research projects involving human subjects in the department, and should review protocols of such investigations as often as needed to insure that the project is being conducted in compliance with our institution and with DHHS regulations.

This institution has an Assurance on file with the Office for Protection from Research Risks. The Assurance Number is IRB00000446.

Cc: David Pargman
HSC No. 2003.344

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