

**BODY IMAGE AND BEHAVIOR IN NCAA DIVISION III FEMALE ATHLETES
INVOLVED IN TEAM SPORTS IN THE MIDWEST**

**Presented in Partial Fulfillment of the Requirements for the
Degree Doctor of Philosophy in the Graduate School of
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By

Leigh A. Sears, M.S.

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Dissertation Committee:

Professor Janet Buckworth, Advisor

Professor Nancy Ann Rudd

Professor Diane Habash

Approved by

**Advisor
College of Education**

ABSTRACT

Sociocultural theories of body image examine the influence of common or culture-wide social ideals or expectations. These theories include the ‘Culture of Thinness,’ Feminist theories, and Gender Role Socialization. Many researchers believe that the strongest influences on the development of body image and body image disturbance in Western societies are sociocultural factors (Thompson, 1996). These sociocultural factors have a considerable impact on women in sport. With the enactment of Title IX in 1972, the opportunities for women in sport have increased dramatically; however, their portrayal in the media as well as the idea of being ‘stereotyped’ as gay or considered unfeminine for being involved in athletics is still a concern for many. Even if the type of sport itself (e.g., football versus figure skating) is not an issue for female athletes, the physique acquired may be. Many women use self-presentation behaviors to make sure that the image they portray is feminine, and for many that image also means being thin and not too muscular. The pressure to be thin and perceived as feminine has the potential to create anxiety in female athletes about their appearance. This anxiety in turn could contribute to athletes engaging in dietary and exercise behaviors that may be unhealthy and detrimental to their athletic performance. It was therefore the purpose of this study to gain a better understanding of the factors, or combination of factors, that lead to risky eating and exercise behavior in female athletes. Results from this study can help guide in the development of interventions for female athletes to help them deal effectively with the pressures of body image ideals.

The sample for this study was female college students between the ages of 18-23 who participated in intercollegiate team sports at National Collegiate Athletic Association Division III institutions in the Midwest. The head coaches were contacted via e-mail asking them to have their teams complete an Internet questionnaire. The coaches were asked to distribute an e-mail to the athletes on their team explaining the survey and its purposes. Data collection used a web-based host site where respondents used an Internet link to obtain a copy of the survey. Once a respondent decided to participate, she completed and submitted the survey electronically.

Outcome variables were excessive exercise and disordered eating. The predictor variables taken from sociocultural theories that were hypothesized to influence the outcome variables were body image, social physique anxiety, athletic identity, traditional sex role, internalization of sociocultural attitudes, self esteem, as well as the demographic variables of age, body mass index, participation in appearance or non-appearance sport, coach's gender, and whether the coach discusses body weight and dieting. These variables were analyzed using multiple regression analysis. Statistical significance was established a priori at $p < .05$ and effect size of η^2 was reported to estimate clinical significance. Using a proposed power of .80, a small effect size of .02, with 12 predictor variables, the estimated sample size was calculated to be 874. Initial examination of the above variables through linear regression led to the elimination of 9 of the original variables used to estimate sample size. Therefore, the sample size for power of .80

anticipating a small effect size of .02 was recalculated to be 543 with 3 predictor variables (e.g., self-esteem, body mass index, and internal).

Binary logistic regression was used to predict the dichotomous variable of risky eating. Three variables were entered into the model (self-esteem, body mass index, and social physique anxiety). The only significant variable according to adjusted odds ratio was social physique anxiety. This variable accounted for approximately 12% of the risky eating variance within the sample (Nagelkerke $R^2 = .124$).

Binary logistic regression was also used to predict the dichotomous variable of excessive exercise. Three variables were entered into the model (self-esteem, body mass index, and social physique anxiety). The linear combination of the three variables accounted for approximately 48% of the excessive exercise variance within the sample ($R^2 = .475$), which was significant, $F(3,522) = 159.096$, $p = .000$, $\eta^2 = .477$.

Based on these results, there was one common variable from sociocultural theory that helped predict both risky eating and excessive exercise for Division III female athletes. Social physique anxiety (SPA) was able to account for more of the variance in excessive exercise (42%) compared with risky eating (12%); however, these variables may be related. It was shown that those with a higher SPA also had higher BMI's and were more likely to engage in risky eating behaviors than in excessive exercise. With all athletes participating in on campus pre-season physicals and screenings, athletic trainers have the potential to administer a simple SPA survey. These results, along with BMI may help identify those females at risk for risky eating behaviors. These results also have

the potential to guide interventions with Division III female athletes involved in team sports. Education intervention on body image and healthy eating for training may help lower the SPA of some athletes.

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VITA

August 29, 1969	Born – Cincinnati, Ohio
1991	B.A. Physical Education and Health Education K-12 Ohio Wesleyan University
1999	M.S. Physical Education, Ithaca College, Ithaca NY
1994 – 2000	Instructor of Sports Medicine Head Women’s Soccer Coach Marietta College, Marietta OH
2000 – Present	Assistant Professor of Kinesiology Head Women’s Soccer Coach Hope College, Holland MI
2001 – 2005	Graduate Teaching Associate The Ohio State University

PUBLICATIONS

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CHAPTER 1

INTRODUCTION

Dieting, excessive exercise, and concern with appearance are part of the female experience in Western Society. One critical factor believed to underlie the alarming increase in the prevalence of eating disorders in Western nations is the current emphasis on thinness in standards of beauty. The current standard of beauty for women, which has been termed the “thin ideal” (McCarthy, 1990), is thought to be communicated to women primarily through the popular media as well as peer groups (Delaney, O’Keefe, & Skene, 1997). Women are expected to be thin to be considered attractive and accepted by society (Markula, 1995). It is the acceptance of these unrealistic ideals that lead women, athlete and non-athlete, to participate in risky behaviors to change their appearance to fit the standards of society.

Background and Rationale

Forty-five percent of American women are on a diet on any given day, with 51% of 9 and 10 year old girls expressing that they would feel better about themselves if they were on a diet (Eating Disorder Awareness & Prevention, 1999). Even women who fall within the normal weight range perceive themselves as too heavy and continue to pursue this thin ideal (Napoli, Murgolo-Poore, & Boudville, 2003). Eighty-three percent of college aged women use dieting for weight loss and believe they would be 2% to 6% larger if they did not (Malinauskas, Raedeke, Aeby, Smith, & Dallas, 2006). Body

dissatisfaction has led to a tireless pursuit of thinness, which has become a normative behavior among women in Western society (Dittrich, 2005). Thinness has not only come to represent attractiveness, but also has come to symbolize success, self-control and higher socioeconomic status. The media promote an unnatural body type, making it difficult for most women and men to accept natural beauty. For example, there is a discrepancy between reality and the media ideal. According to the Centers for Disease Control and Prevention (CDC), the average American woman age 20-74 is 5' 4" tall and weighs 164 pounds ("Americans are getting bigger but not taller," 2004). The average American model is 5' 11" and weighs 117 pounds, and most fashion models are thinner than 98% of American women. Consequences of this discrepancy are that 80% of women are dissatisfied with their appearance (Goldberg, Bailey, Lenart, & Koff, 1996; Katz, 2005) and 75% of normal-weight women think they are too fat (The Ohio State University Body Image & Health Task Force, 1998).

Body image dissatisfaction and eating disorders are more prevalent among women than among men. This gender specificity is apparent in that over 90% of patients with anorexia nervosa or bulimia nervosa are women (Dittrich, 2005). Although clinical eating disorders are relatively uncommon in college women, subclinical eating disorders are far more prevalent (Mazzeo, 1999). Some researchers have found that as many as 20% of college women report having engaged in disordered eating behaviors. According to a National Collegiate Athletic Association (NCAA) study, these behaviors included bingeing, vomiting, laxatives, diuretics, diet pills, sauna, and steam bath (Johnson, Powers, & Dick, 1999). Mintz and Betz (1988) found that 61% of college women had some intermediate form of an eating disorder, such as chronic dieting, subclinical bulimia, or

bingeing or purging alone. Only 33% of the subjects reported what could be considered normal eating habits. The degree of disturbed eating was strongly correlated with lowered self-esteem, more negative body image, greater tendency to endorse sociocultural beliefs regarding the desirability of female thinness, as well as obsessive thoughts concerning weight and appearance. Therefore, unhealthy eating behaviors may actually be considered relatively normative among undergraduate women (Mazzeo, 1999).

Olympic Gymnast Cathy Rigby states: (Otis & Goldingay, 2000)

The very thing that makes a great athlete or a great student or a great businessperson already predisposes them to be obsessive. Add on top of that the sport demands you to be young, demands you to be thin, and where perfection is the name of the game....If she happens to have a coach that is demanding, that very thing that makes her coachable can lead to a problem (p. 55).

Eating disorders and body image concerns have been frequently reported within the athletic population (Engel et al., 2003; Thompson & Sherman, 1993). Athletes are often perfectionists (Gould, Diffenbach, & Moffet, 2002), and may seek a perfect physique in the hopes of improving their performance. However, some athletes take this tendency to seek perfection too far and jeopardize their health when they engage in disordered eating behaviors (Carter & Rudd, 2005). The increased risk of eating disorders is not a consequence of being an athlete or participating in sports; rather, it arises because of the pressure placed on some athletes to lose weight (Otis & Goldingay, 2000). Many athletes misplace an emphasis on body weight and appearance as indicators or measures of success in their sports, and extend their perfectionism to this area.

Some studies have taken a closer look at the relationship between athletic participation, the type of sport, and body image. Petrie (1996) looked at differences in behavioral and psychological indices of eating disorders among college men and women. He compared nonathletes, students who participated in lean sports (where weight and appearance are central to success), and students who participated in nonlean sports. He found that female athletes in lean sports were more preoccupied with weight than either the female athletes in nonlean sports or the female nonathletes. Garner et. al., (1998) studied male and female athletes involved in lean sports (wrestling, gymnastics, figure skating, and diving) and compared them with groups of nonathletes. Garner and colleagues went on to theorize that the type of sport an athlete participates in (lean versus nonlean) might be related to greater or lesser disordered eating behaviors and insecurity about body image. Carter and Rudd (2005) also confirmed this finding among a variety of lean and non-lean sports. Although these studies opened the door to the idea of lean versus nonlean sports, the emphasis was still on male and female differences and not on differences exclusively among women participating in a variety of sports (Robinson & Ferraro, 2004).

Garner (1998) theorized that one potential risk factor that women face for developing an eating disorder is sports participation. Being an athlete places extra pressure on girls and women to be both thin and physically fit. It has also been proposed that coaches, judges, and teammates might encourage unhealthy weight management behaviors that could spiral into eating disorders. Many studies of female athletes have focused primarily on traditional female sports such as figure skating, dance, and gymnastics. Petrie (1993) examined disordered eating in college gymnasts and classified

them as normal/nondisordered eaters, exercisers, bingers, dieter/restrictors, sub threshold bulimics, or bulimics. He found that over 60% of his participants met the criteria for one of the intermediate disordered eating categories. The majority of the gymnasts reported a high drive for thinness and lower self esteem than female norms for these measures. Only 22% of the participants in Petrie's study reported eating behaviors that could be classified as normal or nondisordered. Ziegler et al. (1998) focused on 40 nationally ranked figure skaters. These skaters did not report significant body dissatisfaction; however, data suggested that a majority of the skaters dieted. These studies emphasized female sports participation but did not demonstrate whether the problem eating behaviors and negative body images they found were unique to athletes or merely a mirror of the general female population (Robinson & Ferraro, 2004).

Harris & Greco (1990) found that female athletes were no more at risk for eating disorders than nonathletes. However, Benson et.al. (1990) showed that female athletes were more preoccupied with weight, dieted more often, and had greater body dissatisfaction than their nonathlete counterparts. A 1992 study by Davis showed that female athletes involved in lean sports scored higher on scales measuring preoccupation with weight and dieting than female athletes who participated in nonlean sports (Davis, 1992). Robinson and Ferraro (2004) stated that there needs to be a better distinction between lean versus nonlean sports. Instead of looking at which sports tend to encourage leaner bodies, one needs to address which sports have a measurement of success that may depend on weight, primarily due to speed and time. In their study, athletes were selected based on their involvement in speed based versus technique based sports. The assumption was that speed based sports (sports that base success on speed) require lighter

bodies and therefore the athletes may feel greater pressure to be thin. Technique focused sports (sports in which success does not depend on speed but on technique, e.g., golf) are less weight oriented and therefore may place less pressure on athletes to restrict their body weight. Robinson and Ferraro (2004) compared these groups to nonathletes and found no statistically significant differences between the speed and technique athletes on body dissatisfaction and weight concern. However, nonathletes scored significantly higher than speed athletes on several dependent variables: drive for thinness, body dissatisfaction, ineffectiveness, the Beck Depression Inventory (BDI), body mass index (BMI), weighing more than their ideal body weight, and being larger than their ideal body shape. The nonathletes also scored higher than the technique athletes on drive for thinness and body dissatisfaction. What Robinson and Ferraro hypothesized was that sports participation not only helps maintain physical health in women, but also encourages healthier body images. The previous conflicting results raise the possibility that some athletic programs promote a healthier athlete than others. Some coaches may discourage excessive weight concerns and focus the athletes on the sport instead of on their bodies. Although this has not been addressed in any of the previously mentioned studies, the characteristics of the coach and the athletic program should be considered in the future.

Purpose of the Study

The purpose of this study was to gain a better understanding of the factors, or combination of factors, that lead to risky eating and exercise behavior in female collegiate athletes.

Research Questions

The following research questions were examined:

1. What factors, alone or in combination, are most predictive of the level of risky eating in Division III female athletes participating in team sports?
2. What factors, alone or in combination, are most predictive of the level of excessive exercise in Division III female athletes participating in team sports?

Hypotheses

1. Social physique anxiety will contribute the greatest proportion of variance in risky dieting in female collegiate athletes.
2. Social physique anxiety will contribute the greatest proportion of variance in excessive exercise in female collegiate athletes.
3. Internalization of sociocultural attitudes will contribute the greatest proportion of variance in risky dieting in female collegiate athletes.
4. Internalization of sociocultural attitudes will contribute the greatest proportion of variance in excessive exercise in female collegiate athletes.
5. Traditional sex role will contribute the greatest proportion of variance in risky dieting in female collegiate athletes.
6. Traditional sex role will contribute the greatest proportion of variance in excessive exercise in female collegiate athletes.
7. Self-esteem will contribute the greatest proportion of variance in risky dieting in female collegiate athletes.
8. Self-esteem will contribute the greatest proportion of variance in excessive exercise in female collegiate athletes.
9. Athletic Identity will contribute the greatest proportion of variance in risky dieting in female collegiate athletes.
10. Athletic Identity will contribute the greatest proportion of variance in excessive exercise in female collegiate athletes.
11. Body Image will contribute the greatest proportion of variance in risky dieting in female collegiate athletes.
12. Body Image will contribute the greatest proportion of variance in excessive exercise in female collegiate athletes.

Limitations and Assumptions

A survey intended to reach all Division III female athletes involved in team sports in the Midwest had the potential to reach over 9000 athletes. The Internet survey method saved not only time for data entry but also money that would have been spent on duplicating paper questionnaires and mailing. With the sensitive nature of some survey items, athletes were able to complete these surveys in private. Despite the fact that in 2003, only 62% of U.S. households reported owning a computer (Cheeseman Day, Ianus, & Davis, 2005), typical college campuses host computer labs, so accessibility to a computer should not have been a limitation of this study.

Despite these advantages, an Internet based survey has disadvantages, such as limitations in the computer skills of the respondent and the potential for multiple responses from the same person. Also, because the survey was completely anonymous, there was the possibility that someone not in the intended population could have submitted responses.

The major limitation to this study was selection bias. The target population was female, division III athletes in the Midwest, but access to the target sample was dependent on the head coaches distributing the Internet link to the survey to their athletes.

The study was implemented in the spring, which introduces a possible confounding influence of in or out of season athletes completing the survey.

Follow-up with non-respondents was not possible because there were no identifiers linked to the individual surveys.

As always, it must be recognized that survey studies may be influenced by social desirability and other attempts at impression management, even when several instruments and self-rating scales are used. Self-reporting of height and weight may be one case in point, which could result in inaccurate BMI scores. It is assumed that participants completed the Internet Survey themselves and answered all questions honestly.

Operational Definitions

For the purpose of this study the following definitions and abbreviations of terms apply.

Appearance sport

Appearance sports are those that present a higher pressure on athletes to be lean for performance (e.g., endurance sports) and/or aesthetic (e.g., judged sports) reasons (Reinking & Alexander, 2005). For the purpose of this study, the following sports were classified as appearance sports: rowing, synchronized swimming, volleyball, and water polo.

Athletic Identity

Athletic identity may be defined as the degree to which an individual identifies with the athletic role (Brewer, Van Raalte, & Linder, 1993). Scores on the Athletic Identity Scale were used to represent athletic identity (Brewer et al., 1993). Scores can range from 10 to 70, with higher scores indicative of a stronger identification with the athletic role.

Body Mass Index (BMI)

Body Mass Index is considered the simplest way to examine body weight status. BMI is calculated by dividing the body weight in kilograms by the height in meters squared. It examines body weight relative to height. As the BMI increases, mortality

from heart disease, cancer, and diabetes also increases (Durstine, King, Painter, Roitman, & Zwiren, 1993). BMI was calculated in this study using self-reported height and weight.

Disordered Eating

Disordered eating refers to the continuum of abnormal eating behaviors, ranging from poor nutritional habits to clinical eating disorders. These abnormal and harmful eating behaviors are often used in a misguided attempt to lose weight or maintain a lower than normal body weight (Beals, 2004). The results of the Q-EDD were used as an index of disordered eating (symptomatic behavior) (Mintz et al., 1997). The Q-EDD creates the categorical labels by a scoring manual that consists of flowchart decision rules, in which items or combinations of items were dichotomously scored (yes or no) in terms of meeting or not meeting individual Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) criteria. Questions were then asked regarding how often (4 point scales) and for how long (6 point scale) the behavior had been practiced. On the basis of decision rules, respondents were placed into diagnostic categories. At the most general level were diagnostic categories of non-eating disordered and eating disordered, each of which was composed of more specific categories. The non-eating-disordered category was composed of two other categories: symptomatic (e.g., some eating disorder symptoms but no DSM-IV diagnosis) and asymptomatic (e.g., no eating disorder symptoms).

Division III

Division III athletics features student-athletes who receive no financial aid related to their athletic ability. Athletic departments are staffed and funded like any other department in the university. Division III athletics encourages participation by

maximizing the number and variety of athletic opportunities available to students, placing primary emphasis on regional in-season and conference competition (NCAA, 2005).

Division III athletic programs in the Midwest were identified through an Internet search of each conference contained within the Midwest and for this study included 112 colleges.

Eating Disorder

Eating disorder is defined as any one of three clinical eating disorders – anorexia nervosa, bulimia nervosa, and eating disorders not otherwise specified (EDNOS) – recognized in the American Psychiatric Association’s 1994 DSM-IV (Beals, 2004). In this study, eating disorder was defined using the Q-EDD (Mintz et al., 1997), which was based upon the DSM-IV criteria (*Diagnostic and Statistical Manual of Mental Disorders (DSM-IV)*, 1994).

Excessive Exercise

Excessive exercise is exercise that is over and above that required for normal training and is done solely for the purpose of burning extra calories. Excessive exercise has recently been recognized as a form of purging (Beals, 2004). In this study, excessive exercise is one of the outcome variables of interest and is defined dichotomously using scores on the self-loathing subscale (SLSS) of the Exercise Orientation Questionnaire (Yates, Edman, Crago, & Crowell, 2001). A score above 16 on the SLSS indicates excessive exercise (Yates et al., 2001).

Exercise Orientation

Exercise orientation assesses the attitudes of the exerciser toward exercise, their bodies, and themselves (Draeger, Yates, & Crowell, 2005). In this study exercise orientation was measured using the Exercise Orientation Questionnaire (EOQ) (Yates, Edman, Crago, Crowell, & Zimmerman, 1999). Scores on the EOQ were calculated by taking the mean scores of the 27 items. A self-loathing subscale (SLSS) included in the EOQ was also used. A score higher than 16 out of 20 is related to high ratings of exercise investment, exercise frequency, and duration of exercise sessions and may also indicate other obligatory behaviors, such as eating disorder (Draeger et al., 2005).

Gender Role

Gender roles refer to the degree to which a person adopts the gender – specific and appropriate behaviors ascribed by his or her culture. The Personal Attributes Questionnaire (PAQ) was used to measure gender role (Spence & Helmreich, 1978).

Individual Sport

The following were classified as individual sports for purposes of the NCAA: Archery, Badminton, Bowling, Cross Country, Equestrian, Fencing, Golf, Gymnastics, Rifle, Skiing, Squash, Swimming and Diving, Tennis, Track and Field Indoor and Outdoor, and Wrestling (*2005-2006 NCAA Division III Manual: Constitution, Operating Bylaws, Administrative Bylaws*, 2005).

Midwest

The Midwest is constituted by the following 12 states: Ohio, Indiana, Michigan, Wisconsin, Illinois, Missouri, Iowa, Minnesota, North Dakota, South Dakota, Nebraska, and Kansas ("Graphic Areas Reference Manual," 2005).

National Collegiate Athletic Association (NCAA)

The NCAA is a voluntary association of about 1200 institutions, conferences, organizations and individuals that organizes the athletic programs of many colleges and universities in the United States ("National Collegiate Athletic Association," 2006, December 21).

Non-appearance Sport

Non-appearance sports are those that do not present a higher pressure to be lean for performance and/or aesthetic reasons. For the purpose of this study, the following sports were classified as non-appearance sports: basketball, field hockey, ice hockey, lacrosse, rugby, soccer, and softball.

Obligatory Exercise

The extent to which well-being is dependent upon adherence to an exercise regimen and a pathological aspect, defined as continuous exercise in the face of adverse circumstances.

Risky Eating

Risky eating behavior is one of the outcome variables in this study and is defined through scores on the Q-EDD (Mintz et al., 1997). Participants will be classified into two categories: exhibiting risky eating behavior if classified as symptomatic (e.g., some eating disorder symptoms but no DSM-IV diagnosis) and no risky eating behavior if classified as asymptomatic (e.g., no eating disorder symptoms).

Self Presentation

Self presentation (also called impression management) refers to the process by which people control how they are perceived and evaluated by others (Leary, 1992).

Social Physique Anxiety

Social physique anxiety (SPA) is defined as a subtype of social anxiety that occurs as a result of the prospect or presence of interpersonal evaluation involving one's physique, which is body form and structure, specifically body fat, muscle tone, and general body proportions (Hart, Leary, & Rejeski, 1989). The Social Physique Anxiety Scale has a possible total of 60, with higher scores showing greater physique anxiety. The short form of the Situational Inventory of Body-Image Dysphoria (SIBID; Cash, 2000a) was used to measure SPA. Scores on the SIBID range from 0-80 with higher scores showing greater physique anxiety.

Sport

Sports are institutionalized competitive activities that involve rigorous physical exertion or the use of relatively complex physical skills by participants motivated by personal enjoyment and external rewards (Coakley, 2001).

Sub-threshold Eating Disorder

Sub-threshold eating disorders are those that do not fully meet the criteria for eating disorders in the DSM-IV of the American Psychiatric Association (1994), but are nevertheless indicative of disordered eating patterns that may be harmful to the individual. The decision rules of the Q-EDD were used to determine if an athlete fell into the category of Sub-threshold Eating Disorder (Mintz et al., 1997).

Team Sport

The following are classified as team sports for the purposes of the NCAA: Baseball, Basketball, Field Hockey, Football, Ice Hockey, Lacrosse, Rowing, Soccer, Softball, Synchronized Swimming, Team Handball, Volleyball, Water Polo (2005-2006

NCAA Division III Manual: Constitution, Operating Bylaws, Administrative Bylaws, 2005).

Varsity Intercollegiate Sport

According to the NCAA (*2005-2006 NCAA Division III Manual: Constitution, Operating Bylaws, Administrative Bylaws, 2005*):

A varsity intercollegiate sport is a sport that has been accorded that status by the institution's chief executive officer or committee responsible for intercollegiate athletics policy and that satisfies the following conditions:

- (a) It is a sport that is administered by the department of intercollegiate athletics;
- (b) It is a sport for which the eligibility of the student-athletes is reviewed and certified by a staff member designated by the institution's chief executive officer or committee responsible for intercollegiate athletics policy; and (c) It is a sport in which qualified participants receive the institution's official varsity awards (p. 123).

CHAPTER 2
REVIEW OF LITERATURE
INTRODUCTION

Body image is the term that has come to be widely accepted as the internal representation of your own outer appearance, or your own unique perception of your body (Thompson, Heinberg, Altabe, & Tantleff-Dunn, 2002). According to Cash and Pruzinsky (1990), body image is a multidimensional construct broadly describing internal, subjective representations of physical appearance and bodily experience. Simply stated, body image refers to a person's attitudes about her/his body. Body image is not so much our actual appearance or how we seem to others, but our own internal view of how we look, how we think we appear to others, and how we feel about our looks (Thompson et al., 2002). The concept of body image is not static, and an individual's definition of his or her ideal body image is developed over a lifetime. Attitudes are formed and re-formed as a result of the influences of a range of factors, including representation in the media, cultural traditions, as well as attitudes of friends and relations (Ausport.gov, 2001). This changing internal view is typically associated with feelings and thoughts and may even modify behavior in certain situations.

According to Thompson et al. (2002), a continuum model may be the best way to conceptualize body image, with levels of disturbance ranging from none to extreme and most people falling near the middle of the range. A specific disturbance may take many

forms including perceptual, subjective (cognitive and affective), and behavioral (Thompson, 1996). The perceptual component of a disturbed body image has been traditionally defined as an overestimation of one's body size. The cognitive component might consist of an unrealistic expectation for a certain appearance feature. The affective component refers to feelings of distress or anxiety about one's appearance, and the behavioral aspect can manifest as avoidance of certain situations that elicit body image scrutiny (Thompson et al., 2002).

Theories

Body image is a multi-dimensional construct. Likewise, there are many theories available to help explain body image disturbance. Researchers in the area of body image generally delineate between perceptual and subjective theories. Perceptual theories of body image disturbances refer to the accuracy of one's size estimation. This aspect of body image is often discussed in terms of eating disorders because perceiving one's body as bigger or smaller than its objective size is used as one of the diagnostic criteria (Heinberg, 1996). Theories to help explain perceptual disturbances include cortical deficits, adaptive failure, and perceptual artifact. Cortical deficits refer to a potential disturbance in the visuospatial ability, resulting in the inability to accurately judge size (Thompson & Spana, 1991). Adaptive failure maintains that subjects' perceptions of their body size may not change at the same rate as their actual size changes (Crisp & Kalucy, 1974). Perceptual artifact proposes that a tendency to overestimate one's body size is related to one's actual body size. For example, individuals who are of a smaller

size overestimate to a larger extent than individuals of average or larger sizes (Coovert, Thompson, & Kinder, 1988). These theories address disturbances that are typical of clinical populations with body image distortions.

Subjective theories describe the satisfaction with one's body size or specific parts of the body. This is often examined more in non-clinical populations. Theories to explain subjective disturbances are divided between the developmental and sociocultural (Heinberg, 1996). Developmental theories focus on the important role of childhood and adolescent development in later body image disturbance and include (1) puberty and maturational timing, (2) negative verbal commentary and teasing, (3) early sexual abuse and (4) sexualization. Sociocultural theories examine the influence of common or culture-wide social ideals, expectations, and experiences on the etiology and maintenance of body image disturbance. These theories consist of (1) sociocultural ideas, or the "Culture of Thinness", (2) feminist theories and gender role socialization, and (3) self-ideal discrepancy and social comparison (Thompson, 1996). Even though both developmental and sociocultural theories may contribute to explaining the development of body image disturbance, many researchers agree that the strongest influences on the development of body image and body image disturbance in Western societies are sociocultural factors (Thompson, 1996).

A model that combines many of these sociocultural theories was proposed by Rudd and Lennon (1994). This model extends on social identity theory (Tajfel & Turner, 1979) to explain the active creation of appearances in responses to the cultural aesthetic ideal. Their model is based on the idea that the predominant appearance ideal of any culture becomes the internal standard that individuals use to create their appearances as

well as against which individuals compare themselves. This requires that individuals use social comparison to continually assess themselves as well as others. As a result of these social comparisons, individuals engage in appearance management behaviors to “re-create” their appearance. This new appearance is presented to others and those evaluations internalized. Positively perceived assessments may lead to a strong self-image, whereas negatively perceived assessments can require adjustments characterized by a feedback loop. In the feedback loop, coping strategies are employed to create and re-create appearances in an attempt to approximate the aesthetic ideal. Evaluations from others also factor into perceptions of what is personally ideal. The degree to which these evaluations are internalized may also affect the coping strategies, which prompt individuals to create and re-create their appearances. Sociocultural theories that contribute to Rudd and Lennon’s concepts of comparison and self recreation are described below.

Culture of Thinness

Norms of feminine beauty in Western culture have varied during different periods throughout history, with the most recent feminine “ideals” emphasizing a slender body type (Oelke, 2002). For example, magazine models 20 years ago weighed 8% less than the average woman; today, magazine models weigh 23% less than the average woman (Oelke, 2002). Stereotypes of the “ideal” male and female body types are constantly presented in the media and become a standard by which people judge themselves as well as others (Ausport.gov, 2001). Similarities between the ideal and individuals’ own

bodies are commended and differences are considered unattractive. A negative body image can occur when self-perception deviates too greatly from the ideals constantly represented in visual images (Ausport.gov, 2001).

Adolescent females growing up in Western society are often exposed to unrealistic images of women in terms of size and shape. The extent to which an individual cognitively “buys into” these socially defined ideals of attractiveness and engages in behaviors designed to produce an approximation of these ideals is termed thin-ideal internalization. Thin-ideal internalization is thought to directly foster body dissatisfaction because this ideal is virtually unattainable for most females (Thompson et al., 2002). These images largely set the standard for the body a female should aspire to and, as a result, an alarming number of young women and girls are dieting (Napoli et al., 2003). Forty-five percent of American women are on a diet on any given day, with 51% of 9 and 10 year old girls expressing that they would feel better about themselves if they were on a diet (Eating Disorder Awareness & Prevention, 1999). Even women who fall within the normal weight range perceive themselves as too heavy and continue to pursue this ideal (Napoli et al., 2003). A recent study by Malinauskas, Raedeke, Aeby, Smith, and Dallas (2006) surveyed 185 college students and found that 83% used dieting for weight loss and believed they would be 2% to 6% heavier than their current weight if they did not diet. Eighty percent of participants reported using physical activity for weight loss while 32% skipped breakfast and 9% smoked cigarettes to lose weight. According to work done by Thompson and Stice (2001), it has been suggested that internalization of the thin-ideal is a causal risk factor for body image and eating disturbances.

Body dissatisfaction leads to the tireless pursuit of thinness, which has become a normative behavior among women in Western society (Dittrich, 2005). Thinness has not only come to represent attractiveness, but also has come to symbolize success, self-control and higher socioeconomic status (Dittrich, 2005). The media push an unnaturally thin body type, making it difficult for us to accept natural beauty. According to the Centers for Disease Control and Prevention (CDC), the average American woman of age 20-74 is 5'4" tall and weighs 164 pounds (2004). The average American model is 5'11" and weighs 117 pounds. Most fashion models are thinner than 98% of American women. Consequences of this discrepancy are that 80% of women are dissatisfied with their appearance (Goldberg et al., 1996; Katz, 2005; Eating Disorder Awareness & Prevention, 1999) and 75% of normal-weight women think they are too fat (The Ohio State University Body Image & Health Task Force, 1998). This can be confirmed by the 2005 Youth Risk Behavior Survey that included data on 13,953 high school students. It was found that 61.7% of 9-12th grade girls were attempting to lose weight, which was in contrast to 29.9% of boys trying to lose weight (CDC, 2006). Body image dissatisfaction and eating disorders are also more prevalent among women than men (Dittrich, 2005). According to Thompson and colleagues (2002), the experience of being female is important to the gender difference for eating disorders for which there are nine women for every one male with this diagnosis. According to Striegel-Moore, Silberstein, and Rodin (1986), 90% of bulimics are women.

This emphasis on unrealistic and often unattainable ideals may result in an increasing number of women who are dissatisfied with their weight (Oelke, 2002). There also seem to be different standards for an ideal female body shape. With the evolution of

fitness magazines such as *Shape* and *Heath and Fitness*, there is a trend for the ideal physique for women to be fit and lean, in contrast to the ultra thin image often put forth by the popular fashion media (Oelke, 2002). This creates the cultural ideal for the feminine body to be a cluster of contradictions: firm but shapely, fit but sexy, strong but thin (Markula, 1995).

Although much body image research has been done with various groups of women, there is limited research focusing on female athletes, who may have an ideal body image that is more closely tied to muscularity and fitness for sport than to the ultra thin ideal. Female athletes, especially those at the elite and collegiate levels of competition, are thus at risk of having a negative body image and practicing unhealthy behaviors, which are compounded by aesthetic and performance demands of their sports (Thompson & Sherman, 1999). The impact of contradictory ideal body shapes was revealed in the most recent National Collegiate Athletic Association (NCAA) study on Division I elite athletes and eating disorders. Johnson et al. (1999) found that female athletes consistently reported significantly higher rates of disordered eating attitudes and behaviors. They were also found to report significantly lower self-esteem than the male athletes. Of the 1445 athletes in the 11 colleges chosen for the survey, 2.8% of the women had clinically significant problems with anorexia and 9% had clinically significant problems with bulimia. An additional 58% of female athletes and 38% of male athletes were at risk for disordered eating behaviors (Johnson et al., 1999).

According to Powers and Johnson (1996), this drive for thinness affecting primarily female athletes comes from two sources that they have referred to as performance thinness and appearance thinness. Performance thinness refers to the

commonly held belief that achieving a lower body weight and lower percentage body fat will enhance physical performance, particularly in the endurance sports. This can lead to negative consequences because on average, most women have to maintain approximately 17% body fat in order to menstruate. Approaching this submenstrual threshold body fat can increase preoccupation with food and trigger adaptive physiological mechanisms that will heighten the likelihood that overeating will occur in an effort to defend body fat above the menstrual threshold. The second source for the drive for thinness is appearance thinness, which refers to the trend to reward thinner athletes in the sports that require judging, such as gymnastics and figure skating. This practice could be a contributing factor to the female athlete's drive for thinness (Johnson et al., 1999) through the influence of internalized evaluations as proposed by Rudd and Lemon (1994). The question remains if these same ideals of performance and appearance thinness apply to competitive athletes participating at a lower level, that is, NCAA Division III.

Feminist Cultural Studies

Mariah Nelson (1994) states:

If you grew up female in America, you hear this: Sports are unfeminine. And this: Girls who play sports are tomboys or lesbians. You got this message: Real women don't spend their free time sliding feet-first into home plate or smacking their fists into soft leather gloves (p. 1). If you grew up male in America, you heard this: Boys who *don't* play sports are sissies or faggots. And this: Don't throw like a girl. You got this message: Sports are a male initiation rite, as fundamental and natural as shaving and deep voices – a prerequisite, somehow, to

becoming an American man. So you played football or soccer or baseball and felt competent and strong, and bonded with your male buddies. Or you didn't play and risked ridicule (p. 2).

Feminist cultural studies are an investigation of the reciprocity between gender and culture. How gender is produced within society, and how culture influences beliefs about gender become important for how females, particularly athletes are viewed. Gender is typically understood as socially learned behaviors and expectations that are associated with being biologically male and female in Western culture (Krane, Waldron, Michalenok, & Stiles-Shiple, 2001). Western society generally understands male as masculine and female as feminine, with masculinity and femininity being culturally defined sets of characteristics. Characteristics of masculinity include strength, competitiveness, assertiveness, confidence, and independence. On the other hand, being emotional, passive, dependent, maternal, compassionate, and gentle are characteristics of femininity (Krane, 2001). Society scrutinizes and marginalizes individuals who engage in cross-gender role behaviors (Krane, 2001; Young, 1997). The hegemonic values and expectations of gender-role appropriate behaviors are so deeply ingrained in our culture that they rarely are questioned. We simply assume that feminine and masculine behavior is "normal" (Krane, 2001). Individuals who go against this "normality" are punished through negative sanctions. Interviews with female athletes in a variety of sports (e.g., martial arts, rock climbing, rugby, wrestling, and ice hockey) revealed the common assumption that they were lesbian because they participated in nontraditional sports for females (Young, 1997). As they described, it was common to be "tagged 'butch', 'unfeminine', and 'dykey' " (Young, 1997, p. 300).

Femininity is a socially constructed standard for women's appearance, demeanor, and values (Bordo, 1993). Rather than representing the diversity among female bodies, the media produce homogenous images that combine and erase differences (Bordo, 1993). It is the mass media, primarily magazines and television, that is the most aggressive medium of images and narratives of the ideal slender beauty (Groesz, Levine, & Murnen, 2002). This perfect female body has flawless skin, a thin waist, long legs, and well-developed breasts (Thompson et al., 2002).

The culturally defined idea of femininity affects all women, and especially athletic women. Attitudes about gender appropriate sports, masculinity, and femininity are influenced in the same way as body image. Because western culture emphasizes a feminine ideal body and demeanor that contradicts with an athletic body and demeanor, participation in certain sports, such as football or body building, is often represented in the media as unfeminine (Krane, Choi, Baird, Aimar, & Kauer, 2004). Stereotypes influence the types of sports in which women are likely to participate. Not only are sports labeled as masculine or feminine, those female athletes who participate in sports are also subject to being labeled and stereotyped as either masculine (lesbian) or feminine (conforming to ideal). Royce, Gebelt, and Duff (2003) looked at how female athletes were perceived by male and female athletes and non-athletes. They found that non-athletes perceived female athletes as less feminine than did the athletes, suggesting that traditional stereotypes about female athletes may be stronger in the non-athletic population. As a group, men perceived female athletes as less feminine than did women, suggesting that traditional stereotypes might be stronger in the "out group" than in the "in group" to whom the stereotypes are personally relevant. It was also found by Lantz and

Schroeder (1999) that non-athletes were more likely to equate athletic identity with the masculine gender role. Because of these stereotypes, females in sports understand the importance of a heterosexually feminine appearance. More importantly, they know the consequences of not appearing feminine or participating in sports not perceived to be feminine (e.g., negative treatment by administrators and coaches, verbal harassment by fans, lack of media attention and endorsements) (Krane, 2001).

Sport as a masculine domain has been readily supported by society. Engaging in active, powerful, assertive, and competitive movements is considered masculine behavior. It is socially acceptable for males, but not for females. Because sport is defined by masculine standards, the cultural practices within sport conflict with femininity. Sports that require considerable physical strength, substantial body mass or muscularity, and those not traditionally open to females are socially constructed as masculine activities (Krane, 2001). This can help explain why some “men’s” sports have evolved for women. For example, to avoid the aggressive rough image of ice hockey, Canadian girls are encouraged to play ringette, a feminine, girls-only version of hockey. American girls who want to play baseball are encouraged to play softball. The primary component of these sports is that they are offered primarily for girls and women, thereby ensuring they could not be considered masculine. The creation of these all-girls sports also works to preserve the sanctity of the all-male, masculine sport environment (Krane, 2001).

Sport can be an opportunity for women to be in control of their own bodies. However, a problematic expression of femininity for female athletes is the presentation of a feminine body (Krane et al., 2004). Although there is greater acceptance of females

engaging in sport behaviors, there still are limits as to how much athletic prowess and muscularity are socially acceptable (Krane, 2001). Women challenge feminine hegemony as they develop toned and muscular bodies, yet they are also compelled to maintain a small, thin body that is consistent with the socially accepted ideal body (Markula, 1995). Ideally, sportswomen have toned bodies, yet they must avoid excessive, masculine-perceived, muscular bodies. When women start to develop attributes that are perceived to be masculine, they are often subject to a type of harassment (e.g., being labeled masculine or lesbian) that comes of stepping outside the conventional range of ideal female bodies (Ausport.gov, 2001). In sport, a muscular, lean, and strong body is essential, yet big muscles are not considered feminine in Western culture (Krane, Waldron et al., 2001). Consequently, female athletes struggle with the contradiction of the desire to be strong and successful, but not to develop “oversized” musculature (Wright & Clarke, 1999). Muscle development for athletes, therefore, creates a paradox in which a tight, toned body is perceived as ideal, yet large muscles symbolize strength and masculinity (Bordo, 1993). This conflict between a female body for sport and a socially acceptable female body may negatively impact athletes’ self-esteem, health, and self-presentation (Krane, Waldron et al., 2001).

Two recent studies clearly show the contradiction between the idea of femininity and sport performance in female athletes. Krane, et al (2001) interviewed American college female athletes, who revealed that they had conflicting body images. As athletes, the women had developed strong, muscular bodies to meet their aspirations in sport; however, their muscular physiques were a source of personal concern in social settings. This manifestation of concern was tied to their knowledge that their bodies did not fit the

cultural idea of a toned but not-too-muscular female body. Similarly, Russell (2002), in a study of British female athletes identified tensions between the “sporting body” and “the social body.” The women were satisfied with their sporting bodies as strong, useful, and admired while participating in their sport, yet they expressed dissatisfaction with their bodies when they considered social contexts.

Female athletes must balance some traits essential for athletic success with presentation of an acceptable appearance conforming to the heterosexist norms of society (Krane, 2001). They must be mentally and physically strong yet also portray an image of vulnerability to be perceived as feminine. To be successful in sport, some traditionally masculine characteristics are essential (e.g., assertiveness, competitiveness, physical strength), yet females may be denigrated for portraying these characteristics. Therefore, female athletes must be athletic yet also portray grace and beauty to be perceived as feminine (Krane, 2001). Those athletes who successfully portray a heterosexually feminine appearance not only avoid negative treatment, they also reap the benefits. Women who looked feminine and those with unquestionable heterosexual credentials (e.g., husbands, boyfriends, children) were treated differently than women who did not look feminine, single women, and lesbians (Andrews, 1998; Higgs & Weiller, 1994; Messner, Duncan, & Jensen, 1993). These athletes were more likely to attract the attention of journalists and media for post-competition interviews, which is an important avenue for gaining endorsements (Krane, 2001).

Presenting female athletes as more feminine to attract positive attention from the media goes back to Phillip Wrigley and the All-American Girls Softball League (AAGSBL) of 1943. Mr. Wrigley was well aware of the public’s image of women

softball players. Wrigley and his staff were determined to ensure the AAGSBL's success by carefully controlling almost every aspect of their players' appearance and behavior. In 1943 and 1944, during spring training players were required to attend charm school at night. The league's nighttime charm school included lessons in the arts of walking, sitting, speaking, selecting clothes, applying makeup, and other everyday activities. The girls were even provided a handbook, which spelled out the recommended cosmetics each player should have in their "All-American Girls Baseball League Beauty Kit." Whenever possible, Wrigley and his advertising director Meyerhoff helped writers point out how their players exemplified the "feminine" ideal. Meyerhoff provided the press with background information on the most glamorous players, and the resulting articles often focused on the women's personal lives (Macy, 1993).

Throughout the league's 12-year existence, conduct rules emphasizing femininity and healthy competition were emphasized. From the start, the rules included the following:

(1) Always appear in feminine attire when not actively engaged in practice or playing ball. At no time may a player appear in the stands in her uniform or wear slacks or shorts in public;

(2) Boyish bobs are not permissible and in general your hair should be well groomed at all times with longer hair preferable to short hair cuts. Lipstick should always be on;

(3) Smoking or drinking are not permitted in public places. Liquor drinking will not be permitted under any circumstances. Other intoxicating drinks in limited portions with after-game meal only will be allowed; obscene language will not be tolerated at any time (p. 145) (Johnson, 1994).

The players were reminded of the importance of being feminine. In 1950, Racine Bells' president Don Black sent his players a six-page letter to prepare them for the upcoming season (Macy, 1993).

Our league and our club have only two important things to sell the public, playing ability and femininity. While the playing ability of our teams has been steadily on the increase, we must not forget and grow lax about the all-important femininity angle. It was one of the prime factors on which our league was founded and it is more than ever important that it should remain. You'd be surprised at the importance this holds with the average fan. Nobody is especially surprised or impressed if a rough, tough mannish looking babe shows some ability at sports. But to realize that a truly feminine creature can reach the top in one branch of athletic endeavor is refreshing and pleasing. Your fans want you to look and act like ladies and still play ball like gentlemen (p. 18)!

Since the 1972 passage of Title IX, women in the U.S. have had a legal basis from which to push for greater equity in high school and collegiate athletics. Although equity is still a goal in terms of funding, programs, facilities, and media coverage, substantial gains have been made by female athletes, indicated by increasing participation as well as the peer and self-acceptance of female athleticism (Messner, 1988). Even though times have changed, more recent sports have reflected this same strategy used by Wrigley in

the AAGSBL. For example, in 1979 and 1980, the California Dreams of the Women's Professional Basketball League (WBL) sent their players to charm school. Another WBL team, the New Orleans Pride, hired a makeup specialist to help players apply cosmetics before each home game (Macy, 1993). During the 1990's, the Ladies Professional Golf Association (LPGA) employed an image consultant who focused on the hair, fingernails, makeup, and skin of the golfers (Festle, 1996). Since this began, the tour has experienced an increase in corporate sponsorship and prize money, a 50% gain in revenue, and twice as much television coverage (Festle, 1996).

Knight and Giuliano looked at how the media portray women as opposed to men. Typically women are portrayed as heterosexual, feminine women first and athletes second whereas men, for the most part, are portrayed solely in terms of their athleticism. This brings about the idea of the "female apologetic," whereby female athletes go out of their way to show their feminine side either during competition (e. g., wearing bows in their hair) or outside of their sport (e.g., dressing extremely feminine). This begins to address self-presentation, or the process by which people control how they are perceived and evaluated by others (Leary, 1992). Leary looks at this idea of how people (or athletes) are concerned with what others think of them and how this can influence their behavior and even lead to risky behaviors (Leary, 1992; Leary, Tchividjian, & Kraxberger, 1994). Such self-presentation may not be desirable or comfortable; however, sportswomen realize the consequences of not adhering to a more feminine presentation (Krane, 2001). For example, many members of the 1990 Canadian national hockey team who wore pink uniforms resented the inherent sexism of the gimmick, but went along with it, knowing that disagreeing openly could spell the end of their national team

experience. Thus, many female athletes employ various strategies to present an appearance consistent with hegemonic feminine ideals (Krane, 2001). An excellent example can be seen on the cover of Danica Patrick's 2006 autobiography, *Crossing The Line*. Patrick is presented in a black evening gown, with her hair blowing in the wind, while holding her racing helmet (Patrick & Morton, 2006). Patrick explained this cover on the NPR program, *All Things Considered* (Silverman, 2006). The cover came about because of an earlier photo shot for *For Him Magazine* in which she was lying across the hood of a car in a bathing suit and high heels. Patrick admitted that she was able to use being a woman to her advantage to promote a product and make sponsors happy.

Social Physique Anxiety

Female athletes have adapted their images to fit the situation, in some cases to avoid being considered masculine outside of the sporting world. Concern with how other people perceive one's physique is one aspect of social physique anxiety (SPA). Social physique anxiety refers to the idea of experiencing anxiety when placed in situations in which your body can be evaluated. There has been speculation that SPA is one barrier to exercise for women who fear that their bodies will be evaluated while they work out. However, research has also shown that women could decrease their SPA by working out (e.g., workout and lose weight, therefore decrease anxiety over being evaluated because physique is more like culturally defined thin ideal) (Tucker & Maxwell, 1992; Williams & Cash, 2001). Social physique anxiety has also been negatively associated with commitment to sport or activity (Finkenbergh, DiNucci, McCune, Chenette, & McCoy, 1998), and positively associated with more extrinsic motives for exercise (Crawford & Eklund, 1994; Frederick & Morrison, 1996). This implies a complicated situation for

collegiate female athletes, whose commitment to their sport at the college level should be linked to lower SPA, but their extrinsic appearance-related motivation for working out may foster higher SPA. Female athletes must contend with an athletic body that is necessary to meet their sport goals yet one that also is contrary to societal standards of the ideal female body. While these athletes may feel perfectly comfortable and they may be supported and successful in the athletic environment (e.g., low SPA), they may not be as comfortable in social settings where traditional femininity is expected. Here their muscular bodies may be perceived as masculine and it is these perceptions and standards that affect how females in sport are perceived by society at large (Krane, 2001). Given the different standards, it is possible that these female athletes experience little SPA while working out or in their sport environment, but more SPA when they are in a social environment and away from teammates and other athletes.

The feminist theories focus almost entirely on how the role of culture, society, and women's roles can have a profound influence on the development of body image disturbance and eating disorders (Thompson et al., 2002). What these theories fail to completely explain is the large heterogeneity of normative discontent among women in Western cultures. "Normative discontent" is a phrase that captures the essence of a body image disturbance so prevalent among women that it can be considered a normal part of their life experience (Thompson et al., 2002). This discontent exists on a continuum, with some women reporting relative satisfaction with their bodies and appearance and others developing eating disorders. Given the fact that all women are exposed to the culture of thinness and the stressors related to women's role in society, it is unclear how this heterogeneity develops (Striegel-Moore et al., 1986). Sex-role orientation is

proposed as etiologically significant in the development of body image dissatisfaction. Murnen and Smolak (1997) conducted a meta-analysis of 69 studies that examined the connection among masculinity, femininity, and eating problems. They found a small, positive relationship between femininity and eating problems and a negative relationship between masculinity and eating problems. Jackson, Sullivan & Rostker (1988) took this one step further and tested 166 undergraduate students on gender role, body image, and self-esteem. Their findings suggested that gender role was related to body image. Traditionally sex-typed women had lower body satisfaction than their more androgynous peers. Perhaps certain women, because of their endorsement of more traditional feminine values, are at a higher risk for being dissatisfied with their appearance and body shape (Thompson et al., 2002). While high self-esteem predicted more favorable evaluations of physical appearance, it did not account for all of the relationship between gender, gender role, and body image. The importance of the masculine component of gender role has also been demonstrated. Androgynous and masculine women had more favorable body image ratings and more feminine men had unfavorable ratings in a physical fitness domain of image (Jackson et al., 1988).

Self-Esteem

Self-esteem can be defined as a confidence and satisfaction in oneself ("Merriam-Webster OnLine," 2005). On one hand, sports participation has been known to be associated with higher levels of self-esteem in boys and men, while the literature generally suggests that the same relationship holds for girls and college women (Butcher, 1989; Cate & Sugawara, 1986). Because of this, athletic participation might actually serve to help protect against the development of eating problems. More specifically,

being an athlete might give a girl a sense of pride that is separate from appearance and may help her to invest in what her body can do rather than how it looks (Smolak, Murnen, & Ruble, 2000).

On the other hand, athletic participation in certain sports has been linked to a higher incidence of eating problems, including the eating disorders anorexia nervosa, bulimia nervosa, and a variant of eating disorders not otherwise known (EDNOS). It has been suggested that success in these sports requires a particular appearance (lean), which may lead to direct pressure from judges, coaches, and parents to be thin (Sundgot-Borgen, 1994a). Leanness, and even thinness, is also viewed as generally enhancing performance. Therefore, even in sports that have less appearance emphasis, one might expect some pressure to attain and maintain a relatively low weight with a low percentage of body fat. This type of pressure might, in turn, lead to a drive for thinness, preoccupation with weight and shape, adoption of extreme methods to lose weight, and, eventually, serious eating problems (Smolak et al., 2000).

Thus there are conflicting models of how athletic participation might be related to eating problems among girls and women. A National Collegiate Athletic Association (NCAA) study performed by Johnson, Powers, and Dick (1999) found female athletes, when compared with males, reported higher rates of disordered eating attitudes and behaviors as well as significantly lower levels of self-esteem.

Thompson and Sherman (1993) wrote that sport could have three possible roles in affecting eating disorders: that sport can attract already at risk individuals, that participation can result in the disorder, or that sport can precipitate an eating disorder in those who are predisposed to its development. It may be then, that individuals with low

self-esteem who are just starting or who are already involved in competitive sports are at risk for the development of an eating disorder particularly when the added pressure of the sports arena is factored in.

Excessive Exercise

Over the past decade public attention has focused increasingly on matters of health and well-being. Participation in regular physical activity is considered an important preventative health behavior, and is purported to contribute to a plethora of physical and psychological benefits (CDC, 1996). As a consequence, the promotion of physical fitness has become an obsession in North America (Davis, 1990).

In the 4th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) (*Diagnostic and Statistical Manual of Mental Disorders (DSM-IV)*, 1994), excessive exercise is listed, along with fasting, as a defining feature of bulimia nervosa “non-purging subtype.” The criteria for excessive exercise suggested in DSM-IV is exercise that “significantly interferes with important activities, occurs at inappropriate times or in inappropriate settings, or continues despite injury or other medical complications” (p. 546). With athletes in particular it may be difficult to determine what constitutes “excessive” exercise or physical training. Nonetheless, it is generally accepted that exercise should be considered excessive if it is over and above that required for normal training and is done solely for the purpose of burning extra calories. Excessive exercise as a purging technique may lead to an overuse injury. This could leave the athlete unable to exercise, which can lead to other forms of purging (e.g., self-induced vomiting, use of laxatives or diuretics) or severe energy restriction in an attempt to prevent weight gain (Beals, 2004).

A study surveying 185 Division III athletes used the Multiple Addictive Behavior Questionnaire to investigate addictive behaviors (Bacon & Russell, 2004). The self reported data revealed that exercise addiction was the largest category of addictive behaviors with substance abuse being the smallest category. When looking at gender differences, it was found that the male athletes fell into the substance/gambling/alcohol cluster, while female athletes fell into the eating/exercise cluster. For female athletes in this study, it was found that disordered eating correlated with excessive exercise (Bacon & Russell, 2004).

CONCLUSION

Sociocultural theories of body image examine the influence of common or culture-wide social ideals or expectations. These theories include the Culture of Thinness, Feminist theories, and Gender Role Socialization. Many researchers believe that the strongest influences on the development of body image and body image disturbance in Western societies are sociocultural factors (Thompson, 1996). These sociocultural factors have a significant impact on women in sport. Despite the fact that women in sport have progressed toward greater equality with male athletes, the portrayal of female athletes in the media and the risk of being stereotyped or considered unfeminine for being involved in athletics are still concerns. Even if the type of sport itself is not an issue for female athletes, the physique acquired may be. Many women use self-presentation behaviors to make sure the image they portray is feminine, and that image can also mean being thin and not too muscular. The pressure to be thin or perceived as feminine has the potential to create anxiety in female athletes. This anxiety in turn could contribute to athletes using diet and exercise to become more like the

cultural ideal, which can lead to risky diet and exercise behaviors that can also be detrimental to their athletic performance. **It was therefore the purpose of this study to gain a better understanding of the factors, or combination of factors based on sociocultural theories of body image, that lead to risky eating and exercise behavior. Results from this study can help guide in the development of interventions for female athletes to help them deal effectively with the pressures of body image ideals.**

CHAPTER 3

METHODS AND MATERIALS

The purpose of this study was to examine the factors that influence the level of disordered eating and excessive exercise in female collegiate athletes at the division III level. The following sections will describe the subject characteristics and recruitment process, the study design, measures, and analysis.

Research Design

Sample

Female college students between the ages of 18 and 23 who participate in intercollegiate team sports at National Collegiate Athletic Association (NCAA) Division III institutions in the Midwest were recruited to participate in this study. Division III athletes are different from Division I or Division II athletes in many ways. Division III athletes are unable to receive an athletic scholarship for their performance. Because these athletes are not playing for their tuition, it makes them more like general students who carry the responsibility of potentially working to pay for their education. They are also not bound to mandatory out of season workouts, which potentially leaves more time for becoming involved in campus life and activities outside of sport. This fact leaves a Division III athlete more like the ‘normal’ population, which will make results from this study more generalizable to the general public, including non-collegiate athletes or

women involved in everyday sport. Data were also collected on an additional 456 teams of individual sports for secondary analysis, which was not part of this proposal. Based on an Internet search of each conference located in the Midwest, 479 Division III female athletic teams were found. By estimating the average number of participants per team, the sample population consisted of approximately 8,200 student athletes. The head coaches for each team sport (basketball, field hockey, ice hockey, lacrosse, rowing, soccer, softball, synchronized swimming, volleyball, and water polo) were contacted via e-mail asking them to have their teams complete an Internet questionnaire (Appendix A). The coaches were asked to distribute an e-mail to the athletes on their team explaining the survey and its purpose (Appendix B). Coaches were sent a letter two weeks later reminding them to pass along the information if they had not already (Appendix C). Participation was voluntary, anonymous, and in accordance with University and federal guidelines for human subjects (Appendix D). Any athlete who was found to have a previously diagnosed eating disorder, or found to have a current eating disorder was excluded from the sample. One instrument (Q-EDD) enabled us to classify the respondent as having an eating disorder; however, because the instrument is completely confidential, no follow up was possible with either that athlete or her coach. To encourage those who think they may be struggling with risky behavior to seek additional resources, the final page of the instrument included a statement with a link to The Ohio State Body Image & Health Task Force website (<http://www.hec.ohio-state.edu/bitf/>) as well as a statement urging any one showing concern to seek the advice of her school's Student Health Clinic.

Data collection occurred using a web-based host site where respondents could use an Internet link to obtain a copy of the survey (<http://frostcenter.org/ImageBehavior.htm>). Once a respondent decided to participate, she would complete and submit the survey electronically. Responses to the survey were held in reserve by the host site software and downloaded into a data file for analysis by Laurie Van Ark, the assistant director of the Frost Research Center at Hope College, Holland, Michigan. A copy of the original data was saved on a data storage device, given to the principle investigator, and stored in a locked cabinet and on a password-protected computer.

Measurement / Instrumentation

The questionnaire (Appendix E) was a 221-item, 15-20-minute survey designed to assess demographics; the nature and extent of athletic involvement; eating-related behaviors such as dieting, fasting, purging, and the use of diet pills/supplements; exercise related behaviors such as exercise orientation (exercise motivation); attitudes concerning body image and weight related issues. The questionnaire included: The Rosenberg Self Esteem Scale (Rosenberg, 1965), The Exercise Orientation Questionnaire (Yates et al., 1999), The Questionnaire for Eating Disorders Diagnoses (Mintz et al., 1997), The Multidimensional Body-Self Relations Questionnaire (Cash, 2000b), The short form of The Situational Inventory of Body-Image Dysphoria (Cash, 2002), The Athletic Identity Measurement Scale (Brewer et al., 1993), The Personal Attributes Questionnaire (Spence & Helmreich, 1978), and the Sociocultural Attitude Towards Appearance Scale-3 (SATAQ-3) (Thompson, Van Den Berg, Roehrig, Guarda, & Heinberg, 2004). Due to the length of the questionnaire, the web site contained a progress bar to alert the

participant as to how much of the instrument had been completed. The instrument also included a pause feature, which allowed the participant to stop the questionnaire and receive an e-mail reminder within the week to complete the questionnaire. If the participant failed to complete the questionnaire, her data were not recorded.

Variables

The outcome variables were disordered eating and excessive exercise. The predictor variables hypothesized to influence the outcome variables were organized under the following categories:

Demographic: BMI (height and weight), age, coach's gender, whether the coach discusses weight, and whether the coach discusses dieting.

Body dissatisfaction: body image (Cash, 2000b), social physique anxiety measured with the situational inventory of body-image dysphoria score (Cash, 2002).

Gender role socialization: athletic identity (Brewer et al., 1993), sport, type of sport (appearance sport, non-appearance sport), traditional sex role (Spence & Helmreich, 1978), self-esteem (Rosenberg, 1965), and internalization of sociocultural attitudes (Thompson et al., 2004).

Instruments

Demographics

Questions in this section of the survey included current sport, years of involvement in current sport, whether they were a starter in their current sport, age, year in school, height and weight (body mass index), ethnicity, home state, state in which their school was located, as well as the gender of their coach and whether the coach discusses weight and dieting.

Excessive Exercise Behavior

The Exercise Orientation Questionnaire (EOQ) (Yates et al., 1999) was used to assess degree of obligatory exercise. It is a 27-item questionnaire containing subscales for Self Control, Orientation to Exercise, Self Loathing, Weight Reduction, Identity, and Competition. Responses are made on a 5-point Likert scale that ranges from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). The total EOQ score was calculated by taking the mean of scores for the 27 items. Scores on each subscale were calculated by taking the mean of scores associated with that scale. Alpha values are .87 for Self Control, .82 for Orientation to Exercise, .74 for Self Loathing, .75 Weight Reduction, .78 for Identity, and .76 for Competition (Yates, et al, 1999). The alpha value for the total score is .92.

Risky Eating Behavior

Risky eating behavior can include but is not limited to: restriction, dieting, laxative use, vomiting, the use of diuretics, and binge eating. Risky eating behavior was examined using scores from the Questionnaire for Eating Disorders Diagnosis (Q-EDD) (Mintz et al., 1997). This instrument is a 50 item self-report questionnaire that operationalizes the DSM-IV diagnoses of Anorexia Nervosa, Bulimia Nervosa, and Eating Disorders Not Otherwise Specified. The Q-EDD yields both frequency data for individual behaviors (e.g., self-induced vomiting) and categorical labels (e.g., eating disordered and non-eating disordered). Categorical labels were generated by a scoring manual that consisted of flowchart decision rules, in which items, or combinations of items, are dichotomously scored (yes or no) in terms of meeting or not meeting individual DSM-IV criteria. Questions were then asked regarding how often (4 point scales: 1 = *no*,

2 = *daily*, 3 = *twice/week*, 4 = *once/week*, 5 = *once/month*) and for how long (6 point scale: 1 = *1 month*, 2 = *2 months*, 3 = *3 months*, 4 = *4 months*, 5 = *5-11 months*, 6 = *more than a year*) the behavior had been practiced. On the basis of decision rules, respondents were placed into diagnostic categories. At the most general level were diagnostic categories of non-eating disordered and eating disordered, each of which was composed of more specific categories. The non-eating-disordered category was composed of two other categories: symptomatic (e.g., some eating disorder symptoms but no DSM-IV diagnosis) and asymptomatic (e.g., no eating disorder symptoms). Mintz et. al., (1997) reported adequate reliability and validity. The authors found test-retest reliability kappa values ranging from .64 to .94, and an accuracy rate of 98% between the Q-EDD and clinician diagnosis of eating disorder categories (anorexia, bulimia, subthreshold bulimia, menstruating anorexia, binge-eating disorder, nonbinging bulimia).

Body Image

Body image was measured using The Multidimensional Body-Self Relations Questionnaire Appearance Scales (MBSRQ-AS; Cash, 2000). The MBSRQ-AS contains 34 items and includes subscales for *appearance evaluation*, *appearance orientation*, *overweight preoccupation*, and *self-classified weight*, and the *body area satisfaction scale* (BASS). The 34 items are scored on a 5-point Likert type scale where 1 = *definitely disagree* and 5 = *definitely agree*, with subscale scores being the means of the constituent items after reversing contra-indicative items. After scoring, each subscale provides a score of 1 to 5. *Appearance evaluation* measures feelings of physical attractiveness or unattractiveness; satisfaction or dissatisfaction with one's looks. High scorers feel mostly positive and satisfied with their appearance; low scorers have a general unhappiness with

their physical appearance. *Appearance orientation* is the extent of investment in one's appearance. High scorers place more importance on how they look, pay attention to their appearance, and engage in extensive grooming behaviors. Low scorers are apathetic about their appearance; their looks are not especially important and they do not expend much effort to "look good." *Overweight preoccupation* assesses a construct reflecting fat anxiety, weight vigilance, dieting, and eating restraint. Higher scores represent greater preoccupation with weight. *Self-classified weight* reflects how one perceives and labels one's weight, from very underweight to very overweight. Higher scores indicate a higher weight. The *body area satisfaction scale* (BASS) is similar to the appearance evaluation subscale, except the BASS taps satisfaction with discrete aspects of one's appearance. High scorers are generally content with most areas of their body. Low scorers are unhappy with the size or appearance of several areas.

Cronbach's alpha for each subscale is adequate: appearance evaluation .88, appearance orientation .85, body areas satisfaction .73, overweight preoccupation .76, and self-classified weight .89. One-month test-retest for each subscale is as follows: appearance evaluation .91, appearance orientation .90, body area satisfaction .74, overweight preoccupation .89, and self-classified weight .74 (Cash, 2000b).

Physique anxiety

Social physique anxiety was examined using the short form of the Situational Inventory of Body-Image Dysphoria (SIBID). According to Cash (Cash, 2002), body-image emotions are proposed to depend, in part, upon situational events, for example, situations involving body exposure, social scrutiny, social comparisons, wearing certain clothing, looking in the mirror, eating, weighing, exercising and so forth. The SIBID

assesses this affective aspect of the construct, which is the persons' negative body-image emotion in specific situational contexts. This 20-item short form was developed from the original 48-item scale and validated with eight college-student databases with a total of 1465 women. The instrument describes situations for which participants indicate their frequency of negative body-image emotions, from 0 (*never*) to 4 (*always or almost always*). The SIBID-S yields one composite score, computed as the mean of its 20-items, and can range from 0 to 4. Situations include social and nonsocial contexts and activities related to exercising, grooming, eating, intimacy, and physical self-focus, as well as appearance alterations. Internal consistencies (Cronbach's alpha) ranged from .94 to .96 (Cash, 2002). Correlations with the 48-item SIBID surpassed .95. One-month test-retest reliability with a sample of 118 women was .87.

Athletic identity

Athletic identity was measured with the athletic identity measurement scale (AIMS) (Brewer et al., 1993). This is a 10-item questionnaire to which responses are made on a 7-point Likert scale that ranges from 1 (*strongly disagree*) to 7 (*strongly agree*). Scores on the AIMS range from 10 to 70, with higher scores indicative of a stronger identification with the athletic role. Cronbach's alpha was found to be .93 with a 14-day test-retest reliability coefficient of .89 (Brewer et al., 1993).

Traditional Sex Role

Traditional sex role was measured using the Personal Attributes Questionnaire (PAQ) (Spence & Helmreich, 1978). The PAQ is composed of 24 bipolar items describing personal characteristics, on each of which respondents are to rate themselves on a 5-point scale. The questionnaire is divided into three 8-item scales, labeled

Masculinity (M), Femininity (F), and Masculinity-Femininity (M-F). The M subscale reflects self-assertive and instrumental characteristics (e.g., independence, self-confidence), and the F subscale reflects interpersonally oriented expressive characteristics (e.g., kind, aware of feelings of others). The MF subscale reflects personality traits that are differentially desirable depending on the sex of the respondent (e.g., does not cry easily, aggressive). Each item is scored from 0 to 4, a high score on items assigned to the M and M-F scales indicating an extreme masculine response and a high score on F scale items indicating an extreme feminine response. Total scores are obtained on each scale by adding the individual's scores on the eight items. Participants were then classified into one of four categories using a split mean method. Participants were classified by means of a 2 by 2 table according to their position above or below the median on the two scales. Normative values ($M = 21$, $F = 15$) were found using 715 college students (Spence & Helmreich, 1978). Those scoring above the norm on both the masculine and feminine scales were considered androgynous (e.g., $M > 21$ and $F > 15$). Those scoring below the norm on both the masculine and feminine scales were considered undifferentiated. Those scoring above the norm on the masculine scale and below the norm on the feminine scale were considered masculine, while those scoring above the norm for femininity and below the norm for masculinity were considered feminine. The PAQ, in its entirety, has demonstrated good internal consistency at 0.83. Cronbach's alpha for each subscale is .85, .82, and .78 for M, F, and M-F respectively (Spence & Helmreich, 1978).

Internalization of Sociocultural Attitudes

Internalization of sociocultural attitudes was measured using the Sociocultural Attitudes Towards Appearance Scale – 3 (SATAQ-3) (Thompson et al., 2004). The SATAQ-3 was designed to expand and update the measurement of a sociocultural influence on body image and eating disturbance by (1) including a relatively new focus on athleticism for women, and (2) examining media influences beyond internalization, such as pressures and information. This instrument consists of 30 items and four subscales (*Internalization-General*, nine items; *Information*, nine items; *Pressures*, seven items; *Internalization-Athlete*, five items). The subscales of this instrument were scored individually by totaling the scores for each. The scores on the *Internalization General* subscale ranged from 9 to 45. The scores on the *Information* subscale ranged from 9 to 45. The scores on the *Pressures* subscale ranged from 7 to 35. The scores on the *Internalization Athlete subscale* ranged from 5 to 25. Higher scores on each subscale represent greater internalization of the thin ideal, greater internalization of the athletic body type, greater feeling of media pressure or information. Reliability on these subscales was found to be uniformly high: Internalization-General (.96), Information (.96), Pressures (.92), Internalization-Athlete (.95), and total scale (.96). One-month test–retest demonstrated stabilities of .86 (Thompson et al., 2004).

Self Esteem

Self-esteem was assessed using the Rosenberg Self-Esteem Scale (SES) (Rosenberg, 1965). The Rosenberg Self-Esteem Scale is a 10-item self-report measure of global self-esteem. It consists of 10 statements related to overall feelings of self-worth or self-acceptance. The items are answered on a 5-point scale ranging from *strongly agree* to

strongly disagree. Of the 10 items in this instrument, five are positive statements about the self and five are negative statements about the self. The negative statements are reverse scored so that higher scores indicate higher self-esteem. The test-retest reliability over a 2-week period has been found to be high ($r = .85$), suggesting that the scale is stable over time (Rosenberg, 1965).

Procedures

The participants for the study were drawn from female athletes involved in team sports at NCAA Division III institutions located in the Midwest. Head coaches for each team were contacted with information regarding the study (Appendix A) along with a request to pass the information on to their team (Appendix B). The initial e-mail to each head coach was sent March 30th, 2007. A reminder was sent to coaches again on April 13th asking them to forward the information to their team if they had not already done so (Appendix C). Data collection lasted just over two months and ended on May 18th, 2007. Data were collected via an Internet survey whose link was included in an introductory e-mail to each head coach.

Because participants were contacted directly, the responses were completely anonymous. The questionnaire itself contained no identifiers to connect the participant with any personal information, including the school they attend. IP addresses from which the respondent completed the survey were not stored. The only connecting information collected included sport as well as the state in which they attended school. Study bias was limited by attempting to contact every coach of a women's Division III team sport within the 12 states of the Midwest.

Data Analysis

A data file of the responses was created using the Statistical Package for the Social Sciences (SPSS, version 15.0; SPSS Inc., Chicago, IL). Descriptive statistics (means and standard deviations) and frequency counts were calculated for participant demographic information. These variables included: eating disorder classifications, percent responding from each sport, age, class in school, ethnicity, body mass index, self-classified weight, and desired weight loss. The following demographics for coaches were also reported: percentage of male and female, percentage of female and male coaches discussing body weight or diet with their team as well as percentage discussing both diet and body weight.

The following predictor variables were included in these analyses:

- body image (MBSRQ-AS subscales)
 - The following subscales were combined to form the new variable *image*
 - *appearance evaluation*
 - *appearance orientation*
 - *overweight preoccupation*
 - *self-classified weight*
 - *body area satisfaction scale (BASS)*
- body mass index
- social physique anxiety (SIBID)
- athletic identity measurement scale (AIMS)

- traditional sex role (PAQ subscales)
 - *Masculinity*
 - *Femininity*
 - *Androgynous*
- internalization of sociocultural attitudes (SATAQ-3 subscales)
 - The following subscales were combined to form the new variable *internal*
 - *internalization-general*
 - *information*
 - *pressures*
 - *internalization-athlete*
- self-esteem (SES)
- appearance and non-appearance sport

The variables associated with excessive exercise and risky eating were analyzed separately. To look for differences between groups (excessive exercise or no excessive exercise, and symptomatic or asymptomatic) on each variable, Independent sample t-tests, ANOVAs, and Chi-square tests were performed. Table 3.1 shows the order in which the variables were analyzed for excessive exercise and risky eating as well as which statistical analysis was used for each.

Variable	Statistical Analysis			
	%	t-test	ANOVA	χ^2
Excessive Exercise	X			
Risky Eating		X		
Exercise Outside of Practice	X			
Risky Eating Behaviors	X		X	
Body Image - <i>image</i>		X		
BMI		X		
Self-Classified Weight				X
Desired Weight Loss		X		
Social Physique Anxiety		X		
Athletic Identity		X		
Traditional Gender Role	X			
Internalization - <i>internal</i>		X		
Self-Esteem		X		
Appearance and Non-Appearance Sport	X			X

Table 3.1

Variables for Excessive Exercise and Statistical Analysis

To test for collinearity amongst these predictor variables, correlations were performed on all independent variables (See Tables F.4 and F.5). Due to high correlations on the subscales of the MBSRQ-AS and the SATAQ-3, reliability analyses were performed on each subscale in the MBSRQ-AS (appearance evaluation, appearance orientation, BASS, weight preoccupation, and self-classified weight) and the SATAQ-3 (internalization general, internalization athlete, pressure, and information). Based on these analyses, subscales were combined to create 2 new variables from the MBSRQ-AS

(*image*) and the SATAQ-3 (*internal*) with tests for reliability indicating the Cronbach's alpha scores were in excess of .70 for each scale. These newly created variables were then entered into a linear regression along with values for body mass index, athletic identity, self-esteem, social physique anxiety, gender, and the demographic variables of age, appearance or non-appearance sport, coaches' gender, does coach discuss weight, and does coach discuss diet. Even though image, internal, and athletic identity were significant in the model, there was still a concern with collinearity based on low Eigenvalues for these factors (image = .003, internal = .006, athletic identity = .005). Based on low Eigenvalues as well as low standardized beta scores (image = -.07, internal = -.09, athletic identity = -.12), image, internal, and athletic identity were removed from the model and not included in the analysis to test the study hypotheses.

To test hypotheses 1-12, a multiple binary logistic regression was performed on the dichotomous variables of both risky eating and excessive exercise using three variables: social physique anxiety, body mass index, and self-esteem. Statistical significance was established a priori at $p < .05$ and effect size (η^2) was reported to estimate clinical significance.

To make an a priori estimate of N , a sample size calculator for multiple regression was used (Pezullo, 2006). Using a proposed power of .80, a small effect size of .02, with 12 predictor variables (e.g., age, body mass index, appearance or non-appearance sport, coach's gender, coach discuss weight, coach discuss diet, social physique anxiety, athletic identity, gender, internalization, self-esteem, and body image), the estimated sample size was calculated to be 874. Initial examination of the results described above led to the elimination of 9 of the original variables used to estimate sample size.

Therefore, the sample size for power of .80 anticipating a small effect size of .02 was recalculated to be 543 with 3 predictor variables (e.g., social physique anxiety, body mass index, and self-esteem).

CHAPTER 4

RESULTS

This chapter presents the results of the statistical analysis performed on the survey responses. In order to answer the research questions that guided the study, several statistical analyses were performed to examine the demographics of the sample and the study questions. Descriptive statistics are reported as means and standard deviations and as proportions for the study sample ($n = 526$) excluding participants identified with eating disorders ($n = 49$). In addition, variables associated with excessive exercise and risky eating were analyzed. To examine any differences between groups (excessive exercise and no excessive exercise, or symptomatic and asymptomatic) on each variable, Independent sample t-tests, ANOVAs, and Chi-square analyses were performed. Also, prior to logistic regression, collinearity was examined. To help confirm the possibility of collinearity a linear regression was performed on the self-loathing subscale of the exercise orientation questionnaire using the following variables: self-esteem, social physique anxiety, body mass index, gender orientation, image, and internal. Finally, in an attempt to examine the degree of relationship between the dichotomous variables of disordered eating and excessive exercise and the independent variables of body mass index, social physique anxiety, and self-esteem, stepwise binary logistic regression was performed. This was done in an attempt to determine which of the variables were most important in predicting excessive exercise and risky eating.

The manner of presentation of the statistical analysis is as follows: demographics of coaches and respondents, independent variables examined by grouping (excessive exercise and risky eating), linear regression to check for collinearity, prediction of excessive exercise, and prediction of risky eating.

Demographics

Surveys were sent to 479 coaches of Division III team sports located in the Midwest. These coaches were then asked to pass the information to their team, which represents approximately 8,200 athletes. Of those coaches who passed the information to their respective teams, the majority was female (55.5%). Of those female coaches, 19% discussed body weight with their teams and 18% discussed dieting with their teams. Only 5% of those coaches discussed both body weight and dieting with their teams. Of those coaches who were male (44.5%), 21% discussed body weight with their team, and 23% discussed dieting with their teams. Only 6% of those coaches discussed both body weight and dieting with their teams. Tables F.1 and F.2 show both the frequencies and percentages for both male and female head coaches and their discussion of body weight and dieting with their team, broken down according to sport.

A total of 575 responses were received from athletes, which constitutes a 7% response rate. Of the sample of 575 participants, 8.5% were found by the Questionnaire for Eating Disorders Diagnosis (Q-EDD) to possess an eating disorder and were excluded from the analysis. Of the 526 respondents included in the analysis, 23% were symptomatic whereas 77% were found to be asymptomatic. Table 4.1 contains information on frequencies and percentages of specific eating disorders as well as eating disorders not otherwise specified.

Eating Disorder Group	<i>n</i>	%
Eating Disorders (total)	49	8.5
Anorexia	0	0.0
Menstruating Anorexia	1	0.2
Bulimia	1	0.2
Subthreshold Bulimia	22	3.8
Binge Eating Disorder	10	1.7
Nonbinging Bulimia	15	2.6
Symptomatic	119	20.7
Asymptomatic	407	70.8
Total	575	100

Table 4.1
Q-EDD Classifications

Respondents represented 10 of the 11 sports identified as team sports. Soccer players comprised the largest group (222 participants) with rugby being the smallest (1 participant). No respondent reported Synchronized Swimming as her primary sport. Table 4.2 shows both the frequency and percentage of respondents from each sport.

Soccer players had the greatest number of those found with eating disorders ($n = 22$). Field hockey players had the highest percentage of players on a team with an eating disorder (25%). Table 4.2 shows the total sample as compared to those to be found with no eating disorder (symptomatic and asymptomatic).

Sport	Symptomatic and Asymptomatic ^a		Total Sample ^b		Eating Disorder	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Basketball	73	13.90	78	13.60	5	10.20
Crew	6	1.10	7	1.20	1	2.04
Field Hockey	9	1.70	12	2.10	3	6.12
Ice Hockey	13	2.50	16	2.80	3	6.12
Lacrosse	8	1.50	9	1.60	1	2.04
Rugby	1	0.20	1	0.20	0	0.00
Soccer	222	42.20	244	42.40	22	44.89
Softball	98	18.60	104	18.10	6	12.24
Volleyball	94	17.90	102	17.70	8	16.32
Water Polo	2	0.40	2	0.30	0	0.00

^a *n* = 526

^b *n* = 575

Table 4.2

Total Sample versus Symptomatic and Asymptomatic Participants

The number of participants classified as appearance and non-appearance athletes was examined. It was found that 19.2% of respondents participated in appearance sports while 80.6% participated in non-appearance sports. Additional demographics were examined and it was noted that the respondents were primarily Caucasian (Table 4.3) with an average age of 19.86 (*SD* = 1.27) years with the majority of respondents being freshman (35.6%). Table F.3 shows the average age as well as year in school.

Ethnicity	<i>n</i>	%
Caucasian/White	504	95.8
African-American/Black	4	0.76
Hispanic/Latino/Mexican-American	6	1.14
Asian American/Pacific Islander	5	0.95
Other:		
African-American/Mexican	1	0.19
Bi-Racial	3	0.57
Bi-Racial Hispanic -Caucasian	1	0.19
European	1	0.19
Pacific Islander and White	1	0.19

Table 4.3
Ethnicity of Participants

Body Mass Index

Upon examination of the body mass index (BMI), it was noted that the mean BMI for the participants was 23.28 kg/m² (*SD* = 2.49). Table 4.4 shows the frequency distribution for BMI of the subjects. No participant had a BMI below 15. There were 34 participants with a BMI between 15 and 19.99. At the other extreme, 5 participants had BMI's between 30 and 34.99, and 1 participant had a BMI over 35. Approximately 21.29 % of the subjects had a BMI in the overweight / obese range (e.g., BMI ≥ 25).

BMI	<i>n</i>	%
15-19.99	34	6.46
20-24.99	280	53.23
25.29.99	106	20.15
30-34.99	5	0.95
35-40	1	0.19
Total	526	100.00

Table 4.4
Body Mass Index (BMI)

The average weight in pounds of the participants was 146.11 ($SD = 19.48$) with the average weight loss desired being 10.40 pounds ($SD = 8.55$). Table 4.5 shows the self-classified weight of the participants.

	<i>n</i>	%
grossly obese	0	0.00
moderately obese	5	1.00
overweight	148	28.10
normal weight	356	67.70
low weight	17	3.20
Total	526	100.00

Table 4.5
Self-Classified Weight of Participants

The Measurement of Outcome Variables

For the purpose of this study, the participants needed to be classified into categories based on their exercise as well as eating habits. Participants were classified as excessive or non-excessive exercisers, as well as symptomatic or asymptomatic of an eating disorder.

Excessive Exercise

In order to measure differences between exercise groups on independent variables, the self-loathing subscale (SLSS) of the Exercise Orientation Questionnaire was used. Participants were classified as excessive or non-excessive exercisers based on their answers on 8 questions with a maximum possible score of 20. A score higher than 16 represents a high risk for excessive exercise. One hundred and seven participants (21%) were found to have a score higher than 16, and were classified as excessive exercisers with the remaining 79% being found not to participate in excessive exercise.

Risky Eating

In order to measure differences between eating groups on the independent variables, participants were divided into symptomatic and asymptomatic eating groups based on Q-EDD scores. Twenty-three percent of the participants were classified as symptomatic, while the remaining 77% were classified asymptomatic.

Predictor Variables

The following independent variables will be examined by dependent variable grouping (excessive exercise and risky eating): exercise outside of practice, risky eating behavior, body image, body mass index, self-classified weight, desired weight loss, social physique anxiety, athletic identity, traditional gender role, internalization, and self-esteem.

Exercise Outside of Practice

Exercise outside of practice was measured as part of the Q-EDD. Participants were asked if they participated in exercise outside of practice and for how long they had been participating in this behavior. Table 4.6 shows frequency and percentage of exercise performed outside of practice for those in the excessive and non-excessive exercise groups. Participants answering “no” to the question ($n = 272$) were not included in this table. Fifteen percent of the non-excessive exercisers participated in exercise outside of practice daily, with 48% of this group participating twice per week. Twenty-three percent of the excessive exercise group participated in exercise outside of practice daily, with 49% of this group participating twice per week.

	Daily		twice/week		once/week		once/month		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
No Excessive Exercise	32	14.88	103	47.91	56	26.05	24	11.16	215	84.64
Excessive Exercise	9	23.07	19	48.72	9	23.07	2	5.13	39	15.35

Table 4.6
Exercise Outside of Practice and Excessive Exercise

Table 4.7 shows frequency and percentage of exercise performed outside of practice for those in the symptomatic and asymptomatic groups. Fourteen percent of the asymptomatic participants participated in exercise outside of practice daily, with 49% of this group participating twice per week, whereas 20% of the symptomatic group participated in exercise outside of practice daily, with 45% of this group participating twice per week.

	daily		twice/week		once/week		once/month		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Asymptomatic	24	14.03	84	49.12	48	28.07	15	8.77	171	67.32
Symptomatic	17	20.48	38	45.78	17	20.48	11	13.25	83	32.68

Table 4.7
Exercise Outside of Practice by Symptomatic and Asymptomatic Participants

Risky Eating Behaviors

Risky eating behaviors were measured using 8 questions on the Q-EDD.

Participants were asked if they participated in each behavior and if so, for how long.

Table 4.8 shows the percentage of excessive and non-excessive exercisers who participated in risky eating behavior. Those athletes who did not participate in excessive exercise participated in more risky eating behaviors (7) than did those who did participate in excessive exercise (3).

	No Excessive Exercise %	Excessive Exercise %
Make Yourself Vomit	11.11	0.00
Take Diuretics	2.22	0.00
Take Laxatives	4.44	40.00
Skip Food For 24 Hours	13.33	0.00
Take Appetite Pills	17.78	20.00
Diet Strictly	45.56	40.00
Give Yourself an Enema	0.00	0.00
Chew Food and Spit it out	5.56	0.00

Table 4.8
Risky Eating Behavior and Excessive Exercise

Table 4.9 shows the percentage of symptomatic and asymptomatic athletes who participated in risky eating behaviors. Of those athletes who were asymptomatic, none of them participated in any risky eating behavior. Of the symptomatic athletes, 45.3% of them diet strictly and 17.9% take appetite pills. Taking diuretics was utilized the least at 2.1%. No respondents checked “Give yourself an enema.”

	Asymptomatic (%)	Symptomatic (%)
Make Yourself Vomit	0.00	10.52
Take Diuretics	0.00	2.10
Take Laxatives	0.00	6.32
Skip Food For 24 hours	0.00	12.63
Take Appetite Pills	0.00	17.89
Diet Strictly	0.00	45.26
Give Yourself an Enema	0.00	0.00
Chew Food and Spit it out	0.00	5.26

Table 4.9
Use of Risky Behavior by Symptomatic and Asymptomatic Participants

Analysis of Variance (ANOVA) was used to determine if mean values for risky eating behaviors were significantly different between teams. There were no significant differences found between teams (see Table 4.10).

Variable	<i>df</i>		<i>F</i>	<i>p</i>	η^2
	Between	Within			
Make Yourself Vomit	8	516	0.43	.90	.01
Take Laxatives	8	516	0.03	.97	.00
Take Diuretics	8	516	0.49	.86	.01
Skip Food for 24 hours	8	516	0.46	.88	.01
Chew Food and Spit it out	8	516	1.02	.42	.01
Give Yourself an Enema	8	516	0.00		
Take Appetite Pills	8	516	0.79	.61	.01
Diet Strictly	8	516	0.73	.66	.01

Table 4.10
ANOVA Analysis of Risky Behavior by Sport Teams

Body Image

The Multidimensional Body-Self Relations Questionnaire – Appearance Scales (MBSRQ-AS) is composed of 34 items and 5 appearance related subscales. The subscales include: *Appearance Evaluation*, *Appearance Orientation*, *Overweight Preoccupation*, and *Self-Classified Weight*, and *The Body Areas Satisfaction Scale* (BASS). Each scale provided a score from 1 to 5. The mean for each subscale by exercise group can be found in Table 4.11. It was found that the excessive exercise group and no excessive exercise group participants were significantly different on each subscale

MBSRQ-AS Subscale	No Excessive Exercise		Excessive Exercise		t-test	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>t</i> (524)	<i>p</i>
Appearance Evaluation	2.96	0.36	3.18	0.3	-5.74	.000
Appearance Orientation	3.05	0.32	2.91	0.36	3.69	.000
BASS	3.36	0.57	3.87	0.45	-8.27	.000
Weight Preoccupation	2.55	0.77	1.9	0.66	8.1	.000
Self-Classified Weight	3.2	0.44	2.97	0.45	4.65	.000

Table 4.11
MBSRQ-AS Subscale Means and Excessive Exercise

When examining the relationship between body image and risky eating, symptomatic and asymptomatic participants were found to be significantly different on each subscale (Table 4.12).

MBSRQ-AS Subscale	Symptomatic		Asymptomatic		t-test	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>
Appearance Evaluation	2.87	0.38	3.05	0.34	4.79	0
Appearance Orientation	3.12	0.34	2.99	0.32	-3.59	0
BASS Weight	3.2	0.58	3.54	0.56	5.77	0
Preoccupation Self-Classified	2.98	0.77	2.25	0.79	-9.36	0
Weight	3.33	0.5	3.15	0.45	-4.96	0

Table 4.12
MBSRQ-AS Subscale Means by Symptomatic and Asymptomatic Participants

Body Mass Index

The mean BMI for those participating in excessive exercise was lower ($M = 22.37$ kg/m², $SD = 2.15$) than for those who were not participating in excessive exercise ($M = 23.53$ kg/m², $SD = 2.53$). This difference was significant $t(524) = 4.37, p = .000$. Table 4.13 shows both the frequency and percentage of the symptomatic and asymptomatic participants falling into each BMI category.

BMI	No Excessive Exercise		Excessive Exercise		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Under weight	2	0.48	0	0.00	2	0.38
Normal weight	317	76.02	95	87.16	412	78.33
Over weight	92	22.06	14	12.84	106	20.15
Obese	6	1.44	0	0.00	6	1.14

Table 4.13
Body Mass Index and Excessive Exercise

Examination of the relationship between BMI and risky eating group revealed that the mean body mass index of the asymptomatic group was lower ($M = 23.12 \text{ kg/m}^2$, $SD = 2.41$) than that of the symptomatic group ($M = 23.48 \text{ kg/m}^2$, $SD = 2.71$). This difference was found to be significant $t(524) = -2.75$, $p = .006$. Table 4.14 shows both the frequency and percentage of the symptomatic and asymptomatic participants falling into each BMI category.

BMI	Asymptomatic		Symptomatic		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Under weight	1	0.24	1	0.84	2	0.38
Normal weight	329	80.83	83	69.74	412	78.33
Over weight	73	17.93	33	27.73	106	20.15
Obese	4	0.98	2	1.68	6	1.14

Table 4.14
Body Mass Index by Symptomatic and Asymptomatic Participants

Self-Classified Weight

Self-Classified weight was measured using the multiple-choice question “Do you consider yourself: grossly obese, moderately obese, overweight, normal weight, or low weight?” Of those participants considering themselves to be of normal weight, 75% did not participate in excessive exercise while 25% did participate in excessive exercise. Of those participants considering themselves to be overweight, 91% did not participate in excessive exercise while 9% of did participate in excessive exercise. Table 4.15 shows both the frequency and percentage of participants classifying themselves into each weight classification. Differences between these groups were found to be significantly different $\chi^2(3, N = 526) = 18.9$, $p = .000$.

Self-Classified Weight	No Excessive Exercise		Excessive Exercise		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Grossly Obese	0	0.00	0	0.00	0	0.00
Moderately Obese	5	1.19	0	0.00	5	0.95
Overweight	134	32.13	14	12.84	148	28.13
Normal weight	267	64.02	89	81.65	356	67.68
Low Weight	11	2.63	6	5.50	17	3.23

Table 4.15
Self-Classified Weight and Excessive Exercise

Of those participants considering themselves to be of normal weight, 85% were classified as asymptomatic while 15% were symptomatic. Of those participants considering themselves to be overweight, 60% were classified as asymptomatic while 40% were symptomatic. Table 4.16 shows both the frequency and percentage of participants classifying themselves into each weight classification. Differences between these groups were found to be significant $\chi^2(3, N=526) = 47.6, p = .000$.

Self-Classified Weight	Asymptomatic		Symptomatic		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Grossly Obese	0	0.00	0	0.00	0	0.00
Moderately Obese	1	0.00	4	3.36	5	0.95
Overweight	89	21.86	59	49.57	148	28.12
Normal weight	304	74.69	52	43.69	356	67.68
Low Weight	13	3.19	4	3.36	17	3.23

Table 4.16
Self-Classified Weight by Symptomatic and Asymptomatic Participants

Desired Weight Loss

Desired weight loss was calculated by asking for current weight and ideal weight. The desired weight loss of those participating in excessive exercise was lower ($M = 6.67$ pounds, $SD = 6.15$) than that of those not participating in excessive exercise ($M = 11.4$ pounds, $SD = 8.8$). This difference was found to be significant $t(524) = 554, p = .000$.

Statistical analysis on the desired weight loss of participants showed that those classified as symptomatic had a greater mean desired weight loss ($M = 13.74, SD = 8.80$) than did the asymptomatic group ($M = 9.42, SD = 8.24$). This difference was found to be significant $t(524) = -4.95, p = .000$.

Social Physique Anxiety

The Situational Inventory of Body-Image Dysphoria was used to measure physique anxiety. The mean score for the excessive exercise group ($M = 1.12, SD = .53$) was lower than that of the group who did not perform excessive exercise ($M = 1.81, SD = .56$) suggesting they had lower physique anxiety in certain social settings. This difference was found to be significant $t(524) = 8.53, p = .000$.

The mean score for the symptomatic group ($M = 2.11, SD = .83$) was higher than that of the asymptomatic group ($M = 1.54, SD = .75$) suggesting the symptomatic group had higher physique anxiety in certain social settings. This difference was found to be significant $t(524) = -7.07, p = .000$.

Athletic Identity

Using the Athletic Identity Scale, the group who did not perform excessive exercise had a greater mean athletic identity score ($M = 48.6, SD = 9.04$) than the group performing excessive exercise ($M = 42.5, SD = 8.17$). This difference was found to be significant $t(524) = 6.42, p = .000$.

The symptomatic group had a greater mean athletic identity score ($M = 48.33, SD = 9.27$) than the asymptomatic group ($M = 47.03, SD = 9.17$). This difference was not found to be significant $t(524) = -1.35, p = .177$.

Traditional Gender Role

The Personality Attributes Questionnaire (PAQ) was used to classify participants into one of four categories (androgynous, undifferentiated, masculine, and feminine) using a split mean method. Of the female athletes in the current study, 43.7% scored above the norm on both the masculine and feminine scales and the PAQ, and were thus classified as androgynous. The thirteen percent who scored below the norm on both the masculine and feminine scales were classified as undifferentiated. Twenty-two percent who scored above the norm on the masculine scale and below the norm on the feminine scale and were thus classified as masculine, while 21% were classified as feminine because they scored above the norm for femininity and below the norm for masculinity. Table 4.17 shows both the frequency and percentage of those participants classified into each gender role by excessive exercise behavior.

Gender Role	No Excessive Exercise		Excessive Exercise		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
	Feminine	96	23.02	16	14.67	112	21.29
Masculine	84	20.14	32	29.35	116	22.05
Androgynous	176	42.21	54	49.54	230	43.72
Undifferentiated	61	14.62	7	6.42	68	12.93

Table 4.17
Gender Role by Excessive Exercise

Table 4.18 shows both the frequency and percentage of the symptomatic and asymptomatic participants falling into each gender role.

Gender Role	Symptomatic		Asymptomatic		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Feminine	25	21.00	87	21.37	112	21.29
Masculine	28	23.52	88	21.62	116	22.05
Androgynous	40	33.61	190	46.46	230	43.73
Undifferentiated	26	21.84	42	10.31	68	12.93

Table 4.18
Gender Role by Symptomatic and Asymptomatic Participants

Internalization

The Sociocultural Attitudes Towards Appearance Scale – 3 (SATAQ-3) consists of 30 items and contains 4 subscales (*Internalization-General*: 9 items; *Information*: 9 items; *Pressures*: 7 items; *Internalization-Athlete*: 5 items). The SATAQ-3 is meant to measure the internalization of the societal standards of attractiveness. Higher scores indicate greater internalization, pressure, or information. The group not participating in excessive exercise had higher scores on each of the 4 subscales (Table 4.19) and each of

these differences was found to be significant. *Internalization-General* $t(524) = 7.16, p = .000$; *Information* $t(524) = 3.30, p = .001$; *Pressures* $t(524) = 5.57, p = .000$;

Internalization-Athlete $t(524) = 5.48, p = .000$.

SATAQ-3 Subscales	No Excessive Exercise		Excessive Exercise	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Internalization General	27.35	7.51	21.57	7.44
Internalization Athlete	19.41	3.00	17.59	3.30
Pressure	20.83	6.52	16.93	6.42
Information	25.12	7.48	22.42	7.67

Table 4.19
SATAQ-3 Subscale Means by Excessive Exercise

The symptomatic group had higher scores on each of the 4 subscales (Table 4.20) and each of these differences were found to be significant. *Internalization-General* $t(524) = -4.89, p = .000$; *Information* $t(524) = -3.66, p = .000$; *Pressures* $t(524) = -4.58, p = .000$; *Internalization-Athlete* $t(524) = -3.36, p = .000$.

SATAQ-3 Subscales	Symptomatic		Asymptomatic	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Internalization General	29.18	7.63	25.27	7.69
Internalization Athlete	19.88	3.20	19.03	3.15
Pressures	22.45	6.10	20.02	6.68
Information	26.80	6.88	24.56	7.67

Table 4.20
SATAQ-3 Subscale Means by Symptomatic and Asymptomatic Participants

Self-Esteem

The group participating in excessive exercise had a higher mean self-esteem ($M = 33.56$, $SD = 4.62$) than did the group not participating in excessive exercise ($M = 27.70$, $SD = 6.65$). This difference was found to be significant $t(524) = 8.67$, $p = .000$.

The symptomatic group had a lower mean self-esteem ($M = 27.10$, $SD = 6.91$) than did the asymptomatic group ($M = 29.44$, $SD = 6.57$). This difference was found to be significant $t(524) = 3.38$, $p = .001$.

Appearance and Non-Appearance Sports

Appearance and non-appearance sports were classified as sports that present a higher pressure on athletes to be lean for performance and/or aesthetic reasons. Table 4.21 shows both the frequency and percentage of participants participating in excessive and non-excessive exercise by sport type (appearance and non-appearance). When examining sport type against excessive exercise, the groups were not found to be significantly different $\chi^2 (1, N=526) = .338$ $p = .561$.

Sport Type	No Excessive Exercise		Excessive Exercise		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Appearance	83	15.77	19	3.61	102	19.4
Non-Appearance	334	63.49	90	17.11	424	80.6

Table 4.21
Sport Type by Excessive Exercise

Table 4.22 shows both the frequency and percentage of participants classified as symptomatic and asymptomatic by sport type. When examining sport type against symptomatic and asymptomatic participants, the groups were not found to be significantly different $\chi^2 (1, N=526) = 3.33 p = .068$.

Sport Type	Asymptomatic		Symptomatic		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Appearance	72	13.68	30	5.7	102	19.4
Non-Appearance	335	63.68	89	16.92	424	80.6

Table 4.22
Sport Type by Symptomatic and Asymptomatic Participants

Correlations

Pearson correlations were obtained to determine the relationship between all the independent variables used in this study. The correlation tables can be found in F.4 and F.5. Due to the fact that subscales for the Multidimensional Body-Self Relations Questionnaire were highly correlated with each other, a reliability analysis was performed. Cronbach's alpha for reliability for all 5 subscales was $\alpha = .29$. Appearance Orientation had the lowest correlation with the other subscales and was therefore removed. This removal resulted in an increase in Cronbach's alpha to $.75$. The remaining 4 subscales (appearance evaluation, BASS, weight preoccupation, and self classified weigh) were then combined into a new variable named *image*. The same procedure was used on the Internalization of Sociocultural Attitudes Towards

Appearance subscales and their reliability was found to be $\alpha = .79$; therefore, each of the subscales was retained. These subscales (internalization general, internalization athlete, pressure, and information) were combined to form a new variable named *internal*, which was used in subsequent analyses.

Linear Regression To Check For Collinearity

A linear stepwise regression was performed on the following variables: age, coach's gender, does the coach discuss weight, does the coach discuss diet, image, athletic identity, self-esteem, social physique anxiety, internal, body mass index, and gender. A stepwise regression was used to determine which of the variables were most important in predicting the dependent variable of excessive exercise. The entire range of the Self-Loathing Subscale of the Exercise Orientation Questionnaire was used as the continuous outcome variable (higher score indicating greater obligatory exercise). Even though 11 variables were entered into the regression equation, only 6 came out in the final statistical model described in Table 4.23.

	<i>B</i>	<i>SE B</i>	β
Social Physique Anxiety	-1.29	0.16	-0.33***
Self-Esteem	0.17	0.01	0.36***
BMI	-0.18	0.04	-0.14***
Athletic Identity	-0.04	0.01	-0.11***
Internal	-0.01	0.01	-0.09**
Image	-0.26	0.12	-0.08*

* $p < .05$. ** $p < .01$. *** $p < .001$

Table 4.23
Stepwise Linear Regression Model To Check For Collinearity

The linear combination of the 6 variables accounted for approximately 50% of the variance for excessive exercise within the sample ($R^2 = .50$), which was significant $F(6, 519) = 89.087, p = .000, \eta^2 = .51$. Even though 6 variables were found in the model, there was a concern with collinearity based on the low Eigenvalues of the variables *image*, *internal*, and athletic identity (.003, .006, and .005 respectively). Based on these Eigenvalues as well as low standardized beta scores (*image* = -.07, *internal* = -.09, athletic identity = -.12), these factors were removed from the model. Although 8 variables were entered into the new regression equation, only 3 exhibited statistical significance in the final model and can be seen in Table 4.24.

	<i>B</i>	<i>SE B</i>	β
Social Physique Anxiety	-1.56	0.15	-0.39***
Self-Esteem	0.16	0.02	0.35***
BMI	-0.20	0.04	-0.16***

* $p < .05$. ** $p < .01$. *** $p < .001$

Table 4.24
Final Stepwise Linear Regression Model

The linear combination of the 3 variables (social physique anxiety, self-esteem, and body mass index) accounted for approximately 48% of the excessive exercise variance within the sample ($R^2 = .48$), which was significant $F(3, 522) = 159.09, p = .000, \eta^2 = .48$. This model posed less risk for collinearity.

Predicting Excessive Exercise

Forward stepwise logistic regression was used to examine the effects of body mass index, social physique anxiety, and self-esteem on excessive exercise. The self-loathing subscale (SLSS) of the Exercise Orientation Questionnaire was used to identify excessive exercise (excessive exercise = score > 16; non-excessive exercise = score ≤ 16) for the purpose of performing the binary logistic regression. An individual binary logistic regression was performed on each variable alone to see its effect on excessive exercise (Table 4.25). A multiple forward stepwise logistic regression analysis was then performed on all the variables together. Summary Table 4.25 shows the effects of the following variables on excessive eating. Odds ratios are reported for the individual regressions while adjusted odds ratios are reported for the multiple regressions.

	OR	95% CI	AOR	95% CI
BMI	0.80***	0.72 – 0.89	0.85**	0.75 – 0.96
Social Physique	0.22***	0.14 – 0.32	0.39***	0.25 – 0.61
Self-Esteem	1.21***	1.15 – 1.27	1.16***	1.10 – 1.22

* p < .05. ** p < .01. ***p < .001

Table 4.25
Logistic Regression for Excessive Exercise

The three significant variables according to adjusted OR are BMI, social physique anxiety, and self-esteem. The combination of these three variables accounted for approximately 32% of the excessive exercise variance within the sample (Nagelkerke R² = .320).

Predicting Risky Eating

Forward stepwise logistic regression was used to examine the effects of BMI, social physique anxiety, and self-esteem on risky eating. The decision rules of the Q-EDD were used to categorize participants as symptomatic or asymptomatic for the purpose of performing the binary logistic regression. An individual binary logistic regression was performed on each variable alone to see its effect on risky eating. A multiple forward stepwise logistic regression analysis was then performed on all the variables together (Table 4.26). Summary Table 4.26 shows the effects of the following variables on risky eating. Odds ratios are reported for the individual regressions while adjusted odds ratios are reported for the multiple regressions.

	OR	95% CI	AOR	95% CI
BMI	1.11**	1.03 - 1.21		
Social Physique	2.37***	1.82 - 3.08	2.37***	1.82 - 3.08
Self-Esteem	0.95***	0.92 - 0.98		

* $p < .05$. ** $p < .01$. *** $p < .001$

Table 4.26
Logistic Regression for Risky Eating

This one significant variable according to adjusted OR was social physique anxiety. This variable accounted for approximately 12% of the risky eating variance within the sample (Nagelkerke $R^2 = .124$).

Summary

Examination of the data provided insights into which variables may help predict both excessive exercise as well as risky eating. After the potential collinearity was examined via correlations and linear regression, three variables remained for entrance into the binary logistic regression analyses: social physique anxiety, body mass index, and self-esteem. The variables remaining in the model for excessive exercise were social physique anxiety, body mass index, and self-esteem. The only variable to remain in the model for risky eating was social physique anxiety.

CHAPTER 5

DISCUSSION

Norms of feminine beauty in Western culture have varied during different periods throughout history, with the most recent feminine ideals emphasizing a slender body type (Oelke, 2002). For many to meet this standard of the thin ideal, dieting has become a way of life. In 1993 it was estimated that 40% of all American women were trying to lose weight (Horm & Anderson). These ideas hold true over 10 years later with 83% of women attending a Division I university being found to use dieting for weight loss (Malinauskas et al., 2006). This national obsession for weight loss is fueled primarily by the intemperate value that society places on physical perfection and the subsequent unrelenting pressures on women to achieve the archetype of perfection, a thin physique (Rodin, 1993). Athletes are not protected from these ideals.

Even though female athletes probably constitute the group that most closely embodies the female “ideal” physique of physical perfection, they are likely to be under heavy pressure to achieve this ideal (Beals & Manore, 1994). The source of their pressure is twofold. In addition to the sociocultural demands placed on all women to achieve and maintain an ideal body shape, female athletes are also under pressure to improve performance and conform to the specific aesthetic requirements of their sport (Beals & Manore, 1994). There has been little research on the eating pathology of non-elite athletes or those in non-weight dependent sports. Given that most female college

athletes participate at the non-elite level, it appears that such a subject group is an important but underrepresented field of study (DiBartolo & Shaffer, 2002).

Therefore, the purpose of this study was to gain within the context of the sociocultural theory of body image a better understanding of the factors, or combination of factors, that lead to risky eating and excessive exercise in Division III female athletes involved in team sports.

This study was unique in the fact that it looked only at female athletes involved in team sports at the Division III level who do not have eating disorders. Many studies look for differences between males and females, athletes and non-athletes, individual and team sports, or even between lean and non-lean sports. This study attempts to see eating pathology on a continuum and look solely for the differences between athletes who are asymptomatic and symptomatic in respects to eating pathology and excessive and non-excessive in relation to exercise. By searching for differences along these continuums, it was our hope to get a better picture of Division III athletics, as well as to predict some of the factors that may be contributing to problematic eating and exercise.

The discussion will address the following: prevalence of eating disorders, risky eating behaviors, predicting risky eating and the contribution of social physique anxiety, risky exercise behavior, predicting risky exercise and the contribution of social physique anxiety, body mass index, and self esteem. The limitations of this research as well as directions for future research will also be discussed.

Prevalence of Eating Disorders

Many athletes practice weight control methods similar to those reported in persons with eating disorders, and a significant number suffer from disordered eating patterns, eating problems, or show tendencies toward eating disorders (Sundgot-Borgen, 1993). Approximately 2% to 4% of the young adult female population has full-syndrome eating disorders (anorexia nervosa, bulimia, or binge-eating disorder) (Striegel-Moore et al., 2003). In addition, rates of subthreshold or partial syndrome eating disorders likely exceed those of full-syndrome eating disorders, suggesting that the combined rates easily exceed 4%. Furthermore, subthreshold or partial-syndrome eating disorders exist on a continuum with full-syndrome eating disorders and represent similar levels of functional impairment (Taylor et al., 2006).

An NCAA study performed by Johnson, Powers and Dick (1999) found that 2.85% of their population of Division I athletes (562 females) had subclinical anorexia and 9.2% had clinically significant problems with bulimia. In the current study, 8.5% of Division III female athletes had an eating disorder based on the Q-EDD. None were classified as anorexics, but 6.6 % were classified as subthreshold or nonbinging bulimics. Of the remaining sample that was not classified as having an eating disorder, 20.7% showed symptoms of eating disorders. These results are similar to the NCAA study of Division I athletes, and are also consistent with data from 20 years ago reported by Sundgot-Borgen and Corbin (1987), who found that 10% of Division I female college athletes were either preoccupied with weight or had tendencies towards eating disorders.

In a more recent study by Sundgot-Borgen (1993), a combination of self-report and interview format was used to assess elite female athletes in the Norwegian Confederation of Sports ($N = 522$). Their results indicated that 1.3% of elite athletes met the criteria for anorexia nervosa as defined in the DSM-IV, and 8% met DSM-IV criteria for bulimia nervosa. These findings presented by Sundgot-Borgen in 1993 are also similar to the current findings; however, due to our use of questionnaire only to classify eating disorders, the current estimate should be considered conservative.

Although some sports, such as gymnastics may be more at risk for problematic eating and exercise behaviors, no sport may be considered exempt from having individuals susceptible to eating disorders. In the current study, eating disorders were reported in a wide range of sports, including several that are not traditionally associated with the problem (e.g., field hockey and lacrosse). Eating disorders were found across 8 of the 10 sports. Rugby and water polo were found to have no eating disorders; however, there were only 3 athletes in that sample. This was consistent with an earlier NCAA study performed by Dick (1991). Dick surveyed the athletic directors at 491 Division I institutions. Sixty-five percent of those institutions reported having at least one student athlete with an eating disorder (93% female, 7% males) and those eating disorders came across a variety of sports. It was concluded that the prevalence might actually be higher due to under reporting or to the secretive nature of the problem.

Disordered Eating

Disordered eating is a general term used to describe the spectrum of abnormal and harmful eating behaviors that are used in a misguided attempt to lose weight or maintain an abnormally low or unhealthy body weight (Beals, 2004). Disordered eating has been

placed on a continuum (Thompson & Sherman, 1993). On one extreme lie normal eating and no concern with weight and on the other extreme are clinical eating disorders. In between lie a variety of disordered eating behaviors ranging in severity from limiting food groups to significantly restricting energy intakes to occasionally bingeing and purging. Along this continuum there are varying degrees of symptomatic participants who possess some of the symptoms of eating disorders but are not diagnosed with an eating disorder according to the DSM-IV criteria. It is these symptomatic participants who are potentially at risk for a future eating disorder and who were of particular interest in this study.

Risky Eating Behaviors

Only 12% of the non-eating disordered participants practiced risky eating behaviors (vomiting, diuretics, laxatives, skipping meals, taking appetite pills, strictly dieting, using an enema, and chewing food and spitting it out) at least once per month. Ninety-five behaviors were recorded and performed by symptomatic participants. It is important to note that asymptomatic participants reported no risky eating behaviors, and only extra exercise. All 95 behaviors were performed by those considered symptomatic.

Of the 12% of female athletes who participated in risky eating behaviors, 67% participated in only one behavior, 23% participated in two behaviors, 2% in three behaviors, 5% in four behaviors, and 2% in five or six behaviors. These results were in contrast to Mintz and Betz (1988) who found that 82% of women attending a Division I college and not participating in athletics reported one or more dieting behavior at least daily and Rosen et al., (1986) who found that 32% of Division I female athletes participated in at least one pathogenic (daily for at least one month) weight control

behavior. However, the current results with Division III female athletes are similar to the Johnson, Powers, Dick NCAA study (1999), which found that 13% of Division I female athletes had clinically significant pathogenic weight control behaviors. The authors explained the low rates of symptomatic eating behaviors and attitudes as being a consequence of the sample population of Division I athletes, and speculated that risk factors for disturbed eating behavior may be higher among lower tier athletes. In the current study, 20.7% of the athletes were considered symptomatic, which supports the idea proposed by Johnson and colleagues (1999). However, we found a smaller proportion of symptomatic female athletes than was reported in an earlier study Rosen et al. (1986).

In the current study, 62 athletes participated in 95 risky eating behaviors. Of those, 69.4% strictly dieted, 27.4% used appetite pills, 19.4% skipped meals, 16.1% vomited, 9.7% used laxatives, and 3.2% used diuretics. Of those 95 behaviors practiced, 28% were practiced daily, 26% twice per week, 20% once per week, and 25% once per month. These numbers are within ranges reported by both athletes attending a Division I university (diet pills 25%, laxatives 16%, vomiting 14%) (Rosen et al., 1986) and females not participating in sports at a Division I university in 1988 (diet pills 20%, dieting 20%, laxatives and vomiting less than 10%) (Malinauskas et al., 2006; Mintz & Betz, 1988; Rosen et al., 1986). Malinauskas et al. (2006) revealed that women attending a Division I university and not participating in athletics had a higher rate of dieting (83%) than was present in 1988 but similar to the current study at 80%. However, less than

10% of that Division I, non-athletic population used laxatives or vomited, while the rate in the current study of Division III athletes was higher (11% used laxatives and 14% vomited).

Pathogenic behavior has been defined as daily for at least one month. When considering this definition, our results were lower (28%) than those reported by Rosen et al. (1986) who found that 32% of Division I female athletes use at least one pathogenic weight control behavior. What was similar was that many athletes in the current study practiced weight-control techniques such as using laxatives, appetite control pills, and strictly dieting that are health threatening and likely to affect athletic performance adversely,. These behaviors were even practiced in sports such as basketball or ice hockey where extreme thinness is not the typical physique of the participants.

When comparing the current study to a more recent study on elite athletes by Sundgot-Borgen (1993), 80% of at risk athletes used pathogenic weight control methods or eating patterns at least once a week (pathogenic defined as being used once a week). The current study revealed that of the symptomatic participants using at least one behavior, 20% were performed once a week. Among the elite athletes the most prevalent method was vomiting, performed by 53%, compared to the current findings of 18%. Of the elite athletes, 8.2% exhibited significant symptoms of eating disorders and eating pathology but did not meet formal diagnosis. Of the Division III athletes, 20.7% were found to have symptoms of eating disorders without meeting diagnostic criteria.

It is important to note that Sundgot-Borgin (1993) found significant underreporting of both the use of certain pathogenic weight control methods and eating disorders in the screening (survey) portion of their study with elite athletes. An interview

of 117 at risk athletes as well as 30 athletic controls, 30 at risk nonathletes, and 30 nonathletic controls followed the initial screening. In these interviews, they found that as many as 10% of the female athletes practiced vomiting; yet the screening phase indicated that only 3% did. This supports the possibility that the risky behaviors practiced by Division III athletes is potentially larger than what was reported. It is also a possibility that a portion of the 20.7% of athletes found to be symptomatic may actually possess an eating disorder. Due to this, the current results represent a conservative estimate of the extent of pathogenic eating behavior among athletes at this level.

Predicting Risky Eating

In predicting risky eating, social physique anxiety was the only factor remaining in the final model to have a significant independent effect. This variable accounted for approximately 12% of the risky eating variance within the sample.

Social Physique Anxiety

The current study revealed that the symptomatic group had a significantly higher mean social physique anxiety than did the asymptomatic group. This finding was expected and could be explained through self-presentation and sociocultural theories.

Self-presentation involves selective presentation and omission of aspects of the self to create desired impressions and to avoid undesired impressions. It has been suggested that eating pathologies stem in part from self-presentational concerns involving physique (Leary et al., 1994). This type of self-presentation is termed social physique anxiety (SPA) and can be described as the concern that others are negatively evaluating one's body or physical appearance (Hart et al., 1989). It is conceivable that people's

concerns with how they are regarded by others (SPA) may increase their risk of pathological eating and dieting behaviors in an attempt to convey positive impressions.

Sociocultural pressures to be thin within a woman's immediate environment can exacerbate body dissatisfaction. In the athletic environment, many athletes and coaches believe that it is necessary to maintain a certain weight and body shape for optimal performance (Davis, 1992; Petrie et al., 1996). Athletes and coaches believe that excess weight inhibits speed, endurance, and agility. Conversely, leanness is believed to enhance performance (Davis, 1992). It has generally been suggested that lean sport athletes would be more likely to engage in disordered eating patterns than non-lean sport athletes (Petrie, 1996). Some studies have found that lean sport athletes are more likely to be weight preoccupied or eating disordered (Sundgot-Borgen, 1994b), while others have found no differences between lean and non-lean sport athletes (Sundgot-Borgen & Corbin, 1987). It would make sense that all athletes would benefit from being lean (e.g., muscular without excessive body fat); therefore, the lean/non-lean distinction may not reveal the actual mechanism leading to body dissatisfaction in athletes (Krane, Stiles-ShIPLEY, Waldron, & Michalenok, 2001). The current study revealed no significant difference between appearance and non-appearance athletes in terms of symptomatic and asymptomatic eating behavior. Therefore, it is possible that because female athletes are susceptible to cultural pressures to maintain an ideal body shape, it is not the type of sport per se that influences an athlete's concern about body size and the likelihood of unhealthy eating. Rather, female athletes who feel that others are evaluating their body may be at greater risk. If an athlete perceives her body as less than ideal, this may increase the likelihood of body dissatisfaction, social physique anxiety, and unhealthy eating

behaviors. This idea was supported in this study: participants having the highest BMIs also classified themselves as the most overweight. The participants with the highest self-classified weights also had the highest social physique anxiety.

Making sense out of the research on disordered-eating behaviors in athletes is difficult, because study results have been divergent. It is difficult to compare the results of previous studies with the current study because of different research methods, participants, sports studied, eating-disorder measures, and statistical analyses. Our study suggests that when trying to predict risky eating behavior in Division III female athletes involved in team sports in the Midwest, social physique anxiety is of primary importance.

Risky Exercise Behavior

Participation in regular physical activity is considered an important preventative health behavior. As a consequence, the promotion of physical fitness has become a priority in North America. This is evidenced by the addition of physical activity to the Food Guide Pyramid (MyPyramid.gov, 2007) as well as programs such as the 10,000 steps program ("The Walking Site: 10,000 Steps A Day,"), and Girls on the Run ("Girls on the Run International,"). This governmental and media emphasis on fitness has likely influenced some people to become obligatory exercisers. Obligatory exercisers are unlike normal exercisers in the fact that they will not interrupt their exercise schedule even when they are injured or when they know that continuing to exercise could cause physiological or psychological changes that could harm them (Draeger et al., 2005). Despite this, it is difficult to know the characteristics of an obligatory exerciser, partly because no clear-cut definition of the condition has been established. The *Diagnostic and Statistical Manual of Mental Disorders*, 4th Edition describes "excessive exercise" as a

criterion for bulimia nervosa, but no explanation of how much exercise is “excessive” is given. According to Mond et al., (2006), exercise is considered excessive when its postponement is accompanied by intense guilt and/or when it is undertaken solely or primarily to influence weight or shape. Beals (2004) has described excessive exercise as exercise that is over and above that required for normal training and is done solely for the purpose of burning calories.

For purpose of this study, the self-loathing sub scale (SLSS) of the Exercise Orientation Questionnaire was used to measure excessive exercise. A score higher than 16 on the SLSS was related to high ratings of exercise investment, exercise frequency, and duration of exercise sessions and may also indicate other obligatory behaviors, such as an eating disorder (Yates et al., 2001). Based on this definition, we observed 21% of our participants to participate in risky exercise (e.g., score > 16 on the SLSS).

Additional indicators of excessive exercise were reported in response to questions in the Questionnaire for Eating Disorder Diagnosis (Q-EDD). Forty-eight percent of the participants reported exercising outside of their regular sports practice. Sixteen percent of those exercised daily, 48% exercised twice per week, 26% exercised once per week, and 11% once per month. According to the definition provided by Mond et al., (2006) as well as Beals (2004), of the 48% reporting exercise outside of practice in the current study, 37% answered yes to the question “Is your primary reason for exercising to counteract the effects of binges or to prevent weight gain?” This is drastically different from the results presented by Malinauskas, et al. (2006), who reported that 80% of college women attending Division I universities reported using physical activity to control weight.

When combining the standards of the SLSS subscale (score > 16) and Mond's definition of exercise for the purpose of weight loss being considered excessive exercise, only 9 participants met the criteria and only 2 (22%) of those were symptomatic. This is in contrast to a study performed by Bacon and Russell (2004), who studied Division III athletes attending a New England college. These authors developed an instrument to assess five addictive behaviors on two levels (problematic and clinically diagnostic). Their results revealed that exercise addiction was the largest problematic category. The women in their study tended to fall into an eating and exercise cluster, with disordered eating being correlated with excessive exercise. Even though our study revealed a significant difference between symptomatic and asymptomatic eaters in terms of excessive exercise, it was not in the direction expected. Many more asymptomatic participants fell into the category of risky exercise (58.3%) than did those who were symptomatic (1.7%).

Predicting Risky Exercise

Norms of feminine beauty in Western culture have varied during different periods throughout history, with the most recent feminine ideals emphasizing a slender body type (Oelke, 2002). However, over the last thirty years, the acceptable female shape has become even thinner (Furnham, Titman, & Sleeman, 1994). For example, magazine models 20 years ago were an average 8% thinner than the average woman; today, magazine models are 23% thinner than the average woman (Wortman, 2005). These images stereotype women by constantly representing the ideal body type. These stereotypes become a standard by which people judge themselves as well as others (Ausport.gov, 2001).

This information has the potential to work in two directions. Women will either use exercise and dangerous eating practices in an effort to conform to society's standards, or they will be deterred from exercise for fear of being negatively evaluated for not currently appearing like the standard. What our study revealed was the linear combination of three variables (social physique anxiety, body mass index, and self-esteem) accounted for approximately 48% of the risky exercise variance within the sample.

Social Physique Anxiety

The concept of Social Physique Anxiety (SPA) addresses this issue of experiencing apprehension and discomfort via others' observations or evaluations of their physiques (Williams & Cash, 2001). The current study revealed that those found to participate in excessive exercise had a statistically significant lower social physique anxiety than did those who did not participate in risky exercise. Based on sociocultural theory, women who exercise more tend to have a lower social physique anxiety (Skrinar, Bullen, Cheek, McArthur, & Vaughan, 1986; Tucker & Maxwell, 1992; Tucker & Mortell, 1993; Williams & Cash, 2001), which was supported by our findings. These women had a lower anxiety about being evaluated in public and therefore spent more time exercising outside of practice. Those with a higher physique anxiety were less likely to put themselves in additional situations in which their body may be evaluated.

Body Mass Index

Over 50% of the participants in this population had a BMI between 20 and 25. This is similar to a Division I population of top tier athletes, in which 54% had a BMI between 20 and 25 (Johnson et al., 1999). However, the Division I population had a

much greater percentage of athletes in the 15-20 range (31%) as compared with 6.5% in the Division III population. Twenty-one percent of Division III athletes fell into the overweight / obese range, while only 4% of the Division I athletes fell into this category.

The BMI of the excessive and non-excessive exercise groups was found to be statistically different, with the non-excessive group possessing the higher BMI. Based on sociocultural theory as well as the results of each group's social physique anxiety, this can be explained. It was shown that the group possessing the lower social physique anxiety and lower BMI was also the group that was involved in performing excessive exercise. This group had a lower anxiety about being evaluated in public and therefore spent more time exercising outside of practice, potentially leading to the lower BMI. This left the non-excessive exercise group with the higher BMI's and higher SPA as well as higher self classified weights. This group had a higher anxiety about being evaluated in public; therefore, they exercised less outside of practice. This could contribute to their higher BMI's as well as this group having a higher self-classified weight.

As anticipated based on the emphasis on leanness in our culture, the desired weight loss for all participants was nearly 11 pounds. This is in agreement with Reinking & Alexander (2005) who also found all groups of female collegiate students (athletes and non-athletes) had a lower mean desired body weight than actual body weight. It was not anticipated that the excessive exercise group would have a desired average weight loss of 6.5 pounds with the non-excessive exercise group desiring a weight loss of 11.4 pounds. Even though these results did not seem immediately intuitive, they can be explained with the help of the results from BMI and SPA. The non-excessive exercise group possessed the higher BMI's, the higher greater desired weight loss as well as the higher SPA.

Perhaps these individuals did not want to participate in any additional exercise outside of their normal sport due to the high levels of SPA.

Self-Esteem

The current study revealed that those found to participate in excessive exercise had a significantly higher self-esteem than those who did not participate in excessive exercise. This is possibly due to the excessive exercise group also having the lower BMI as well as lower SPA, which can contribute to more positive self-evaluations.

It is difficult to address these issues in isolation. According to Williams and Cash (2001), there is a proposed mechanism by which exercise can increase body image through the decrease in SPA and this usually occurs through a change in body shape or weight. With this decrease in body shape and weight also comes an increase in self-esteem. This can be supported through our findings of high negative correlations between self-esteem and SPA ($r = -.47$) and positive correlations between SPA and BMI ($r = .35$).

It is also difficult to address the issues of risky eating and excessive exercise in isolation. Even though it was beyond the scope of this study, many studies addressing obligatory exercise do so in the context of eating disorders or risky eating behaviors (Bacon & Russell, 2004; Bamber, Cockerill, Rogers, & Carroll, 2003; Lindeman, 1999; Mond et al., 2006). For example, even in determining unhealthy eating behaviors, the Q-EDD includes exercise outside of practice in its list of risky eating behaviors to place participants into the categories of eating disordered and non-eating disordered. According to the definition provided by Beals (2004), exercise is considered excessive when it is over and above that required for normal training and is done solely or the

purpose of burning extra calories. Based on this definition, the current study revealed an excessive exercise rate of 37%. However, based on scores of the SLSS, only 9 participants were classified as excessive exercisers who also exercised for weight loss. Mond et al., (2006) added to Beals' 2004 definition by considering exercise to be excessive when its postponement is accompanied by intense guilt. Mond et. al. (2006) went on to state that the combination of both behaviors (exercise solely for weight loss and guilt at withdrawal) would appear to indicate clinically significant eating disorder psychopathology. This cannot be determined from the present study because guilt at withdrawal was not measured; however, Mond et. al., (2006) did conclude that in the absence of eating disorder symptoms, excessive exercise does not constitute a clinically significant syndrome. With only 9 subjects being classified as excessive exercisers (above 16 on the SLSS and exercise to lose weight), 7 were found to be asymptomatic while 2 subjects were classified as symptomatic. It could then possibly be concluded that for these 7 participants excessive exercising does not constitute a clinically significant syndrome.

Limitations

The use of self-reporting investigative techniques has been criticized. However, we believe that if inaccuracies exist in this study, they will be on the side of under-reporting rather than over-reporting the presence of pathogenic weight-control techniques. This idea was supported by the underreporting of the risky eating behaviors of elite Norwegian athletes (Sundgot-Borgen, 1993). The validity of self-reports, both of actual weight and of eating behaviors, has plagued almost all research on this topic.

However, it is our hope that because the subjects were guaranteed anonymity, they were able to answer honestly.

The results of this study are generalizable only to college women involved in team sports at Division III schools located in the Midwest.

This study used volunteers so it is possible that athletes who had an eating disorder or a concern for their eating habits did not choose to participate and those individuals who did volunteer may have been less concerned about their body image. Also, due to the nature of the survey, the coach had to be contacted in hopes that he or she would pass the survey along to their team. Coaches who were unwilling to participate, whether due to time or survey topic, essentially eliminated their entire team from participation.

The proportion of soccer players who submitted the survey was found to be 42% of the total submissions; however, only 14% of the NCAA Division III athletes across the country are soccer players (NCAA, 2007). An estimate based on number of teams and average squad size of athletes in the Midwest reveals that 30% of female athletes in the Midwest are soccer players. This has the potential to introduce bias into the results. The introductory letter to head coaches informed them of the researcher's status as a collegiate women's soccer coach and included a brief personal history. Soccer coaches may have been more willing to pass the survey along to help out a colleague. Also, the largest percentage of respondents (25%) was from Ohio, which also has the potential to introduce bias.

Future Studies

Due to the major underreporting of pathogenic weight control methods (e.g. vomiting) and of eating disorders found by Sundgot-Borgen (1993) it has been indicated that reliable data regarding the prevalence of pathogenic weight control methods and eating disorders should not be obtained through questionnaires alone. They should be considered merely a screening instrument for further investigation by personal interview and clinical evaluation. Therefore, the next logical step would be to interview a portion of the sample to determine if the results truly are an underestimation of prevalence rates as well as behaviors.

Due to the amount of data collected many future studies can be derived. The following is a list of comparisons that could be made:

- Team sports versus individual sports.
- Non-eating disordered athletes (symptomatic and asymptomatic) with eating disordered athletes.
- Midwest Division III athletes with athletes outside of the Midwest.

Other studies that would be of interest but would also require more data collection would be to compare each of the above groups to a Division III sample of non-athletes, considering that one assumption was that Division III athletes are similar in many respects to physically active non-athletes. With Division I athletes being different than Division III athletes in terms of scholarship opportunities and practice outside of season, it would also be of great interest to compare Division III athletes to a top-tier Division I group of athletes.

Conclusion

This study was undertaken to gain a better understanding of the factors, or combination of factors, that lead to risky eating and excessive exercise in the Division III female athletes involved in team sports within the context of the sociocultural theory of body image. It was hypothesized that each variable (social physique anxiety, internalization of sociocultural attitudes, traditional gender role, self-esteem, athletic identity, and body image) would contribute the greatest proportion of variance to risky eating as well as excessive exercise. This was not found to be true.

Due to the high amount of correlation between the predictor variables, collinearity had to be examined. Upon examination, eight variables were removed (age, coaches gender, does your coach discuss dieting, does your coach discuss weight, image, internal, athletic identity, and traditional gender role) leaving three variables to enter the binary logistic regression to predict both risky eating and excessive exercise.

For the prediction of risky eating, the only variable to provide any unique variance was social physique anxiety. This finding of only one variable remaining in the final model was not originally expected; however, due to the large number of predictor variables and the collinearity between those variables, and having only entered three variables into the final model (social physique anxiety, body mass index, and self-esteem), it was not a surprise. Those participants classified as symptomatic had a significantly higher social physique anxiety. This group also had higher BMIs and higher self-classified weights. Based on sociocultural theory, these women with higher BMIs and self-classified weights also had a greater anxiety about being evaluated in public. Therefore, their method to try to lose weight involved risky eating behaviors, which can

be performed in private, rather than performing additional exercise in public. It should also be noted that indicators of unhealthy dieting practices were found across all sporting groups tested and it can be concluded that any athlete should be considered potentially at risk for an eating disorder when some or all of the risk factors outlined above are present.

For the prediction of excessive exercise, all three variables entered remained in the final model: social physique anxiety, body mass index, and self-esteem. These variables were explained in the context of the sociocultural theory in that those who exercise typically have a lower social physique anxiety. This lower physique anxiety is likely due to an improvement in body image as a consequence of a change in body size or shape, and this was found in the current results. Those participating in what was classified as excessive exercise based on the SLSS of the EOQ had lower BMIs, lower social physique anxiety, as well as higher self-esteem.

Although the details of intervention for disordered eating are beyond the scope of this paper, the best intervention is a sound preventive program. Because sports medicine providers, including athletic trainers and team physicians, see athletes on a frequent basis, they must be aware of the problem of female athletes using risky eating behaviors as well as participating in excessive exercise. Athletic trainers and team physicians have the potential to be involved in early identification as well as educational programs. Preparticipation examinations should include appropriate screening tools, such as a measurement of social physique anxiety. The ultimate goal of this research is to provide information to guide the development of educational sessions to promote healthy eating, training methods, and body image for both the athletes as well as the coaches. This could be done through the addition of a meeting with all female sports teams, an online

educational module for female athletes, the addition of outside speakers, or the creating of a body image course available to athletes as well as the entire student body. In reality, the only way to mandate these ideas would be through the NCAA. These ideas and programs will help to maximize the safe and healthy participation of women in sports.

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Appendix A

Coaches Invitation to Participate in Study

The Ohio State University College of Education and Human Ecology
Dr. Janet Buckworth, Principal Investigator
Leigh A. Sears, Student Investigator
Body Image and Behavior in NCAA Division III Female Athletes Involved in Team
Sports in the Midwest.

Dear Coach,

In your experience as a head coach of female athletes, you are probably aware of issues female athletes have with their body image. As the Head Women's Soccer Coach at Hope College in Holland Michigan, I too have noticed some of the girls on my team who diet in season or participate in extra exercise outside of practice. My interest in how athletes' Body Image contributes to their behavior has developed into my dissertation research. I will be looking at several different variables, such as athletic identity and body dissatisfaction to see how much they alone, or in combination, account for level of dysfunctional eating and/or excessive exercise. Ultimately, I want to take what I learn from this study to develop interventions to decrease the risk of eating disorders and unhealthy levels of exercise in female athletes.

Your athletes can participate by going to the link in the attached letter and completing the survey online. You may chose not to participate by not passing the attached information and link on to your team without prejudice from the researchers. However, please be assured your team members' answers will be anonymous. After your athletes link to the host site, there will be no identifiers to link the responses back to them, you, your team, or your institution.

I know this is a busy time for all of us, including your athletes, but it would be very helpful if you could pass this along and encourage your team to participate. This study is part of my doctoral degree requirements at The Ohio State University. My advisor is Dr. Janet Buckworth from The Ohio State University, College of Education and Human Ecology.

If you chose to have your team participate, please take a minute to cut and past the attached text into your teams e-mail distribution list.

Thank you for your time and consideration. If you have any questions, you may contact Leigh Sears at 616-395-7693, sears@hope.edu or Dr. Janet Buckworth at 614-292-0757, buckworth.1@osu.edu.

Sincerely,

Leigh A. Sears, M.S.
222 Fairbanks
Holland, MI 49423

Appendix B

Player Invitation to Participate in Study

The Ohio State University College of Education and Human Ecology
Dr. Janet Buckworth, Principal Investigator
Leigh A. Sears, Student Investigator

Dear Athlete,

I am the Head Women's Soccer Coach at Hope College in Holland Michigan and am conducting research for my dissertation through The Ohio State University. I have contacted your coach, who agreed to pass this information along for your consideration.

This research involves completing a one time online survey that takes about 15 minutes to complete. I am surveying female Division III athletes involved in intercollegiate sports located in the Midwest, so your response is important. I am looking at how your attitudes about yourself and your sport affect your behavior; therefore, it is extremely important that if you choose to answer the survey, you answer with complete honesty.

Completing and submitting the survey indicates your consent for use of the answers you supply. You may choose not to participate or withdraw at any time without prejudice from the researchers. Your responses will be anonymous since your coach initially contacted you and there are no individual identifiers within the survey itself. Your name, e-mail, team, or institution cannot be linked to your responses in any way. Also, your coach will not receive your results or responses.

I understand that this is a busy time for you, but it would be very helpful if you would take **15 – 20** minutes to fill out and submit the survey. This study is part of my doctoral degree requirements at The Ohio State University. My advisor for this study is Dr. Janet Buckworth from The Ohio State University, College of Education and Human Ecology.

If you choose to participate please follow the link below to the online survey.
<http://frostcenter.org/ImageBehavior.htm>

Thank you for your time and consideration. If you have any questions, you may contact Leigh Sears at 616-395-7693, sears@hope.edu or Dr. Janet Buckworth at 614-292-0757, buckworth.1@osu.edu

Sincerely,

Leigh A. Sears
Hope College - DeVos Fieldhouse
222 Fairbanks
Holland, MI 49423

Appendix C

Coaches Reminder Letter

Dear Coach,

It has been two weeks since you received an e-mail from me inviting you to have your team participate in my dissertation research study to examine body image and behavior in Division III female athletes participating in team sports located in the Midwest. I know this is a busy time for you as well as your athletes; however, your team's input is important.

I am once again asking for your assistance. If you have already passed the information along, thank you very much, and I would ask you to please send a short reminder to your team asking them to complete the survey if they have not done so. If you have yet to pass the information along, I would ask you to please consider asking your team to participate.

If you have any questions or concerns about your teams participation in this study please feel free to contact Leigh A. Sears at 616-395-7693, sears@hope.edu or Dr. Janet Buckworth at 614-292-0757, buckworth.1@osu.edu.

The information for your team is attached. Please take a minute to cut and paste the attached text into your teams e-mail distribution list.

Thanks so much for your consideration,

Leigh A. Sears
Hope College
DeVos Fieldhouse
222 Fairbanks
Holland, MI 49423

Appendix D

Human Subjects Approval

REC'D FEB 08 2007

TITLE PAGE - APPLICATION FOR EXEMPTION
 FROM REVIEW BY THE INSTITUTIONAL REVIEW BOARD
 The Ohio State University, Columbus OH 43210

For office use only
PROTOCOL NUMBER:
 2007E0014

► Principal Investigator		Name: Janet Buckworth	Phone: 616-292-0757
University Title: <input type="checkbox"/> Professor <input checked="" type="checkbox"/> Associate Professor <input type="checkbox"/> Assistant Professor <input type="checkbox"/> Instructor <input type="checkbox"/> Other. Please specify. (May require prior approval.)	Department or College: EDU PAES	E-mail: buckworth.1@osu.edu	
	Campus Address (room, building, street address): 169 Cunz Hall 1841 Miliken Rd Columbus, OH 43210		
	Signature: <i>Janet Buckworth</i> Date: 2-6-07	Fax: 614-688-3432	

► Co-Investigator		Name: Leigh A. Sears	Phone: 616-886-1072
University Status: <input type="checkbox"/> Faculty <input type="checkbox"/> Staff <input checked="" type="checkbox"/> Graduate Student <input type="checkbox"/> Undergraduate Student <input type="checkbox"/> Other. Please specify.	Campus Address (room, building, street address) or Mailing Address: 222 Fairbanks Holland, MI 49423	E-mail: sears@hope.edu sears.11@osu.edu	
	Signature: <i>Leigh Sears</i> Date: 2-1-07	Fax: 616-395-7175	

► Co-Investigator		Name:	Phone:
University Status: <input type="checkbox"/> Faculty <input type="checkbox"/> Staff <input type="checkbox"/> Graduate Student <input type="checkbox"/> Undergraduate Student <input type="checkbox"/> Other. Please specify.	Campus Address (room, building, street address) or Mailing Address:	E-mail:	
	Signature:	Date:	Fax:

► Protocol Title	Body Image and Behavior in NCAA Division III Female Athletes Involved in Team Sports in the Midwest
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► Source of Funding	n/a
----------------------------	-----

<i>For Office Use Only</i>	
<input checked="" type="checkbox"/> Approved.	► Research has been determined to be exempt under these categories: #2 Research may begin as of the date of determination listed below.
<input type="checkbox"/> Disapproved.	► The proposed research does not fall within the categories of exemption. Submit an application to the appropriate Institutional Review Board for review.

Date of determination: 2/09/07	Signature: <i>Janet A. Schutte</i> Office of Research Risk Protection
---------------------------------------	--

MEMORANDUM

DATE: February 21, 2007

TO: Leigh Sears

FROM: John Patnott, Chairperson
Kinesiology Dept.



RE: Research proposal approval

Your research proposal titled "Body Image and Behavior in NCAA Female Athletes Involved in Team Sports in the Midwest" has been approved by the HSRB. This approval is for a 12-month period.

Thank you for submitting your proposal and I hope all goes well with your research.

Appendix E

Survey Instrument

Please read the following information carefully. After reading this form, you will decide whether or not you wish to participate in the research described.

I am Leigh Sears and I am the Head Women's Soccer Coach at Hope College in Holland Michigan and am conducting research for my dissertation through The Ohio State University.

This research will be specific to Division III female athletes involved in sports in the Midwest. I am looking at how your attitudes about yourself and your sport affect your behavior; therefore, it is extremely important that if you choose to continue, you answer with complete honesty.

This survey will take you 15-20 minutes to complete. If you do not have time to complete the survey once started, you may hit the Pause button located at the bottom of each screen. You will be sent an e-mail reminder providing you a link to return and finish the survey.

By checking the box below and moving forward with the survey you indicate your consent for use of the answers you supply. Your participation is voluntary and you may choose not to participate or withdraw at any time without prejudice from the researchers. Your responses will be ANONYMOUS since your coach initially contacted you and there are no individual identifiers within the survey itself. Your name, e-mail, team, or institution can not be linked to your responses in any way. Because this is completely ANONYMOUS, your coach in no way will receive the answers to your responses.

Thanks again for your time and consideration.

I Give My Consent

Sport History

Current Sport:

Years of participation in current sport at current college/university (use whole numbers):

Overall years of participation in current sport (use whole numbers):

Are you currently a "starter" (or first string player) in your sport?

Yes No

Coach Information

Is your head coach a male or female?

Male Female

Yes No

Does your coach talk about body weight?

Does your coach talk about dieting?

Background Information

What State is your College/University in:

What is your Home State:

Your age

18 19 20 21 22 23

Your year in school

Freshman

Sophomore

Junior

Senior

5th Year

Your Race/Ethnicity

Caucasian/White

African-American/Black

Hispanic/Latino/Mexican-American

American Indian

Asian American/Pacific Islander

Other

If other, please specify:

Survey

Please read each of the following items carefully and indicate the number that best reflects your agreement with the statement.

Definitely Disagree Mostly Disagree Neither agree nor disagree Mostly Agree Definitely Agree

TV programs are an important source of information about fashion and "being attractive".

I've felt pressure from TV or magazines to lose weight

I do not care if my body looks like the body of people on TV.

I compare my body to people who are on TV.

TV commercials are an important source of information about fashion and "being attractive".

I do not feel pressure from TV or magazines to look pretty.

I would like my body to look like the models who appear in magazines.

I compare my appearance to the appearance of TV and movie stars.

Music videos on TV are not an important source of information about fashion and "being attractive".

I've felt pressure from TV and magazines to be thin.

I would like my body to look like the people who are in movies.

I do not compare my body to the bodies of people who appear in magazines.

Definitely Disagree Mostly Disagree Neither agree nor disagree Mostly Agree Definitely Agree

Magazine articles are not an important source of information about fashion and "being attractive".

I've felt pressure from TV or magazines to have a perfect body.

I wish I looked like the models in music videos.

I compare my appearance to the appearance of people in magazines.

Magazine advertisements are an important source of information about fashion and "being attractive".

I've felt pressure from TV or magazines to diet.

I do not wish to look as athletic in people in magazines.

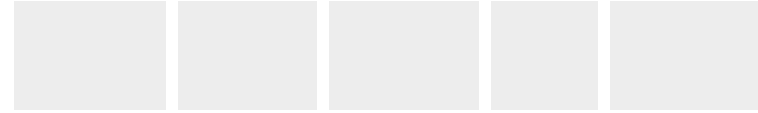
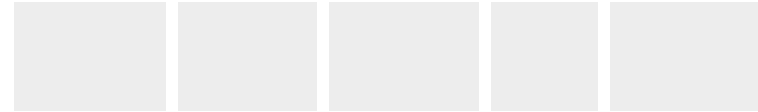
I compare my body to that of people in "good shape".

Pictures in magazines are an important source of information about fashion and "being attractive".

I've felt pressure from TV or magazines to exercise.

I wish I looked as athletic as sports stars.

I compare my body to that of people who are athletic.



Definitely Disagree Mostly Disagree Neither agree nor disagree Mostly Agree Definitely Agree

Movies are an important source of information about fashion and "being attractive".

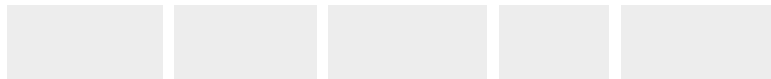
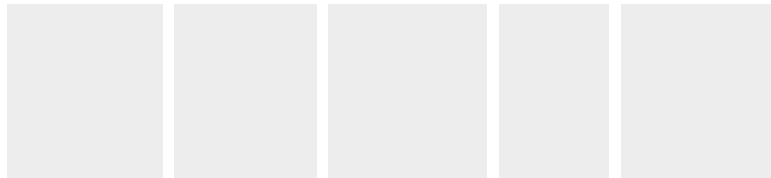
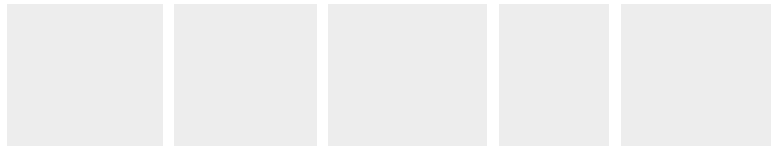
I've felt pressure from TV or magazines to change my appearance.

I do not try to look like the people on TV.

Movie stars are not an important source of information about fashion and "being attractive".

Famous people are an important source of information about fashion and "being attractive".

I try to look like sports athletes.



The following statements may or may not describe your feelings about exercise. Read each statement and then choose the appropriate word to indicate how well the statement describes your feelings most of the time. There are no right or wrong answers.

	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
I try to exercise instead of snacking.					
I very much want to control my weight.					
Exercise keeps me from feeling bloated.					
I disliked my body before I began to exercise.					
I would like a lower percent body fat.					
For me, exercising comes first.					
I buy state of the art equipment to monitor/improve my performance.					
I want to measure my performance (by time, distance, accuracy, etc.).					
I am controlled by my training regimen.					
I follow a regular exercise routine.					
I strive for a personal best.					
I need a goal to shoot for.					
If I make one goal, I shoot for a harder one.					

	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
It is important for me to measure my performance accurately.					
I am dissatisfied with my performance.					
I choose to exercise rather than socialize.					
I hate my body when it won't do what I want.					
If I don't reach my exercise goals, I feel like a failure.					
I am a serious athlete.					
I am a good athlete.					
My best friends are athletes.					
I am an active person.					
Exercise puts me more in control.					
I exercise to get rid of frustration.					
I feel better after I exercise.					
Vigorous exercise gives me a "high".					
I can organize my thoughts better when I exercise.					

Choose the answer that indicates your level of agreement with the following statements.

"SD" = Strongly Disagree

"SA" = Strongly Agree

SD

SA

I consider myself an athlete.

I have many goals related to sport.

Most of my friends are athletes.

Sport is the most important part of my life.

I spend more time thinking about sport than anything else.

I need to participate in sport to feel good about myself.

Other people see me mainly as an athlete.

I feel bad about myself when I do poorly in sport.

Sport is the only important thing in my life.

I would be very depressed if I were injured and could not compete in sport.

At various times and in various situations, people may experience negative feelings about their own physical appearance. Such feelings include feelings of unattractiveness, physical self-consciousness, distress, or dissatisfaction with one or more aspects of one's appearance. This questionnaire lists a number of situations and asks how often you have uncomfortable feelings about your physical appearance in each of these situations.

Think about times when you have been in each situation and indicate how often you've had negative feelings about your physical appearance in that situation. Use the "never" to "always" scale below to indicate HOW OFTEN you have such negative emotional experiences.

There may be situations on the list that you have not been in or that you avoid. For these situations, simply indicate how often you believe that you would experience negative emotions about your appearance if you were in the situation.

Please answer accurately and honestly by choosing from "never" to "always" to describe your experiences. There are no right or wrong answers.

How often do (would) you have uncomfortable feelings about your physical appearance in each situation?

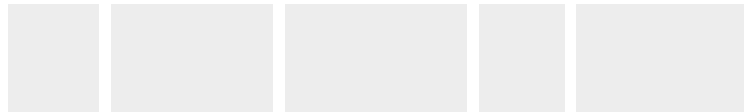
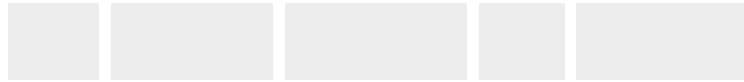
	Never	Sometimes	Moderately Often	Often	Always or Almost Always
At social gatherings where I know few people					
When I look at myself in the mirror					
When people see me before I've "fixed up"					
When I am with attractive persons of my sex					
When I am with attractive persons of the other sex					
When someone looks at parts of my appearance that I dislike					

When I look at my nude body in the mirror

When I am trying on new clothes at the store

After I have eaten a full meal

When I see attractive people on television and magazines



Never Sometimes Moderately Often Often Always or Almost Always

When I get on the scale to weigh myself

When anticipating having sexual relations

When I'm already in a bad mood about something else

When the topic of conversation pertains to physical appearance

When someone comments unfavorably on my appearance

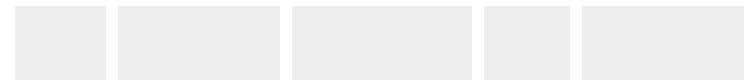
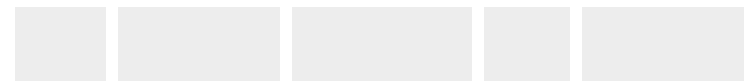
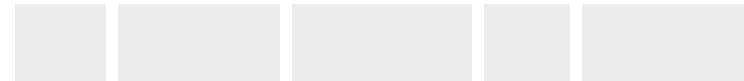
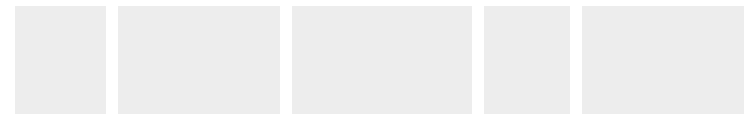
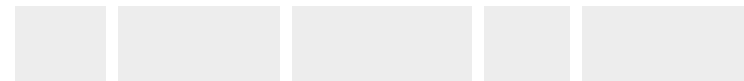
When I see myself in a photograph or videotape

When I think about what I wish I looked like

When I think about how I may look in the future

When I am with a certain person

During certain recreational activities



Below is a list of statements dealing with your general feelings about yourself. Indicate your level of agreement with each statement.

"SA" = Strongly Agree

"SD" = Strongly Disagree

	SD				SA
On a whole, I am satisfied with myself.					
At times, I think I am no good at all.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I feel that I have a number of good qualities.					
I am able to do things as well as most other people.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I feel I do not have much to be proud of.					
I certainly feel useless at times.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I feel that I'm a person of worth, at least on an equal plane with others.					
I wish I could have more respect for myself.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
All in all, I am inclined to feel that I am a failure.					
I take a positive attitude towards myself.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The items below inquire about what kind of person you think you are. Each item consists of a PAIR of characteristics, with the letters "A" - "E" in between.

Not at all artistic ... A.....B.....C.....D.....E... Very artistic

Each pair describes contradictory characteristics - that is, you cannot be both at the same time, such as very artistic and not at all artistic.

The letters form a scale between the two extremes. Please choose a letter which describes where YOU fall on the scale. For example, if you think that you have no artistic ability, you would choose "A". If you think that you are pretty good, you might choose "D". If you are only medium, you might choose "C", and so forth.

- | | | | | | | |
|--|---|---|---|---|---------|--|
| Not at all aggressive | A | B | C | D | E | Very aggressive |
| Not at all independent | A | B | C | D | E | Very independent |
| Not at all emotional | A | B | C | D | E..... | Very Emotional |
| Very submissive | A | B | C | D | E | Very dominant |
| Not at all excitable in a major crisis | A | B | C | D | E | Very excitable in a major crisis |
| Very passive | A | B | C | D | E | Very active |
| Not at all able to devote self completely to others | A | B | C | D | E | Able to devote self completely to others |
| Very rough | A | B | C | D | E | Very gentle |
| Not at all helpful to others | A | B | C | D | E | Very helpful to others |
| Very home oriented | A | B | C | D | E | Very worldly |

Very home oriented	A	B	C	D	E	.....	Very worldly
Not at all kind	A	B	C	D	E	.....	Very kind
Indifferent to others' approval	A	B	C	D	E	.....	Highly needful of others' approval
Feelings not easily hurt	A	B	C	D	E	.....	Feelings easily hurt
Not at all aware of feelings of others	A	B	C	D	E	.....	Very aware of feelings of others
Can make decisions easily	A	B	C	D	E	.....	Has difficulty making decisions
Gives up very easily	A	B	C	D	E	.....	Never gives up easily
Never cries	A	B	C	D	E	.....	Cries very easily
Not at all self-confident	A	B	C	D	E	.....	Very self-confident
Feels very inferior	A	B	C	D	E	.....	Feels very superior
Not at all understanding of others	A	B	C	D	E	.....	Very understanding of others
Very cold in relations with others	A	B	C	D	E	.....	Very warm in relations with others
Very little need for security	A	B	C	D	E	.....	Very strong need for security
Goes to pieces under pressure	A	B	C	D	E	.....	Stands up well under pressure

The following contain a series of statements about how people might think, feel, or behave. You are asked to indicate the extent to which each statement pertains to you personally.

There are no right or wrong answers. Just give the answer that is most accurate for you. Remember, your responses are confidential, so please be completely honest and answer all items.

	Definitely Disagree	Mostly Disagree	Neither Agree Nor Disagree	Mostly Agree	Definitely Agree
Before going out in public , I always notice how I look.					
I am careful to buy clothes that will make me look my best.					
My body is sexually appealing.					
I constantly worry about becoming fat.					
I like my looks just the way they are.					
I check my appearance in the mirror whenever I can.					
Before going out, I usually spend a lot of time getting ready.					
I am very conscious of even small changes in my weight.					
Most people would consider me good-looking.					
It is important that I always look good.					

I use very few grooming products.

Definitely Disagree Mostly Disagree Neither Agree Nor Disagree Mostly Agree Definitely Agree

I like the way I look without my clothes on.

I am self-conscious if my grooming isn't right.

--	--	--	--	--

I usually wear whatever is handy without caring how it looks.

I like the way my clothes fit me.

--	--	--	--	--

I don't care what people think about my appearance.

I take special care with my hair grooming.

--	--	--	--	--

I dislike my physique.

I am physically unattractive.

--	--	--	--	--

I never think about my appearance.

I am always trying to approve my physical appearance.

--	--	--	--	--

I am on a weight loss diet.

I have tried to lose weight by fasting or going on crash diets.

Never

Rarely

Sometimes

Often

Very Often

Very Underweight Somewhat Underweight Normal Weight Somewhat Overweight Very Overweight

I think I am:

From looking at me, most other people would think I am:					
---	--	--	--	--	--

Use this 5-point scale to indicate how dissatisfied or satisfied you are with each of the following areas or aspects of your body:

Very Dissatisfied Mostly Dissatisfied Neither Satisfied Nor Dissatisfied Mostly Satisfied Very Satisfied

Face (facial features, complexion)

Hair (color, thickness, texture)					
----------------------------------	--	--	--	--	--

Lower torso (buttocks, hips, thighs, legs)

Mid torso (waist, stomach)					
----------------------------	--	--	--	--	--

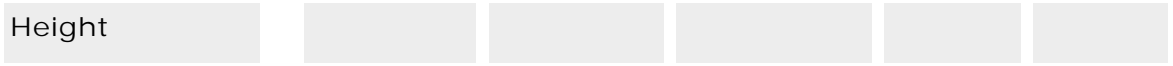
Upper torso (chest or breasts, shoulders, arms)

Muscle tone					
-------------	--	--	--	--	--

Weight

Height

Overall
appearance



Weight History

Present Height:
__ feet

and inches

Present weight: pounds

My body frame size is:

I would like to weigh _____pounds:

Please complete the following questions as honestly as possible. The questions refer to current behaviors and beliefs, meaning those that have occurred in the past 3 months.

Do you experience recurrent episodes of binge eating, meaning eating in a discrete period of time (e.g., within any 2-hour period) an amount of food that is definitely larger than most people would eat during a similar time period?

Yes

No

Do you have a sense of lack of control during the binge eating episodes (i.e., the feeling that you cannot stop eating or control what or how much you are eating?)

Yes No

On the average, I have had ____ binge eating episodes a WEEK

1

2

3

4

5

6

more

for at least

1 month

2 months

3 months

4 months

5 months

6-12 months

more than one year

Please click the appropriate response below concerning things you may do currently to prevent weight gain.

If you choose an answer other than "no", indicate how often on the average you do this AND how long you have been doing this.
To prevent weight gain, do you:

	How often do you do this?					How long have you been doing this?					
	No	Daily	Twice/Week	Once/Week	Once/Month	1 month	2 months	3 months	4 months	5-11 months	More than a year
Make yourself vomit											
Take laxatives											
Take diuretics											
Skip food for 24 hours											
Chew food and Spit it out											
Give yourself an enema											
Take appetite pills											
Diet Strictly											
Exercise in addition to normal sports practice											

participate in

minutes at a time

days per week

I participate in

minutes at a time

days per week

I participate in

minutes at a time

days per week

Other

minutes at a time

days per week

Yes No

My exercise sometimes significantly interferes with important activities.

I exercise despite injury and/or medical complications.

Is your primary reason for exercising to counteract the effects of binges or to prevent weight gain?

For the following questions, choose the response that best reflects your answer:

Not at all A Little A moderate amount Very Much Extremely or Completely

Does your weight and/or body shape influence how you feel about yourself?

How afraid are you of becoming fat?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------	--------------------------	--------------------------

How afraid are you of gaining weight?

Do you consider yourself to be:

- Grossly Obese
- Moderately Obese
- Overweight
- Normal Weight
- Low Weight
- Severely Underweight

Yes No

Certain parts of my body (e.g., my abdomen, buttocks, thighs) are too fat.

I feel fat all over.

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

I believe that how little I weigh is a serious problem.

I have missed at least 3 consecutive menstrual cycles (not including those missed during a pregnancy).

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

Do you have any additional comments?

A large empty rectangular box with a vertical scrollbar on the right side, intended for additional comments. The box is white with a thin black border. The scrollbar is located on the right edge and consists of a vertical track with a small rectangular slider in the middle. The track has a light gray background with a darker gray border.

Thank you for taking the time to complete this survey.

You might have noticed this survey contained questions regarding risky behavior.

If you think you may need help for a risky behavior please seek the advice of your Student Health Clinic OR please visit The Body Image & Task Force Website of The Ohio State University for additional resources.

<http://www.hec.ohio-state.edu/bitf/index.htm>

Pausing the Survey

You can copy the URL above, or bookmark this page, and use it to return to the survey where you left off.

If you enter your e-mail address, the link will be sent to you to continue later. This is an automated message generated by our survey software. *Your email address will not be stored in our database.*

You will have 3 days to return and finish the survey before your completed portion will be deleted.

email (include @xxxxx.xxx):

Appendix F
Additional Tables

Group	Coach			Coach Discuss Dieting		Total
				Yes	No	
Asymptomatic	Male	Sport	Basketball	2	4	6
			Ice Hockey	0	6	6
			Rugby	1	0	1
			Soccer	30	97	127
			Softball	1	19	20
			Volleyball	4	15	19
			Water Polo	1	1	2
			Total	39	142	181
	Female	Sport	Basketball	4	43	47
			Crew Field	2	4	6
			Hockey	1	7	8
			Ice Hockey	1	3	4
			Lacrosse	0	7	7
			Soccer	9	38	47
			Softball	8	54	62
Volleyball			18	27	45	
Total	43	183	226			
Symptomatic	Male	Sport	Basketball	2	2	4
			Ice Hockey	0	2	2
			Soccer	12	22	34
			Softball	0	3	3
			Volleyball	1	9	10
			Total	15	38	53
	Female	Sport	Basketball	4	12	16
			Field Hockey	0	1	1
			Ice Hockey	1	0	1
			Lacrosse	0	1	1
			Soccer	2	12	14
			Softball	1	12	13
			Volleyball	3	17	20
Total	11	55	66			

Table F.1
Does Your coach Discuss Dieting

Group	Coach			Coach Discuss Body Weight		
				Yes	No	Total
Asymptomatic	Male	Sport	Basketball	0	6	6
			Ice Hockey	0	6	6
			Rugby	1	0	1
			Soccer	30	97	127
			Softball	0	20	20
			Volleyball	3	16	19
			Water Polo	0	2	2
			Total	34	147	181
	Female	Sport	Basketball	6	41	47
			Crew Field	4	2	6
			Hockey	2	6	8
			Ice Hockey	1	3	4
			Lacrosse	0	7	7
			Soccer	10	37	47
			Softball	7	55	62
Volleyball			16	29	45	
Total	46	180	226			
Symptomatic	Male	Sport	Basketball	3	1	4
			Ice Hockey	0	2	2
			Soccer	9	25	34
			Softball	0	3	3
			Volleyball	4	6	10
			Total	16	37	53
	Female	Sport	Basketball	3	13	16
			Field Hockey	0	1	1
			Ice Hockey	1	0	1
			Lacrosse	0	1	1
			Soccer	2	12	14
			Softball	1	12	13
			Volleyball	3	17	20
Total	10	56	66			

Table F.2
Does Your Coach Discuss Body Weight

Year In School						
Age	Freshman	Sophomore	Junior	Senior	5th Year	Total
18	69	0	0	0	0	69
19	117	54	1	0	0	172
20	1	91	32	0	0	124
21	0	2	65	31	0	98
22	0	0	1	49	2	52
23	0	0	2	1	8	11
Total	187	147	101	81	10	526

Table F.3
Age and Year In School of Non-Eating Disordered

		BMI	Athletic Identity Total	Social Physique Anxiety total	Self Esteem Scale	PAQ Masculine	PAQ Feminine	Appearance Evaluation	Appearance Orientation
BMI	Pearson Correlation	1.0	.11*	.32**	-.05	.06	.08	-.32**	.04
	Sig. (2-tailed)		.02	.00	.28	.18	.06	.00	.33
Athletic Identity Total	Pearson Correlation	.11*	1.	.14**	-.15**	.09*	-.06	-.08	.18**
	Sig. (2-tailed)	.016		.00	.00	.05	.16	.08	.00
Social Physique Anxiety total	Pearson Correlation	.32**	.14**	1	-.47**	-.29**	.03	-.53**	.27**
	Sig. (2-tailed)	.000	.002		.00	.00	.44	.00	.00
Self Esteem Scale	Pearson Correlation	-.05	-.15**	-.47**	1	.50**	.12**	.42**	-.07
	Sig. (2-tailed)	.28	.00	.00		.00	.01	.00	.11
PAQ Masculine	Pearson Correlation	.06	.09*	-.29**	.50**	1	-.01	.28**	.01
	Sig. (2-tailed)	.18	.05	.00	.00		.77	.00	.74
PAQ Feminine	Pearson Correlation	.08	-.06	.03	.12**	-.01	1	.06	.08
	Sig. (2-tailed)	.06	.16	.44	.01	.77		.18	.06
Appearance Evaluation	Pearson Correlation	-.32**	-.08	-.35**	.42**	.28**	.06	1	.06
	Sig. (2-tailed)	.00	.08	.00	.00	.00	.18		.16
Appearance Orientation	Pearson Correlation	.04	.18**	.27**	-.07	.01	.08	.06	1
	Sig. (2-tailed)	.33	.00	.00	.11	.74	.06	.16	

Continued

Table F.4
Correlation Table for All Independent Variables

Table F.4 Continued

		BMI	Athletic Identity Total	Social Physique Anxiety total	Self Esteem Scale	PAQ Masculine	PAQ Feminine	Appearance Evaluation	Appearance Orientation
Body Area Satisfaction	Pearson Correlation	-.33**	-.14**	-.62**	.57**	.38**	.07	.63**	-.11**
	Sig. (2-tailed)	.00	.00	.00	.00	.00	.09	.00	.01
Overweight Preoccupation	Pearson Correlation	.32**	.21**	.61**	-.29**	-.06	.05	-.35**	.39**
	Sig. (2-tailed)	.00	.00	.00	.00	.17	.28	.00	.00
Self Classified Weight	Pearson Correlation	.65**	.03	.40**	-.13**	.01	.02	-.41**	.08
	Sig. (2-tailed)	.00	.47	.00	.00	.91	.65	.00	.08
Internalization General	Pearson Correlation	.02	.13**	.48**	-.27**	-.15**	.04	-.21**	.32**
	Sig. (2-tailed)	.73	.00	.00	.00	.00	.34	.00	.00
Internalization Athlete	Pearson Correlation	.13**	.21**	.29**	-.09*	.05	.08	-.14**	.14**
	Sig. (2-tailed)	.00	.00	.00	.02	.24	.06	.00	.00
Pressures	Pearson Correlation	.17**	.08	.49**	-.21**	-.12**	.11**	-.22**	.24**
	Sig. (2-tailed)	.00	.06	.00	.00	.01	.01	.00	.00
Information	Pearson Correlation	.01	.19**	.25**	-.12**	-.07	.05	-.09*	.22**
	Sig. (2-tailed)	.85	.00	.00	.01	.10	.26	.05	.00

* Correlations are significant at the .05 level

**Correlations are significant at the .01 level

		Body Area Satisfaction	Overweight Preoccupation	Self Classified Weight	Internalization General	Internalization Athlete	Pressures	Information
BMI	Pearson Correlation	-.33**	.32**	.65**	.02	.13**	.17**	.01
	Sig. (2-tailed)	.00	.00	.00	.73	.00	.00	.85
Athletic Identity Total	Pearson Correlation	-.14**	.21**	.03	.13**	.21**	.08	.19**
	Sig. (2-tailed)	.00	.00	.47	.00	.00	.06	.00
Social Physique Anxiety total	Pearson Correlation	-.62**	.61**	.40**	.48**	.29**	.49**	.25**
	Sig. (2-tailed)	.00	.00	.00	.00	.00	.00	.00
Self Esteem Scale	Pearson Correlation	.57**	-.29**	-.13**	-.27**	-.09*	-.21**	-.12**
	Sig. (2-tailed)	.00	.00	.00	.00	.02	.00	.01
PAQMasculine	Pearson Correlation	.38**	-.06	.01	-.15**	.05	-.12**	-.07
	Sig. (2-tailed)	.00	.17	.91	.00	.24	.01	.10
PAQFeminine	Pearson Correlation	.1	.05	.02	.04	.08	.11**	.05
	Sig. (2-tailed)	.09	.28	.65	.34	.06	.01	.26
Appearance Evaluation	Pearson Correlation	.63**	-.35**	-.41**	-.21**	-.14**	-.22**	-.09*
	Sig. (2-tailed)	.00	.00	.00	.00	.00	.00	.05
Appearance Orientation	Pearson Correlation	-.12**	.39**	.08	.32**	.14**	.24**	.22**
	Sig. (2-tailed)	.01	.00	.08	.00	.00	.00	.00
Body Area Satisfaction	Pearson Correlation	1.0	-.50**	-.41**	-.32**	-.18**	-.29**	-.14**
	Sig. (2-tailed)		.00	.00	.00	.00	.00	.00

Continued

Table F.5
Correlation Table for All Independent Variables Continued

Table F.5 Continued

		Body Area Satisfaction	Overweight Preoccupation	Self Classified Weight	Internalization General	Internalization Athlete	Pressures	Information
Overweight Preoccupation	Pearson Correlation	-.50**	1	.39**	.49**	.34**	.47**	.25**
	Sig. (2-tailed)	.00		.00	.00	.00	.00	.00
Self Classified Weight	Pearson Correlation	-.41**	.39**	1	.14**	.12**	.22**	.05
	Sig. (2-tailed)	.00	.00		.00	.01	.00	.22
Internalization General	Pearson Correlation	-.32**	.49**	.14**	1	.42**	.71**	.60**
	Sig. (2-tailed)	.00	.00	.00		.00	.00	.00
Internalization Athlete	Pearson Correlation	-.18**	.34**	.12**	.42**	1	.37**	.26**
	Sig. (2-tailed)	.00	.00	.01	.00		.00	.00
Pressures	Pearson Correlation	-.29**	.47**	.22**	.71**	.37**	1	.57**
	Sig. (2-tailed)	.00	.00	.00	.00	.00		.00
Information	Pearson Correlation	-.14**	.25**	.05	.60**	.26**	.57**	1
	Sig. (2-tailed)	.00	.00	.22	.00	.00	.00	.00

* Correlations are significant at the .05 level

**Correlations are significant at the .01 level