

BODY IMAGE, FIGURE PREFERENCE, AND SOCIAL COMPARISON AMONG  
FEMALE ATHLETES IN SEX-INTEGRATED AND  
SINGLE-SEX ATHLETIC PROGRAMS

A THESIS

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## DEDICATION

For my family—  
Cayce, Mom, Dad, Lindsay, and Kristen.  
I would not be where I am today without you.

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## ABSTRACT

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### BODY IMAGE, FIGURE PREFERENCE, AND SOCIAL COMPARISON AMONG FEMALE ATHLETES IN SEX-INTEGRATED AND SINGLE-SEX ATHLETIC PROGRAMS

The purpose of the study was to further understand the increased risk of eating disorders among female athletes by exploring differences in three established eating disorder risk factors: body image, figure preference, and social comparison. The present study compared female athletes to female non-athletes and female athletes who compete in sports in a sex-integrated athletic program compared to those in a single-sex athletic program. Although research on eating disorders among female athletes is abundant, environmental influences such as sex-integration and single-sex environments have rarely been studied as risk or prevention factors. Participants were 228 college women ranging between 18 and 27 years ( $M= 19.36$ ,  $SD= 1.71$ ) recruited from students currently enrolled at Texas Woman's University (single-sex group) and The University of North Texas (sex-integrated group). 66 of the participants were athletes. Upon consent, the participants were instructed to complete a demographic form and four questionnaires with 77 items assessing body image, figure preference, and frequency of social and body comparison. The results showed that athletes in the single-sex athletic program prefer larger body types and report less comparison behaviors than those in the sex-integrated athletic program. In addition, female swimmers prefer smaller body types than soccer

players. Correlations on risk factors found that as participants' body satisfaction decreases and drive for thinness increases, their reports of comparison behaviors increase. Overall, athletes rated their current figures smaller than non-athletes and have a smaller difference between their current and ideal figure ratings than non-athletes. Eating disorder risk factors vary by race and ethnicity, with White and Asian individuals at higher risk. Understanding the risk and protective factors in college athletes and college non-athletes is essential for the prevention and treatment of eating disorders. Limitations and suggestions for future research are discussed.

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## CHAPTER I

### INTRODUCTION

Female athletes have become at greater risk for disordered eating in Western culture compared to non-athletes (Becker, McDaniel, Bull, Powell, & McIntyre, 2012; de Bruin, Oudejans, & Bakker, 2007; Hausenblas & Carron, 1999; Kirk, Singh, & Getz, 2001; Petrie, 1993; Schwarz, Gairrett, Arguete, & Gold, 2005; Thompson & Fleming, 2007). Exercise and athletic participation— although once believed to predict health, positive body image, and self-esteem in females— have progressively been found to be related to disordered eating and a drive for extreme thinness in female athletes (Krane, Stiles-Shiplely, Waldron & Michalenok, 2001; Petrie; Schwarz, et al.). The harmful impact of Western cultural ideals on females' body image and self-esteem is nothing new in eating disorder research, but the significant connection between sports participation and disordered eating or exercising has become an alarming topic among those concerned with women's health issues today (de Bruin, et al.).

Many researchers have explained this phenomenon by (a) comparing various sports that are heavily populated by females (aesthetic vs. non-aesthetic, lean vs. non-lean) (Krane, et al., 2001; Petrie, 1993; Robinson & Ferraro, 2004), (b) exploring media influences reinforcing thin ideals in female athletes (Bissell, 2004; Daniels, 2009; Daniels & Wartena, 2011), and (c) measuring gender role conflict in these traditionally masculine environments (Johnson & Petrie, 1995; Krane, Choi, Baird, Aimar, & Kauer, 2004; Mean

& Kassing, 2008; Miller & Levy, 1996; Steinfeldt, Zakrajsek, Carter, & Steinfeldt, 2011). All of these ideas provide some explanation as to why athletes seem to be more at risk in the development of an eating disorder than non-athletes, although these explanations are sometimes contradictory. Studies have also shown that gender composition in educational environments may affect risk for eating disorder development (Davey, Jones, & Harris, 2011; Tiggemann, 2001; Weinberger-Litman, Rabin, Fogel, & Mesinger, 2008). However, there has been little to no research on how gender composition in sports, (whether single-sex as opposed to sex-integration in the sports environment) may affect risk for eating disorder development. Although research has suggested that single-sex versus sex-integrated educational environments impact body dissatisfaction (Baur, 2004), figure preference (Davey, Jones, & Harris, 2011), and comparison behaviors (Weinberger-Litman, et al., 2008), these factors have not been studied among athletes across single-sex or sex-integrated environments. Through this study, I hoped to explore whether gender composition in sport environment (sex-integrated as opposed to single-sex) may impact known risk factors for eating disorder development. These risk factors include body image, figure preference, and social comparison among female athletes.

### **Eating Disorders among Athletes**

Unfortunately, athletes appear to be at more risk than non-athletes to develop disordered eating or engage in compulsive exercising (Becker, et al., 2012; de Bruin, et al., 2007; Petrie, 1993; Schwarz, et al., 2005; Thompson & Fleming, 2007). Although there is a wide range of disordered eating and compulsive exercising behavior, the three most common eating disorders are anorexia nervosa, bulimia nervosa, and binge eating

disorder. Common behaviors seen among athletes with eating disorders include restricting food intake, bingeing, and/or purging through the use of vomiting, laxatives, or excessive exercising (*DSM-IV-TR*; American Psychiatric Association, 2000). It has been found that up to 46% of elite females in lean sports (i.e. gymnastics, dance, figure skating) and up to 20% of females in non-lean sports (i.e. soccer, basketball, hockey) display diagnosable disordered eating, compared to 9-20% in female control groups (non-athletes) (Sundgot-Borgen & Torstveit, 2004; Torstveit, Rosenvinge, & Sundgot-Borgen, 2008). The exact causes of eating disorders have not yet been found but factors including body dissatisfaction, weight concerns, actual dieting behaviors, low self-esteem, associating thinness with self-worth and self-esteem, and a greater tendency to endorse U.S. cultural values regarding attractiveness and thinness, have been found to be significant predictors (de Bruin, et al.; De Souza, Hontscharuk, Olmsted, Kerr, & Williams, 2007; Petrie; Thompson & Chad, 2002).

### **Sport Type**

Research among athletes with eating disorders suggests that the type of sport played (lean vs. non-lean and individual vs. team sport) may also be a significant factor in the development of eating disorders, with lean and individual sports as greater predictors (de Bruin, et al., 2007; Hasse, 2009; Petrie, 1993; Torstveit, et al., 2008). Researchers have aimed to explain why these particular sports (lean sports; gymnastics, dance, diving) seem to produce increased risks of poor body image. Studies have found support for increased state anxiety (or situational anxiety), competition anxiety, greater concentration on aesthetics, as well as the likelihood that the performance in a particular

sport is based on judges, in lean or individual sports compared to non-lean or group sports (de Bruin, et al.; Haase; Torstveit, et al.). However, recent research has shown that sport type is not solely responsible for the increased risk in eating disorder development among female athletes due to the rise in eating disorders among male athletes and those who participate in non-lean sports (Petrie, Greenleaf, Carter, & Reel, 2007; Thompson & Fleming, 2007).

### **Femininity and Sport**

Research is lacking on the connections of femininity with lean or individual sports. Many lean or aesthetic sports emphasize self-presentation and thinness, a stark contrast to technical skills valued in ball games and physical strength valued in power sports (de Bruin, et al., 2007). Although different sports genuinely require different body types in order to be successful, it appears that the expectations in lean or aesthetic sports (self-presentation, thinness) compared to non-lean or technical sports (upper body strength) correlate strongly with Western cultural ideals for femininity and masculinity (McCaughy, 2006). The current rates of eating disorders among female athletes may not be surprising then, after analyses of sport type and their extension of traditional femininity. As discussed previously, endorsing traditional Western ideals of beauty and femininity is a risk factor of eating disorder development and body dissatisfaction (Petrie, 1993).

### **Demographic Differences**

Studies have examined whether race or ethnicity, age, and socioeconomic status influence the risk of eating disorder development. Research has found that differences

between race and ethnicity on eating disorder development and risk factors remain small (Ericksen, Markey, & Tinsley, 2004; Gardner, Friedman, & Jackson, 1999; Shaw, Ramirez, Trost, Randall, & Stice, 2004), although differences have been found in specific disordered behaviors (Edwards-Hewitt & Gray, 1993). One study found that White-Americans have been found to identify more with the behaviors of binge eating disorder and bulimia nervosa than Black-Americans (Edwards-Hewitt & Gray). Other studies have found that Hispanic adolescent girls and Asian and African-American women report higher rates of diuretic use and binge eating than White girls and women (Story, French, Resnick, & Blum, 1995). Studies have found that Hispanic ethnicity may be a risk factor for eating disorder development (The McKinght Investigators, 2003), who report the highest prevalence of disordered eating in mid to late adolescence (Croll, Neumark-Sztainer, Story, & Ireland, 2002). Hispanic adolescents report more overweight concerns (Robinson, Chang, Haydel, & Killen, 2001), lower body esteem (Vander Wal & Thomas, 2004), more weight loss attempts, chronic dieting behaviors, and binge eating compared to other ethnic groups (Neumark-Sztainer, Croll, Story, Hannan, French, & Perry, 2002). Studies have found similar results with Hispanic adults, who report greater symptoms of eating pathology and distress about body shape and weight compared to Caucasians and African Americans (Franko, et al., 2012). Research on bi-ethnic or multi-ethnic individuals and eating disorder development remains limited. However, one study found that the effect of acculturation on body dissatisfaction or weight concerns was insignificant (Gowen, Hayward, Killen, Robinson, & Taylor, 1999).

The relationship between socioeconomic status and eating disorder development remains mixed. In fact, research has shown that disordered eating in all forms exists across all socioeconomic classes (Edwards-Hewitt & Gray, 1993; Gibbs, 1986; Gross & Rosen, 1988). Some research suggests that individuals in lower socioeconomic statuses may exhibit more weight control behaviors and body dissatisfaction (Story, et al., 1995), but the reverse has also been found (Drewnowski, Kurth, & Krahn, 1994).

Mid to late adolescence and young adulthood appear to be high-risk times for eating disorder development (Abebe, Lien, & von Soest, 2012; Croll, Neumark-Sztainer, Story, & Ireland, 2002; Fairburn & Harrison, 2003). However eating disorders have been found across all ages (Patrick, Stahl, & Sundaram, 2011). Mid-life can also be a high-risk period due to decreases in body satisfaction (Koch, Mansfield, Thureau, & Carey, 2005; Mangweth-Matzek, Rupp, Haussmann, Assmayr, Mariarcher, & Whitworth, et al, 2006).

### **Recent Directions**

Studies on social comparison (or the process of comparing oneself to another), body image, and gender role identity are becoming an increasing topic of research in sports literature in an effort to explain the prevalence of eating disorders and compulsive exercising (Davison & McCabe, 2006; Schutz and Paxton, 2007; Migliaccio & Berg, 2007; Steinfeldt, et al., 2011). Currently, there has been little research on how sex-integrated as opposed to single-sex sport environments may influence these particular variables that may contribute to the development of eating disorder behaviors.

## **Single-Sex Education and Coeducation**

Research on the protective and risk factors for disordered eating in single-sex education compared to coeducation remains mixed within the literature. Research has shown that coeducation or sex-integration benefits both males and females on a range of interpersonal and academic development including body image and self-esteem (Dale, 1971; Davey, et al., 2011; Lambert, 1998; Langlois, 2006; Lirgg, 1992; Roland, 1978; Rosenthal, 1980; Schroeder & LeMay, 1973; Signorella, Frieze, & Hershey, 1996; Singh, Sehgal, & Kapoor, 1976; Tiggemann, 2001). In contrast, research has supported single-sex education for eating disorder prevention factors including decreased sex-role stereotyping, increased self-esteem, and increased confidence (Astin, 1977; Holland & Esienhart, 1990; James & Richards, 2003, Lee & Bryk, 1986, Lee & Marks, 1990)

### **Gender Stereotyping**

Several studies have found that individuals in sex-integrated settings are less likely to endorse gender stereotyping in situations such as academic performance and future occupations, particularly pertaining to women (Roland, 1978; Rosenthal, 1980; Signorella, et al., 1996). On the other hand, some studies have found that coeducational settings can exacerbate gender socialization differences and can actually perpetuate gender or sex-role stereotyping (James & Richards, 2003). Similarly, researchers have found that girls in single-sex schools engage in significantly less sex-role stereotyping of women in the workplace, and experience less gender role conflict (Lee & Bryk, 1986, Lee & Marks, 1990; Weinberger-Litman, et al., 2008).



## **Interpersonal Relationships**

Sex-integrated environments appear to benefit interpersonal development by providing real-work social interactions and better preparation for cross-gender interactions and integration (Dale, 1971). For example, research has found that individuals who live in coed dormitories are more mature, more flexible, and better able to develop meaningful, healthier interpersonal relationships (Dale, 1971; Schroeder & LeMay, 1973). However, girls and women who attend single-sex schools have been found to display greater leadership development and report greater feelings of support from their institutions (Astin, 1993; Astin & Leland, 1991, Kinzie, Thomas, Palmer, Umbach, and Kuh, 2007; Whitt, 1994).

## **Self-Concept and Self-Esteem**

Individuals in sex-integrated settings have been found to display higher levels of self-concept. Among the dimensions of self-concept, a high level of physical self-concept appears to be the highest among individuals in sex-integrated environments (Lambert, 1998; Singh, et al., 1976), a particularly relevant component when discussing sex-integrated sports and athletics. Boys in sex-integrated environments have been shown to be more confident, perceive themselves to be better behaved, more affiliated, and more involved compared to boys in sex-segregated environments. Similarly, girls report that having males in the classroom adds to their learning experience and self-esteem (Langlois, 2006; Lirgg, 1992).

In contrast, several studies have found just the opposite— women who attend single-sex universities have increased intellectual confidence, self-perceived academic ability, confidence, leadership development, and self-esteem (Astin, 1977; Astin, 1993; Astin & Leland, 1991, Holland & Esienhart, 1990; Kim, 2002; Kim & Alvarez, 1995; Smith, Wolf, & Morrison, 1995, Whitt, 1994).

### **Academics**

Recent research has shown that historically beneficial aspects of single-sex classrooms have decreased due to diminishing stereotypes in education (Chouinard, Vezeau, & Bouffard, 2008). Achievement motivation may no longer be influenced by environment even in traditionally masculine courses such as mathematics (Chouinard, et al.; Harker, 2000), although the reverse has also been found (McFarland, Benson, and McFarland, 2011). Research has also shown that in sex-integrated classes, boys are more frequently called on than girls, and that girls are less likely to pursue advanced mathematics and science (American Association of University Women (AAUW)), 1992; U.S. General Accounting Office, 1996). Studies have also demonstrated that not only do boys get more attention in coeducational classes, but that they receive more encouragement in school (Sadker, & Sadker, 1994). Girls in single-sex education have also been found to have more academically oriented friends, to adopt a greater academic emphasis with more time spent on homework, and to be more competitive (Lee & Bryk, 1986). These benefits of single-sex education appear to be even more beneficial for girls of color, whose performance has been found to be stronger in all subject areas than their counterparts at coeducational schools (Riordan, 1990; Riordan, 1994). These mixed

results related to gender stereotyping, interpersonal development, self-concept, self-esteem, and academic performance make it difficult to predict the impact of the gender composition of school settings on the development of eating disorder risk factors.

### **Eating Disorder Risk Factors**

Even though some of these findings are not directly related to eating disorder symptomology, understanding interpersonal development, social attitudes, and self-perception may help explain differences in eating disorder risk factors (Petrie, 1993; Walcott, Pratt, & Patel, 2003) among girls in single-sex environments as opposed to girls in sex-integrated environments. Research has found that girls in single-sex schools are thinner overall, more likely to express body dissatisfaction, and are more likely to endorse thin ideals compared to those sex-integrated schools (Davey, et al., 2011; Dyer & Tiggemann, 1996; Tiggemann, 2001). Additionally, researchers have linked shared characteristics among girls in single-sex schools, including higher levels of eating disturbance, a greater emphasis on achievement, and higher levels of adherence to traditional femininity (Behar, de la Barrera, & Michelotti, 2002; Dyer & Tiggemann, 1996; Evans, Rich, & Holroyd, 2004; Tiggemann, 2001). For example, one study found that adolescent girls attending single-sex schools that had higher levels of achievement held smaller figure ideals. The reverse was true for girls in coeducational schools; higher scores on achievement were associated with larger figure ideals (Tiggemann, 2001). University settings have displayed similar results, with those in single-sex environments scoring significantly higher on subscales of the Eating Disorders Inventory (Limbert, 2001).

On the other hand, research has also found that single-sex environments may provide some protective factors for the development of eating disorders. One study found that girls who attended coeducational schools demonstrated higher levels of gender role conflict and social comparison to media images than their single-sex counterparts (Weinberger-Litman, et al., 2008), known risk factors for eating disorder development (Davison & McCabe, 2006; Schutz and Paxton, 2007; Migliaccio & Berg, 2007; Steinfeldt, et al., 2011). The literature suggests that there is not a clear advantage or disadvantage of single-sex environments or sex-integrated environments for risk of eating disorder development.

### **Physical Education Classes**

When isolating physical education classes in schools, research has found an overall decrease in liking physical education (P.E.) from sixth to eighth grade among girls (Treanor, Graber, Housner, & Wiegand, 1998). However, girls' activity levels are generally consistent with boys, if not higher, in coeducational settings (Hannon & Ratcliffe, 2005; McKenzie, Prochaska, Sallis, & LeMaster, 2004; Van Acker, da Costa, De Bourdeaudhuij, Cardon, & Haerens, 2010), although the reverse has also been found (Treanor, Graber, Housner, & Wiegand, 1998). Girls and boys in coeducational physical education classes report more favorable attitudes towards PE classes (Koca, Asci, & Demirhan, 2005; Hong, Yoon, and Yeo, 2003), although some studies have shown the opposite (Lyu & Gill, 2011). Not surprisingly, student preferences for single-sex physical education as opposed to coeducational physical education remain mixed and appear to vary by grade level (Lirgg, 1993; Lyu & Gill, 2011) and format of athletic environment

(Kruisselbrink, Dodge, Swanburg, & MacLeod, 2004). For example, Kruisselbrink, et al. found that in exercise settings (as opposed to physical education classes), women reported more social physique anxiety in an all male or sex-integrated exercise setting.

Teachers have been found to interact more frequently with boys in coeducational physical education classes due to gender stereotyped beliefs by both the teacher and students (Hannon & Ratliffe, 2005; Koca, 2009). Despite comparable activity levels, girls' report perceiving themselves to be significantly more overweight than males, regardless of setting (sex-integrated vs. single-sex) (Treanor, et al., 1998). More research on physical education classes in schools is needed in order to understand girls' perceptions of being overweight as well as their significant decrease in interest in physical activity.

### **Eating Disorders and Social Comparison Theory**

Social comparison theory has been used to help explain the risk of disordered eating symptomology (Davison & McCabe, 2006; Schutz and Paxton, 2007; Van den Berg, Thompson, Obremski-Brandon, & Covert, 2002). Festinger's (1954) social comparison theory suggests that humans have a drive to assess how they are doing. In order to assess how they are doing, people seek standards against which to compare themselves, often consisting of environments or standards that personally apply to them. For example, one study comprised of Olympic speed skaters, professional models, and college students (Franzoi & Klaiber, 2007) found that college students were more likely than Olympic athletes or professional models to compare themselves to people in the general population. Athletes were more likely than students or models to compare

themselves to elite athletes, and models were more likely to compare themselves to elite models than college students or athletes (Franzoi & Klaiber, 2007). According to social comparison theory, when a discrepancy exists between the individual and the idealized standard, the individual adjusts his or her behavior in order to minimize the difference between themselves and the desired standard (Corning, Krumm, & Smitham, 2006). For the purposes of this study, an individual may then develop disordered eating and exercising behaviors after identifying a discrepancy among themselves and another athlete.

Although this process seems like a natural response experienced by a majority of people, some individuals can be classified as “high comparers” (Gibbons & Buunk, 1999). Research has shown that the more an individual participates in social comparison, the more likely they are to develop body dissatisfaction and eating disturbance (Corning, et al., 2006; Dittmar & Howard, 2004; Leahey, Crowther, Mickelson, 2007; Tiggmann, Polivy & Hargreaves, 2009; Tylka & Sabik, 2010). Not surprisingly, studies have found similar characteristics between high comparers and those with eating disorders or eating disorder behaviors, including lower levels of self-esteem; higher levels of social anxiety, self-consciousness, and neuroticism; and a greater sensitivity to other people’s behaviors (Gibbons & Buunk; de Groot & Rodin, 1994; Schupak-Neuberg & Nemeroff, 1993; Mintz & Betz, 1988; Striegel-Moore, Silberstein, & Rodin, 1993; Tylka & Subich, 1999; Mendelson, McLaren, Gauvin, & Steiger, 2002).

Similar characteristics have been found among athletes as well, including a tendency to experience social physique anxiety (or the anxiety or nervousness experienced about the evaluation of one's body by others), self-consciousness, and negative perfectionism (Haase, Prapavessis, & Owens, 2002; Thompson & Fleming, 2007).

In general, women and girls have been found to be more likely than their male counterparts to experience concerns about their weight and negative body attitudes when comparing themselves to their reference group. Franzoi & Klaiber's (2007) study of college students, models, and athletes found that college women, more frequently than college men, compared themselves to professional models when evaluating body parts associated with weight concerns and sexual attractiveness. In addition, the more female Olympian speedskaters compared themselves to professional models, the more negative their body attitudes associated with weight concern increased, and the more interested they were in changing weight-related body aspects (Franzoi & Klaiber, 2007). Davison and McCabe (2006) found that adolescent girls engaged in significantly more appearance-based comparisons with same-sex peers and were significantly more aware of the positive and negative social implications of appearance. The girls also reported body image concerns that were more closely related to same-sex interactions than opposite-sex interactions compared to adolescent boys (Davison & McCabe). On the other hand, one study found that girls who attended coeducational schools demonstrated higher levels of social comparison to media images than their single-sex counterparts (Weinberger-Litman, et al., 2008).

Research has found a stronger connection between social comparison and body image/eating disturbance for women than for men (Heinberg & Thompson, 1992; Tylka & Sabik, 2010).

These findings suggest that females, and especially female athletes, would be at an even greater risk for negative effects of excessive social comparison. Few studies have explored how gender composition in athletic settings would impact levels of social comparison, despite the growing number of eating disorders among female athletes. Researchers have suggested, however, that participation in traditionally masculine sports, such as soccer and speedskating, may “decrease social pressure on women to judge themselves according to feminine ideals” (Franzoi & Klaiber, 2007, p. 211). It is possible that similar results may be seen in women’s participation in sex-integrated sport environments, by creating a more diverse environment consisting of male and female athletes where an individual’s reference or idealized group for social comparison could be expanded.

In contrast, reports of social comparison behaviors have been found to be higher in coeducational settings (Weinberger-Litman, et al., 2008). Researchers have explained that women in coeducational settings can display higher levels of adherence to the “Superwoman Ideal” than those in single-sex settings. Attempting to excel in several areas at once (school, career, sports, and/or social activities) while negotiating traditional female roles can foster perfectionistic attitudes, causing increased comparison to others (Weinberger-Litman, et al.).



### **Sex-Integrated and Single-Sex Sports**

Even though research on sex-integrated education and single-sex education has explored areas of self-esteem, self-concept, and endorsement of thin-ideals, limited research has studied how those variables may transfer to actual sport environments. There has been some research on the positive outcomes of participating in traditionally masculine sports for women on body image and sense of empowerment. Migliaccio and Berg (2007) found that women given the opportunity to play in traditionally male-only sports, such as football, enjoyed the opportunity to “be physical and to use their bodies and minds in a new way than society typically allows them” (p. 271). Female athletes who play traditionally masculine sports tend to have body types considered to be outside of the traditional feminine ideal and report that their size benefits their performance (Migliaccio and Berg). Identifying with certain masculine characteristics, such as risk taking, has also been shown to increase body esteem among female athletes (Steinfeldt, et al., 2011). Female athletes have reported feeling more empowered and confident in their ability to defend themselves when participating in traditionally masculine sports due to their developed size and strength as a result (Krane, et al., 2004; Migliaccio and Berg). Consistent with research on aesthetic sports, coeducation, and social comparison theory, participation in typically masculine sports additionally allows for female athletes to meet diverse teammates as well as work as a team (Migliaccio & Berg). Research also suggests that by continuing to perpetuate divisions among men and women (in sports and elsewhere), stereotypes and gender role rigidity flourish (McDonagh & Pappano, 2008).

Thus, by participating in sex-integrated sports, females may receive new opportunities to express and develop their athletic abilities while continuing to diminish stereotypes in athletics.

Women who participate in typically male sports do not remain unscathed by societal expectations, however. Female athletes, particularly those in non-lean sports, have reported to greatly struggle with their presentation of an ideal feminine body (Krane, et al., 2004; Russell, 2004). As an athlete participating in a historically and overwhelmingly male space, female athletes have to attempt to reconcile their athletic build and the feminine ideal of Western culture. This reconciliation of femininity and masculinity can be easily seen through choice of uniforms, media images, and content in sport critiques (female athlete's ability vs. appearance) of female athletes (Krane, et al.; McDonagh & Pappano, 2008). Further research on sex-integrated sport environments is needed in order to understand if and how participation beside male athletes may affect female athletes' perceptions of their body size and figure, as well as overall body image.

In sum, eating disorders and body image in sports and athletics remain a significant issue in women's and girl's health today. Further examination is needed in order to better understand causes and prevention in this body of research. Previous studies have found body dissatisfaction and a drive for thinness as risk factors for eating disorder development. Research on educational environments suggests that sex-integrated and single-sex environments may impact body image and disordered eating among females.

Research concerning social comparison theory suggests that females and athletes may experience increased pressures and negative consequences of high comparison behaviors.

### **Purpose of the Study**

The purpose of this study was to further understand the rise in eating disorders among female athletes by exploring differences in three established eating disorder risk factors: body image, figure preference, and social comparison. Those who compete in sports in a sex-integrated athletic program were compared to participants in a single-sex athletic program. Although research on eating disorders among female athletes is abundant, the possible influences of sex-integrated and single-sex environments have rarely been studied in the sports literature as risk or prevention factors for the development of eating disorders among athletes.

The two primary hypotheses were that:

1. There would be differences between athletes and non-athletes in eating disorder risk factors. This hypothesis was non-directional due to research indicating that sport type may impact eating disorder risk factors rather than sports as a whole.
2. There would be differences between athletes who participate in the single-sex athletic program and the athletes who participate in sex-integrated athletic program in eating disorder risk factors. This hypothesis was non-directional due to inconsistent findings in single-sex and coeducation literature.

An additional five exploratory hypotheses were studied:

1. There would be significant differences between the types of sport played in the risk for eating disorder risk factors.
2. There would be a significant correlation between measures of body image, figure preference, and social comparison.
3. There would be a positive correlation between body esteem and figure preference.
  - a. As body esteem scores increase, the preference for a healthier figure would increase.
4. There would be a negative correlation between social comparison and body esteem.
  - a. As reports of comparison to others increase, body esteem scores would decrease.
5. There would be a negative correlation between social comparison and figure preference.
  - a. As reports of comparison to others increase, the preference for a healthier figure would decrease.

### **Definition of Terms**

**Lean Sports:** The category of lean sports encompasses any sport in which a thin or lean body or a low weight is believed to provide an advantage in sport performance or in the judging of sport performance. Examples include distance running, diving, equestrian, figure skating, gymnastics, dancing, cheerleading, rowing, bodybuilding, martial arts,

wrestling, swimming, and weight lifting. These sports may also be classified as weight-class, aesthetic, or endurance sports (Otis, Drinkwater, Johnson, Loucks, and Wilmore, 1997; Smolak, Murnen, Ruble, 2000); West, 1998).

**Non-lean Sports:** Non-lean sports include any sport in which a thin or lean body or low weight is not believed to provide an advantage in sport performance or in the judging of sport performance. Examples include softball, volleyball, football, soccer, basketball, and lacrosse (Otis, et al., 1997; Smolak, et al., 2000; West, 1998).

**Single-Sex Athletic Program:** For the purposes of this study, the single-sex athletic program included female athletes from Texas Woman's University (TWU). TWU has only women's NCAA sport teams, resulting in a single-sex athletic program.

**Sex-Integrated Athletic Program:** For the purposes of this study, the sex-integrated athletic program included female athletes from the University of North Texas (UNT). UNT has both men's and women's NCAA sport teams, resulting in a sex-integrated athletic program.

## CHAPTER II

### METHOD

#### **Participants**

Participants included were 228 college women ranging between 18 and 27 years ( $M= 19.36$ ,  $SD= 1.71$ ) recruited from students currently enrolled at Texas Woman's University and The University of North Texas. In order to control for confounding variables, three participants were removed from the original sample because they reported being pregnant. Participants from Texas Woman's University were recruited through athletic departmental email and introductory psychology courses through the TWU research subject pool SONA system. Students from Texas Woman's University were included in the athletes in the single-sex athletic program group and non-athlete group. The University of North Texas students were recruited through athletic departmental emails. Students from the University of North Texas were included in the athletes from the sex-integrated athletic program group. Of the 228 students, 66 were athletes (162 non-athletes). There were 30 self-reported athletes from The University of North Texas, and 36 from Texas Woman's University. 39.7% of the participants identified as white, 24.3% as Black or African American, 21.1% as Hispanic or Latino, 13.4% as Asian, 2.8% as Other, and .8% as Hawaiian or Other Pacific Islander.

For the purposes of this study, all competitive university level sports offered at the universities were included in the data collection of the study, including basketball (3.6%, n=3), gymnastics (7.1%, n=6), soccer (19%, n=16), softball (16.7%, n=14) volleyball (15.5%, n=13), golf (4.8%, n=4), swimming (13.1%, n= 11), diving (1.2%, n=1), and track and field (2.4%, n=2). Figure 1 shows sport type among female athletes from Texas Woman's University (single-sex athletic program). Figure 2 shows sport type among female athletes from the University of North Texas (sex-integrated athletic program). The selected participants were surveyed on their college experiences in participating in sports and athletics. Experiences in a sex-integrated sport environment or single-sex sport environment prior to college were not used when assigning to groups. The mean length of participation in university athletics was 3.48 semesters, with a range of 1-8 semesters. The mean number of sports that the athletes currently participated in was 1.38 sports, with a range of 1-8 sports.

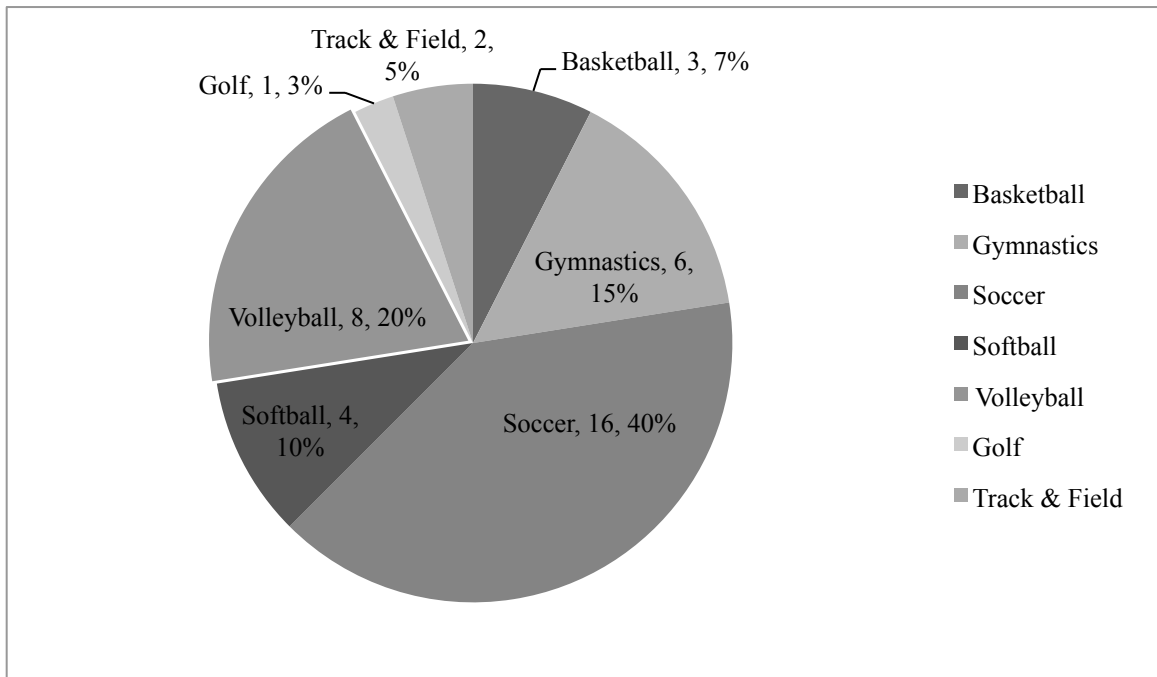


Figure 1. Single-sex athletic program group by reported sport type (TWU athletes)

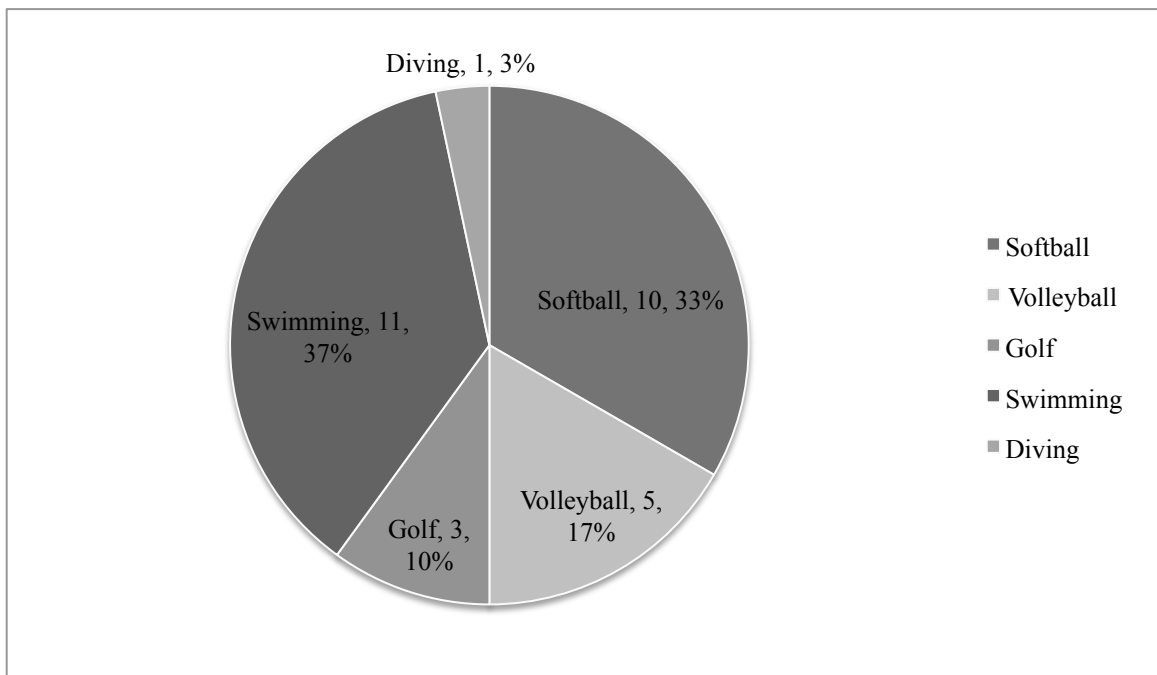


Figure 2. Sex-integrated athletic program group by reported sport type (UNT athletes)



## **Procedure**

Upon consent, the participants were instructed to complete a demographic form and four questionnaires with 77 items assessing body image, figure preference, and frequency of social and body comparison. The participants were provided with a link through PsychData via email or by signing up using the SONA system. Participants submitted their responses anonymously. The average time to complete the forms and questionnaires was approximately 15 minutes.

## **Measures**

The demographic form gathered information about race, ethnicity, and date of birth as well as a history of the participants' experiences, if any, with university level sports during college. Questions regarding type and length of sport(s) played were included in the demographic form. This demographic form is included in Appendix A.

The Body Esteem Scale (Franzoi & Shields, 1984) is a 35-item test used to measure body dissatisfaction and body image. Participants were asked to answer on a 5-point likert scale anchored by "have strong negative feelings" and "have strong positive feelings" on various body parts and functions. Test-retest reliability coefficients for the three male subscales in the Body Esteem Scale were as follows: physical attractiveness  $r = .58$ ; upper body strength  $r = .75$ ; and physical condition  $r = .83$ . For females, test-retest reliability for the three subscales were as follows: sexual attractiveness  $r = .81$ ; weight concern  $r = .87$ ; and physical condition  $r = .75$  (Franzoi, 1994). Research on eating disorders has found body dissatisfaction to be a strong predictor for the development of disordered eating (Krane, et al., 2001; Petrie, 1993; Thompson & Chad, 2002). Assessing body

dissatisfaction between the groups (athlete vs. non-athletes and sex-integrated vs. single-sex athletic programs) may aid in the understanding of the development of disordered eating among female athletes. This scale is included in Appendix B.

The Stunkard Figure Preference Scale (Stunkard, Sorensen, & Schulsinger, 1983) was used to measure figure preference or body shape preference. The Stunkard scale consists of 9 silhouette figures that increase gradually in size from very thin (a value of 1) to very obese (a value of 9). Following other researchers, this study will classify these figures into underweight (figures 1 and 2), normal weight (figures 3 and 4), overweight (figures 5 through 7), and obese (figures 8 and 9) (Bhuiyan, Gustat, Srinivasan, & Berenson, 2003). Participants were asked to rate their current figure and choose the preferred figure (silhouettes 1-9) on perceptions of attractiveness. Multiple studies have found a desire for thinness as a risk factor in the development of disordered eating (de Bruin, et al., 2007, De Souza, et al, 2006; Petrie, 1993; Thompson & Chad, 2002). This scale can be found in Appendix C.

The Physical Appearance Comparison Scale (PACS; Thompson, Heinber, & Tantleff, 1991) was used to measure levels of social comparison. The PACS is a five-item scale that assesses an individual's tendency to compare their own appearance to the appearance of others. Participants were asked to answer on a 5-point likert scale anchored by "never" and "always" on comparison behaviors. The internal consistency of the PACS using Cronbach's alpha was found to be .78 and test-retest reliability was .72 (Thompson, et al.).

Previous studies have found a significant increase in disordered eating and body dissatisfaction among individuals with high levels of comparison (Corning, et al., 2006; Dittmar & Howard, 2004; Leahey, et al., 2007; Tiggmann, et al., 2009; Tylka & Sabik, 2010). This scale is included in Appendix D.

The Body Comparison Scale (BCS; Fisher, Dunn, & Thompson, 2002) was used to measure levels of social comparison. The BCS is a 25-item questionnaire used to assess how often an individual compares a specific body part to another of the same sex. Participants were asked to answer on a 5-point likert scale anchored by “never” and “always” on body part comparison behaviors. The reliability for the BCS is high with an alpha of .91 (Van den Berg, Thompson, Obremski-Brandon, & Covert, 2002). This additional measure of social comparison was used because of the increased tendency for athletes to have physique anxiety and compare specific body parts to their peers due to the unique pressures of the sport environment (Haase, Prapavessis, & Owens, 2002; Thompson & Fleming, 2007). This scale is included in Appendix E.

## CHAPTER III

### RESULTS

Data were analyzed using independent samples t-tests to measure differences between athletes and non-athletes, and between athletes in the sex-integrated athletic program and athletes in the single-sex athletic program, on eating disorder risk factors (body image, figure preference, and social comparison). Pearson's  $r$  was used to measure correlations between the eating disorder risk factors. A one-way ANOVA was used to measure differences in sport type and eating disorder risk factors.

#### **Hypothesis One: Athletes and Non-Athletes**

Hypothesis one predicted that athletes and non-athletes would differ on eating disorder risk factors. This hypothesis was not supported. The results showed no significant differences between these two groups on body image. Athlete's body image score ( $M = 121.75$ ) was not significantly different than non-athlete's ( $M = 117.04$ ),  $t(220) = 1.48, p > .05$ .

Similarly, the results showed no significant differences between these athletes and non-athletes on figure preference. Athlete's figure preferences score ( $M = 12.56$ ) was not significantly different than non-athlete's ( $M = 13.42$ ),  $t(219) = -1.79, p > .05$ .

The results additionally showed no significant differences between the two groups on social comparison. Athlete's social comparison score ( $M = 15.49$ ) was not significantly different than non-athlete's ( $M = 14.97$ ),  $t(218) = .913, p > .05$ .

Likewise, the results showed no significant differences between athletes and non-athletes on body part comparison. Athlete's body part comparison score ( $M = 66.56$ ) was not significantly different than non-athlete's ( $M = 66.97$ ),  $t(218) = -.162, p > .05$ .

Hypothesis one was not supported. There were no significant differences between athletes and non-athletes on any of these four risk factors: body image, figure preference, social comparison, and body comparison.

### **Hypothesis Two: Athletes in Sex-Integrated and Single-Sex Athletic Programs**

Hypothesis two predicted that athletes in the sex-integrated athletic program and athletes in the single-sex athletic program would differ on eating disorder risk factors. This hypothesis received partial support. A significant difference was found between these groups on one variable (figure preference), a trend toward significance was found on another variable (social comparison), and no differences were found on two other variables (body image and body part comparison).

The results showed no significant differences in body image between athletes in the sex-integrated and single-sex athletic programs. Athletes in the sex-integrated athletic program reported a body image score ( $M = 117.76$ ) that did not significantly differ from the athletes in the single-sex athletic program ( $M = 125.06$ ),  $t(62) = 1.50, p > .05$ .

In contrast, the results showed significant differences in figure preference between athletes in the sex-integrated and single-sex athletic programs. Athletes in the sex-integrated athletic program reported a figure preference score ( $M = 11.83$ ) that was significantly lower than the athletes in the single-sex athletic program ( $M = 13.17$ ),  $t(62) = 2.04, p < .05, (d = .52)$ .

Similarly, the results showed a trend toward significance in differences in social comparison between the two groups. Athletes in the sex-integrated athletic program reported a social comparison score ( $M = 16.36$ ) that was higher than that for athletes in the single-sex athletic program ( $M = 14.80$ ),  $t(61) = -1.95$ ,  $p < .06$ , ( $d = -.50$ ).

The results showed no significant differences in body part comparison between athletes in the sex-integrated and single-sex athletic programs. Athletes in the sex-integrated athletic program reported a body part comparison score ( $M = 68.89$ ) that did not significantly differ from athletes in the single-sex athletic program ( $M = 64.69$ ),  $t(61) = -1.27$ ,  $p > .05$ .

Hypothesis two was partially supported with athletes in the single-sex athletic program preferring larger body types overall and reporting less comparison behaviors compared to those in the sex-integrated athletic program.

### **Exploratory Hypothesis One: Sport Type and Eating Disorder Risk Factors**

The literature reports greater risk of eating disorders among athletes participating in “lean sports” (e.g., gymnastics and diving) (de Bruin, et al., 2007; Hasse, 2009; Petrie, 1993; Torstveit, et al., 2008) than in “non-lean” sports. Due to uneven distribution among the sport types in this sample, an analysis was run on the four sports with the most participants (lean= swimming; non-lean=soccer, softball, volleyball) to see if there were differences in sport type in eating disorder risk factors among athletes.

A one-way ANOVA was conducted to test the impact of sport type on eating disorder risk factors. These analyses revealed a significant effect of sport type on figure preference,  $F(3, 48) = 3.90$ ,  $p < .05$ . The Tukey post hoc test indicated that there was a

significant difference in figure preference between soccer players and swimmers, with swimmers preferring smaller body types, ( $M = 10.55$ ) than soccer players ( $M = 13.60$ ). There was not a significant difference between swimmers and athletes who participated in other non-lean sports (softball and volleyball). Therefore, exploratory hypothesis one was partially supported.

**Exploratory Hypothesis Two: Correlation between Body Image, Figure Preference, and Social Comparison**

Another set of exploratory analyses was conducted to look at the relationships between different eating disorder risk factors (body image, figure preference, and social comparison). Exploratory hypothesis two predicted that there would be significant correlations among the eating disorder risk factors. Table 1 shows some significant correlations between body image, figure preference, and social comparison.

Measure	Body Esteem	Figure Preference	Social Comparison	Body Comparison
Body Esteem	1	-.098	-.355**	-.369**
Figure Preference	-.098	1	-.137*	-.072
Social Comparison	-.355**	-.137*	1	-.566**
Body Comparison	-.369**	-.072	-.566**	1

*Table 1:* Correlation between body image, figure preference, and social comparison.  
 \*\* Correlation is significant at the 0.01 level (2-tailed). \* Correlation is significant at the 0.05 level (2-tailed).

Exploratory hypothesis two was partially supported.

### **Exploratory Hypothesis Three: Body Dissatisfaction and Figure Preference**

Exploratory hypothesis three predicted a positive correlation between body esteem scores and figure preference scores. Table 1 shows a non-significant correlation between body dissatisfaction and figure preference,  $r = -.098$ ,  $n = 222$ ,  $p > .05$ . Therefore, exploratory hypothesis three was not supported.

### **Exploratory Hypothesis Four: Social Comparison and Body Dissatisfaction**

Exploratory hypothesis four predicted a negative correlation between social comparisons scores (two measures; social and body part comparison) and body esteem scores. Table 1 shows a significant negative correlation between social comparison and body esteem scores,  $r = -.355$ ,  $n = 220$ ,  $p < .05$ . As body esteem scores decreased, social comparison scores increased. Similarly, Table 1 shows a significant negative correlation between body part comparison and body esteem scores,  $r = -.369$ ,  $n = 220$ ,  $p < .05$ . As body esteem scores decreased, body part comparison scores increased. Therefore, exploratory hypothesis four was supported.

### **Exploratory Hypothesis Five: Social Comparison and Figure Preference**

Exploratory hypothesis five predicted a negative correlation between figure preference scores and social comparison (two measures; social and body part comparison) scores. Table 1 shows a significant negative correlation between figure preference and social comparison,  $r = -.137$ ,  $n = 220$ ,  $p < .05$ . As figure preferences got larger, social comparison scores decreased.



Table 1 shows a non-significant correlation between figure preference and body part comparison, the specific comparison of body parts to others,  $r = -.072$ ,  $n = 220$ ,  $p > .05$ . Exploratory hypothesis five was partially supported.

### **Additional Findings**

Table 1 shows a significant positive correlation between body part comparison and the comparison of physical appearance to others,  $r = .566$ ,  $n = 220$ ,  $p < .05$ . As reports of comparison of body parts increased, reports of comparison of physical appearance to others' increased.

Hypothesis one predicted that there would be a significant difference between the athletes and non-athletes on eating disorder risk factors. Although that hypothesis was not supported, there was a significant difference between the two groups' ratings of their current figure. The athletes' ratings of their current figure ( $M = 3.81$ ) was significantly smaller than that of the non-athletes ( $M = 4.34$ ),  $t(219) = -2.76$ ,  $p < .05$  ( $d = -.37$ ). Therefore, the mean difference of athletes' and non-athletes' current and ideal figures was also significantly different. The athletes' mean difference between current and ideal figures ( $M = .73$ ) was significantly smaller than that of the non-athletes ( $M = 1.13$ ),  $t(218) = -2.28$ ,  $p < .05$  ( $d = -.31$ ).

A one-way ANOVA was also conducted to test the impact of race and ethnicity on eating disorder risk factors. These analyses revealed a significant effect for race on body image,  $F(4, 217) = 3.18$ ,  $p < .05$ . The Tukey post hoc test indicated that there was a significant difference in body image between Asians and African Americans, with Asian individuals scoring significantly lower on body esteem, ( $M = 110.58$ ) than African

Americans ( $M = 126.98$ ). Post hoc analyses also indicated a significant difference between Whites and African Americans, with White individuals scoring significantly lower on body esteem, ( $M = 116.46$ ) than African Americans ( $M = 126.98$ ). Figure 3 shows body esteem scores by race.

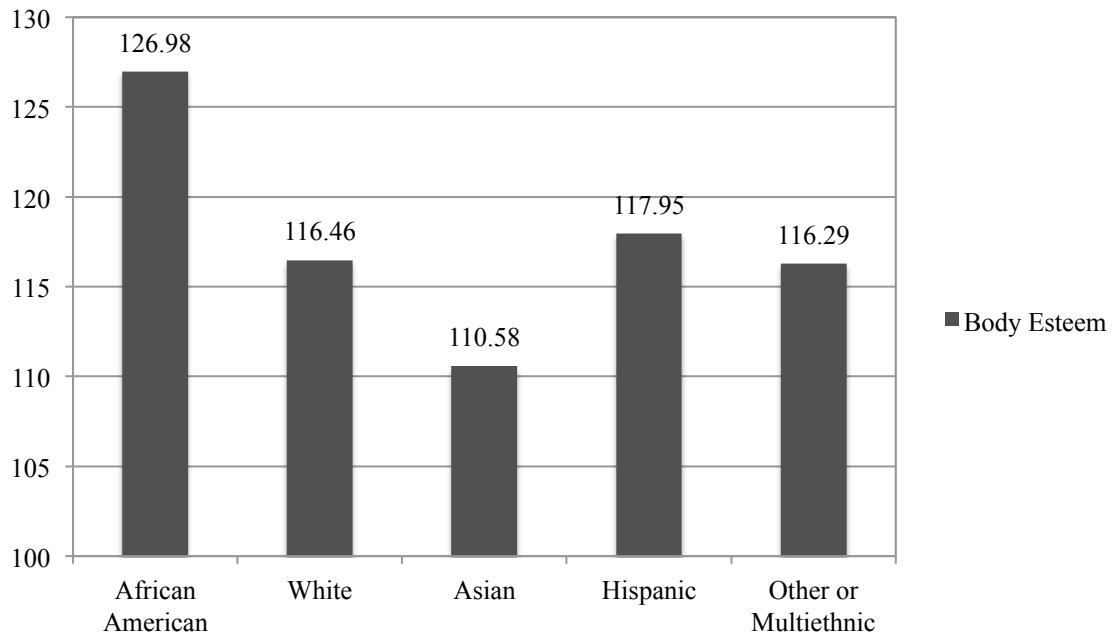


Figure 3: Body esteem scores by race.

These analyses also revealed a significant effect for race on figure preference,  $F(4, 216) = 6.16, p < .05$ . The Tukey post hoc test indicated that there was a significant difference in figure preference between Whites and African Americans, with White individuals preferring significantly smaller body types, ( $M = 12.09$ ) than African Americans ( $M = 14.38$ ).

Post hoc analyses also showed a significant difference between Whites and individuals who identify as Multiethnic or Other on figure preference scores, with White individuals preferring significantly smaller body types, ( $M = 12.09$ ) than those who identified as Multiethnic or Other ( $M = 14.58$ ). Figure 4 shows figure preference scores by race.

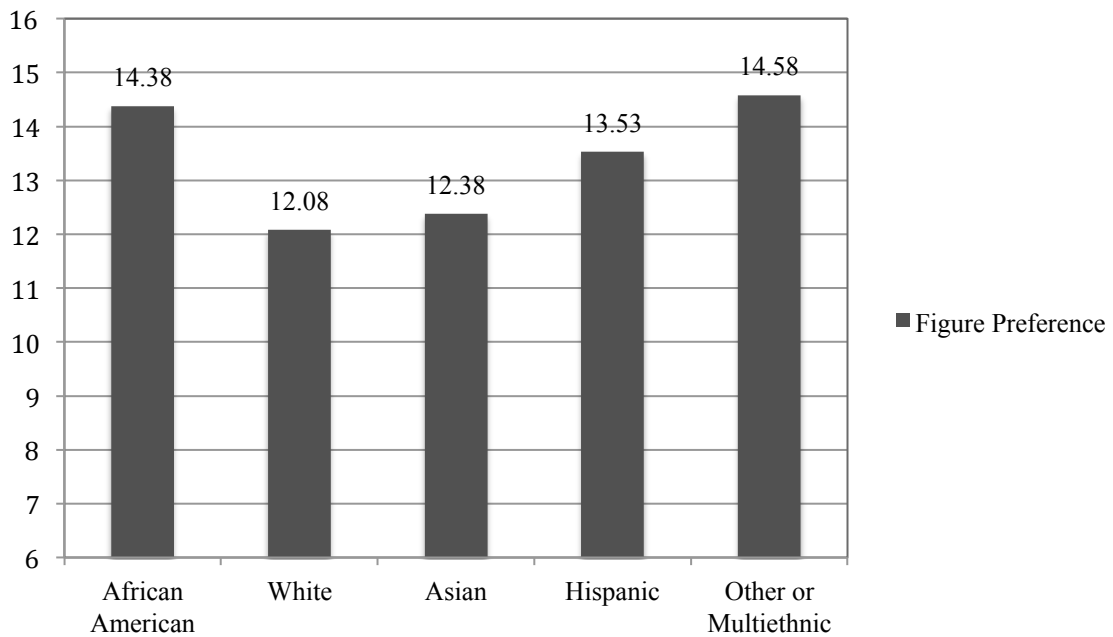


Figure 4: Figure preference scores by race.

Similarly, analyses also revealed a significant effect for race on social comparison,  $F(4, 215) = 2.93, p < .05$ . The Tukey post hoc test indicated that there was a significant difference in the reports of social comparison behaviors between Whites and African Americans, with White individuals reporting significantly higher comparison behaviors, ( $M = 15.75$ ) than African Americans ( $M = 13.58$ ). Figure 5 shows social comparison scores by race.

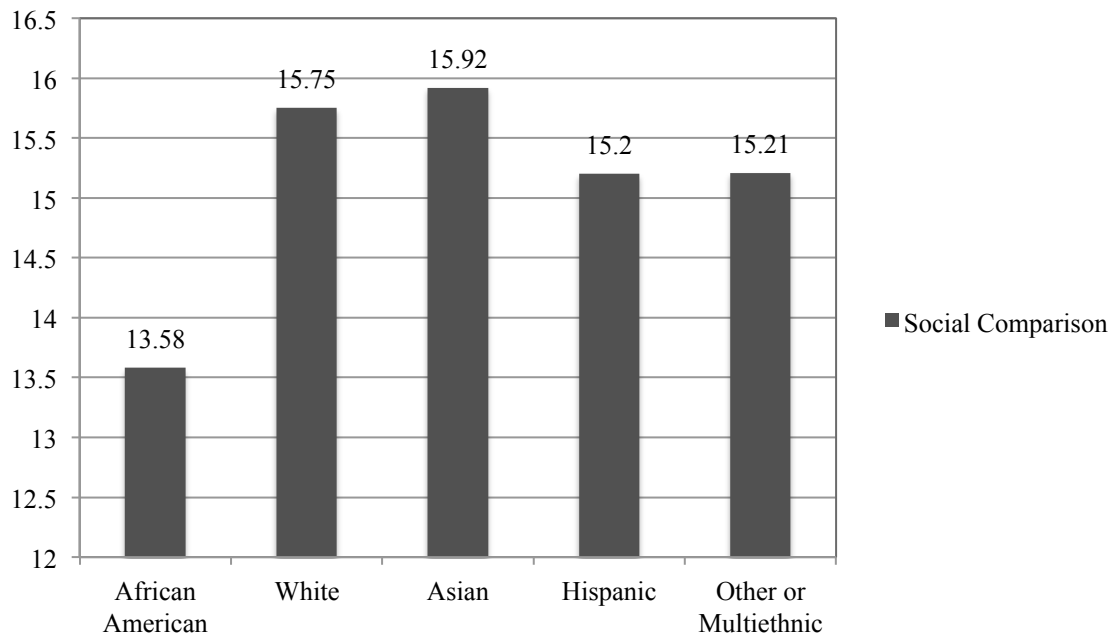


Figure 5: Social comparison scores by race.

These analyses also revealed a significant effect for race on body part comparison,  $F(5, 214) = 7.08, p < .05$ . The Tukey post hoc test indicated that there was a significant difference in the reports of body part comparison behaviors between Whites and African Americans, with White individuals reporting significantly higher comparison behaviors, ( $M = 69.14$ ) than African Americans ( $M = 56.94$ ). Post hoc analyses similarly showed a significant difference between Asians and African Americans, with Asian individuals reporting significantly higher comparison behaviors, ( $M = 75.15$ ) than African Americans ( $M = 56.94$ ). Likewise, post hoc analyses showed a significant difference between Hispanics and African Americans, with Hispanics reporting significantly higher comparison behaviors ( $M = 72.35$ ) than African Americans ( $M = 56.94$ ). Post hoc analyses also showed a significant difference between Asians and

individuals who identify as Multiethnic or Other, with Asian individuals reporting significantly higher comparison behaviors, ( $M = 75.15$ ) than those who identify as Multiethnic or Other ( $M = 61.71$ ). Figure 6 shows body part comparison scores by race.

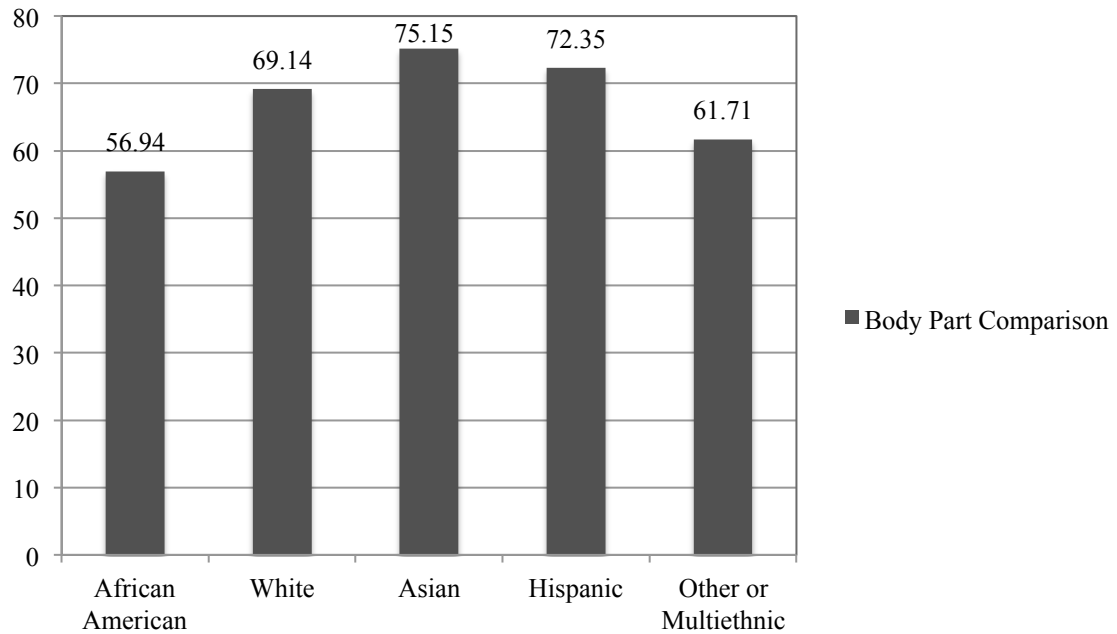


Figure 6: Body part comparison scores by race.

### Summary of Results

- Athletes in the single-sex athletic program prefer larger body types and report less comparison behaviors than those in the sex-integrated athletic program.
- Swimmers (in the sex-integrated athletic program) prefer smaller body types than soccer players (in the single-sex athletic program).
- Eating disorder risk factors body dissatisfaction, figure preference, and social comparison, are correlated. Specifically, results indicated a negative correlation between social comparison and body esteem; a negative correlation between

figure preference and social comparison; and a positive correlation between body part comparison and social comparison (the comparison of appearance to others).

- Female athletes rated their current figures smaller than female non-athletes and have a smaller difference between their current and ideal figure ratings than non-athletes.
- Eating disorder risk factors vary by race and ethnicity. White and Asian females appear to be at higher risk than African American females.

## CHAPTER IV

### DISCUSSION

#### **Athletes Vs. Non-Athletes**

Research has shown that athletes tend to be at greater risk for eating disorder development than non-athletes (de Bruin et al., 2007; Hausenblas & Carron, 1999; Kirk, et al., 2001; Petrie, 1993; Schwarz, et al., 2005). Studies have found common factors among the qualities valued in athletics and those that lead to an eating disorder, putting athletes at greater risk for eating disorder development than non-athletes. Common factors include an extreme drive for thinness and leanness, comparison and competition against others, the emphasis on self-presentation, and in some sports, judgment of the body (de Bruin, et al.; Franzoi & Klaiber, 2007; Haase; Torstveit, et al.; McCaughtry, 2006).

Surprisingly, in the current study there was a not a significant difference in any of the four eating disorder risk factors measured (body image, figure preference, social comparison, and body part comparison) between athletes and non-athletes. However, additional analyses found a difference between athletes and non-athletes on their current figure preference ratings, with athletes rating themselves significantly smaller. There were no significant differences between the groups' ideal figure preference ratings. These results were consistent with other studies that found that females in general tend to perceive their current figure as larger than their ideal, or the figure they perceive to be the

most attractive (Davey, et al., 2011; Treanor, et al., 1998). These results reflect a broader issue of pervasive body dissatisfaction seen among women (Dohnt & Tiggemann, 2006).

The mean difference between athletes' current figure and ideal figure ratings was therefore also significantly different from non-athletes', with athletes' mean difference as significantly smaller. Without actual weights and heights of the participants, it is hard to determine why athletes rated their current bodies as smaller. It may be that athletes are physically smaller, which would be consistent with previous research on a thin and lean ideal in sports environments (de Bruin, et al., 2007; Petrie, 1993).

### **Sex-Integrated Vs. Single-Sex Athletic Programs**

Literature on the influence of sex-integrated and single-sex environments on eating disorder development have remained mixed. Some studies have shown that girls in coeducational environments have more protective factors by preferring larger body types and having lower levels of body dissatisfaction (Davey, et al., 2011; Dyer & Tiggemann, 1996; Evans, et al., 2004; Mensinger, 2001; Tiggemann, 1996; Tiggemann, 2001). Others have found that girls in single-sex environments display lower levels of gender role conflict and social comparison, and higher levels of confidence and self-esteem, putting them at lower risk for eating disorder development (Astin, 1977; Holland & Esienhart, 1990; Smith, et al., 1995; Weinberger-Litman, et al., 2008). The results of this study indicate that single-sex athletic programs may provide more protective factors for eating disorder development than sex-integrated athletic programs. Athletes from the single-sex athletic program reported lower levels of social comparison behaviors compared to those in the sex-integrated athletic program, consistent with some research on single-sex



schools (Weinberger-Litman, et al.). This is consistent with the idea that when girls and women are in coeducational settings, they can feel more pressure to obtain academic or professional success while also negotiating traditional female and male roles (Weinberger-Litman, et al.). Research has found this pressure to “have it all”, can actually lead to greater gender role conflict and perfectionist behaviors, or what has been coined the “Superwoman Ideal” (Hart & Kenny, 1997; Steriner-Adair, 1986; 1989; Smolak & Murnen, 2001). It has been found that social comparison behaviors increase among women who experience the Superwoman Ideal in order to assess their achievements, physical appearance, and adherence to the ideal compared to other women (Weinberger-Litman, et al.).

The athletes in the single-sex athletic program also had larger figure preference ratings overall than those in the sex-integrated athletic program. This is inconsistent with research on figure preference, which suggests that women in single-sex environments typically prefer smaller body types (Davey, et al., 2011; Dyer & Tiggmann, 1996; Tiggemann, 2001). The inconsistent findings may be an indicator that trends in education are not necessarily transferable to athletic programs. There are unique components to a strictly athletic environment that may impact figure preference other than the gender-composition, such as sport type. In the current study, the sex-integrated athletic program included the swimmers, a lean sport. Participation in lean sports has been found to be a risk factor for eating disorders compared to participation in non-lean sports (de Bruin, et al., 2007; Hasse, 2009; Petrie, 1993; Torstveit, et al., 2008), possibly confounding the results. Future research on gender composition in athletic programs should aim to have

comparable numbers of athletes participating in non-lean and lean sports in their prospective groups in order to avoid any confounding variables.

### **Sport Type**

As previously discussed, the risk for eating disorder development has been shown to vary by sport type. Research has shown that sports with more revealing uniforms (typically lean sports) can cause greater levels of social physique anxiety (Greenleaf, 2004), a risk factor for eating disorder development (Thompson & Chad, 2007), compared to sports with less revealing uniforms. Likewise, sports with a greater emphasis on the body, or self-presentation as a part of competition, typically value thinness and appearance more so than non-lean sports, causing greater risk for eating disorder development (de Bruin, et al., 2007; Haase, 2009; Torstveit, et al., 2008). In order to test for differences between sport type in the current study, only the top four sports with the most participants were measured due to incomparable group sizes. Athletes participating in swimming (lean), volleyball (non-lean), soccer (non-lean) and softball (non-lean) were tested for any differences in eating disorder risk factors. The results found that swimmers preferred significantly smaller figures than soccer players, consistent with the literature on sport type (de Bruin, et al.; Hasse; Petrie, 1993; Torstveit, et al.).

### **Eating Disorder Risk Factors**

Numerous researchers have aimed to discern the exact cause of eating disorders. Research has demonstrated that eating disorders are extremely complex, with no one cause but many risk factors, including body dissatisfaction, weight concerns, comparison behaviors, actual dieting behaviors, low self-esteem, associating thinness with self-worth

and self-esteem, and a greater tendency to endorse U.S. cultural values regarding attractiveness and thinness (Davison & McCabe, 2006; de Bruin, et al., 2007; De Souza, et al., 2006; Petrie, 1993; Thompson & Chad, 2002). The current study aimed to see if eating disorder risk factors, namely, body dissatisfaction, figure preference, and social comparison were correlated.

Consistent with previous findings, body dissatisfaction, figure preference, and social comparison were related (Corning et al., 2006; Dyer & Tiggemann, 1996; Thompson & Chad, 2005; Tylka & Sabik, 2010). Specifically, results indicated a negative correlation between social comparison and body esteem, a negative correlation between figure preference and social comparison, and a positive correlation between body part comparison and the comparison of appearance to others. In other words, as reports of comparison behaviors decreased, body satisfaction increased. As figure preferences became thinner, reports of social comparison behaviors increased. And similarly, as reports of social comparison behaviors increased, reports of body part comparison behaviors increased. Understanding the relationship between risk factors is required for future research in treatment and prevention of eating disorders.

### **Race and Ethnicity**

The results showed a significant difference between race and ethnicity on eating disorder risk factors. Asian and White women scored significantly lower on body esteem than African American women. Similarly, White women preferred significantly thinner body types than African American and multiethnic women. White and Asian women also reported higher comparison behaviors than African American women. Asian, White and

Hispanic women reported significantly higher levels of body part comparison compared to African American and Multiethnic women. In the current study, it appears that, overall, White and Asian women are at greater risk for eating disorder development, exhibiting lower body satisfaction, preferring thinner figures, and reporting higher levels of comparison. In the current study, African American women overall scored lowest on the eating disorder risk factors, consistent with previous research findings (Neumark-Sztainer, et al., 2002). There were no significant differences between races on eating disorder risk factors when only looking at athletes. These findings suggest that among athletes, all races and ethnicities are at equal risk for the development of eating disorders. Overall, research has remained mixed on the impact of race on eating disorder development, and weight related concerns and behaviors tend to be prevalent across all ethnicities (Ericksen, et al., 2004; Gardner, et al., 1999; Neumark-Sztainer, et al., 2002; Shaw, et al., 2004). More research is needed in this area to better understand the impact of race and ethnicity on eating disorder risk and prevention in athletes and non-athletes.

### **Limitations and Future Research**

There were several sample size and design limitations in the current study. First, the sample only included college level athletes and college aged non-athletes making these findings less generalizable to the entire population. Future research could investigate the impact of gender composition on eating disorder risk factors with a broader age range and within other athletic environments, such as physical education classes or exercise groups outside of NCAA sports (e.g. CrossFit) to increase generalizability. Another limitation of the study was excluding male participants.

Researchers have highlighted the exclusion of males in single-sex/coeducation research, which may be to the field's disadvantage (Foundation for Education Reform & Accountability, 2006). Given that male athletes may be at greater risk in developing disordered eating than non-athletes (Petrie, et al., 2007; Petrie & Rogers, 2001), future research including male participants may aid in the understanding of risk and protective factors in eating disorder development among athletes. The current study did not include socioeconomic status due to research that indicates it does not influence eating disorder development (Edwards-Hewitt & Gray, 1993; Gibbs, 1986; Gross & Rosen, 1988). However, future studies could continue to control for extraneous variables such as socioeconomic status.

The design of the study was also limited because the sex-integrated group was not truly sex-integrated. Due to NCAA rules and regulations, there are no college-level sports that are truly sex-integrated, where males and females compete and play against each other. In order to have comparable groups, the design was based on athletic programs, and not specific sex-integrated leagues or teams. Our definition of sex-integrated for the purpose of this study was an athletic program that includes both male and female teams whose interaction may be limited to practices and shared facilities. Future research could examine eating disorder risk factors and attitudes within athletic environments that are truly sex-integrated in order to better understand the influence of gender composition on eating disorder risk factors. Furthermore, by using self-report, there was risk of inconsistent data. Some inconsistencies were found in the athlete sample from Texas Woman's University after the final analyses were conducted. Three participants who

reported being collegiate athletes reported participating in sports not offered at the university, potentially influencing the validity of the results. Additionally, because there were multiple measures and groups, there is a risk of Type I error inflation due to multiple tests.

It may also be helpful if future research on this topic shifted more towards analyzing a program's or school's gender role attitudes rather than their actual gender composition. Research on gender composition in schools has suggested that perhaps the composition itself is not as influential on risk factors as the school's or program's expectations of masculinity and femininity (Mensing, Bonifazi, LaRosa, 2007). Differences in specific schools' attitudes may explain the mixed results within the single-sex and coeducation literature. For example, Mesinger, et al. found that schools characterized as having more "conflicting" environments (or schools with more pressure to engage in stereotypical feminine and masculine behaviors, rather than the gender composition) had more disordered eating among female students. More research is needed on the development, consequences, and prevention of conflicting school environments.

### **Implications for Practice**

Even though risk for eating disorder development was not significantly different between athletes and non-athletes in this current sample, previous studies have shown that athletes are at equal risk, if not greater risk for eating disorder development. The results of the current study are consistent with previous findings that athletes may be at more risk for preferring thinner bodies, especially those participating in lean sports.

Educators, coaches, trainers, and school counselors should be aware of the pressure to be thin experienced by some athletes participating in sports, and work towards promoting health over weight and shape. Becoming educated on what really is advantageous in sports may also help dispel the thin and lean ideal commonly found in sports environments. For example, research conducted on sports where low weight has been traditionally thought of as advantageous such as gymnastics, distance running, and ski jumping, remains inconsistent, if not unsupported (Thompson & Sherman, 2010). In addition, coaches and trainers should understand the differences between an individual with an eating disorder and those of a good athlete, as the distinct differences can become blurry in the sports environment. Professionals in the field also suggest for coaches and trainers to emphasize factors outside of body weight and shape that contribute to personal success such as the athletes' motivation, determination, and enthusiasm; and to encourage sports and athletic participation for enjoyment and health rather than weight loss or other appearance-related reasons (National Eating Disorders Association, 2013).

### **Conclusion**

The results of the study suggest that in college athletics, single-sex environments may provide more protective factors for eating disorder development. The results are consistent with previous research on eating disorder risk factors that indicate that as an individual's body satisfaction decreases and their drive for thinness increases, reports of comparison behaviors increase. Similarly, the results related to sport type are consistent with previous findings that athletes in lean sports are at higher risk for developing eating disorders due to the emphasis on leanness, thinness, and self-presentation. Becoming

aware of risk factors can lead to better prevention programming with high-risk individuals, such as female athletes participating in lean sports. The percentage of participants who rated their current figure as larger than their ideal (69.4 %) is alarming, and further indicates that serious body dissatisfaction issues are found among women. Understanding the risk and protective factors of college athletes and college non-athletes in eating disorder development is essential in the future prevention and treatment of these complex diseases.



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APPENDIX A  
Demographic Form

1. Race and Ethnicity. Circle/Check all that apply.

- a. American Indian
- b. Alaska Native
- c. Asian
- d. Black or African American
- e. Hawaiian or Other Pacific Islander
- f. White
- g. Hispanic or Latino
- h. Not-Hispanic or Latino
- i. Other

2. Age: \_\_\_\_\_

3. Are you pregnant?

- a. Yes
- b. No

4. Which university are you currently attending?

- a. TWU
- b. UNT

5. Do you participate in university level athletics?

- a. Yes
- b. No

**\* If you have answered no, you may skip to the next questionnaire.**

6. How many semesters have you participated in university level sport(s) during college?
  - a. 1
  - b. 2
  - c. 3
  - d. 4
  - e. 5
  - f. 6
  - g. 7
  - h. 8
  - i. 9
  - j. 10
  - k. More than 10
  
7. Including the university level sport(s) you are currently playing, how many university level sports have you participated in during college?
  - a. 1
  - b. 2
  - c. 3
  - d. 4
  - e. 5
  - f. 6
  - g. 7
  - h. 8
  - i. 9
  - j. 10
  - k. More than 10
  
8. What university level sports do and have you participated in? (Circle/Check all that apply)
  - a. Basketball
  - b. Gymnastics
  - c. Soccer
  - d. Softball

- e. Volleyball
- f. Cross country
- g. Golf
- h. Swimming
- i. Diving
- j. Tennis
- k. Track & Field



APPENDIX B  
Body Esteem Scale

Instructions: On this page are listed a number of body parts and functions. Please read each item and indicate how you feel about this part or function of your own body using the following scale:

1= Have strong negative feelings

2=Have moderate negative feelings

3=Have no feeling one way or the other

4=Have moderate positive feelings

5=Have strong positive feelings

---

1. body scent \_\_\_\_\_

2. appetite \_\_\_\_\_

3. nose \_\_\_\_\_

4. physical stamina \_\_\_\_\_

5. reflexes \_\_\_\_\_

6. lips \_\_\_\_\_

7. muscular strength \_\_\_\_\_

8. waist \_\_\_\_\_

9. energy level \_\_\_\_\_

10. thighs \_\_\_\_\_

11. ears \_\_\_\_\_

12. biceps \_\_\_\_\_

13. chin \_\_\_\_\_

14. body build \_\_\_\_\_

15. physical coordination \_\_\_\_\_

16. buttocks \_\_\_\_\_

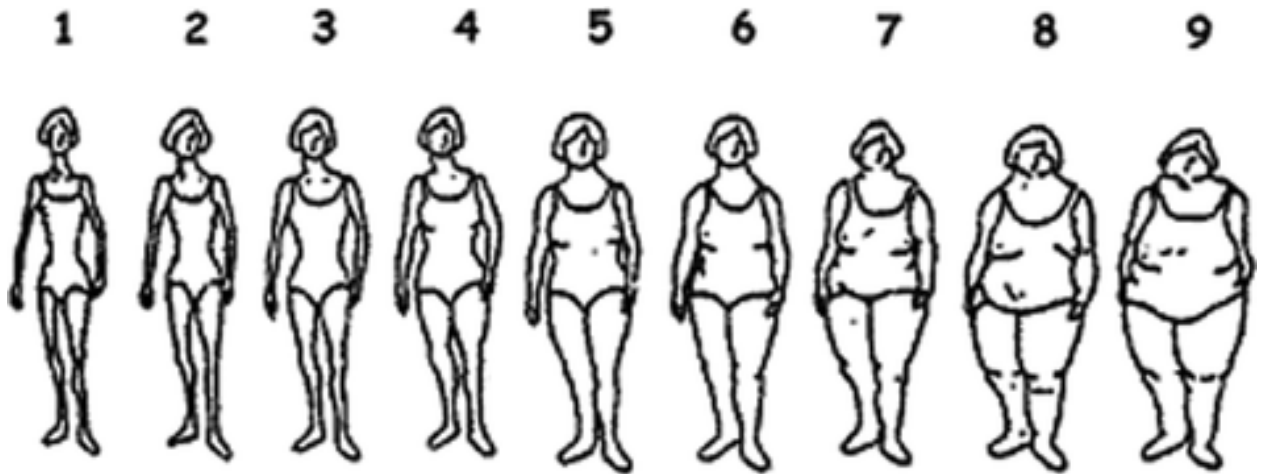
17. agility \_\_\_\_\_

18. width of shoulders \_\_\_\_\_

19. arms \_\_\_\_\_
20. chest or breasts \_\_\_\_\_
21. appearance of eyes \_\_\_\_\_
22. cheeks/cheekbones \_\_\_\_\_
23. hips \_\_\_\_\_
24. legs \_\_\_\_\_
25. figure or physique \_\_\_\_\_
26. sex drive \_\_\_\_\_
27. feet \_\_\_\_\_
28. sex organs \_\_\_\_\_
29. appearance of stomach \_\_\_\_\_
30. health \_\_\_\_\_
31. sex activities \_\_\_\_\_
32. body hair \_\_\_\_\_
33. physical condition \_\_\_\_\_
34. face \_\_\_\_\_
35. weight \_\_\_\_\_

## APPENDIX C

### Stunkard Figure Preference Scale



Using figures 1- 9, select the figure that most closely approximates....

1) your own current figure \_\_\_\_\_

2) your ideal figure \_\_\_\_\_

3) the figure you believe would be most attractive to men \_\_\_\_\_

4) the figure you believe would be most attractive to women \_\_\_\_\_

## APPENDIX D

### The Physical Appearance Comparison Scale (PACS)

Using the following scale please select a number that comes closest to how you feel:

Never: 1

Rarely: 2

Sometimes: 3

Often: 4

Always: 5

1. At parties or other social events, I compare my physical

appearance to the physical appearance of others.

1      2      3      4      5

2. The best way for a person to know if they are overweight or

underweight is to compare their figure to the figure of others.

1      2      3      4      5

3. At parties or other social events, I compare how I am

dressed to how other people are dressed.

1      2      3      4      5

4. Comparing your "looks" to the "looks" of others is a bad

way to determine if you are attractive or unattractive.

1      2      3      4      5

5. In social situations, I sometimes compare my figure to

the figures of other people.

1      2      3      4      5

APPENDIX E

Body Comparison Scale



For the items below, use the following scale to rate how often you compare these aspects of your body to those of other individuals of the same sex. NOTE: Please be sure that you read and respond to all of the questions according to how you would compare yourself to your same sex peers.

Never: 1

Rarely: 2

Sometimes: 3

Often: 4

Always: 5

1.	Ears	1	2	3	4	5
2.	Nose	1	2	3	4	5
3.	Lips	1	2	3	4	5
4.	Hair	1	2	3	4	5
5.	Teeth	1	2	3	4	5
6.	Chin	1	2	3	4	5
7.	Shape of face	1	2	3	4	5

8.	Cheeks	1	2	3	4	5
9.	Forehead	1	2	3	4	5
10.	Upper arm	1	2	3	4	5
11.	Forearm	1	2	3	4	5
12.	Shoulders	1	2	3	4	5
13.	Chest	1	2	3	4	5
14.	Back	1	2	3	4	5
15.	Waist	1	2	3	4	5
15.	Stomach	1	2	3	4	5
17.	Buttocks	1	2	3	4	5

18.	Thighs	1	2	3	4	5
19.	Hips	1	2	3	4	5
20.	Calves	1	2	3	4	5
21.	Muscle tone of upper body	1	2	3	4	5
22.	Overall shape of upper body	1	2	3	4	5
23.	Muscle tone of lower body	1	2	3	4	5
24.	Overall shape of lower body	1	2	3	4	5
25.	Overall body	1	2	3	4	5

## APPENDIX F

### IRB Forms



**Institutional Review Board**  
Office of Research and Sponsored Programs  
P.O. Box 425619, Denton, TX 76204-5619  
940-898-3378 FAX 940-898-4416  
e-mail: IRB@twu.edu

January 22, 2013

Ms. Aimee Howarth  
4945 Morris Ave., #1344  
Addison, TX 75001

Dear Ms. Howarth:

*Re: Body Image, Figure Preference, and Social Comparison Among Female Athletes in Sex-Integrated and Single-Sex Athletic Programs (Protocol #: 17489)*

The above referenced study has been reviewed by the TWU Institutional Review Board (IRB) and appears to meet our requirements for the protection of individuals' rights.

If applicable, agency approval letters must be submitted to the IRB upon receipt PRIOR to any data collection at that agency. A copy of the approved consent form with the IRB approval stamp is enclosed. Please use the consent form with the most recent approval date stamp when obtaining consent from your participants. A copy of the signed consent forms must be submitted with the request to close the study file at the completion of the study.

This approval is valid one year from January 22, 2013. Any modifications to this study must be submitted for review to the IRB using the Modification Request Form. Additionally, the IRB must be notified immediately of any unanticipated incidents. If you have any questions, please contact the TWU IRB.

Sincerely,



Dr. Rhonda Buckley, Chair  
Institutional Review Board - Denton

cc. Dr. Claire Sahlin, Women's Studies  
Dr. Jeff Harris, Women's Studies  
Graduate School



To whom it may concern:

I am approving **Aimee Howarth** to request volunteer participation from female students in the athletics program at the University of North Texas for her Master's thesis: *Body Image, Figure Preference, and Social Comparison among Female Athletes in Sex-Integrated and Single-Sex Athletic Programs*: in person and electronically at the University of North Texas Athletics Department.

Chaunte Baldwin

11/14/2012

**Chaunte' Baldwin**  
Assistant Athletic Director, Student Services

**Date**

Cinnamon Sheffield

11/12/12

**Cinnamon Sheffield**  
Senior Associate Athletic Director, Student Services

**Date**

**THINK  
GREEN**