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Factors of Body Image Dissatisfaction Among High School Female Athletes

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LOYOLA UNIVERSITY CHICAGO

FACTORS OF BODY IMAGE DISSATISFACTION
AMONG HIGH SCHOOL FEMALE ATHLETES

A DISSERTATION SUBMITTED TO
THE FACULTY OF THE GRADUATE SCHOOL
IN CANDIDACY FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

PROGRAM IN DEVELOPMENTAL PSYCHOLOGY

BY

TRISHA M. KARR

CHICAGO, IL

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Many people are worthy of praise for their contributions during my journey toward the achievement of my doctoral degree. During my transition from clinical interests to developmental research at Roosevelt University Chicago, Dr. Steven Kvaal inspired me to aggressively pursue my educational goals and to embrace obstacles along the way. Now years later at Loyola University Chicago my skills in research have been strengthened through the supervision of my advisor and Dissertation Director, Dr. Denise Davidson. I'd also like to thank my dissertation committee for their guidance in the creation and development of this project, including Drs. Gloria Balague, Amy Bohnert, and Kathleen Kannass. I am also grateful for the statistical assistance provided by committee member, Dr. Fred Bryant. His skills in quantitative analyses are admirable and have inspired me to create a new goal of acquiring advanced knowledge in statistical methods.

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For my parents.

I'm learning to fly.

Tom Petty and the Heartbreakers

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ABSTRACT

The relation between sport type and body image dissatisfaction was investigated with a sample of high school female athletes living in the Chicago area. In order to assess sport type, gymnastics, cross country, and softball were designated for the comparison of aesthetic, endurance, and ball sports. Low family cohesion and high independence were predictive of body image concerns among gymnasts, whereas high cohesion and infrequent conversations about sport participation with mothers were associated with body dissatisfaction among runners. Although body mass index was a risk factor for body image concerns across all sports, athletic self-efficacy was protective against body dissatisfaction for all athletes. Neither sport type nor maternal body image concerns were related to body dissatisfaction among daughters. These findings are considered in relation to Western standards of beauty and pressure to excel within the athletic context.

CHAPTER ONE

INTRODUCTION

Previous research has examined risk and protective factors such as maternal eating disturbance, family dynamics, sport participation, and self-efficacy on body image dissatisfaction and the incidence of eating disorders among women (e.g., Ackard & Neumark-Sztainer, 2001; Bardone-Cone, Abramson, Vohs, Heatherton, & Joiner, 2006; Bonne, et al., 2003; Lacey & Price, 2004; Lattimore, Wagner, & Gowers, 2000; Smolak, Murnen, & Ruble, 2000). The vast majority of previous research, however, has assessed these variables in isolation. The purpose of the present study was to further examine these factors in relation to body image dissatisfaction among female athletes.

Specifically the focus of this investigation was to utilize a developmental approach in order to assess maternal body image dissatisfaction, family dynamics, and athletic self-efficacy in relation to body image dissatisfaction among young female athletes. Gymnastics, cross country, and softball were examined in this study because previous research has suggested the presence of both risk and protective factors for body dissatisfaction in relation to specific sport classifications, including aesthetic, endurance, and ball sports (e.g., Berry & Howe, 2000; Petrie, 1993; Smolak et al., 2000; Zucker, Womble, Williamson, & Perrin, 1999).

CHAPTER TWO

LITERATURE REVIEW

In the last two decades, a wealth of studies has focused on associations between the athletic environment and body image dissatisfaction. Study results provide differing perspectives of the athletic environment, showing both key risk and protective factors related to body dissatisfaction (e.g., Berry & Howe, 2000; Staples, 1990; Streigel-Moore, Silberstein, & Rodin, 1986; Taub & Blinde, 1992; Taub & Blinde, 1994). Key risk factors for body dissatisfaction within the athletic environment include societal pressures, environmental pressures, and fluctuations in self-esteem (e.g., Brownell, Rodin, & Wilmore, 1992; Engel, et al., 2003; Johnson, 1994; Petrie, 1993; Powers & Johnson, 1996; Thompson & Sherman, 1999a; Thompson & Sherman, 1999b; Williamson et al., 1995; Wilson & Eldredge, 1992); whereas protective factors of sport participation include characteristics of women's empowerment (e.g., bodily competence, self-competence) and elevations in self-esteem (e.g., Blinde, Taub, & Han, 1993; Cantor & Bernay, 1992; Hall, 1990; DiBartolo & Shaffer, 2002; Fulkerson, Keel, Leon, & Dorr, 1999; Furnham, Titman, & Sleeman, 1994; Ozer & Bandura, 1990; Petrie, 1993; Wilkins, Boland, & Albinson, 1991).

Risk Factors Among Female Athletes

Societal pressures. Pressures within society encourage women to achieve an ideal body shape of thinness in relation to beauty, which in turn, may lead to body image

dissatisfaction (e.g., Killen et al., 1996; Leon, Fulkerson, Perry, & Cudeck, 1993; Stice & Agras, 1998). To meet these standards of beauty, women may use unhealthy weight control methods such as laxatives, vomiting, fasting, and diet aides (Taub & Blinde, 1992). Several studies have confirmed the awareness of these expectations among both athletic and non-athletic women (e.g., Petrie, 1993; Streigel-Moore, et al. 1986; Taub & Blinde, 1992, 1994). These standards of beauty appear to be magnified within the athletic environment along with unique pressures for achieving athletic success (Petrie, 1993; Streigel-Moore et al., 1986). For example, over 60% of college-level female gymnasts reported using these unhealthy methods in order to improve athletic performance (Petrie, 1993). That is, in some sports being thinner may enhance athletic performance (e.g., cross country) or may improve subjective ratings during competition (e.g., gymnastics). Magnification of these pressures within the athletic environment may predispose female athletes to develop body image dissatisfaction.

Environmental pressures. Pressures among the athletic arena are geared toward obtaining a physique most optimal for successful performance. Body shapes that contain excessive body fat are considered unfavorable for performance and may facilitate social pressures toward thinness (Brownell et al., 1992; Stice & Agras, 1998). Peers, coaches, and family members may encourage athletes to develop a body shape that not only conforms to societal expectations, but also functions as an instrument for athletic success (e.g., Beals & Manore, 1994; Cattarin & Thompson, 1994; Fulkerson et al., 1999; Stice, Nemeroff, & Shaw, 1996). Due to pressures to maintain an athletic physique, athletes may choose unhealthy weight control methods such as laxative use, restrictive eating, and

excessive exercise (e.g., Beals & Manore, 1994; Berry & Howe, 2000; Taub & Blinde, 1994). For instance, in a sample of 46 female college level athletes from various sports (e.g., field hockey, swimming, soccer, rowing, basketball), social pressures within the athletic setting significantly predicted restrained eating behaviors (Berry & Howe, 2000). It appears that as the discrepancy between an athlete's actual body shape and her ideal body shape increases, so does her risk for developing an eating disorder (Brownell et al., 1992; Wilson & Eldredge, 1992). That is, while efforts toward developing the perfect athletic body are beneficial for athletic performance, these goals may predispose athletes to develop eating disordered attitudes such as body image dissatisfaction (Davis, 1992).

Self-esteem as a risk factor. Self-esteem is strongly correlated with body dissatisfaction and eating disorder symptoms among athletes (Beals & Manore, 1994; Johnson, 1994). Engel et al. (2003) examined disordered eating among athletes, finding significant implications of self-esteem. Beyond the influence of demographic (i.e., sex, ethnicity), academic (i.e., academic year, self-rated ability), and sport-related variables (i.e., ability, training time, in/out of season, years eligibility), self-esteem was predictive of drive for thinness. Female athletes who derive their self-esteem from performance outcomes may experience fluctuations in self-esteem which may in turn, generalize across other areas of life such as global low self-esteem (Beals & Manore, 1994; Johnson, 1994).

Protective Factors Among Female Athletes

Women's empowerment. Aside from the numerous studies showing risk factors in relation to the development of eating disorders, much research has revealed

associations between protective factors and sport participation. Because the sport setting is often considered to be a male-dominated field, women may feel empowered through participation in athletics (Staples, 1990). Sport participation allows women to not only counter societal views that objectify the female body, but to also experience the body as a powerful, physical machine (Blinde et al., 1993; Hall, 1990). In this way, athletics allow women to develop dedication and self-competence toward goal achievement (Biddle, 1993; Cantor & Bernay, 1992; Fulkerson et al., 1999; Ozer & Bandura, 1990). That is, sport participation may facilitate the development of qualities such as self-efficacy, which is characterized by the combination of initiative and self-competence to perform a particular skill. These qualities may reduce the risk for eating disorders and body image dissatisfaction within the athletic context (Fulkerson et al., 1999).

Self-esteem as a protective factor. Despite the potential for self-esteem to function as a risk factor for eating disorders among athletic young women, a high level of global self-esteem and positive attitudes toward life have also been correlated with sport participation (Engel et al., 2003; Johnson, 1994). More specifically, athletes commonly report higher self-esteem compared to non-athletes (Wilkins et al., 1991). Thus, the nature of sport participation allows athletes to focus on their bodies' abilities as opposed to their bodies' appearances, which may in turn, buffer athletes from developing low self-esteem and drive for thinness. These findings were supported by Bowker (2006), showing that high school girls who participate in sports develop healthy physical self-esteem.

Sport participation may also facilitate the development of psychological hardiness, along with buffering negative attitudes related to stress (Dishman, 1992). For example, a sample of 144 female high school athletes from a variety of sports (e.g., basketball, cross country, gymnastics, volleyball, tennis) exhibited more positive emotions and less negative emotions toward life compared to non-athletes (Fulkerson et al., 1999). Hence, the combination of sport participation and emotional resilience may protect athletes from developing eating disturbances and body dissatisfaction.

Thus, sport participation may be both a risk and a protective factor involved in the development of body image dissatisfaction. Although societal and environmental pressures to attain the thin ideal body shape may increase the risk for eating disordered behaviors (e.g., Beals & Manore, 1994; Cattarin & Thompson, 1994; Davis, 1992; Fulkerson et al., 1999; Stice et al., 1996), additional characteristics within the athletic setting facilitate the enhancement of qualities that may protect against the presentation of these attitudes (e.g., Biddle, 1993; Cantor & Bernay, 1992; DiBartolo & Shaffer, 2002; Engel et al., 2003; Fulkerson et al., 1999; Johnson, 1994; Ozer & Bandura, 1990; Smolak et al., 2000; Wilkins et al., 1991). Therefore, the sport environment fosters unique opportunities and experiences that shape how athletic young women perceive their bodies.

Type of Sport and Body Image Dissatisfaction

Awareness of risk and protective factors in the development of eating disorders has facilitated a new direction of research that depicts the importance of categories of sport participation. Recent studies have assessed the influence of sports that emphasize

the evaluation of physical appearance or endurance (e.g., gymnastics, ballet, running, swimming, diving, figure skating, synchronized swimming), and sports in which physical appearance does not influence performance outcomes or are not weight-restricted (e.g., volleyball, basketball, softball) (e.g., Davis & Cowles, 1989; Stoutjesdyk & Jevne, 1993). Two reviews have demonstrated that sports that emphasize physical appearance are associated with an increased risk for developing body dissatisfaction. Hausenblas and Carron (1999) reviewed 92 studies involving 58 sports across six categories (i.e., aesthetics, endurance, ball sports, weight dependent, power, technical). Participation in aesthetic sports (e.g., figure skating, gymnastics, diving) appeared to amplify pressures to obtain a body shape for enhanced performance and was most strongly correlated with eating-disordered behaviors. Smolak et al. (2000) examined 34 studies in order to clarify the influence of risk factors for eating disorders among female athletes. Sports that require a lean body shape, especially dance, were associated with a greater incidence of eating-disordered behaviors, a finding also shown by Tseng et al. (2007). In general, many researchers agree that the type of sport is influential for assessing the risk for developing eating disordered symptoms and body image dissatisfaction (e.g., Johnson, 1994; Johnson, Powers, & Dick, 1999; Petrie, 1993; Smolak, et al., 2000; Stoutjesdyk & Jevne, 1993; Sundgot-Borgen, 1994).

However, conflicting results have surfaced regarding the relation between participation in various categories of sports and body dissatisfaction. For instance, in an assessment of body image concerns of young women figure skaters, Ziegler et al. (1998) found that the athletes were generally satisfied with their body shape. Similar results

were shown in an examination with young women gymnasts (Salbach, Klinkowski, Pfeiffer, Lehmkuhl, &, Korte, 2007). Consequently, an investigation of eating disordered behaviors across a variety of sports teams (e.g., field hockey, swimming, rowing, basketball) showed no differences in eating disturbances as simply due to sport type (Berry & Howe, 2000). That is, disordered eating behaviors may not be specific to sports that do or do not emphasize physical appearance, but may instead be normative within the athletic environment. Therefore, the present study examined three types of sports - aesthetic (gymnastics), endurance (cross country), and ball sports (softball), in order to better understand the relation between sport type and body image dissatisfaction.

High School Sport Participation

The high school years indicate a period of physical development in which women may be especially vulnerable to body dissatisfaction; sport participation may offer new perspectives on this issue. In comparison to non-athletes, high school athletes reported a slightly greater risk for developing eating disorders (Taub & Blinde, 1992). Hausenblaus and Carron (1999) found similar results in that high school female athletes reported more behaviors related to bulimia nervosa compared to women in general. Tseng et al. (2007) presented similar findings, suggesting that young women dancers may be vulnerable to eating and body shape disturbances. Thus, the combination of physical maturation and environmental pressures to conform to a particular body shape may create conflict in how young athletic women view their bodies. These stresses within the athletic setting may increase the risk for high school female athletes to develop eating disorders, especially for those who participate in sports that emphasize physical appearance (Sherwood,

Neumark-Sztainer, Story, Beuhring, & Resnick, 2002; Taub and Blinde, 1992). In contrast, however, Fulkerson et al. (1999) found that young athletic women are not at a greater risk for developing eating disorders than the general population. Bowker (2006) reinforced this finding, suggesting that self-esteem in relation to physical appearance and competence mediates the relation between sport participation and general self-esteem. In this way, it appears that self-esteem that develops through athletic experience may enhance global self-esteem among athletes. Given these contrary results, the present study sought to assess the dynamic interplay of multiple factors in relation to sport participation among young athletic women.

Maternal Eating Disturbance and Body Image Dissatisfaction

Research has shown that eating disorders tend to cluster within families. Indeed, the risk of developing either anorexia nervosa or bulimia nervosa is higher among first-degree relatives than the general population (Lacey & Price, 2004). In comparison with control group daughters, daughters of eating-disordered mothers have five times the risk of developing eating disturbances (Strober, Lampert, Morrell, Burroughs, & Jacobs, 1990). Furthermore, genetics account for up to half of the variance in the presentation of eating disorders development. However, despite the influence of genetics, not all susceptible young women develop eating disordered attitudes or body image dissatisfaction. A significant percentage of children are unaffected by maternal eating attitudes and behaviors (Lacey & Price, 2004; Patel, Wheatcroft, Park & Stein, 2002). In addition, children without family histories of eating disorders develop eating disturbances as well. Environmental factors may identify children who are at risk for this

developmental trajectory (Barbin et al., 2002; Lacey & Price, 2004; Patel et al., 2002).

Thus, an investigation of familial factors within the mother-daughter relationship is necessary in order to better understand the development of body image dissatisfaction.

Previous studies have linked maternal eating-disordered behaviors, including body dissatisfaction, to daughters' eating and body attitudes (Elfhag & Linne, 2005). Clinical comparison studies have assessed relationships between eating-disordered mother-daughter dyads and control dyads. Compared to control mothers, eating disordered mothers are more likely to be concerned with their daughters' weight, and are more likely to exhibit a longer history of dieting, additional eating problems, and to think their daughters should lose weight (Agras, Hammer, & McNicholas, 1999; Pike & Rodin, 1991). In general, daughters of mothers who encouraged them to lose weight reported greater body dissatisfaction than daughters who did not receive the same maternal pressures (Wertheim, Martin, Prior, Sanson, & Smart, 2002).

Maternal eating behaviors have also been shown to influence pre-teen girls. Similarities in dieting awareness and perceived self-worth have been found among 8-year-old girls (Hill & Pallin, 1998). Indeed, mothers' dieting has been positively related to daughters' awareness of dieting. Furthermore, daughters' global self-worth has been negatively associated with awareness of dieting (Hill, Weaver, & Blundell, 1990). As young as 5 years of age, girls are more likely to report weight concerns if their mothers engage in strict dieting behaviors (Ruther & Richman, 1993). Other researchers have confirmed these results, suggesting that maternal modeling of unhealthy eating and body

attitudes may impact girls during early childhood (Abramovitz & Birch, 2000; Carper, Fisher, & Birch, 2000; Davison & Birch, 2001; Davison, Markey, & Birch, 2000).

Adolescent girls are also affected by maternal body dissatisfaction. Generally speaking, mothers and adolescent daughters often report similar eating and body attitudes (Elfhag & Linne, 2005). For instance, mothers' drive for thinness and dieting has been related to body dissatisfaction among daughters who have begun menstruating (Wertheim et al., 2002). Hill and Franklin (1998) supported this result, finding common attitudes of dietary restraint between mothers and preteen daughters. These links between mothers and adolescent daughters' eating and body attitudes may reflect daughters' degree of body identification with their mothers (Elfhag & Linne, 2005). That is, as daughters mature physically they may be more likely to relate to their mothers in terms of body attitudes.

Thus, it appears that research investigations confirm relevance of particular qualities within the mother-daughter relationship in regard to the development of body image dissatisfaction (Steinberg & Phares, 2001). However, not all children develop body image concerns similar to their mothers (Patel et al., 2002). Prominent environmental factors, such as dynamics within the family, may also impact daughters' body dissatisfaction.

Family Dynamics

Familial characteristics (e.g., conflict, communication, cohesion, independence) have been linked to the development of eating disorders. Yet, despite research evidence, the direction of the relation between familial factors and the development of eating

disorders is currently undefined (Benninghoven, Schneider, Strack, Reich, & Cierpka, 2003; Lattimore et al., 2000). The assessment of these factors in relation to the athletic context may provide information regarding the development of body image dissatisfaction among female athletes.

Family conflict. Conflict within families is often measured by problem-solving tasks within eating disorders research. For example, mother-daughter dyads that include a daughter suffering from anorexia tend to report more disagreements and blame than control dyads (Lattimore et al., 2000). Indeed, mothers of eating-disordered daughters appear to be more critical of their daughters than control dyads. In addition, young women who were suffering from bulimia have reported more difficulties in family conflict resolution than other clinical samples (Benninghoven et al., 2003). Thus, conflict-ridden interactions between mothers and daughters who are suffering from eating disturbances may reflect a confrontational style of communication in which critical attitudes are consistently reciprocated.

Conflict in eating-disordered families has also been assessed by the magnitude of family hassles and the presence of family chaos (Humphrey, 1994). Comparisons between mother-daughter dyads that include daughters suffering from bulimia nervosa and control dyads have revealed positive correlations between family hassles and bulimic symptoms (Okon, Greene, & Smith, 2003). These families were characterized by a high degree of conflict and minimal emotional expression. Therefore, it appears that conflict within the family environment may be a key factor for daughters who experience eating disordered symptoms.

Family communication and cohesion. Communication patterns that include strong emotions are often linked to family conflict (Hedlund, Fichter, Quadflieg, & Brandl, 2003). Mother-daughter dyads with a daughter suffering from anorexia have shown a greater frequency of destructive communication compared to control dyads (Lattimore et al., 2000). Control dyads exhibit more balanced interactions that consist of both destructive and constructive statements, thus presenting a greater frequency of encouraging comments and requests for clarification. Compared to control dyads, it appears that mother-daughter dyads that involve a daughter who is suffering from anorexia are less likely to achieve conflict resolution through effective communication (Lattimore et al., 2000). Consequently, the inability to resolve conflicts between mothers and daughters may result in a strained relationship and a lack of cohesion between family members.

Minimal family cohesion is also related to the development of eating disorders among adolescent girls (Ackard & Neumark-Sztainer, 2001; Hill & Franklin, 1998). In assessments of dietary restraint among mothers and daughters, daughters who were more prone to follow strict eating habits reported less family cohesion compared to non-restraining girls (Hill & Franklin, 1998). Ackard and Neumark-Sztainer (2001) supported this result, finding families with a daughter suffering from bulimia commonly report low cohesion. Furthermore, Benninghoven et al. (2003) conducted interviews with women suffering from bulimia and revealed relationship styles composed of excessive conflict, nominal expressiveness, and unsupportive cohesion. Thus, it appears that

families afflicted by eating disorders exhibit dynamic characteristics in how they relate to each other.

Daughters' independence. Independence is another key component for assessing family interactions and the presentation of eating disorders. During adolescence, young women seek a sense of autonomy and individuation, as the balance of distinctiveness and connectedness within family relationships (Rupp & Jurkovic, 1996). In contrast, boundary problems between parents and adolescent girls reflect excessive connectedness, or enmeshment, that often impedes the development of independence and has been linked to symptoms of anorexia (Rowa, Kerig, & Geller, 2001). Indeed, women suffering from anorexia report more boundary problems compared to control group women. Thus, emotional overinvolvement and a lack of independence among families with adolescent girls are related to the development of eating disorders (Ackard & Neumark-Sztainer, 2001; Steinberg & Phares, 2001).

Thus, a variety of familial factors are involved in the development of eating disorders among young women. The interactive nature of these familial components may facilitate relationship styles that are associated with the presentation of eating disturbances. The current study assessed associations between these variables of family dynamics in order to illustrate the relation between sport type and body image dissatisfaction within the athletic context.

Self-Efficacy

Self-efficacy is a key concept within social cognitive theory, defined as the combination of self-competence and initiative to act in a given situation (Bandura, 1977,

2000). Self-efficacy involves the cognitive appraisal of an individual's abilities to determine activities for participation and the degree of effort required to complete a particular task (Bandura, 1977, 1986; Bardone-Cone et al., 2006). That is, with an accurate assessment of skill-level and performance capability, self-efficacy may predict behavior (Bandura, 1977).

Self-efficacy and sport. The ability to cognitively process aspects within the athletic environment allows athletes to make performance-related judgments and choices in relation to self-efficacy. Indeed, athletes typically participate in sports if they view themselves as capable of acquiring specific skills, whereas they tend to steer clear of activities viewed as exceeding their talents (Bandura, 1989). Success and failure outcomes due to these perceptions function as reinforcement for beliefs about self-efficacy within the athletic context, or athletic self-efficacy. For instance, successful outcomes due to minimal effort expenditure increase athletic self-efficacy in relation to personal expectations, which may then lead to attempts at reaching more challenging goals (Bandura, 1977; Pender, Bar-Or, Wilk & Mitchell, 2002). In contrast, efficacy expectations in sport participation are more likely reduced if an athlete perceives a lacking ability to perform a task effectively. That is, individuals who are confident in their abilities (i.e., high self-efficacy) tend to respond to challenging situations with increased effort and perseverance, whereas those who doubt their abilities (i.e., low self-efficacy) are more likely to become discouraged in competitive situations (Bandura & Cervone, 1986).

Self-efficacy and body image dissatisfaction. Self-efficacy has surfaced as a key characteristic among women experiencing bulimic symptoms (Cooley & Toray, 1996; Etringer, Altmaier, & Bowers, 1989; Mizes, 1988; Striegel-Moore, Silberstein, Frensch, & Rodin, 1989; Toray & Cooley, 1997). In comparison to control women, women suffering from bulimia exhibited lower self-efficacy in relation to problem-solving capabilities and a greater likelihood for making external, global, and unstable attributions for positive events (Etringer et al., 1989). The combination of lower self-efficacy and a negative attributional style may reflect an inability to cope with personal issues, which may in turn, be manifested through the presentation of bulimic behaviors. For example, a lack of control during stressful situations may facilitate bingeing behaviors among individuals who report high dieting standards, perfectionism, and low self-efficacy (Bardone-Cone et al., 2006; Gormally, Black, Daston, & Rardin, 1982). Strict dieting standards, in particular, may be difficult to maintain during stressful situations, therefore leading individuals to temporarily disregard personal expectations and to engage in binge eating (Berman, 2006).

Eating disorder treatment options often involve the enhancement of self-efficacy in order to reduce the presentation of eating-disordered symptoms among women engaging in bulimic behaviors and dietary restraint (Gormally et al., 1982; Schneider, O'Leary, & Agras, 1987; Wilson & Fairburn, 1993; Wilson, Fairburn, Agras, Walsh, & Kraemer, 2002). Indeed, self-efficacy has been shown to mediate the relation between binge eating and post-treatment outcomes for women suffering from bulimia (Wilson, et al., 2002). That is, an increase in self-efficacy during treatment programming may be

associated with reductions in the frequency of binge eating and purging behaviors (Schneider et al., 1987; Wilson et al., 2002; Wilson & Fairburn, 1993). Whereas low self-efficacy may be related to the development of eating-disordered symptoms, the enhancement of self-efficacy may assist in the prevention of such behaviors.

Purpose of the Study

Previous studies in the area of eating disorders research have depicted a variety of factors, such as societal pressures, that are involved in the development of body image dissatisfaction among women (e.g., see Stice, 2002, for a review). Despite the complex nature of eating disorders, previous statistical models have focused primarily on direct relations between isolated predictive characteristics and outcome variables. The present study sought to resolve this issue by investigating combinations of factors (e.g., sport type, maternal body image dissatisfaction) involved in the presentation of body dissatisfaction within the athletic context.

The goal of the present study was to examine the ability for various factors including maternal body dissatisfaction, family dynamics (conflict, expressiveness, cohesion, independence), and athletic self-efficacy to relate to athletes' body dissatisfaction when considering sport type as a moderator. This study incorporated a developmental perspective by assessing high school female athletes from three specific sports (gymnastics, cross country, softball), as well as their mothers.

Hypotheses

- (1) A main effect for sport type (gymnastics, cross country, softball) was predicted in relation to body image dissatisfaction among high school female athletes. Softball players were expected to report less body dissatisfaction than gymnasts and cross country runners. Gymnasts were hypothesized to report the greatest level of body dissatisfaction.
- (2) An interaction effect between mothers' body image dissatisfaction and sport type was expected to relate to body image dissatisfaction in that gymnasts were hypothesized to report the greatest body dissatisfaction, followed by runners and softball players. Elevations of mothers' body dissatisfaction were predicted to relate to greater body dissatisfaction among daughters.
- (3) Family dynamics variables were predicted to relate to body image dissatisfaction among female athletes. Athletes who experienced high family conflict were anticipated to report greater body dissatisfaction compared to other female athletes. In addition, athletes who experienced low expressiveness, low cohesion, and low independence were expected to report greater body dissatisfaction compared to other female athletes.
- (4) An interaction effect between athletic self-efficacy and sport type was hypothesized to predict body image dissatisfaction in that softball players were predicted to report greater athletic self-efficacy than runners and gymnasts. Female athletes who reported high athletic self-efficacy were expected to also report less body dissatisfaction compared to other female athletes.

CHAPTER THREE

METHOD SECTION

Participants

High school female athletes from gymnastics, cross country and softball teams belonging to the Illinois High School Association (IHSA), along with their mothers, were recruited for participation in the study. Of the 729 athletes recruited for participation, the final sample consisted of 653 athletes and 341 mothers. The total matched-mother-daughter-pairs for each sport were: 101 for gymnastics, 121 for cross country, and 104 for softball. The athletes ranged from 14 to 19 years of age ($M = 15$ years), whereas mothers were between 32 and 59 years of age ($M = 47$ years). Approximately 85% of the sample was Caucasian American, followed by 6.3% Hispanic American, 3.5% Asian American, 2.3% African American, and 3.3% defined themselves as “other”. A power analysis was conducted in order to confirm the required sample size for a small effect size and a power level of .80 at an alpha-level of .05. The recommended sample size was 100 participants from each athletic group; however, the present sample surpassed this estimation, including 212 gymnasts, 207 softball players, and 234 cross country runners.

Procedure

Illinois schools with gymnastics, cross country and softball teams were contacted for participation in the project. Initial correspondence was conducted between the researcher and the principal and/or the athletic director at each respective school. From a

pool of more than 80 schools within the state of Illinois, 11 schools consented to participate in the project. After receiving informed consent from school officials, the researcher contacted each athletic coach approximately 3 weeks before the athletic season began (gymnastics in October, softball in February, cross country in August). Once agreement to participate was provided by the athletic coach, appointments were scheduled with each sports team. Data collection took place during the middle of the athletic season for each respective sport (gymnastics, cross country, softball), beginning in the Fall 2007 and concluding after the Spring 2009 athletic season. See Table 1.

Table 1. *Schedule for Data Collection.*

Sport	Midseason
Gymnastics	Nov. – Jan.
Softball	Feb. – May
Cross Country	Aug. – Oct.

Two meetings were scheduled with each athletic team. Team appointments typically took place during athletic practices or meetings with parents. The first meeting with each team was quite brief, lastly approximately 15 minutes in which the researcher described the project, distributed the parental consent forms along with mothers' questionnaires, and collected contact information from the athletes. See Appendix A for the Parent Consent Form. Contact information was used in order to remind the athletes to return the parental consent information during the second team meeting. In addition to acquiring parental consent, the consent forms also provided the opportunity for mothers to volunteer to participate in the project.

The second team meeting was scheduled approximately 1 week later in which the athletes returned the parental consent forms along with the mothers' questionnaire packets. In order to standardize the data collection process, all athletes - regardless of age - provided parental consent information in order to participate. After receiving the parental consent forms the researcher distributed the questionnaire packets, as well as the athlete informed assent documents, to those who wished to participate in the project. See Appendix B for the Athlete Assent Form. Testing then took place, requiring approximately 25 minutes for completion. Lastly, the debriefing forms were distributed at the conclusion of the testing period. As compensation, each athletic team received a \$100 donation. See Appendix C for the Debriefing Form.

Test materials for data collection included a variety of questionnaires within manila envelopes. All questionnaires and envelopes were number coded in order to ensure participant confidentiality and to create matched-pairs of participating mothers and daughters. The questionnaires were also collated and counter-balanced in order to avoid order effects due to questionnaire organization.

Measures

Assessment of demographic information. Demographic questionnaires were developed for both mothers and daughters. The questionnaires measured participant age, ethnicity, self-reported height and weight, and satisfaction with specific regions of the body (e.g., stomach, legs, hips). Information on height and weight was collected in order to calculate a body mass index (BMI) for each participant. In particular, the daughters' questionnaire included items regarding type of sport participation (i.e., gymnastics, cross

country, softball), years of participation, hours of training, and maternal support of sport participation. The mothers' questionnaire involved information about marital status, pregnancy, and maternal history of sport participation. See Appendices D-E.

Assessment of body image dissatisfaction. In order to assess body image concerns, participants completed two instruments: the Body Dissatisfaction subscale of the Eating Disorder Inventory-3 (EDI-3; Garner, 2004) and the Figure Rating Scale (FRS; Stunkard, Sorensen, & Schulsinger, 1983). Both mothers and daughters completed the assessments of body image dissatisfaction.

The Eating Disorder Inventory-3 (EDI-3; Garner, 2004) is an instrument that assesses 6 primary areas of eating disorder symptoms including: Eating Disorder Risk, Ineffectiveness, Interpersonal Problems, Affective Problems, Overcontrol, and General Psychological Maladjustment. The Eating Disorder Risk Composite (EDRC), which includes the Body Dissatisfaction subscale, has shown internal consistency ranging from (.90) to (.97) across both diagnostic and normative groups (Garner, 2004). The EDRC has also shown strong test-retest stability (.98). The Body Dissatisfaction subscale was the only subscale from the EDI-3 included in this study because it measures satisfaction with body shape in general (e.g., "I feel satisfied with the shape of my body.") as well as thoughts about specific body regions (e.g., "I think that my stomach is just the right size."). All 10 self-report questions are rated on a 6-point scale to determine if each item applies *always, usually, often, sometimes, rarely, or never*. The highest possible score on this subscale is 40. Strong internal consistency has been found for patients suffering from

anorexia nervosa (.90) as well as comparison groups (.91) (Garner, 2004). See Appendix F.

The Figure Rating Scale (FRS; Stunkard et al., 1983) was used to examine perceptions of body shape and the discrepancy between current body shape (i.e., how you think you look) and ideal body shape (i.e., how you would prefer to look). This test consists of nine pictorial silhouette line drawings of female figures ranging from *very thin* (1) to *very obese* (9). In previous analyses with women, this test has shown good test-retest stability over two weeks, ranging between (.55) and (.89) (Thompson & Altabe, 1991). Test validity for the discrepancy between current body shape and ideal body shape is also sufficient when compared to the Body Dissatisfaction subscale of the Eating Disorder Inventory (.62) (Garner, Olmstead, & Polivy, 1983). See Appendix G.

Assessment of the family environment. The Family Environment Scale (FES; Moos & Moos, 1986) was used in order to examine the family setting as perceived by the daughters. That is, mothers did not complete this measure. This instrument is a 90-item self-report tool, divided among 10 subscales. Four specific subscales were used in this study: Conflict, Independence, Cohesion, and Expressiveness. The Conflict subscale assesses how family members respond to tension and controversy (e.g., “Family members often criticize each other.”). The Independence subscale depicts autonomy within the family environment (e.g., “We don’t do things on our own very often in our family.”). The Cohesion subscale examines the degree of family unity and support (e.g., “Family members really support one another.”). The Expressiveness subscale measures the ability to share your feelings with other family members (e.g., “Family members often keep their

feelings to themselves.”). Although the original scoring procedure for this instrument involves a forced choice – true/false answer format - the researcher utilized a 4-point rating scale: *strongly agree*, *agree*, *disagree*, and *strongly disagree*. Based on this new scoring format, the highest possible score on each subscale was 36. Each subscale has adequate test-retest reliability over eight weeks (average .80) (Moos & Moos, 1986). Subscale intercorrelations are on average (.20), indicating that each subscale measures a distinct aspect of the family environment. See Appendix H.

Assessment of self-efficacy. Self-efficacy was assessed by the New General Self-Efficacy Scale (NGSE; Chen, Gully, & Eden, 2001), an 8-item self-report tool with high internal consistency reliability (.86) and reliability toward a specific task (0.92). As a general measure of self-efficacy, this instrument may be structured for use in a variety of settings, such as the athletic environment. Thus, all items on this assessment were phrased in order to reflect experiences due to participation in a particular sport (e.g., “I believe I can succeed at most athletic endeavors to which I set my mind.”). Each item was scored using a 5-point Likert scale: *strongly disagree*, *disagree*, *neutral*, *agree*, and *strongly agree*. The highest possible score on this instrument was 40. See Appendix I.

CHAPTER FOUR

RESULTS SECTION

Data Preparation

Initial statistical procedures evaluated whether there were missing data, outliers and issues of skewness. Missing data were identified as minimal and randomly dispersed across sports and variables, equaling less than 1% of all participant responses within the data set. Because the missing data were sparse, variable mean substitution within each sport type (gymnastics, cross country, softball) was considered a practical option for adjusting the data set (McCartney, Burchinal, & Bub, 2006; Raymond & Roberts, 1987). In this way, each sport's missing data was imputed from the corresponding sport. For example, missing data for gymnastics was substituted from available data from the sample of gymnasts. The advantage of performing few mean substitutions within a large data set is that the results from the analyses are considered identical to those which may have been obtained, had the missing data not been present (McCartney et al., 2006).

Outliers were examined for skewness of the sample distribution. In accord with guidelines provided by Tabachnik and Fidell (2007), standardized z scores beyond 3.00 were investigated. With the exception of one variable, daughters' body mass index (BMI), all study variables were found to be within an acceptable range of skewness (<1.0). Although daughters' BMI was minimally skewed (1.13), issues in statistical analyses were not anticipated given the large sample size of the present study (Tabachnik

& Fidell, 2007; Watermaux, 1976). Follow-up square root and log transformations were performed to adjust the distribution, but neither analysis significantly improved the distribution of the skewed variable. Thus, the decision was made to retain all study variables in their original form.

Preliminary Analyses to Assess Group Differences Across Sport

Group differences in demographic factors (e.g., age, ethnicity), aspects of sport participation (e.g., injury, years of participation), and maternal factors (e.g., marital status, attendance at athletic events) across sport type (gymnastics, cross country, softball) were examined. One-way multivariate analysis of variance (MANOVA) procedures, using sport type as the between-subjects variable, were conducted in order to evaluate individual differences within each set of dependent variables. All variables that showed group differences were examined further as potential covariates.

Daughters' demographic factors. Differences in demographic characteristics were investigated across sport types: age, ethnicity, and body mass index (BMI), see Table 2. A significant difference was found across sport types on the combination of these three dependent variables, Wilks' $\Lambda = .85$, $F(6, 1296) = 18.58$, $p < .001$, partial $\eta^2 = .08$. Using Bonferroni correction, univariate analyses were conducted on each dependent variable. Two main effects were found for sport type: age, $F(2, 650) = 29.04$, $p < .001$, partial $\eta^2 = .08$, and BMI, $F(2, 650) = 36.01$, $p < .001$, partial $\eta^2 = .10$. For age, post-hoc assessments showed that softball players were significantly older ($M = 16.31$) than both gymnasts ($M = 15.51$) and cross country runners ($M = 15.73$). For BMI, softball players reported a significantly larger BMI ($M = 22.59$) than both gymnasts ($M = 20.94$) and

cross country runners ($M = 20.42$). Significant differences in ethnicity were not found across sport types, $F(2, 650) = 2.85, p = ns$.

Table 2

Multivariate Analysis of Variance – Daughters' Demographic Factors

Sport Type	N	Age M (SD)	Ethnicity M (SD)	BMI M (SD)
Gymnastics	212	15.51 (1.09) ^b	2.25 (.99)	20.94 (2.94) ^b
Cross Country	234	15.73 (1.11) ^b	2.16 (.86)	20.42 (2.49) ^b
Softball	207	16.31 (1.15) ^a	2.05 (.55)	22.59 (3.13) ^a
Total	653	15.85 (1.16)	2.15 (.83)	21.28 (2.92)

Note. BMI = body mass index. Different letter superscripts indicate significant between-group differences, $p \leq .05$. Standard deviations are in parentheses.

Mothers' demographic factors. Likewise, four maternal demographic factors were examined across sports: age, ethnicity, marital status, and body mass index (BMI), see Table 3. Significant differences were found across sports on the combination of dependent measures, Wilks' $\Lambda = .93, F(8, 650) = 2.97, p < .003$, partial $\eta^2 = .04$. Further tests with Bonferroni adjustment showed a main effect for sport type in relation to marital status, $F(2, 328) = 5.44, p < .005$, partial $\eta^2 = .03$, and mothers' BMI, $F(2, 328) = 4.73, p < .009$, partial $\eta^2 = .03$. For marital status, post-hoc comparisons revealed that mothers of cross country runners were more likely to be married than those of gymnasts or softball players. For mothers' BMI, mothers of softball players were more likely to report a larger BMI ($M = 26.61$) than those of cross country runners ($M = 24.59$). No significant

differences were found for mothers' age, $F(2, 328) = 0.99, p = ns$, or mothers' ethnicity, $F(2, 328) = 1.72, p = ns$, across sport types.

Table 3

Multivariate Analysis of Variance – Mothers' Demographic Factors

Sport Type	N	Age M (SD)	Ethnicity M (SD)	Marital Status M (SD)	BMI M (SD)
Gymnastics	102	46.54 (4.54)	2.22 (.87)	1.38 (.63) ^b	25.31 (4.55)
Cross Country	130	47.39 (4.31)	2.11 (.76)	1.15 (.56) ^a	24.59 (4.87) ^b
Softball	99	47.00 (4.86)	2.02 (.57)	1.36 (.66) ^b	26.61 (5.38) ^a
Total	331	47.01 (4.55)	2.12 (.75)	1.28 (.62)	25.41 (4.99)

Note. BMI = body mass index. Different letter superscripts indicate significant between-group differences, $p \leq .05$. Standard deviations are in parentheses.

Daughters' sport participation. Characteristics of athletic participation were tested across sports: years of sport participation, hours of athletic training, injury, and participation in multiple sports (see Table 4). Significant results were found for the combination of dependent variables, Wilks' $\Lambda = .77, F(8, 1294) = 22.83, p < .001$, partial $\eta^2 = .12$. Main effects were found for sport type in relation to years of sport participation, $F(2, 650) = 64.97, p < .001$, partial $\eta^2 = .17$, injury, $F(2, 650) = 6.16, p < .002$, partial $\eta^2 = .02$, and participation in multiple sports, $F(2, 650) = 13.84, p < .001$, partial $\eta^2 = .04$. Post-hoc comparisons revealed that softball players had participated in their respective sport for a longer period of time, and were less likely to become injured, than both gymnasts and cross country runners. Cross country runners were more likely to

participate in multiple sports than gymnasts and softball players. Significant differences in hours of training were not found across sport types, $F(2, 650) = 2.61, p = ns$.

Table 4

Multivariate Analysis of Variance – Daughters' Sport Participation

Sport Type	N	Years SP M (SD)	Hours TR M (SD)	Injury M (SD)	Part MS M (SD)
Gymnastics	212	2.14 (1.19) ^b	3.36 (0.96)	.16 (.37) ^b	.76 (.43) ^b
Cross Country	234	2.00 (0.77) ^b	3.14 (0.72)	.16 (.37) ^b	.94 (.25) ^a
Softball	207	3.17 (1.46) ^a	3.25 (1.02)	.06 (.24) ^a	.81 (.40)
Total	653	2.42 (1.27)	3.24 (0.90)	.13 (.34)	.84 (.37)

Note. Years SP = years of sport participation. Hours TR = hours of athletic training. Part MS = participation in multiple sports. Different letter superscripts indicate significant between-group differences, $p \leq .05$. Standard deviations are in parentheses.

Mothers' sport participation. To assess mothers' experience in athletics, three variables were measured to investigate differences across sports: participation in high school sports, participation in collegiate sports, and hours of athletic training (see Table 5). Athletic participation was measured as a dichotomous variable (i.e., participation, no participation). No significant differences were found for the combination of dependent variables across sports, Wilks' $\Lambda = .99, F(6, 662) = 0.59, p = ns$. Thus, regardless of daughters' sport type, mothers reported a similar level of athletic experience.

Table 5

Multivariate Analysis of Variance – Mothers' Sport Participation

Sport Type	N	Part HS M (SD)	Part CL M (SD)	Hours TR M (SD)
Gymnastics	103	.68 (.47)	.18 (.39)	1.54 (1.33)
Cross Country	133	.58 (.50)	.15 (.36)	1.37 (1.37)
Softball	100	.60 (.49)	.19 (.39)	1.38 (1.31)
Total	336	.62 (.49)	.17 (.38)	1.43 (1.34)

Note. Part HS = participation in high school sports. Part CL = participation in collegiate sports. Hours TR = hours of athletic training. No significant differences were found across sports for any of the dependent variables. Standard deviations are in parentheses.

Maternal support of daughters' sport participation. Group differences in maternal support of daughters' sport participation was examined by three factors: mothers' attendance at athletic events, mothers' attendance at athletic practices, and conversations about sport participation (see Table 6). Significant differences were shown across sport types, Wilks' $\Lambda = .95$, $F(6, 1296) = 5.90$, $p < .001$, partial $\eta^2 = .03$. Main effects were found for sport type in relation to mothers' attendance at sporting events, $F(2, 650) = 13.02$, $p < .001$, partial $\eta^2 = .04$, and conversations about sport participation, $F(2, 650) = 7.89$, $p < .001$, partial $\eta^2 = .02$. Post-hoc comparisons revealed that mothers of cross country runners were less likely to attend athletic events than those of gymnasts and softball players. In addition, cross country runners were less likely to discuss athletic participation with their mothers than gymnasts and softball players. Differences in

mothers' attendance at athletic practices were not found across sport types, $F(2, 650) = 2.74, p = ns$.

Table 6

Multivariate Analysis of Variance – Maternal Support of Daughters' Sport Participation

Sport Type	N	Attend AE M (SD)	Attend PR M (SD)	Conv SP M (SD)
Gymnastics	212	2.49 (1.37) ^b	.24 (.80)	2.70 (.78) ^b
Cross Country	234	2.14 (1.35) ^a	.10 (.42)	2.48 (.88) ^a
Softball	207	2.78 (1.23) ^b	.22 (.77)	2.78 (.81) ^b
Total	653	2.46 (1.34)	.18 (.68)	2.64 (.83)

Note. Attend AE = mothers' attendance at athletic events. Attend PR = mothers' attendance at athletic practices. Conv SP = conversations about sport participation. Different letter superscripts indicate significant between-group differences, $p \leq .05$. Standard deviations are in parentheses.

In summary, group differences across sport type were found among a total of nine variables; five factors characterized daughters (i.e., age, BMI, years of participation, injury, and participation in multiple sports), and four factors described mothers (i.e., marital status, BMI, attendance at athletic events, and conversations about sport participation). All nine variables were further evaluated as potential covariates for predicting body image dissatisfaction among high school female athletes.

Regression Analyses to Identify Covariates

Two simultaneous multiple regression analyses were conducted in order to examine the amount of unique variance in body image dissatisfaction accounted for by

each of the nine factors. By measuring the unique variance accounted for by each predictor one can determine the factors that most strongly relate to the outcome variables, which in turn, signify the covariates for removing the influence of demographic group differences. Because body image dissatisfaction was evaluated by two separate dependent variables – body dissatisfaction (BD) and the discrepancy between current and ideal body shapes (DISC) - all factors were assessed as potential covariates in two separate regression models.

Body dissatisfaction (BD). In order to determine how well the set of nine factors (daughters' age, daughters' BMI, years of participation, injury, participation in multiple sports, mothers' marital status, mothers' BMI, mothers' attendance at athletic events, and conversations about sport participation) predicted daughters' body dissatisfaction (BD), a multiple regression analysis was conducted (see Table 7). The linear model, containing all nine variables, was statistically significant, $F(9, 324) = 10.62, p < .001$. The combination of factors accounted for approximately 23% of the total variance in the model. Three predictors were statistically significant, including daughters' body mass index (BMI), mothers' attendance at athletic events, and conversations about sport participation. Daughters' BMI was positively related to BD, explaining 14% of the unique variance in the model, $p < .001$. Mothers' attendance at athletic events was negatively related to BD, explaining 1% of variance in the model, $p < .04$. Conversations about sport participation was also negatively related to BD, accounting for 2% of the variance in the model, $p < .001$.

Table 7

Regression Analysis for Covariates Predicting Body Dissatisfaction (BD)

Predictors	b	SE	β	t	p
Age	0.39	0.38	.06	1.02	.31
Daughters' BMI	1.05	0.14	.39	7.36	.001**
Years SP	0.24	0.34	.04	0.71	.48
Injury	1.04	1.15	.04	0.90	.37
Part MS	0.13	1.06	.01	0.12	.90
Marital Status	0.48	0.64	.04	0.76	.45
Mothers' BMI	0.07	0.08	.04	0.85	.40
Attend AE	-0.66	0.31	-.11	-2.10	.04*
Conv SP	-1.33	0.50	-.14	-2.66	.001**

Note. Years SP = years of participation. Part MS = participation in multiple sports. Mothers' BMI = mothers' body mass index. Attend AE = mothers' attendance at athletic events. Conv SP = conversations about sport participation. $R^2 = .23$; $\Delta R^2 = .21$; $F = 10.62$; $p < .05^*$; $p < .001^{**}$.

Discrepancy between current and ideal body shapes (DISC). An additional multiple regression analysis was performed to assess how well the same set of nine factors predicted daughters' discrepancy between current and ideal body shapes (DISC), see Table 8. The linear model was statistically significant, $F(9, 324) = 12.75$, $p < .001$. The combination of factors accounted for 26% of the total variance in the model. Two predictors were statistically significant: daughters' body mass index (BMI) and mothers'

marital status. Daughters' BMI positively predicted DISC and explained 21% of the unique variance in the model, $p < .001$. Mothers' marital status negatively predicted DISC and explained approximately 1% of the unique variance in the model, $p < .03$.

Table 8

Regression Analysis for Covariates Predicting the Discrepancy Between Current and Ideal Body Shapes (DISC)

Predictors	b	SE	β	t	p
Age	-.01	.05	-.01	-1.16	.87
Daughters' BMI	.16	.02	.48	9.33	.001**
Years SP	.04	.04	.06	1.09	.28
Injury	.17	.14	.06	1.25	.21
Part MS	.003	.13	.001	0.02	.98
Marital Status	-.17	.08	-.11	-2.24	.03*
Mothers' BMI	.01	.01	.04	0.71	.48
Attend AE	-.07	.04	-.09	-1.82	.07
Conv SP	-.08	.06	-.07	-1.39	.17

Note. Years SP = years of participation. Part MS = participation in multiple sports. Mothers' BMI = mothers' body mass index. Attend AE = mothers' attendance at athletic events. Conv SP = conversations about sport participation. $R^2 = .26$; $\Delta R^2 = .24$; $F = 12.75$; $p < .05^*$; $p < .001^{**}$.

Given the total amount of variance accounted for in each regression model and the unique variance explained by the individual predictors, the decision was made to include two covariates in further statistical analyses - daughters' body mass index (BMI)

and conversations about sport participation. Thus, all additional statistical analyses considered the predictability of body image dissatisfaction (i.e., BD and DISC) above and beyond the influence of daughters' BMI and conversations about sport participation.

Overview of Statistical Analyses

Multiple analysis of covariance (MANCOVA). Group differences were predicted across sport types (gymnastics, cross country, softball) in relation to body image dissatisfaction. It was expected that softball players would report less body dissatisfaction than both gymnasts and cross country runners. A main effect of sport type was expected in relation to two outcome variables: athletes' body dissatisfaction (BD) and athletes' discrepancy between their current and ideal body shapes (DISC). For both outcome variables, softball players were predicted to report less body dissatisfaction than gymnasts or runners. Given that the analysis of body image dissatisfaction involved two dependent variables (BD and DISC), and two covariates (daughters' BMI, conversations about sport participation), one-way multivariate analysis of covariance was used to assess this research question.

H1: Sport type (gymnastics, cross country, softball) was expected to predict body image dissatisfaction, with softball players reporting less body dissatisfaction than both gymnasts and cross country runners (see Table 9). A one-way multivariate analysis of covariance (MANCOVA) was conducted, using sport type as the between-subjects variable and body dissatisfaction (BD) and the discrepancy between current and ideal body shapes (DISC) as the dependent variables. The covariates, daughters' body mass index (BMI) and conversations about sport participation, were also included in the

model. Main effects were found for daughters' BMI, Wilks' $\Lambda = .74$, $F(2, 643) = 111.18$, $p < .001$, partial $\eta^2 = .26$, and conversations about sport participation, Wilks' $\Lambda = .97$, $F(2, 643) = 11.76$, $p < .001$, partial $\eta^2 = .04$. Follow-up univariate procedures with Bonferroni correction showed similar results for both dependent variables. Main effects were found for daughters' BMI, [BD: $F(1, 644) = 138.03$, $p < .001$, partial $\eta^2 = .18$; DISC: $F(1, 644) = 178.44$, $p < .001$, partial $\eta^2 = .22$] and conversations about sport participation [BD: $F(1, 644) = 23.10$, $p < .001$, partial $\eta^2 = .04$; DISC: $F(1, 644) = 7.15$, $p < .008$, partial $\eta^2 = .01$.]

Post-hoc analyses using simultaneous multiple regression procedures showed that both BMI and conversations about sport participation were significant predictors of body image dissatisfaction [BD: $F(2, 650) = 84.19$, $p < .001$; DISC: $F(2, 650) = 101.06$, $p < .001$. The combination of predictors explained approximately 21% of the variance for BD ($R^2 = .21$), and 24% of the variance for DISC ($R^2 = .24$). Body mass index (BMI) was positively related to BD and DISC, thus associating a higher BMI with a greater level of body image dissatisfaction. Conversations about sport participation was negatively related to BD and DISC, suggesting that frequent discussions about athletic experiences between mothers and daughters may reduce the risk for young female athletes to report body image dissatisfaction. Across both models for the outcome variables (BD and DISC), BMI contributed the greatest amount of unique variance (BD: 18%; DISC: 23%), followed by conversations about sport participation (BD: 4%; DISC: 1%). A main effect was not found for daughters' sport type in relation to body image dissatisfaction, suggesting that sport type did not significantly relate to body

dissatisfaction among athletes, $F(4, 194) = 0.833, p = ns$. Significant interactions were not found between sport type x BMI, $F(4, 1286) = 0.93, p = ns$, or sport type x conversations about sport participation, $F(4, 1286) = 0.44, p = ns$. Regardless of sport type, it appears that a greater BMI among athletes may put them at risk for body image dissatisfaction. In contrast, conversations about sport participation between mothers and daughters may reduce the likelihood of young female athletes to develop body image dissatisfaction.

Table 9

Multivariate Analysis of Covariance – Sport Type in Relation to Body Image Dissatisfaction

Sport Type	N	BMI M (SD)	Conv SP M (SD)	BD M (SD)	DISC M (SD)
Gymnastics	212	20.94 (2.69) ^b	2.70 (.78) ^b	10.62 (7.57)	.48 (.99)
Cross Country	234	20.42 (2.49) ^b	2.48 (.88) ^a	10.64 (8.26)	.52 (.93)
Softball	207	22.59 (3.13) ^a	2.78 (.81) ^b	11.84 (7.85)	.78 (.92)
Total	653	21.32 (2.77)	2.64 (.83)	11.01 (7.92)	.59 (.96)

Note. BMI = body mass index. Conv SP = conversations about sport participation. BD = body dissatisfaction. DISC = discrepancy between current and ideal body shapes. Different letter superscripts indicate significant between-group differences, $p \leq .05$. Standard deviations are in parentheses.

Structural equation modeling (SEM). Beyond the prediction of group differences across sport type, several variables were expected to predict body image dissatisfaction, when considering sport type as a moderator. These predictions were investigated using structural equation modeling (SEM) with LISREL 8.8 (Jöreskog & Sörbom, 1996) software in order to compare the regression coefficients across multiple groups, or sport types. In comparison to multiple regression, SEM is a more efficient strategy for testing the moderating effects of categorical variables on relations between continuous variables (Jaccard & Wan, 1996; McClelland & Judd, 1993). In addition, SEM simplifies the interpretation of interaction effects by computing and directly

comparing separate regression coefficients for each categorical group rather than analyzing product terms, as does multiple regression analyses (Aiken & West, 1991).

Separate SEM models, including baseline and multigroup analyses, were conducted to test the hypothesis that the regression coefficients for key predictor variables differed across the three groups, or sport types (gymnastics, cross country, softball). The baseline model was conducted first to estimate the regression coefficients, standard errors, correlations among predictors, and squared multiple correlations for dependent variables separately for each sport group without cross-group model constraints (Jaccard & Wan, 1996). Because baseline models were saturated (i.e., they estimated all possible model parameters), they provided a perfect fit to the covariance matrix of measured variables for each sport type, $\chi^2(0) = 0.00, p = 1.00$. The multigroup model was then estimated to test the moderating effects of sport type on the regression coefficients relating key predictor variables to study outcomes. This model included an equality constraint that forced the unstandardized value of a particular regression coefficient to be the same for each of the three sport types.

The maximum-likelihood chi-square value of this multigroup model and its degrees of freedom were then used to test the hypothesis that forcing the regression coefficients to be equal across sport types significantly worsened model fit relative to the perfectly fitting baseline model (Jaccard & Wan, 1996). If the multigroup chi-square is statistically significant, then one rejects the null hypothesis of cross-group equality in regression coefficients and concludes that sport type moderates the observed relationships. That is, sport type uniquely impacts the relation between the predictor

variable and the outcome variable. If the multigroup chi-square is not statistically significant, then one fails to reject the null hypothesis of cross-group equality in regression coefficients and concludes that sport type does not moderate the observed relationships. Thus, the interaction effects were examined using the multigroup strategy within SEM. In all SEM analyses, sport type was examined as a moderator of the relation between each predictor variable and athletes' body image dissatisfaction. In addition to interaction effects within the Chi Square results, the strength of each interaction was estimated as a measure of effect size (w ; Cohen, 1988). The conventions for determining effect size, using w are: .10 for a small effect size, .30 for a medium effect size, and .50 for a large effect size. In accord with Cohen (1988) and Johnson (1993), Pearson r correlation coefficients were calculated as indexes of effect size for all regression coefficients: $r < .1$ (small), $r = .1-.3$ (medium), and $r > .5$ (large).

H2: Sport type and mothers' body image dissatisfaction were predicted to elicit an interaction effect in relation to body image dissatisfaction among daughters, or female athletes, see Table 10. Baseline SEM models were conducted across each sport type (gymnastics, cross country, softball) to determine the predictive value of mothers' body dissatisfaction (MBD) in relation to daughters' body dissatisfaction (BD). The set of predictors, including MBD and the covariates (body mass index, conversations about sport participation), accounted for 34% of the variance in BD among softball players, 33% of the variance in BD among gymnasts, and 26% of the variance in BD among runners. For gymnasts, MBD did not significantly predict daughters' BD ($b = .06, p = ns$). However, MBD was positively related to BD for runners ($b = .17, p < .01$)

and softball players ($b = .23, p < .006$). For a one standard deviation unit increase in MBD, BD is expected to increase by 0.07-SD for gymnasts ($\beta = .07$), by 0.19-SD for cross country runners ($\beta = .19$), and by 0.26-SD for softball players ($\beta = .26$). Thus, it appears that MBD significantly predicts BD when daughters participate in either cross country or softball; these effects were medium in magnitude (see Table 10).

Table 10

Structural Equation Modeling – Mothers’ Body Dissatisfaction (MBD) Predicting Daughters’ Body Dissatisfaction (BD) Across Sport Type

Sport Type	<i>N</i>	<i>R</i> ²	<i>b</i>	<i>SE</i>	β	<i>Z</i>	<i>p</i>	<i>r</i>	<i>r</i> ²
Gymnastics	101	.34	.06	.07	.07	0.87	.19	.06	.004
Cross Country	121	.26	.17	.07	.19	2.36	.01*	.15 ⁺⁺	.02
Softball	104	.34	.23	.07	.26	3.24	.006*	.22 ⁺⁺	.05

Note. $p < .01^*$. $r \leq .1-.3 =$ medium effect size⁺⁺.

Multigroup model SEM analyses for the assessment of the interaction between sport type and mothers’ body dissatisfaction (MBD) in relation to daughters’ body dissatisfaction (BD) were not significant, $\chi^2(2) = 3.44, p = ns, w^2 = .01$ (see Figure 1). This result indicates that the regression coefficients reported above for the three sport types do not differ from one another more than would be expected by chance alone. That is, sport type did not moderate the relation between mothers’ BD and daughters’ BD.

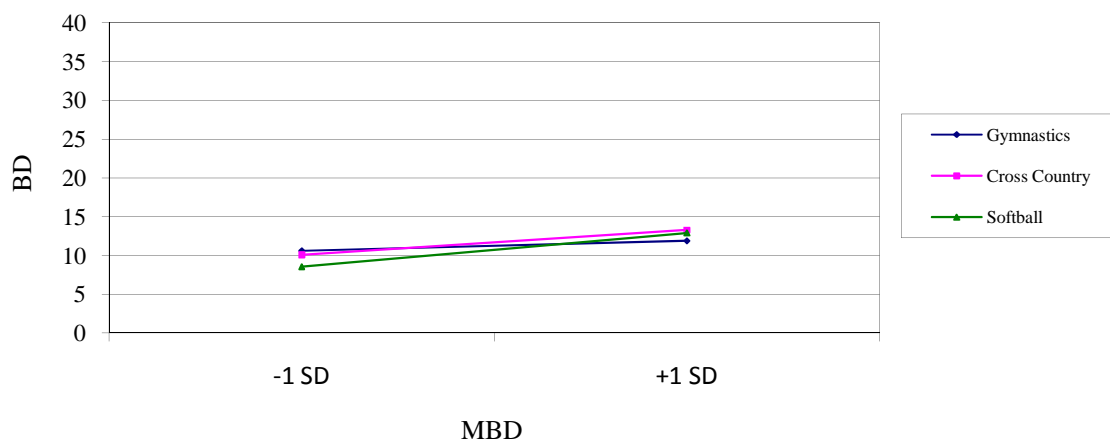


Figure 1. This graph displays the simple slopes for the effects of mothers' body dissatisfaction (BD) predicting daughters' body dissatisfaction (BD) when considering sport type as a moderator.

H2: Mothers' discrepancy between current and ideal body shapes (MDISC) was predicted to positively relate to the discrepancy between daughters' current and ideal body shapes (DISC), when considering sport type as a moderator, see Table 11. To determine the strength of the relation between MDISC and DISC, baseline SEM models were calculated for each sport. The combination of predictors, involving MDISC and the covariates (body mass index, conversations about sport participation), explained 38% of the variance among softball players, followed by 30% of the variance among gymnasts, and 21% of the variance among runners in the model. Regardless of sport type, MDISC did not significantly predict DISC, $p = ns$.

Table 11

Structural Equation Modeling – Mothers’ Discrepancy Between Current and Ideal Body Shapes (MDISC) Predicting Daughters’ Discrepancy Between Current and Ideal Body Shapes (DISC) Across Sport Type

Sport Type	<i>N</i>	<i>R</i> ²	<i>b</i>	<i>SE</i>	β	<i>Z</i>	<i>p</i>	<i>r</i>	<i>r</i> ²
Gymnastics	101	.30	.05	.07	.06	0.74	.46	.05	.003
Cross Country	121	.21	.08	.07	.09	1.16	.25	.07	.005
Softball	104	.38	.08	.06	.10	1.25	.21	.09	.008

Note. No significant differences were found across sports for the relation between mothers’ discrepancy between current and ideal body shapes (MDISC) and daughters’ discrepancy between current and ideal body shapes (DISC).

Follow-up multigroup SEM analyses were performed to test for an interaction effect between mothers’ discrepancy between current and ideal body shapes (MDISC) and sport type in relation to daughters’ discrepancy between current and ideal body shapes (DISC), see Figure 2. No significant differences were found across the three types of sports, $X^2(2) = 0.13$, $p = ns$, $w^2 = .0004$. Thus, the regression coefficients for the three sports do not differ from one another beyond chance. Inspection of the regression coefficients for each separate group indicates that mothers’ DISC was not significantly related to daughters’ DISC when considering sport type.

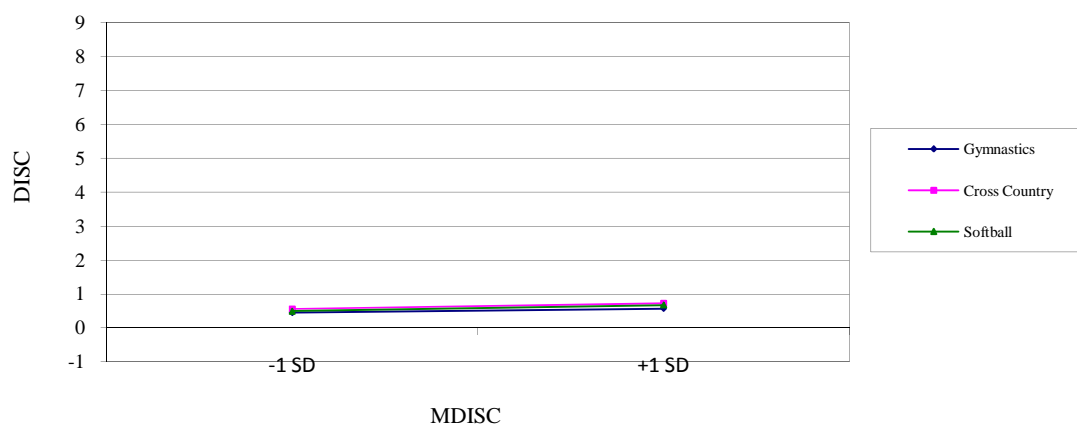


Figure 2. This graph displays the simple slopes for the effects of mothers' discrepancy between current and ideal body shapes (MDISC) predicting daughters' discrepancy between current and ideal body shapes (DISC) when considering sport type as a moderator.

H3 & H4: A set of predictors, including family dynamics (i.e., cohesion, expressiveness, independence, conflict) self-efficacy, and the covariates (i.e., daughters' BMI and conversations about sport participation) was hypothesized to relate to body dissatisfaction among athletes (BD) and athletes' discrepancy between current and ideal body shapes (DISC). Baseline SEM models were created across each sport type to determine the predictive value of each variable in relation to daughters' body image dissatisfaction (e.g., BD and DISC). For BD, the set of predictors explained 37% of the variance among gymnasts, 35% of the variance among runners, and 29% of the variance among softball players (see Tables 12 and 14). For DISC, the set of predictors accounted for 31% of the variance among gymnasts, followed by 28% of the variance among softball players, and 22% of the variance among runners (see Tables 13 and 15). Follow-up multigroup analyses were conducted to measure interaction effects for each hypothesis.

H3: Family dynamics variables (i.e., conflict, expressiveness, cohesion, independence) were hypothesized to predict body dissatisfaction (BD) among athletes, see Table 12. Conflict was described as the open display of anger, and expressiveness was indicated by the direct discussion of feelings among family members. Family cohesion was measured as the level of commitment and support within the family, whereas independence referred to the athlete's degree of assertiveness and autonomous decision-making ability. Regardless of sport type, significant effects were not found for family conflict or expressiveness in relation to athletes' BD, $p = ns$. Cohesion was negatively related to BD among gymnasts ($b = -.39, p < .03$). However, cohesion was positively related to BD among runners ($b = .43, p < .02$). For softball players, cohesion did not significantly predict BD ($b = -.33, p = ns$). Thus, for a one standard deviation unit increase in cohesion, BD is expected to decrease by 0.13-SD for gymnasts ($\beta = -.13$) and to increase by 0.14-SD for cross country runners ($\beta = .14$).

Independence was positively related to BD among gymnasts ($b = .44, p < .03$), however, significant results were not found for runners ($b = .05, p = ns$) or softball players ($b = -.06, p = ns$). For a one standard deviation unit increase in independence, BD is expected to increase by 0.14-SD for gymnasts ($\beta = .14$).

A covariate, conversations about sport participation, was negatively related to BD among runners ($b = -1.20, p < .03$). Significant effects were not found for this covariate in relation to gymnasts ($b = -.98, p = ns$) or softball players ($b = -.32, p = ns$). That is, for a one standard deviation unit increase in conversations about sport participation, BD is expected to decrease by 0.13-SD for runners ($\beta = -.13$).

Interestingly, another covariate, daughters' body mass index (BMI) was positively related to BD across all sport types, (gymnastics, $b = 1.26$, cross country, $b = 1.10$, softball, $b = .99$, $p \leq .001$). These findings indicate that for a one standard deviation unit increase in BMI, BD is expected to increase by 0.45-SD for gymnasts ($\beta = .45$), by 0.33-SD for runners ($\beta = .33$), and by 0.39-SD for softball players ($\beta = .39$).

In summary, across the family dynamics variables, gymnasts were more likely to experience body dissatisfaction (BD) if they reported low family cohesion, high independence, or a considerable body mass index (BMI). In contrast, cross country runners who expressed high family cohesion, infrequent conversations about sport participation, or a considerable BMI were more prone to report BD. Among softball players, those who conveyed a considerable BMI were also apt to indicate BD. The effect sizes for these results range from medium to large in magnitude; see Table 12.

Table 12

Structural Equation Modeling – Family Dynamics Predicting Daughters' Body Dissatisfaction (BD) Across Sport Type

Sport Type	<i>N</i>	<i>R</i> ²	<i>b</i>	<i>SE</i>	β	<i>Z</i>	<i>p</i>	<i>r</i>	<i>r</i> ²
Gymnastics	212	.37							
Cohesion			-0.39	.18	-.13	-2.16	.03*	-.10 ⁺⁺	.01
Expressiveness			0.08	.17	.03	0.47	.65	.02	.0004
Conflict			0.15	.18	.05	0.82	.42	.04	.002
Independence			0.44	.20	.14	2.19	.03*	.11 ⁺⁺	.01
Conv SP			-0.98	.57	-.10	-1.71	.09	-.08	.006
BMI			1.26	.16	.45	7.85	.001**	.40 ⁺⁺⁺	.16
Cross Country	234	.35							
Cohesion			0.43	.18	.14	2.42	.02*	.11 ⁺⁺	.01
Expressiveness			0.15	.22	.04	0.70	.49	.03	.0009
Conflict			-0.15	.20	-.04	-0.74	.46	-.03	.0009
Independence			0.05	.22	.01	0.22	.83	.02	.0004
Conv SP			-1.20	.56	-.13	-2.15	.03*	-.11 ⁺⁺	.01
BMI			1.10	.18	.33	6.02	.001**	.28 ⁺⁺	.08
Softball	207	.29							
Cohesion			-0.33	.20	-.10	-1.62	.11	-.08	.006
Expressiveness			-0.18	.22	-.05	-0.82	.42	-.04	.002
Conflict			0.33	.20	.10	1.67	.10	.08	.006

Independence	-0.06	.22	-.02	-0.26	.79	-.01	.0001
Conv SP	-0.32	.61	-.03	-0.53	.60	-.03	.0009
BMI	0.99	.15	.39	6.53	.001**	.34 ⁺⁺⁺	.12

Note. Conv SP = conversations about sport participation. BMI = body mass index. $p < .05^*$; $p < .001^{**}$. $r \leq .1-.3$ = medium effect size⁺⁺; $r < .3$ = approaching large effect size⁺⁺⁺.

The interaction between sport type and daughters' body mass index (BMI), in relation to athletes' body dissatisfaction (BD), was investigated using multigroup modeling procedures with SEM, see Figure 3. Group differences were not found across sport types, $X^2(2) = 1.53$, $p = ns$, $w^2 = .002$. That is, the regression coefficients across sports do not differ from one another more than would be expected by chance alone. Inspection of the regression coefficients and p -values indicates that BMI is a key predictor for BD for all sport types.

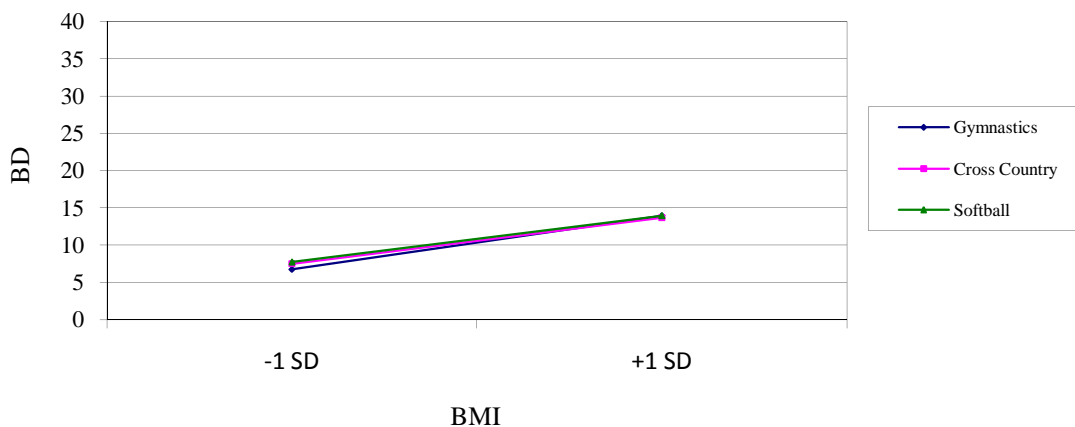


Figure 3. This graph displays the simple slopes for the effects of body mass index (BMI) predicting body dissatisfaction (BD) when considering sport type as a moderator.

H3: Family dynamics variables (i.e., conflict, expressiveness, cohesion, independence) were examined as predictors of athletes' discrepancy between current and ideal body shapes (DISC), see Table 13. No significant effects were found for any of the family dynamics variables across sport types, $p = ns$. However, daughters' body mass index (BMI) was positively related to DISC across all sports (gymnastics, $b = 0.18$, cross country, $b = 1.10$, softball, $b = .99$, $p \leq .001$). Thus, for a one standard deviation unit increase in BMI, DISC is expected to increase by 0.48-SD for gymnasts ($\beta = 0.48$), by 0.39-SD for runners ($\beta = 0.39$), and by 0.49-SD for softball players ($\beta = 0.49$). The effect sizes for the regression coefficients approached large in magnitude, indicating that increases in daughters' BMI are predictive of increases in DISC for all sport types (see Table 13).

Table 13

Structural Equation Modeling – Family Dynamics Predicting Daughters’ Discrepancy Between Current and Ideal Body Shapes (DISC) Across Sport Type

Sport Type	<i>N</i>	<i>R</i> ²	<i>b</i>	<i>SE</i>	β	<i>Z</i>	<i>p</i>	<i>r</i>	<i>r</i> ²
Gymnastics	212	.31							
			-0.37	.03	-.09	-1.52	.13	-.07	.005
			0.01	.02	.02	0.27	.78	.01	.0001
			0.01	.03	.02	0.36	.72	.02	.0004
			0.02	.03	.05	0.72	.47	.03	.0009
			0.02	.08	.01	0.20	.84	.01	.0001
			0.18	.02	.48	8.15	.001**	.42 ⁺⁺⁺	.08
Cross Country	234	.22							
			0.03	.02	.10	1.53	.13	.07	.005
			0.03	.03	.07	1.04	.30	.05	.003
			-0.01	.02	-.03	-0.51	.61	-.02	.0004
			-0.003	.03	-.01	-0.12	.91	-.01	.0001
			-0.04	.07	-.04	0.59	.56	.03	.0009
			0.15	.02	.39	6.46	.001**	.34 ⁺⁺⁺	.12
Softball	207	.28							
			-0.001	.02	-.002	-0.03	.97	-.001	.00001
			-0.004	.03	-.009	-0.14	.89	-.01	.0001
			0.03	.02	.08	1.25	.21	.06	.004

Independence	0.01	.03	.02	0.32	.75	.02	.0004
Conv SP	-0.13	.07	-.11	1.78	.08	-.09	.008
BMI	0.14	.02	.49	8.01	.001**	.42 ⁺⁺⁺	.18

Note. Conv SP = conversations about sport participation. BMI = body mass index. $p < .05^*$; $p < .001^{**}$. $r < .3$ = approaching large effect size⁺⁺⁺.

Follow-up multigroup model SEM analyses were conducted in order to test the interaction between sport type and athletes' body mass index (BMI), in relation to the discrepancy between current and ideal body shapes (DISC), see Figure 4. No differences were found across sport types, $X^2(2) = 1.87$, $p = ns$, $w^2 = .003$. Thus, the predictive values of the regression coefficients for each of the three sports do not differ beyond chance. The relation between BMI and DISC is comparable across athletes' of all sport types.

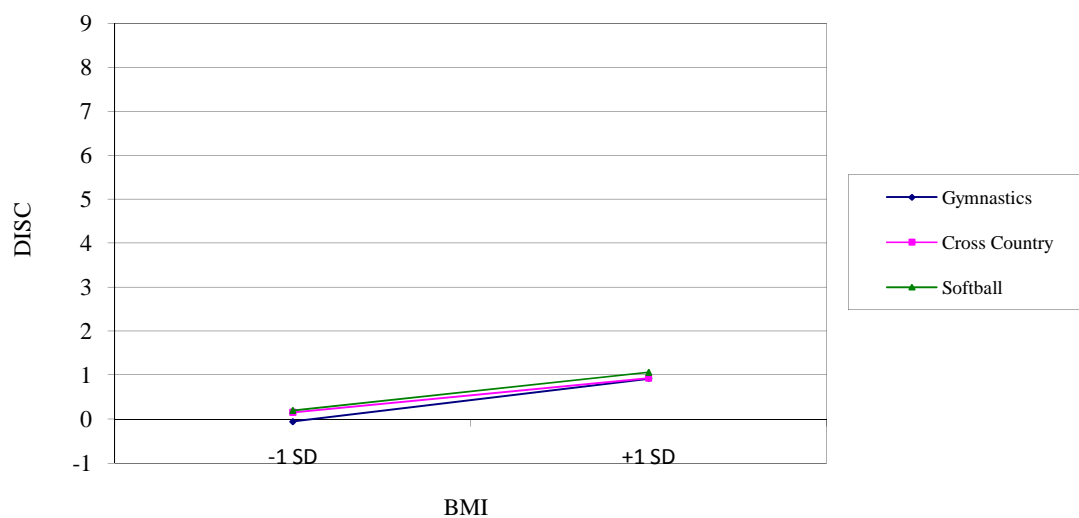


Figure 4. This graph displays the simple slopes for the effects of body mass index (BMI) predicting the discrepancy between current and ideal body shapes (DISC) when considering sport type as a moderator.

H4: Self-efficacy and sport type were hypothesized to elicit an interaction effect for predicting body dissatisfaction (BD), see Table 14. Self-efficacy was negatively related to BD across all sports, (gymnastics, $b = -0.35$, cross country, $b = -0.51$, softball, $b = -0.56$, $p \leq .001$). These results indicate that for a one standard deviation unit increase in self-efficacy, BD is expected to decrease by 0.23-SD for gymnasts ($\beta = -.23$), by 0.34-SD for runners ($\beta = -.34$), and by 0.30-SD for softball players ($\beta = -.30$). That is, greater self-efficacy predicts less BD among athletes of all sport types. The effect sizes for these findings were medium in magnitude, see Table 14.

Table 14

Structural Equation Modeling – Self-Efficacy Predicting Daughters’ Body Dissatisfaction (BD) Across Sport Type

Sport Type	<i>N</i>	<i>R</i> ²	<i>b</i>	<i>SE</i>	β	<i>Z</i>	<i>p</i>	<i>r</i>	<i>r</i> ²
Gymnastics	212	.37	-.35	.09	-.23	3.85	.001**	-.19 ⁺⁺	.04
Cross Country	234	.35	-.51	.08	-.34	6.24	.001**	-.28 ⁺⁺	.08
Softball	207	.29	-.56	.11	-.31	-4.94	.001**	-.23 ⁺⁺	.05

Note. $p < .05^*$; $p < .001^{**}$. $r \leq .1-.3 =$ medium effect size⁺⁺.

Multigroup SEM analyses were performed to assess the potential interaction effect for self-efficacy and sport type in relation to athletes’ body dissatisfaction (BD), see Figure 5. Significant differences were not found across sport types, $X^2(2) = 2.65$, $p = ns$, $w^2 = .004$, suggesting that the predictive value of the regression coefficients for the

three sports did not differ from one another beyond chance. Self-efficacy impacts athletes' BD similarly across all sport types.

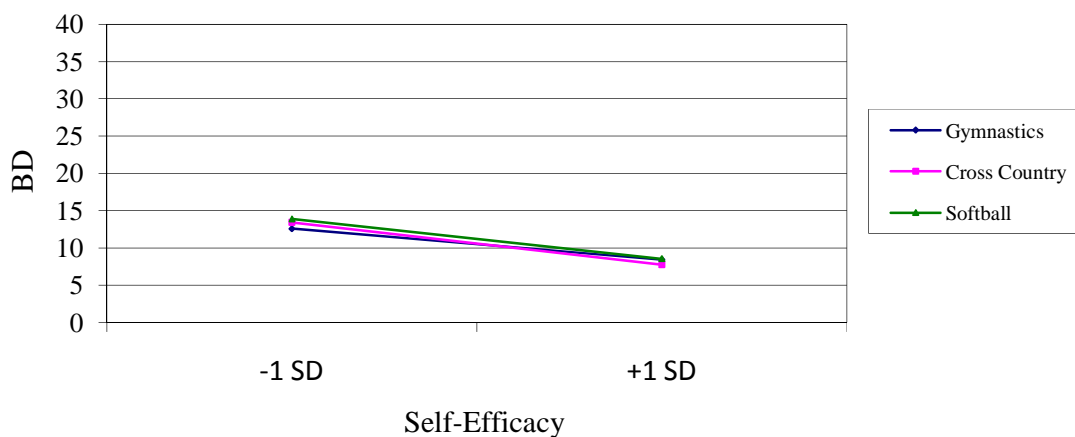


Figure 5. This graph displays the simple slopes for the effects of self-efficacy predicting the body dissatisfaction (BD) when considering sport type as a moderator.

H4: Self-efficacy was expected to predict the discrepancy between current and ideal body shapes (DISC), when considering sport type as a moderator, see Table 15. Self-efficacy significantly predicted, and was negatively related, to DISC across all sports (gymnastics, $b = -.04$, cross country, $b = -.03$, softball, $b = -.03$, $p \leq .01$). These results indicate that for a one standard deviation unit increase in self-efficacy, DISC is expected to decrease by 0.18-SD for gymnasts ($\beta = -0.18$), by 0.15-SD for runners ($\beta = -0.15$), and by 0.16-SD for softball players ($\beta = -0.16$). Thus, greater self-efficacy predicts a smaller discrepancy between athletes' current and ideal body shapes (DISC) across all sport types. These results are supported by medium effect sizes (see Table 15).

Table 15

Structural Equation Modeling – Self-Efficacy Predicting Daughters’ Discrepancy Between Current and Ideal Body Shapes (DISC) Across Sport Type

Sport Type	<i>N</i>	<i>R</i> ²	<i>b</i>	<i>SE</i>	β	<i>Z</i>	<i>p</i>	<i>r</i>	<i>r</i> ²
Gymnastics	212	.31	-.04	.01	-.18	-2.98	.003*	-.14 ⁺⁺	.02
Cross Country	234	.22	-.03	.01	-.15	-2.57	.01*	-.12 ⁺⁺	.01
Softball	207	.28	-.03	.01	-.16	-2.57	.01*	-.12 ⁺⁺	.01

Note. $p < .05^*$; $p < .001^{**}$. $r \leq .1$ -.3 = medium effect size⁺⁺.

The interaction between sport type and self-efficacy in relation to the discrepancy between current and ideal body shapes (DISC) was assessed using multigroup model SEM analyses, see Figure 6. No differences were found across sport types, $X^2(2) = 0.58$, $p = ns$, $w^2 = .0009$. Thus, the strength of the regression coefficients for the three sports did not differ beyond chance; the relation between self-efficacy and athletes’ DISC is not dependent upon sport type.

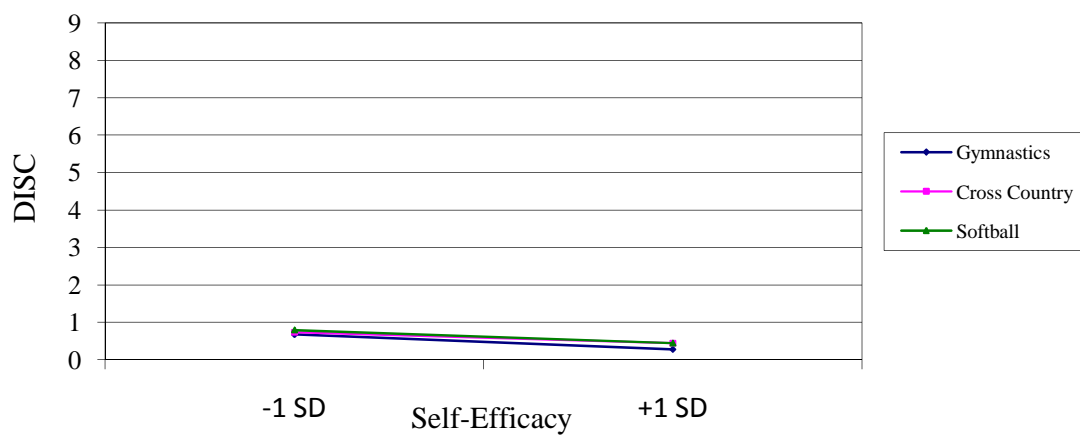


Figure 6. This graph displays the simple slopes for the effects of self-efficacy predicting the discrepancy between current and ideal body shapes (DISC) when considering sport type as a moderator.

CHAPTER FIVE

DISCUSSION SECTION

The purpose of the present study was to investigate factors associated with body image dissatisfaction among high school female athletes participating in gymnastics, cross country, or softball. These sports were assessed given that several studies have examined eating-disordered factors by sport classifications, including aesthetic sports (e.g., gymnastics), endurance sports (e.g., cross country), and ball sports (e.g., softball) (e.g., Berry & Howe, 2000; Brownell et al., 1992; Davis & Cowles, 1989; Garner & Rosen, 1991; Johnson, 1994; Petrie, 1993; Sherwood et al., 2002, Smolak et al., 2000; Stoutjesdyk & Jevene, 1993; Zucker et al., 1999). The present examination included two phases: first, to determine covariates across sports (e.g., body mass index), and second, to assess the impact of predictor variables including maternal body image dissatisfaction, family dynamics (i.e., conflict, independence, cohesion, expressiveness), and athletic self-efficacy on body image dissatisfaction. The goal of the present study was to identify patterns between the predictive factors and body image dissatisfaction, when considering sport type as a moderator.

Two conceptually different measurements were used in order to assess body image dissatisfaction among athletes, the Figure Rating Scale (FRS; Stunkard et al., 1983) and the Body Dissatisfaction subscale of the Eating Disorder Inventory-3 (EDI-3;

Garner, 2004). These assessments utilize separate, but distinct strategies for examining cognitions of body image (Thompson & van den Berg, 2002). The FRS depicts body dissatisfaction using a range of body silhouettes in order to assess potential mismatches between perceptions of current and preferred body shapes. Discrepancy between the two figures signifies dissatisfaction with body shape. Pictorial assessments for the measurement of body image dissatisfaction, such as the FRS, have been shown useful among both adolescent and adult samples (e.g., Sherwood et al., 2004; Thompson & Gray, 1995). However, despite their simplicity in administration and efficiency in the acquisition of information, tests that use body silhouettes for examining body dissatisfaction may limit the breadth of information received, given their confined range for participant responding and inconsistency with size gradations across figures (e.g., Brodie, Bagley, & Slade, 1994; Gardner, Stark, Jackson, & Friedman, 1999; Thompson & van den Berg, 2002). Thus, the EDI-3, a test of global body dissatisfaction and dissatisfaction with specific regions of the body, was also utilized in the present study. In comparisons with other assessments of body dissatisfaction the EDI-3 has shown high correlations and strong test-retest reliability across clinical samples (Garner, 2004; Huon, Piira, Hayne, & Strong, 2002). With the use of both the FRS and the EDI-3, a more thorough exploration of body image dissatisfaction could be taken.

Sport type was predicted to relate to body image dissatisfaction in that softball players would report less body dissatisfaction than gymnasts and runners. In contrast to gymnastics and cross country, in which athletes typically compete individually (i.e., individual-performance sports), softball requires precise event sequences which involve

coordinated skills across multiple players (i.e., group-performance sports). Along with differing experiences between individual-performance sports and group-performance sports, gymnasts have reported more eating-disordered symptoms than volleyball players (Sundgot-Borgen & Torstveit, 2004; Stoutjesdyk & Jevne, 1993). Low body fat percentages are commonly exhibited by gymnasts and cross country runners, thus increasing their risk for experiencing pressure to reduce body fat and to develop subclinical eating disorders (Beals & Manore, 2004; Rosen, McKeag, Hough, & Curley, 1986). Furthermore, the pursuit of weight loss has been commonly expressed by gymnasts, dancers, and figure skaters in order to improve sport performance (e.g., Engel et al., 2003; Petrie, 1993; Rosen & Hough, 1988; Smolak et al., 2000; Tseng et al., 2007; Ziegler, et al., 1998). In contrast, refereed sports (e.g., basketball) and sports that do not emphasize thinness (e.g., volleyball) have been shown to protect young women against eating disturbances (e.g., Smolak et al., 2000; Zucker et al., 1999).

Additionally, while body image dissatisfaction may be a normative characteristic among women, the degree of dissatisfaction may be relative to unique factors, such as pressure to reduce body fat in order to enhance athletic performance and perfectionism in skill development (e.g., Bastiani, Rao, Weltzin, & Kaye, 1995; Berry & Howe, 2000; Johnson, 1994; Pate, Barnes, & Miller, 1985; Taub & Blinde, 1992; Thompson & Sherman, 1999a; Wilmore, 1992; Yates, 1991). Despite having an already thin physique, athletes across a variety of sports (e.g., swimming, cross country, ballet) commonly experience pressure to diet and lose weight (e.g., Davis, 1992; Davis & Cowles, 1989; Rosen & Hough, 1988). The combination of competition and pressure to excel at a sport

may result in a distinct athletic climate. This in turn may foster the development of body image dissatisfaction. Indeed, differences in body dissatisfaction have been shown in previous investigations between weight-matched sports (e.g., rowing, judo), sports that emphasize a thin or aesthetic body build (e.g., gymnastics, dance), and non-weight-restrictive sports (e.g., volleyball, soccer, field hockey) (e.g., Brownell et al., 1992; Davis & Cowles, 1989; Garner & Rosen, 1991; Petrie, 1993; Sherwood et al., 2002; Smolak et al., 2000; Stoutesdyk & Jevne, 1993).

In the present research, however, the hypothesis that softball players would show less body dissatisfaction than gymnasts or cross country runners was not supported. Group differences were not found across any of the sports in relation to body image dissatisfaction. This finding is similar to previous research suggesting that athletes of all sport types (e.g., basketball, swimming, rowing, figure skating) are susceptible to unhealthy eating and body image attitudes (Berry & Howe, 2000). The combination of factors within the sport setting, such as perfectionism and pressure in skill development may also impact athletes, and in turn, neutralize global differences across sport type.

Beyond the influence of the athletic setting, dynamics of the family environment (i.e., cohesion, expressiveness, conflict, independence) were hypothesized to relate to daughters' body image dissatisfaction. Because no previous studies have considered the influence of familial factors in association with body dissatisfaction among athletes, theoretical predictions were not formulated for examining interaction effects between sport type and family dynamics. Moreover, earlier investigations of family dynamics have shown inconsistent findings across assessments of family relationships (Steinberg &

Phares, 2001). Yet research involving clinical populations and community samples has shown that patterns of communication may characterize conflicted and unsupportive relationships within families (e.g., Lattimore et al., 2000; Okon et al., 2003). For instance, the frequency of destructive communication has been more commonly observed than constructive communication when evaluating interactions between anorexic mother-daughter dyads (Lattimore et al., 2000). Additionally, women suffering from bulimia have noted negligible cohesion and flexibility within the familial environment (Bonne et al., 2003). In contrast, Ackard and Neumark-Sztainer (2001) found that a greater frequency of family meals was associated with fewer bulimic symptoms among adolescent women. Family cohesion was also beneficial for gymnasts in the present study, indicating lower levels of body image dissatisfaction.

However, in the present research the ability for gymnasts to assert personal independence was related to higher levels of body dissatisfaction. As mentioned previously, gymnasts may be particularly susceptible to succumb to pressures to engage in unhealthy dietary practices, resulting in eating disordered symptoms (Thompson & Sherman, 1999a). Contrary to women suffering from anorexia who struggle to behave independently and to create a personal identity (Rowa et al., 2001), young female athletes may view themselves as athletically skilled and committed to the sport (Danish, Fazio, Nellen, & Owens, 2002; Johnson, 1994). In this way, the athletic context offers female athletes a chance to behave autonomously and to become immersed within the demands of sport, however; this opportunity may also facilitate the manifestation of body image dissatisfaction among gymnasts. Although an engaged family structure may protect

gymnasts against the development of body image concerns, a sense of independence or autonomy, as created within the sport domain, may also put them at risk for body dissatisfaction.

Unlike gymnasts, a high degree of family cohesion was linked to a high level of body image dissatisfaction among runners. Perhaps runners in the present study feel overwhelmed by the degree of familial closeness in which healthy and supportive interactions are perceived as intrusive. Although enmeshed family relationships may be detrimental to body satisfaction among runners, it appears that the irregularity of conversations about sport participation is also related to the development of body image concerns. Distinct from cohesion, infrequent conversations about sport participation were associated with body dissatisfaction among runners. Therefore, runners experience a strong feeling of belonging within the family, but also perceive a lack of interest in athletic participation among family members.

Clues as to why runners are affected in this way may be found in research involving women whom are diagnosed with bulimia. As suggested by Benninghoven et al. (2003), women suffering from bulimia often inhibit themselves from expressing their feelings given the negative responses provided by family members. Due to a lack of familial interest in sport, runners may simply avoid sport-related discussions. The nature of cross country as an individual-performance sport, in that athletes compete independently and may even run alone for stretches at a time while contributing to a team score, may serve as an outlet for young women to escape from emotionally, overwhelming familial interactions.

In contrast to gymnasts and runners, softball players were not affected by the degree of personal independence or level of cohesion within the family environment. Characteristics specific to group-performance sports, in which athletes coordinate skills in order to perform as a team to achieve a common goal may explain this finding. Indeed, a lower prevalence rate of eating disorders has been shown among athletes who participate in ball sports, such as softball or soccer, than those who engage in aesthetic or endurance sports (Sundgot-Borgen & Torstveit, 2004). Given the atmosphere of the athletic environment for softball players, it is possible that softball players perceive their experiences and attitudes toward sport participation, as well as their bodies, differently than gymnasts and runners.

Contrary to previous research involving clinical populations, the degree of conflict and expressiveness reported across athletes in the present study did not relate to daughters' body image dissatisfaction (e.g., Benninghoven et al., 2003; Humphrey, 1994; Lattimore et al., 2000; Okon et al., 2003). Families of women suffering from bulimia nervosa are often characterized by a high level of family conflict and minimal emotional expression (Benninghoven et al., 2003; Humphrey, 1994). Given the fact that less than 1% of women in the present study scored within the elevated clinical range on the Body Dissatisfaction subscale of the EDI-3 (Garner, 2004), the lack of findings for family conflict and expressiveness in relation to body dissatisfaction are not surprising. Thus, the associations between conflict and body dissatisfaction, and expressiveness and body dissatisfaction shown among athletic young women, did not parallel experiences reported by women suffering from clinically diagnosed eating disorders.

Mothers and daughters were expected to express comparable levels of body image dissatisfaction, when considering sport type as a moderator. Gymnasts and their mothers were predicted to report the greatest level of body dissatisfaction followed by cross country runners and softball players. The present research did not find support for this hypothesis across sports, thus contradicting previous studies which suggest similarity in body attitudes between mothers and adolescent daughters (e.g., Elfhag & Linne, 2005; Steinberg & Phares, 2001). For instance, mothers' dieting behaviors have been linked with drive for thinness among adolescent daughters (Werthein et al., 2002). Although mothers' body dissatisfaction may relate to daughters' body attitudes, "intergenerational transmission of such familial traits is insufficient alone to account for the development of eating disorders in offspring" (Lacey & Price, 2004, p. 195). Indeed, in an investigation to measure continuity in eating and body attitudes between mothers and daughters, daughters of mothers who had a history of eating disorders did not exhibit eating and body image concerns (Barbin et al., 2002). Therefore, factors beyond mothers' body attitudes may account for the development of eating and body image concerns among young women. Elements unique to the sport environment including demands for skill development (e.g., balance, speed, strength, coordination) may overpower the degree to which daughters' internalize mothers' body image concerns, thus neutralizing the strength of the relation between mothers and daughters body attitudes (e.g., Lacey & Price, 2004; Patel et al., 2002). That is, athletic young women may become immersed within the goals of sport participation and the pursuit of their physical abilities, consequently, reducing the impact of mothers' body dissatisfaction.

Furthermore, across sports, mothers' discrepancy between current and ideal body shapes did not predict daughters' discrepancy between current and ideal body shapes. Given the differing developmental stages for mothers and daughters it is possible that both groups have distinctive body shape preferences (Stevens & Tiggemann, 1998; Whitbourn & Skultety, 2002). Mothers' preferred body shapes may reflect comparisons with their same-age peers, rather than women of a younger cohort (Grogan, 2008). That is, differences in body shape perceptions across cohorts may signify independent standards for body shape preferences between mothers and daughters. In addition, mothers may place less importance on their physical appearance and weight with age (Tiggemann, 2004). In an investigation of weight concerns throughout adulthood, women near 40-years of age expressed less concerns in regard to body weight than women in the younger age groups (Tiggemann & Stevens, 1999). In relation to the impact of mothers' body dissatisfaction, the athletic context may function as an inhibiting force, shaping body attitudes exhibited by daughters as separate from the views of their mothers. Future research on mother-daughter pairs in which both mothers and daughters have experience as participants within the same sport may more directly illustrate familial attitudes and support in relation to specific athletic settings.

Athletes' body mass index (BMI) predicted body image dissatisfaction across all three sports (gymnastics, cross country, softball). Thus, regardless of sport type, an athlete's body size is predictive of body dissatisfaction. Pressure to reduce body mass in order to improve athletic performance often creates body image concerns across athletes of all sports, especially among athletes who do not portray an athletic physique (e.g.,

Berry & Howe, 2000; Brownell et al., 1992; Davis, 1992; Stice & Agras, 1998; Wilson & Eldredge, 1992). Because softball players in the present study reported a larger BMI than gymnasts and runners it is possible that these softball players have internalized a mismatch between their actual body shapes and those expected of successful athletes. However, despite reporting a greater BMI than the other athletic teams, the level of body dissatisfaction expressed by softball players was not significantly greater than that reported by gymnasts and cross country runners. That is, BMI was predictive of body dissatisfaction across all sports, yet the BMI value itself did not put softball players at a greater risk for body dissatisfaction than gymnasts or runners. While athletes may perceive their bodies in terms of functionality within the sport domain, they are not immune to social norms of body dissatisfaction (Russell, 2004). Thus, recognition of the extent to which young female athletes accept Western standards of attractiveness may further illustrate connections between BMI and body image dissatisfaction (e.g., Hesse-Biber, Leavy, Quinn, & Zoino, 2006; Stice, Schupak-Neuberg, Shaw, & Stein, 1994).

Although a possible limitation of the present research is the use of self-reported height and weight for the calculation of participant body mass index (BMI), self-reported information has been strongly correlated with objective participant measurements among young adults (e.g., Ambrosi-Randic & Bulian, 2007; Shapiro & Anderson, 2003), and middle-aged women (e.g., Craig & Adams, 2009; Jeffery et al., 2008; Meyer, McPartlan, Sines, & Waller, 2009). Although women may underestimate their weight and overestimate their height, the degree of measurement error due to self-report does not appear to influence assessment reliability when compared to objective measurements

(e.g., Davis & Gergen, 1994; Fonseca et al., 2009). Thus, the use of self-report information for assessing BMI within the present study functions as a reliable estimate of participant characteristics.

Due to the nature of softball as a group-performance sport in that successful performance is contingent upon the coordination of skills across multiple fielders, high athletic self-efficacy was expected to relate to low body image dissatisfaction with softball players reporting the greatest level of self-efficacy, followed by cross country runners, and gymnasts. This hypothesis was partially supported in that greater athletic self-efficacy was related to a reduced level of body dissatisfaction among women of all three sports (gymnastics, cross country, softball). Beyond the effects of body mass index and conversations about sport participation, athletes of all sports who reported high athletic self-efficacy also reported a lower degree of body image dissatisfaction. The present results are in line with studies that have shown that self-efficacy is effective for reducing binge eating and purging behaviors among women suffering from bulimia (Schneider, et al., 1987; Wilson, et al., 2002; Wilson & Fairburn, 1993). Athletic self-efficacy may represent a measurement of self-worth and serve as a protective factor for reminding athletes of their physical capabilities, as opposed to their physical appearances (Blinde et al., 1993; Bowker, 2006; Fulkerson et al., 1999; Hall, 1990; Staples, 1990). Thus, athletic self-efficacy may protect young female athletes from the negative side effects (e.g., body dissatisfaction, drive for thinness) that often result due to internalization of Western standards of beauty. Therefore, sport participation may provide a buffer for young women to deflect societal stereotypes of thinness, and body

attitudes conveyed by their mothers, in order to maintain a healthy perspective of their bodies (e.g., Elfhag & Linne, 2005; Fulkerson et al., 1999).

In addition to factors investigated within the present study, athletes' motivations for sport participation must also be considered. Although the present study linked factors of body dissatisfaction across sport types, it is unclear whether participation in athletics facilitates body image concerns or if female participants experience body dissatisfaction prior to athletic participation (Burckes-Miller & Black, 1988). The "attraction to sport hypothesis" suggests that athletic young women may engage in sport participation in order to fuel or to conceal eating disordered symptoms (Sundgot-Borgen, 1994). Furthermore, an investigation of women's motives for sport participation revealed that women who participated in athletics due to weight-related motives (i.e., to burn calories) typically exhibited normal and healthy body weights (de Bruin, Woertman, Bakker, & Oudejans, 2009). That is, weight-related motives for athletic participation may increase the likelihood for women to develop unhealthy eating and body attitudes, and to believe that participation in a sport that emphasizes a lean physique (e.g., gymnastics, cross country) will assist them in hiding their illness or pursuit of thinness (de Bruin et al., 2009; Sacks, 1990; Thompson & Sherman, 1993).

Athletes often feel compelled to engage in dieting practices in order to improve sport performance (e.g., Davis, 1992; Engel et al., 2003; Rosen & Hough, 1988; Ziegler et al., 1998). Longitudinal research designs are necessary in order to clarify motivational factors that are reflective of unhealthy body attitudes, such as drive for thinness and perfectionism in relation to athletic participation (e.g., Bastiani et al., 1995; Fulkerson et

al., 1999; Mintz & Betz, 1988). Because adolescence represents a hallmark period for young women to experience body image dissatisfaction, athletes within this developmental period may be especially vulnerable (e.g., Keel, Fulkerson, & Leon, 1997; Stice, 2001). Investigations that examine the combination of developmental factors (e.g., menarche, peer relationships, family dynamics), and motivation for sport participation (e.g., drive for thinness, socialization, health benefits), may pinpoint patterns of behavior in relation to body image concerns within the athletic context. For example, research studies that measure body dissatisfaction prior to, during, and after sport participation may identify characteristics of young women who choose to participate in respective sports, but also shifts in body dissatisfaction in accord with athletic participation. With this information researchers may monitor developmental trajectories of athletes who partake in sports throughout adolescence, in comparison to those who refrain from, or discontinue participation.

Interactions between athletes and coaches can create an atmosphere in pursuit of excellence, which may in turn, predispose athletes to develop body image dissatisfaction (Thompson & Sherman, 1999b). Coaches, in particular, may exhibit tremendous dedication toward achieving team excellence, disregarding the athlete's psychological and physical wellbeing (e.g., Burckes-Miller & Black, 1991). For instance, extra weight can hamper the performance of gymnasts and cross-country runners, but may have less of an effect on softball players. In this way, coaches may create an environment in which athletes develop feel pressured to lose weight in order to attain superior athletic performance (e.g., Rosen & Hough, 1988; Williamson et al., 1995). Through interactions

with peers and coaches, competitive athletes - gymnasts in particular - may develop ego-oriented attributions in which weight loss or dieting is associated with improved performance (de Bruin et al., 2009; de Bruin, Oudejans, & Bakker, 2007; Martinsen, Bratland-Sanda, Eriksson, & Sundgot-Borgen, 2010). Pressures by coaches, judges, or family members may convince normal weight athletes that dieting practices are common within the sport setting (Ziegler et al., 1998). Thus, future research is needed to assess how the combination of familial factors and dynamics of the athletic context, including the coach's role in the development of body dissatisfaction, can impact young women's motivation for sport participation.

Family functioning has been associated with the development of body image concerns and eating disordered behaviors among young women (e.g., Benninghoven et al., 2003; Lattimore et al., 2000; Rowa et al., 2001). The notion of reciprocity is commonly overlooked within research, yet it is possible that not only are the behaviors of parents influencing children, but also that children are influencing parents (Steinberg & Phares, 2001). In order to determine the direction of relationship between parent-child behaviors in association with body dissatisfaction, future research must include prospective, longitudinal investigations (Stice, 2001). Additionally, discrepant viewpoints of family relationships have been shown across comparison studies involving women suffering from bulimia and control groups (Bonne et al., 2003; Rupp & Jurkovic, 1996). Because the present study only included the daughters' perspectives of the family environment it is possible that other family members would provide differing attitudes. Future studies that involve perspectives from multiple family members, such as fathers

and siblings, may provide supplementary perspectives for a more thorough interpretation of the family setting and how dynamics of the family relate to the development of body dissatisfaction among female athletes (Steinberg & Phares, 2001).

Given that previous research has suggested that maternal attitudes toward eating and weight concerns may shape the development of body dissatisfaction among daughters (e.g., Werthein et al., 2002), the present study sought to examine the strength of this association within the athletic context. Because parents often facilitate children's socialization into sport, the level of parents' sport experience and support may influence daughters' enjoyment and motivation in athletics (e.g., Pargman, 1998; Smith & Smoll, 2002). However, the direct measurement of maternal experiences in gymnastics, cross country, or softball was not included in this investigation. By matching mothers' sport experiences across these three sports, with daughters' corresponding athletic participation, researchers may glean a more complete assessment of maternal support for sport participation and the impact of maternal body dissatisfaction on daughters' body dissatisfaction.

Because participant data was collected through suburban schools within the Chicago area, it is possible that the findings reflect a special population of athletes. The suburban environment may reflect a category of athletes who represent a level of race, ethnicity, or socioeconomic status which differs from characteristics of athletes from metropolitan or rural areas. For example, the majority of the participant sample was Caucasian American (85%), while less than 2.5% of the sample was African American. Furthermore, according to the National Federation of High Schools (2010), only 23 states

within the U.S. offer gymnastics as an organized sport. Thus, the athletes in the present study are likely to have experienced opportunities unique to the state of Illinois or their respective high schools. In addition, athletes may have experienced opportunities to participate in structured athletic activities (e.g., club teams, summer camps) prior to, or secondary to high school sport participation; these same opportunities may not be accessible to athletes in all communities. The availability of additional resources and opportunities within the suburban environment may also differ across sport types and thus, impact the development of athletic skills and body image dissatisfaction among female athletes.

Baseline skill requirements for making the team may create a committed and goal-seeking athletic environment, and represent a team's caliber of competitiveness. The preliminary guidelines for earning a spot on the team most likely vary across schools and sports. Furthermore, the standard of performance may also impact the retention rate for athletes who continue to participate in sports throughout their high school years. Although this information was not collected in the present study, future investigations should consider the baseline skills necessary for participation as well as the level of team competitiveness, in order to more thoroughly appreciate the dynamics of the athletic context.

Participation in sports (e.g., gymnastics, cross country, softball) offers a positive experience for young women to achieve athletic self-efficacy through the development of an athletic identity. Although athletic young women are not shielded from societal stereotypes of feminine beauty and thinness, or pressures to achieve the stereotypical

athletic body build, women who participate in sports can learn to perceive their bodies as strong, healthy, vehicles for the enhancement of self-esteem, rather than objects of beauty and societal scrutiny (e.g., Bowker, 2006; Brownell et al., 1992; Davis, 1992; Wilson & Eldredge, 1992). Body image concerns may also reflect elements of the family environment, including the degree of family cohesion and independence, in combination with the respective athletic setting. In order to achieve a more thorough viewpoint of the impact of sport participation in relation to body dissatisfaction among high school female athletes, future research must involve characteristics of the athletic context including motives for sport participation.

APPENDIX A:
PARENT CONSENT FORM

PARENT CONSENT FORM

Dear Parent or Female Guardian,

I am a doctoral student in the Developmental Psychology program at Loyola University Chicago, interested in body image issues in adolescents and young women. I am conducting my dissertation project with high school female athletes who participate in gymnastics, cross country, or softball. Mothers of athletes will also be recruited.

You and your daughter are being asked to participate in this research project, which has been supported by your daughter's high school principal, athletic director, and athletic coach. The purpose of this project is to assess the role of sport and family-related factors on the development of body image concerns among high school female athletes. In order to assess body image concerns and the potential factors involved, participants will be asked to complete a group of questionnaires that include questions about sport participation, family relationships, and thoughts about their bodies.

In order to complete this project, you and your daughter, will be asked to complete a series of questionnaires.

You will be asked:

- To complete the *demographic questionnaire*, the *Figure Rating Scale (FRS)*, and the *Eating Disorders Inventory-3 (EDI-3)*. The FRS and the EDI-3 include questions about eating habits and thoughts about your body.

Your daughter will be asked:

- To complete the *demographic questionnaire*, the *Figure Rating Scale (FRS)*, the *Eating Disorders Inventory-3 (EDI-3)*, the *Family Environment Scale (FES)*, and the *New General Self-Efficacy Scale (NGSE)*. The FRS and the EDI-3 include questions about eating habits and her thoughts about her body. The FES includes questions about several aspects of the family environment, whereas the NGSE includes questions about self-confidence in the ability to perform as an athlete. These assessments have been utilized with numerous populations in many geographic areas around the world.

Myself, and an advanced undergraduate student from Loyola University Chicago, will be conducting the testing procedures with approximately 600 high school female athletes as well as their mothers. If you agree to allow your daughter to participate, questionnaire completion will be scheduled with the athletic coach and will take place immediately before or after an athletic practice. You and your daughter will complete the questionnaires independently. Neither the principal nor the athletic coach will receive any information regarding responses to the questionnaires. All questionnaires will be sealed in a coded envelope. If you agree to participate, you will complete the questionnaires provided in the packet. Regardless of your decision about participation, your daughter will return the sealed packet to me during the next team meeting. Questionnaire completion will require approximately 15 minutes for mothers and 25 minutes for daughters.

All information obtained from the study will be used for research purposes only. All information obtained from participants will be completely confidential. No names or other identifying information will be kept with the data, so we will not know how any single person answers in the study. In order to maintain confidentiality, a code number will be assigned to all participants. At no time during the study will your daughter's name or your own name appear with corresponding information, so that we will not know how any single participant has responded to the questionnaires.

Participation will provide no direct benefits other than knowledge gained about psychological research. However, your daughter's athletic team will receive a team donation of \$100 following participation. You and your daughter have the right to withdraw from participation at any time without penalty or prejudice. You and your daughter also have the right to skip any questions that you believe are uncomfortable to answer. We feel that the risks associated with this study are not greater than those presented in everyday life. Following participation you and your daughter will receive a brief written description about the study and will be able to ask questions about the project.

If you have any questions, please contact the researcher, Trisha Dunkel – via email at tdunkel@luc.edu or via telephone at (773) 508 – 8343. You may also contact my faculty advisor, Dr. Denise Davidson, via email at ddavids@luc.edu, or via telephone at (773) 508 – 3008. If you have any questions concerning your daughter's or your own rights as a research participant, please feel free to contact Loyola's compliance manager at (773) 508 – 2689.

Please complete the information below for your daughter to return the form to the researcher.

I _____ (print name of parent) state that I am the parent and/or legal guardian of _____ (daughter's full print name), who is currently attending _____ (name of school).

I acknowledge that I understand the study, its risks and benefits, the need for research, and I have received answers to any questions that I may have concerning the procedure.

Please Check One:

- I freely and voluntarily consent to participate in this study. I also consent to have my daughter participate, and recognize that she will be given the opportunity to decide whether or not she would like to participate in this study.
- I do not wish to participate; however, I do consent to have my daughter participate, and recognize that she will be given the opportunity to decide whether or not she would like to participate in this study.
- I do not wish to participate and I do not consent to have my daughter participate in this study.

My signature below indicates my consent to participate and that I allow my daughter to participate in this research project.

Signature of Parent

Date

- I agree to allow contact for a future follow-up study.
- I do not agree to allow contact for a future follow-up study.

Best Way to Contact You:
(Only for potential follow-up project)

phone: _____

email: _____

APPENDIX B
ATHLETE ASSENT FORM

ATHLETE ASSENT FORM

Dear Athlete,

I am a doctoral student in the Developmental Psychology program at Loyola University Chicago, interested in body image issues in adolescents and young women. I am conducting my dissertation project on high school female athletes who participate in gymnastics, cross country, or softball. Mothers of athletes will also be recruited.

The purpose of this project is to assess the role of sport and family-related factors on the development of body image concerns among high school female athletes. In order to assess body image concerns and the potential factors involved, participants will be asked to complete a group of questionnaires that include questions about sport participation, family relationships, and thoughts about their bodies.

The procedure for the project is designed to be simple, in which the researcher will make school visits in order to distribute and to collect the necessary forms and questionnaires. If you choose to participate you will be asked to complete the questionnaires immediately following an athletic practice. Questionnaire completion will require approximately 25 minutes. However, if you should wish to quit at any time you may do so freely without prejudice or penalty. All data will be collected for research purposes only. No identifying information (athlete's name or name of school) will be kept with the data. Only group analyses will be conducted on the data, so we will not know how individual athletes or schools have responded to the questionnaires. Neither the principal nor the athletic coach will receive any information regarding responses to the questionnaires. All questionnaires will be sealed in a coded envelope.

In order to complete this project, you will be asked to complete a series of questionnaires, including the *demographic questionnaire*, the *Figure Rating Scale (FRS)*, the *Eating Disorders Inventory-3 (EDI-3)*, the *Family Environment Scale (FES)*, and the *New General Self-Efficacy Scale (NGSE)*. The FRS and the EDI-3 include questions about eating habits and thoughts about your body. The FES includes questions about several aspects of the family environment, whereas the NGSE includes questions about self-confidence in the ability to perform as an athlete. These assessments have been utilized with numerous populations in many geographic areas around the world.

All information obtained from the study will be used for research purposes only. All information obtained from participants will be completely confidential. No names or other identifying information will be kept with the data, so we will not know how any single participant answers in the study. In order to maintain confidentiality, a code number will be assigned to all participants. At no time during the study will your name appear with corresponding information, so that we will not know how an individual participant has responded to the questionnaires. All questionnaires will be sealed in a coded envelope.

Participation will provide no direct benefits other than knowledge gained about psychological research. Your athletic team will receive a \$100 team donation following participation.

You have the right to withdraw from participation at any time without penalty or prejudice. You also have the right to skip any questions that you believe are uncomfortable to answer. We feel that the risks associated with this study are not greater than those presented in everyday life. Following participation you will receive a brief written description about the study and will be able to ask questions about the project.

If you have any questions about the project, please contact me - Trisha Dunkel, via email at tdunkel@luc.edu, or via telephone at (773) 508 – 8343. You may also contact my faculty advisor, Dr. Denise Davidson, via email at ddavids@luc.edu or via telephone at (773) 508 – 3008. If you have any questions concerning your rights as a research participant, please feel free to contact Loyola's compliance manager at (773) 508 – 2689.

Please complete the information below and return the form to the researcher.

Please Check One:

- I freely and voluntarily consent to participate in this study. I am _____ years of age, am currently attending _____ (name of school).
- I do not wish to participate in this study.

I acknowledge that I understand the project, its risks and benefits, the need for research, and I have received answers to any questions that I may have concerning the procedure. I freely and voluntarily consent to my participation in this study. My signature below indicates my consent to participate.

Printed Name of Participant

Signature of Participant

Date

- I agree to allow contact for a future follow-up study.
- I do not agree to allow contact for a future follow-up study.

Best Way to Contact You:
(**Only** for potential follow-up project)

phone: _____

email: _____

APPENDIX C
DEBRIEFING FORM

DEBRIEFING FORM

Many studies have been conducted on body satisfaction, or one's belief about the match between their ideal body shape and their current body shape. However, most of these studies have focused on isolated areas of research, such as the family environment or the athletic environment. The purpose of this project was to combine multiple areas of research, focusing on both the family environment and the athletic environment, in order to see if various sport- and family-related factors are involved in the development of body image concerns among high school female athletes.

Of interest is how the combination of these factors may interact in order for body image concerns to develop. Previous research with the family environment has shown that specific communication styles between mothers and daughters may influence the development of body image concerns among young girls (Hedlund, Fichter, Quadflieg, et al., 2003; Lattimore, Wagner, & Gowers, 2000). Other research projects have focused on the athletic environment and shown that pressures to maintain a specific body shape and the type of sport may also influence the development of body image concerns among high school female athletes (Sherwood, Neumark-Sztainer, Story, Beuhring, & Resnick, 2002; Williamson, Netemyer, Jackman, et al., 1995). However, the combination of these factors may be important for understanding the development of body image concerns among high school female athletes.

This research belongs to the category of Developmental or Clinical Psychology. If you have any questions about the study, please feel free to call me – Trisha Dunkel, at (773) 508-8343. If you would like to seek mental health services for any experiences related to participation in this study, please consult the National Association for Anorexia and Associated Disorders, located in Highland Park, IL, 60035. The telephone number is: (847) 831 – 3438. If you would like more information about this area of research, the references below are good places to start.

- Hedlund, S., Fichter, M. M., Quadflieg, N., & Brandl, C. (2003). Expressed emotion, family environment, and parental bonding in bulimia nervosa: A 6-year investigation. *Eating and Weight Disorders*, 8, 26-35.
- Lattimore, P. J., Wagner, H. L., & Gowers, S. (2000). Conflict avoidance in anorexia nervosa: An observational study of mothers and daughters. *European Eating Disorders Review*, 8, 355-368.
- Sherwood, N. E., Neumark-Sztainer, D., Story, M., Beuhring, T., & Resnick, M. D. (2002). Weight-related sports involvement in girls: Who is at risk for disordered eating? *American Journal of Health Promotion*, 16(6), 341-344.
- Williamson, D. A., Netemyer, R. G., Jackman, L. P., Anderson, D. A., Funsch, C. L., & Rabalais, J. Y. (1995). Structural equation modeling of risk factors for the development of eating disorder symptoms in female athletes. *International Journal of Eating Disorders*, 17, 387-393.

APPENDIX D
ATHLETE DEMOGRAPHIC QUESTIONNAIRE

10. Excluding competition, how many hours each week do you spend training for this school-affiliated sport? (Please circle 1 response.)

0-3 4-7 9-12 13-16 17+

11. Please mark any additional sport-related school activities in which you have participated in the last 2 years.

<input type="checkbox"/> gymnastics	<input type="checkbox"/> swimming
<input type="checkbox"/> cross-country	<input type="checkbox"/> volleyball
<input type="checkbox"/> softball	<input type="checkbox"/> track
<input type="checkbox"/> cheerleading	<input type="checkbox"/> golf
<input type="checkbox"/> tennis	
<input type="checkbox"/> dance	<input type="checkbox"/> other
<input type="checkbox"/> basketball	(please specify)

The following questions discuss your mother's involvement in your sport participation.

12. How many of your current athletic events does your mother attend?

none less than half half more than half all events

13. How many of your current athletic practices does your mother attend?

none less than half half more than half all events

14. How frequently do you discuss your sport participation with your mother?

never rarely occasionally daily multiple times daily

The following questions discuss your satisfaction with your current body shape.

Please use the following scale to answer the questions below.

Strongly Dissatisfied	1
Somewhat Dissatisfied	2
Neutral	3
Somewhat Satisfied	4
Strongly Satisfied	5

15. How satisfied are you with your current height? _____
16. How satisfied are you with your current weight? _____
17. How satisfied are you with the current shape of your stomach? _____
18. How satisfied are you with the current shape of your legs? _____
19. How satisfied are you with the current shape of your hips? _____
20. How satisfied are you with the current shape of your buttocks? _____
21. How satisfied are you with the current shape of your chest? _____
22. How satisfied are you with the current shape of your shoulders? _____
23. Please provide your current height by rounding to the nearest inch. _____
24. Please provide your current weight by rounding to the nearest 5 pounds. _____

APPENDIX E
MOTHER DEMOGRAPHIC QUESTIONNAIRE

MOTHER DEMOGRAPHIC QUESTIONNAIRE

1. Age: _____
2. Marital Status: married__ divorced__ separated__ never married__ widow__
3. Please circle the number of children to which you have given birth.
0 1 2 3 4 5 6+
4. Please circle the number of children to which you have parented.
0 1 2 3 4 5 6+
5. Please mark the ethnicity that most closely describes you.

_____ Hispanic/Latino	_____ Asian
_____ Caucasian (non-Hispanic)	_____ Middle Eastern
_____ African	_____ Other
6. Please mark any school-affiliated sports that you participated in during high school.

_____ gymnastics	_____ swimming
_____ cross-country	_____ volleyball
_____ softball	_____ track
_____ cheerleading	_____ golf
_____ tennis	_____ other
_____ dance	(please specify) _____
_____ basketball	_____ none
7. Please mark any school-affiliated sports that you participated in during college.

_____ gymnastics	_____ swimming
_____ cross-country	_____ volleyball
_____ softball	_____ track
_____ cheerleading	_____ golf
_____ tennis	_____ other
_____ dance	(please specify) _____
_____ basketball	_____ none
8. Excluding competition, how many hours each week did you spend training for this school-affiliated sport? (Please circle 1 response.)
0-3 4-7 9-12 13-16 17+

The following questions discuss your satisfaction with your current body shape.

Please use the following scale to answer the questions below.

Strongly Dissatisfied	1
Somewhat Dissatisfied	2
Neutral	3
Somewhat Satisfied	4
Strongly Satisfied	5

9. How satisfied are you with your current height? _____
10. How satisfied are you with your current weight? _____
11. How satisfied are you with the current shape of your stomach? _____
12. How satisfied are you with the current shape of your legs? _____
13. How satisfied are you with the current shape of your hips? _____
14. How satisfied are you with the current shape of your buttocks? _____
15. How satisfied are you with the current shape of your chest? _____
16. How satisfied are you with your current shoulders? _____
17. Please provide your current height by rounding to the nearest inch. _____
18. Please provide your current weight by rounding to the nearest 5 pounds. _____

APPENDIX F
EATING DISORDER INVENTORY – 3 (EDI-3):
BODY DISSATISFACTION SUBSCALE

EATING DISORDER INVENTORY – 3 (EDI-3):

BODY DISSATISFACTION SUBSCALE

Please read each item and rate your answer among the 6 options as each item applies to you. The 6 answer options are listed beside each question and include ‘always,’ ‘usually,’ ‘often,’ ‘sometimes,’ ‘rarely,’ and ‘never.’

1. I think that my stomach is too big.

1	2	3	4	5	6
always	usually	often	sometimes	rarely	never

2. I think that my thighs are too large.

1	2	3	4	5	6
always	usually	often	sometimes	rarely	never

3. I think that my stomach is just the right size.

1	2	3	4	5	6
always	usually	often	sometimes	rarely	never

4. I feel satisfied with the shape of my body.

1	2	3	4	5	6
always	usually	often	sometimes	rarely	never

5. I like the shape of my buttocks.

1	2	3	4	5	6
always	usually	often	sometimes	rarely	never

6. I think my hips are too big.

1	2	3	4	5	6
always	usually	often	sometimes	rarely	never

7. I feel bloated after eating a normal meal.

1	2	3	4	5	6
always	usually	often	sometimes	rarely	never

8. I think that my thighs are just the right size.

1	2	3	4	5	6
always	usually	often	sometimes	rarely	never

9. I think my buttocks are too large.

1	2	3	4	5	6
always	usually	often	sometimes	rarely	never

10. I think that my hips are just the right size.

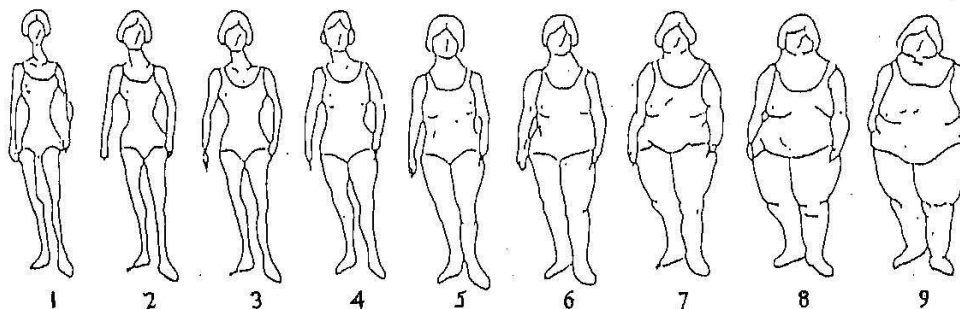
1	2	3	4	5	6
always	usually	often	sometimes	rarely	never

APPENDIX G
FIGURE RATING SCALE (FRS)

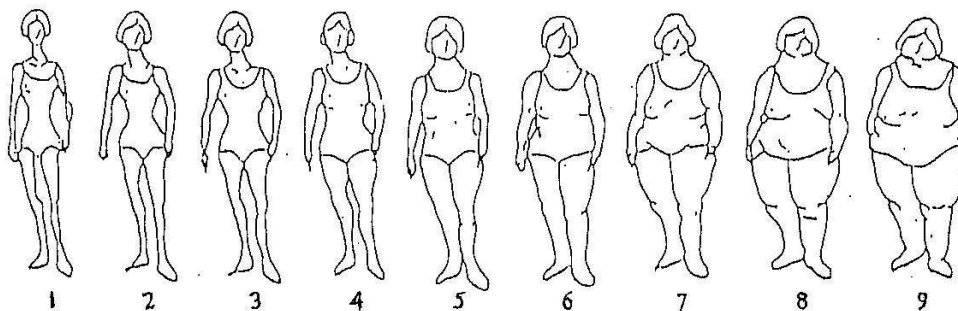
Figure Rating Scale (FRS)

Please answer the following questions based on the nine female and nine male figures.

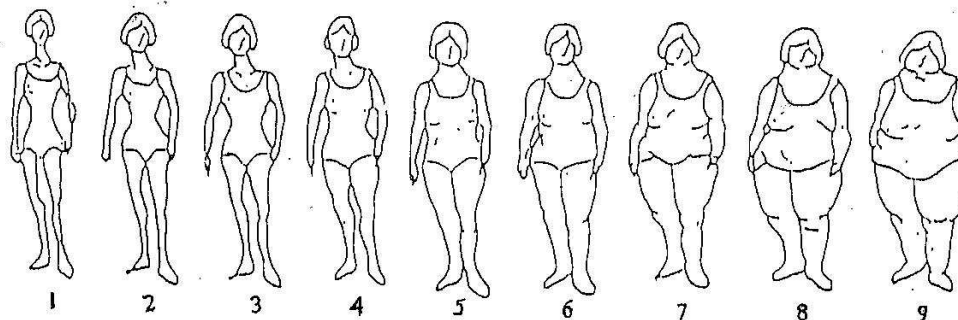
1. Please circle the female figure most closely representing your ideal body figure.



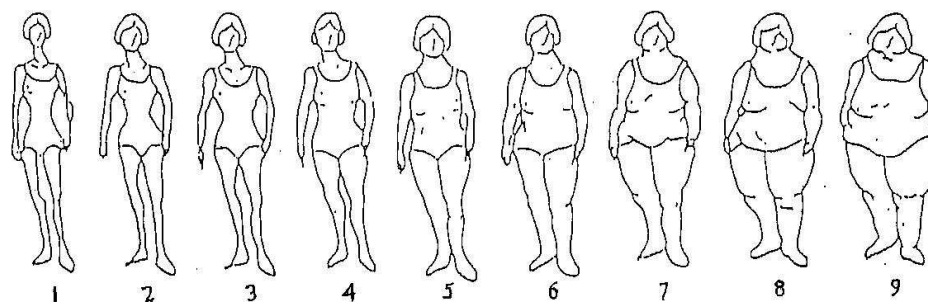
2. Next, please circle the female figure most closely representing how you think you look.



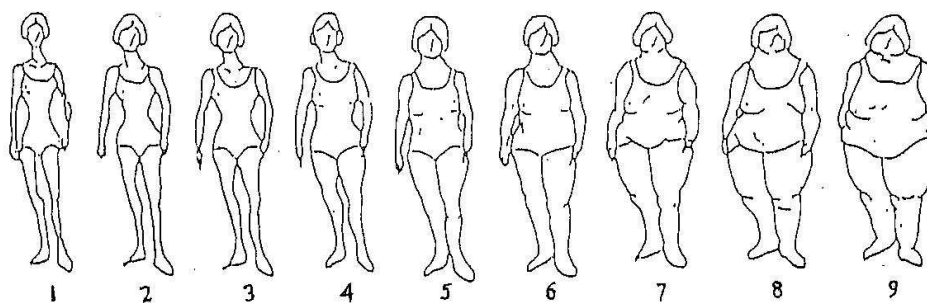
3. Now, please circle the female figure most closely representing how you feel most of the time.



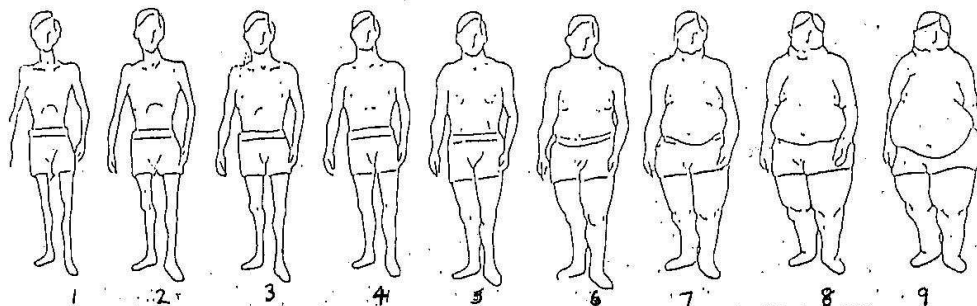
4. Next, please circle the female figure that you think is most preferred by men.



5. Now, please circle the female figure that you think is most preferred by women.



6. Lastly, please circle the male figure that you think is most attractive.



APPENDIX H
FAMILY ENVIRONMENT SCALE (FES): CONFLICT, INDEPENDENCE,
COHESION, AND EXPRESSIVENESS SUBSCALES

FAMILY ENVIRONMENT SCALE (FES): CONFLICT, INDEPENDENCE,
COHESION, AND EXPRESSIVENESS SUBSCALES

Please read each item and rate your answer among the 4 options as each item applies to you. The 4 answer options are listed beside each question and include 'strongly disagree,' 'disagree,' 'agree,' and 'strongly agree.'

1. Family members really help and support one another.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

2. Family members often keep their feelings to themselves.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

3. We fight a lot in our family.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

4. We don't do things on our own very often in our family.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

5. We often seem to be killing time at home.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

6. We say anything we want to around home.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

7. Family members rarely become openly angry.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

8. In our family, we are strongly encouraged to be independent.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

9. We put a lot of energy into what we do at home.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

10. It's hard to "blow off steam" without upsetting somebody.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

11. Family members sometimes get so angry they throw things.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

12. We think things out for ourselves in our family.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

13. There is a feeling of togetherness in our family.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

14. We tell each other about our personal problems.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

15. Family members hardly every lose their tempers.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

16. We come and go as we want to in our family.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

17. We rarely volunteer when something has to be done at home.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

18. If we feel like doing something on the spur of the moment we often just pick up and go.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

19. Family members often criticize each other.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

20. There is very little privacy in our family.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

21. Family members really back each other up.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

22. Someone usually gets upset if you complain in our family.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

23. Family members sometimes hit each other.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

24. Family members almost always rely on themselves when a problem comes up.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

25. There is very little group spirit in our family.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

26. Money and paying bills are openly talked about in our family.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

27. If there's a disagreement in our family, we try hard to smooth things over and keep the peace.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

28. Family members strongly encourage each other to stand up for their rights.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

29. We really get along well with each other.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

30. We are usually careful about what we say to each other.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

31. Family members often try to one-up or out-do each other.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

32. It's hard to be by yourself without hurting someone else's feelings in our household.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

33. There is plenty of time and attention for everyone in our family.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

34. There are a lot of spontaneous discussions in our family.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

35. In our family, we believe you don't ever get anywhere by raising your voice.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

36. We are not really encouraged to speak up for ourselves in our family.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

APPENDIX I

NEW GENERAL SELF-EFFICACY SCALE (NGSE)

NEW GENERAL SELF-EFFICACY SCALE (NGSE)

Please read each item and rate your answer among the 5 options as each item applies to your current athletic season. The 5 answer options are listed beside each question and include 'strongly disagree,' 'disagree,' 'neutral,' 'agree,' and 'strongly agree.'

1. I will be able to achieve most of the athletic goals that I have set for myself.

1	2	3	4	5
strongly disagree	disagree	neutral	agree	strongly agree

2. When facing athletic challenges, I am certain that I will accomplish them.

1	2	3	4	5
strongly disagree	disagree	neutral	agree	strongly agree

3. In general, I think that I can obtain athletic outcomes that are important to me.

1	2	3	4	5
strongly disagree	disagree	neutral	agree	strongly agree

4. I believe that I can succeed at most athletic endeavors to which I set my mind.

1	2	3	4	5
strongly disagree	disagree	neutral	agree	strongly agree

5. I am able to successfully overcome many athletic challenges.

1	2	3	4	5
strongly disagree	disagree	neutral	agree	strongly agree

6. I am confident that I can effectively perform many athletic tasks.

1	2	3	4	5
strongly disagree	disagree	neutral	agree	strongly agree

7. Compared to other athletes, I can perform most athletic skills very well.

1	2	3	4	5
strongly disagree	disagree	neutral	agree	strongly agree

8. Even when things are tough, I can perform quite well in athletic events.

1	2	3	4	5
strongly disagree	disagree	neutral	agree	strongly agree

REFERENCES

- Abramovitz, B. A., & Birch, L. L. (2000). Five-year-old girls' ideas about dieting are predicted by mothers' dieting. *Journal of the American Dietetic Association, 100*, 1157-1163.
- Ackard, D. M., & Neumark-Sztainer, D. (2001). Family mealtime while growing up: Associations with symptoms of bulimia nervosa. *Eating Disorders, 9*, 239-249.
- Agras, S., Hammer, L., & McNicholas, F. (1999). A prospective study of the influence of eating-disordered mothers on their children. *International Journal of Eating Disorders, 25*, 253-262.
- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Thousand Oaks, CA: Sage.
- Ambrosi-Randic, N., & Bulian, A. P. (2007). Self-reported versus measured weight and height by adolescent girls: A Croatian sample. *Perceptual and Motor Skills, 104*, 79-82. doi: 10.2466/PMS.104.1.79-82
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Bulletin, 84*, 191-215.
- Bandura, A. (1986). Self-efficacy. In A. Bandura's (Ed.), *Social foundations of thought and action* (pp. 390-453). Englewood Cliffs, NJ: Prentice-Hall, Inc.
- Bandura, A. (1989). Human agency in social cognitive theory. *American Psychologist, 44*, 1175-1184.
- Bandura, A. (2000). Health promotion from the perspective of social cognitive theory, in P. Norman, C. Abraham, & M. Connor (Eds.), *Understanding and changing health behavior from health beliefs to self-regulation* (pp. 299-399). Harwood Academic Publishers, Amsterdam.
- Bandura, A., & Cervone, D. (1986). Differential engagement of self-reactive influences in cognitive motivation. *Organizational Behavior and Human Decision Processes, 38*, 92-113.

- Barbin, J. M., Williamson, D. A., Stewart, T. M., Reas, D. L., Thaw, J. M., & Guarda, A. S. (2002). Psychological adjustment in the children of mothers with a history of eating disorders. *Eating and Weight Disorders, 7*, 32-38.
- Bardone-Cone, A. M., Abramson, L. Y., Vohs, K. D., Heatherton, T. F., & Joiner, T. E. (2006). Predicting bulimic symptoms: An interactive model of self-efficacy, perfectionism, and perceived weight status. *Behavior Research and Therapy, 44*, 27-42.
- Bastiani, A. M., Rao, R., Weltzin, T., & Kaye, W. H. (1995). Perfectionism in anorexia nervosa. *International Journal of Eating Disorders, 17*, 147-152.
- Beals, K. A., & Manore, M. M. (1994). The prevalence and consequences of subclinical eating disorders in female athletes. *International Journal of Sport Nutrition, 4*, 175-195.
- Benninghoven, D., Schneider, H., Strack, M., Reich, G., & Cierpka, M. (2003). Family representations in relationship episodes of patients with a diagnosis of bulimia nervosa. *Psychology and Psychotherapy: Theory, Research and Practice, 76*, 323-336.
- Berman, E. S. (2006). The relationship between eating self-efficacy and eating disorder symptoms in a non-clinical sample. *Eating Behaviors, 7*, 79-90.
doi: 10.1016/j.eatbeh.2005.07.004
- Berry, T. R., & Howe, B. L. (2000). Risk factors for disordered eating in female university athletes. *Journal of Sport Behavior, 23*, 207-218.
- Biddle, S. (1993). Children, exercise and mental health. *International Journal of Sport Psychology, 24*, 200-216.
- Blinde, E. M., Taub., D. E., & Han, L. (1993). Sport participation and women's personal empowerment: Experiences of the college athlete. In A. Yiannakis and M. J. Melnick (Eds.), *Contemporary issues in sociology of sport* (pp. 159-168). Champaign, IL: Human Kinetics.
- Bonne, O., Lahat, S., Kfir, R., Berry, E., Katz, M., & Bachar, E. (2003). Parent-daughter discrepancies in perception of family function in bulimia nervosa. *Psychiatry, 66*, 244-254.
- Bowker, A. (2006). The relationship between sports participation and self-esteem during early adolescence. *Canadian Journal of Behavioural Science, 38*, 3, 214-229.
doi: 10.1037/cjbs2006009

- Brodie, D., Bagley, K., & Slade, P. (1994). Body-image perception in pre- and post-adolescent females. *Perceptual and Motor Skills, 48*, 147-154.
- Brownell, K. D., Rodin, J., & Wilmore, J. H. (1992). *Eating, body weight and performance in athletes*. Philadelphia: Lea & Febiger.
- Burckes-Miller, M. E., & Black, D. R. (1988). Male and female college athletes: Prevalence of anorexia nervosa and bulimia nervosa. *Athletic Training, 23*, 137-140.
- Burckes-Miller, M. E., & Black, D. R. (1991). College athletes and eating disorders: A theoretical context. In D. Black (Ed.), *Eating disorders among athletes: Theory, issues and research*. (pp. 11-26). Reston, VA: American Alliance for Health, Physical Education, Recreation, and Dance (AAHPERD).
- Cantor, D. W., & Bernay, T. (1992). *Women in power: The secrets of leadership*. Boston: Houghton Mifflin.
- Carper, J. L., Fisher, J. O., & Birch, L. L. (2000). Young girls' emerging dietary restraint and disinhibition are related to parental control in child feeding. *Appetite, 35*, 121-129.
- Cattarin, J. A., & Thompson, J. K. (1994). A three-year longitudinal study of body image, eating disturbance, and general psychological functioning in adolescent females. *Eating Disorders, 2*, 114-125.
- Chen, G., Gully, S. M., & Eden, D. (2001). Validation of a new general self-efficacy scale. *Organizational Research Methods, 4*, 62-83.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences (2nd ed.)*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Cooley, E., & Toray, T. (1996). Disordered eating in college freshmen women: A prospective study. *Journal of American College Health, 44*, 229-235.
- Craig, B. M., & Adams, A. K. (2009). Accuracy of body mass index categories based on self-reported height and weight among women in the United States. *Maternal and Child Health Journal, 13*, 489-496. doi: 10.1007/s10995-008-0384-7
- Danish, S. J., Fazio, R. J., Nellen, V. C., & Owens, S. S. (2002). Teaching life skills through sport: Community-based programs to enhance adolescent development. In J. L. Van Raalte & B. W. Brewer (Eds.), *Exploring sport and exercise psychology (2nd ed.)* (pp. 269-288). Washington, D. C.: American Psychological

Association.

- Davis, C. (1992). Body image, dieting behaviors, and personality factors: A study of high-performance female athletes. *International Journal of Sport Psychology*, 23, 179-192.
- Davis, C., & Cowles, M. (1989). A comparison of weight and diet concerns and personality factors among female athletes and non-athletes. *Journal of Psychosomatic Research*, 33, 526-536.
- Davis, H. & Gergen, P. J. (1994). The weights and heights of Mexican-American adolescents: The accuracy of self-reports. *American Journal of Public Health*, 84, 459-462.
- Davison, K. K., & Birch, L. L. (2001). Weight status, parent reaction, and self-concept in 5-year-old girls. *Pediatrics*, 107, 46-53.
- Davison, K. K., Markey, C. N., & Birch, L. L. (2000). Etiology of body dissatisfaction and weight concerns among 5-year-old girls. *Appetite*, 35, 143-151.
- de Bruin, A.P., Oudejans, R. R. D., & Bakker, F. C. (2007). Dieting and body image in aesthetic sports: A comparison of Dutch female gymnasts and non-aesthetic sport participants. *Psychology of Sport and Exercise*, 8, 507-520.
- de Bruin, A. P., Woertman, L., Bakker, F. C., & Oudejans, R. R. D. (2009). Weight-related sport motives and girls' body image, weight control behaviors, and self-esteem. *Sex Roles*, 60, 628-641. doi: 10.1007/s11199-008-9562-8
- DiBartolo, P. M., & Shaffer, C. (2002). A comparison of female college athletes and nonathletes: Eating disorder symptomatology and psychological well-being. *Journal of Sport & Exercise Psychology*, 24, 33-41.
- Dishman, R. K. (1992). Physiological and psychological effects of overtraining. In K.D. Brownell, J. Rodin, & J.H. Wilmore (Eds.), *Eating, body weight and performance in athletes: Disorders of modern society* (pp. 248-272). Philadelphia: Lea & Febiger.
- Elfhag, K., & Linne, Y. (2005). Gender differences in associations of eating pathology between mothers and their adolescent offspring. *Obesity Research*, 13, 1070-1076.
- Engel, S. G., Johnson, C., Powers, P., Crosby, R., Wonderlich, S. Wittrock, D. et al. (2003). Predictors of disordered eating in a sample of elite Division I college athletes. *Eating Behaviors*, 4, 333-343. doi: 10.1016/S1471-0153(03)00031-X

- Etringer, B. D., Altmaier, E. M., & Bowers, W. (1989). An investigation into the cognitive functioning of bulimic women. *Journal of Counseling & Development, 68*, 216-219.
- Fonseca, H., Silva, A. M., Matos, M. G., Esteves, I., Costa, P., Guerra, A., et al. (2009). Validity of BMI based on self-reported weight and height in adolescents. *Acta Paediatrica, 99*, 83-88. doi: 10.1111/j.1651-2227.2009.01518.x
- Fulkerson, J. A., Keel, P. K., Leon, G. R., & Dorr, T. (1999). Eating-disordered behaviors and personality characteristics of high school athletes and nonathletes. *International Journal of Eating Disorders, 26*, 73-79.
- Furnham, A., Titman, P., & Sleeman, E. (1994). Perception of female body shapes as a function of exercise. *Journal of Social Behavior and Personality, 9*, 335-352.
- Gardner, R. M., Stark, K., Jackson, N. A., & Friedman, B. N. (1999). Development and validation of two new scales for assessment of body-image. *Perceptual and Motor Skills, 89*, 981-991.
- Garner, D. M. (2004). *Eating Disorders Inventory-3*. Lutz, FL: Psychological Assessment Resources.
- Garner, D. M., Olmsted, M. P., & Polivy, J. (1983). Development and validation of a multidimensional eating disorder inventory for anorexia nervosa and bulimia. *International Journal of Eating Disorders, 2*, 15-33.
- Garner, D. M., & Rosen, L. W. (1991). Eating disorders among athletes: Research and recommendations. *The Journal of Strength and Conditioning Research, 5*, 100-107.
- Gormally, J., Black, S., Daston, S., & Rardin, D. (1982). The assessment of binge eating severity among obese persons. *Addictive Behaviors, 7*, 47-55.
- Grogan, S. (2008). *Body image: Understanding body dissatisfaction in men, women, and children*. London: Routledge.
- Hall, M. A. (1990). How should we theorize gender in the context of sport? In M. A. Messner & D. F. Sabo (Eds.), *Sport, men, and the gender order: Critical feminist perspectives* (pp. 223-239). Champaign, IL: Human Kinetics.
- Hausenblaus, H. A., & Carron, A. V. (1999). Eating disorders indices and athletes: An integration. *Journal of Sport & Exercise Psychology, 21*, 230-258.

- Hedlund, S., Fichter, M. M., Quadflieg, N., & Brandl, C. (2003). Expressed emotion, family environment, and parental bonding in bulimia nervosa: A 6-year investigation. *Eating and Weight Disorders*, 8, 26-35.
- Hesse-Biber, S., Leavy, P., Quinn, C. E., & Zoino, J. (2006). The mass marketing of disordered eating and eating disorders: The social psychology of women, thinness and culture. *Women's Studies International Forum*, 29, 208-224.
doi: 10.1016/j.wsif.2006.03.007
- Hill, A. J., & Franklin, J. A. (1998). Mothers, daughters and dieting: Investigating the transmission of weight control. *British Journal of Clinical Psychology*, 37, 3-13.
- Hill, A. J., & Pallin, V. (1998). Dieting awareness and low self-worth: Related issues in 8-year-old girls. *International Journal of Eating Disorders*, 24, 405-413.
- Hill, A. J., Weaver, C., & Blundell, J. E. (1990). Dieting concerns of 10-year-old girls and their mothers. *British Journal of Clinical Psychology*, 29, 346-348.
- Humphrey, L. L. (1994). Family relationships. In K. A. Halmi (Eds.), *Psychobiology and treatment of anorexia nervosa and bulimia nervosa* (pp. 263-282). Washington, DC: American Psychiatric Press.
- Huon, G. F., Piira, T., Hayne, A., & Strong, K. G. (2002). Assessing body and eating peer-focused comparisons: The dieting peer competitiveness (DPC) scale. *European Eating Disorders Review*, 10, 428-446. doi: 10.1002/erv.439
- Jaccard, J., & Wan, C. K. (1996). *LISREL approaches to interaction effects in multiple regression. Series: Quantitative applications in social sciences*. Beverly Hills: Sage Publications.
- Jeffery, R., Finch, E. A., Linde, J. A., Simon, G. E., Ludman, E. J., Operskalski, B. H., et al. (2008). Does clinical depression affect the accuracy of self-reported height and weight in obese women? *Obesity*, 16, 473-475. doi: 10.1038/oby.2007.66
- Johnson, B. T. (1993). *DSTAT: Software for the meta-analytic review of research literatures*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Johnson, C., Powers, P. S., & Dick, R. (1999). Athletes and eating disorders: The national collegiate athletic association study. *International Journal of Eating Disorders*, 26, 176-188.
- Johnson, M. D. (1994). Disordered eating in active and athletic women. *Clinics in Sports Medicine*, 13, 355-369.

- Jöreskog, K. G., & Sörbom, D. (1996). *LISREL 8: User's reference guide*. Lincolnwood, IL: Scientific Software International, Inc.
- Keel, P. K., Fulkerson, J. A., & Leon, G. R. (1997). Disordered eating precursors in pre- and early adolescent girls and boys. *Journal of Youth and Adolescence*, *26*(1), 203-216.
- Killen, J. D., Taylor, C. B., Hayward, C., Haydel, K. F., Wilson, D. M., Hammer, L., et al. (1996). Weight concerns influence the development of eating disorders: A four year prospective study. *Journal of Consulting and Clinical Psychology*, *64*, 936-940.
- Lacey, J. H., & Price, C. (2004). Disturbed families, or families disturbed? *British Journal of Psychiatry*, *184*, 195-196.
- Lattimore, P. J., Wagner, H. L., & Gowers, S. (2000). Conflict avoidance in anorexia nervosa: An observational study of mothers and daughters. *European Eating Disorders Review*, *8*, 355-368.
- Leon, G. R., Fulkerson, J. A., Perry, C. L., & Cudeck, R. (1993). Personality and behavioral vulnerabilities associated with risk status for eating disorders in adolescent girls. *Journal of Abnormal Psychology*, *102*, 438-444.
- Martinson, M., Bratland-Sanda, S., Eriksson, A. K., & Sundgot-Borgen, J. (2010). Dieting to win or to be thin? A study of dieting and disordered eating among adolescent elite athletes and non-athlete controls. *British Journal of Sports Medicine*, *44*, 70-76.
- McCartney, K., Burchinal, M., & Bub, K. L. (2006). Best practices in quantitative Methods for developmentalists. *Monographs of the Society for Research in Child Development*, *71*, 1-145.
- McClelland, G. H., & Judd, C. M. (1993). Statistical difficulties of detecting interactions and moderator effects. *Psychological Bulletin*, *114*, 376-390.
- Meyer, C., McPartlan, L., Sines, J., & Waller, G. (2009). Accuracy of self-reported weight and height: Relationship with eating psychopathology among young women. *International Journal of Eating Disorders*, *42*, 379-381. doi: 10.1002/eat.20618
- Mintz, L. B., & Betz, N. E. (1988). Prevalence and correlates of eating disordered behaviors among undergraduate women. *Journal of Counseling Psychology*, *35*, 463-471.

- Mizes, J. S. (1988). Personality characteristics of bulimic and non-eating-disordered female controls: A cognitive behavioral perspective. *International Journal of Eating Disorders*, 7, 541-550.
- Moos, R. H., & Moos, B. S. (1986). *Family Environment Scale manual* (2nd ed.). Palo Alto: Consulting Psychologist Press.
- National Federation of High Schools (2010). *High school gymnastics*. Retrieved from <http://www.gymnasticsfunandfitness.com/page6.php>
- Okon, D. M., Greene, A. L., & Smith, J. E. (2003). Family interactions predict intraindividual symptom variation for adolescents with bulimia. *International Journal of Eating Disorders*, 34, 450-457. doi: 10.1002/eat.10215
- Ozer, E. M., & Bandura, A. (1990). Mechanisms governing empowerment effects: A self-efficacy analysis. *Journal of Personality and Social Psychology*, 58, 472-486.
- Pargman, D. (1998). *Understanding sport behavior*. Upper Saddle River, New Jersey: Prentice Hall.
- Pate, R. R., Barnes, C., & Miller, W. (1985). A physiological comparison of performance-matched female and male distance runners. *Research Quarterly for Exercise and Sport*, 56, 245-250.
- Patel, P., Wheatcroft, R., Park, R. J., & Stein, A. (2002). The children of mothers with eating disorders. *Clinical Child and Family Psychology Review*, 5, 1-19.
- Pender, N. J., Bar-Or, O., Wilk, B., & Mitchell, S. (2002). Self-efficacy and perceived exertion of girls during exercise. *Nursing Research*, 51, 56-91.
- Petrie, T. A. (1993). Disordered eating in female collegiate gymnasts: Prevalence and personality/attitudinal correlates. *Journal of Sport & Exercise Psychology*, 15, 424-436.
- Pike, K. M., & Rodin, J. (1991). Mothers, daughters, and disordered eating. *Journal of Abnormal Psychology*, 100, 198-204.
- Powers, P. S., & Johnson, C. (1996). Small victories: Prevention of eating disorders among athletes. *Eating Disorders: The Journal of Treatment and Prevention*, 4, 364-367.
- Raymond, M. R., & Roberts, D. M. (1987). A comparison of methods for treating

- incomplete data in selection research. *Educational and Psychological Measurement*, 47, 13-26. doi: 10.1177/0013164487471002
- Rosen, L. W., & Hough, D. O. (1988). Pathogenic weight-control behaviors of female college gymnasts. *Physician and Sportsmedicine*, 16, 141-144.
- Rosen, L. W., McKeag, D. B., Hough, D. O., & Curley, V. (1986). Pathogenic weight-control behavior in female athletes. *The Physician and Sports Medicine*, 14, 79-86.
- Rowa, K., Kerig, P. K., & Geller, J. (2001). The family and anorexia nervosa: Examining parent-child boundary problems. *European Eating Disorders Review*, 6, 97-114.
- Rupp, G. L., & Jurkovic, G. J. (1996). Familial and individual perspective-taking processes in adolescent females with bulimic symptomatology. *American Journal of Family Therapy*, 24, 75-82.
- Russell, K. M. (2004). On versus off the pitch: The transiency of body satisfaction among female rugby players, cricketers, and netballers. *Sex Roles*, 51, 561-574.
- Ruther, N. M., & Richman, C. L. (1993). The relationship between mothers' eating restraint and their children's attitudes and behaviors. *Bulletin of the Psychonomic Society*, 31, 217-220.
- Sacks, M. H. (1990). Psychiatry and sports. *Annals of Sports Medicine*, 5, 47-52.
- Salbach, H., Klinkowski, N., Pfeiffer, E., Lehmkuhl, U., & Korte, A. (2007). Body image and attitudinal aspects of eating disorders in rhythmic gymnasts. *Psychopathology*, 40, 388-393.
- Schneider, J. A., O'Leary, A., & Agras, W. S. (1987). The role of perceived self-efficacy in recovery from bulimia: a preliminary examination. *Behavior Research and Therapy*, 25, 429-432.
- Shapiro, J. R., & Anderson, D. A. (2003). The effects of restraint, gender, and body mass index on accuracy of self-reported weight. *International Journal of Eating Disorders*, 34, 177-180. doi: 10.1002/eat.10166
- Sherwood, N. E., Beech, B. M., Klesges, L. M., Story, M., Killen, J., McDonald, T., et al., (2004). Measurement of weight concern and dieting measures in 8-10-year old African American girls from GEMS pilot studies. *Preventative Medicine*, 38, S50-S29. doi: 10.1016/j.ypmed.2003.12.031

- Sherwood, N. E., Neumark-Sztainer, D., Story, M., Beuhring, T., & Resnick, M. D. (2002). Weight-related sports involvement in girls: Who is at risk for disordered eating? *American Journal of Health Promotion, 16*, 341-344.
- Smith, R. E., & Smoll, F. L. (2002). Youth sports as a behavior setting for psychosocial interventions. In J. L. Van Raalte & B. W. Brewer (Eds.), *Exploring sport and exercise psychology* (2nd ed.) (pp. 269-288). Washington, D. C.: American Psychological Association.
- Smolak, L., Murnen, S. K., & Ruble, A. E. (2000). Female athletes and eating problems: A meta-analysis. *International Journal of Eating Disorders, 27*, 371-380.
- Staples, L. H. (1990). Powerful ideas about empowerment. *Administration in Social Work, 14*, 29-42.
- Steinberg, A. B., & Phares, V. (2001). Family functioning, body image, and eating disturbances. In J. K. Thompson and L. Smolak (Eds.), *Body image, eating disorders, and obesity in youth: Assessment, prevention, and treatment* (pp. 127-147). Washington, DC: American Psychological Association.
- Stevens, C., & Tiggemann, M. (1998). Women's body figure preferences across the lifespan. *Journal of Genetic Psychology, 159*, 94-102.
- Stice, E. (2001). Risk factors for eating pathology: Recent advances and future directions. In R. H. Striegel-Moore and L. Smolak (Eds.), *Eating disorders: Innovative directions in research and practice*. Washington, D.C.: American Psychological Association.
- Stice, E. (2002). Risk and maintenance factors for eating pathology: A meta-analytic review. *Psychological Bulletin, 128*, 825-848.
- Stice, E., & Agras, W. S. (1998). Predicting onset and cessation of bulimic behaviors during adolescence: A longitudinal grouping analysis. *Behavior Therapy, 29*, 257-276.
- Stice, E., Nemeroff, C., & Shaw, H. (1996). A test of the dual pathway model of bulimia nervosa: Evidence for restrained-eating and affect-regulation mechanisms. *Journal of Social and Clinical Psychology, 15*, 340-363.
- Stice, E., Schupak-Neuberg, E., Shaw, H. E., & Stein, R. I. (1994). Relation of media exposure to eating disorder symptomatology: An examination of mediating mechanisms. *Journal of Abnormal Psychology, 103*, 836-840.
- Stoutjesdyk, D., & Jevne, R. (1993). Eating disorders among high performance athletes.

Journal of Youth and Adolescence, 22, 271-281.

- Striegel-Moore, R. H., Silberstein, L. R., Frensch, P., & Rodin, J. (1989). A prospective study of disordered eating among college students. *International Journal of Eating Disorders*, 8, 499-509.
- Streigel-Moore, R. H., Silberstein, L. R., & Rodin, J. (1986). Toward and understanding of risk factors for bulimia. *American Psychologist*, 41, 246-263.
- Strober, M., Lampert, C., Morrell, W., Burroughs, J., & Jacobs, C (1990). A controlled family study of anorexia nervosa: Evidence of familial aggregation and lack of shared transmission with affective disorders. *International Journal of Eating Disorders*, 9, 239-253.
- Stunkard, A. J., Sorensen, T., & Schulsinger, F. (1983). Use of the Danish adoption register for the study of obesity and thinness. In S. Kety, L. P. Rowland, R. L. Sidman, & S. W. Matthysse (Eds.), *The genetics of neurological and psychological disorders* (pp. 115-120). New York: Raven.
- Sundgot-Borgen, J. (1994). Eating disorders and female athletes. *Sports Medicine*, 17, 176-188.
- Sundgot-Borgen, J., & Torstveit, M. K. (2004). Prevalence of eating disorders in elite athletes is higher than in the general population. *Clinical Journal of Sport Medicine*, 14, 25-32.
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed). Boston: Pearson.
- Tafarodi, R. W., & Swann, W. B. (1996). Self-liking and self-competence as dimensions of global self-esteem: Initial validation of a measure. *Journal of Personality Assessment*, 65, 322-342.
- Taub, D. E., & Blinde, E. M. (1992). Eating disorders among adolescent female athletes: Influence of athletic participation and sport team membership. *Adolescence*, 27, 833-848.
- Taub, D. E., & Blinde, E. M. (1994). Disordered eating and weight control among adolescent female athletes and performance squad members. *Journal of Adolescent Research*, 9, 483-497.
- Thompson, J. K., & Altabe, M. N. (1991). Psychometric qualities of the Figure Rating Scale. *International Journal of Eating Disorders*, 10, 615-619.
- Thompson, M. A., & Gray, J. J. (1995). Development and validation of a new body-

image assessment scale. *Journal of Personality Assessment*, *64*, 258-269.

- Thompson, R. A., & Sherman, R. T. (1993). *Helping athletes with eating disorders*. Champaign, IL: Human Kinetic Publishers.
- Thompson, R. A., & Sherman, R. T. (1999a). Athletes, athletic performance, and eating disorders: Healthier alternatives. *Journal of Social Issues*, *55*, 317-337.
- Thompson, R. A., & Sherman, R. T. (1999b). "Good athlete" traits and characteristics of anorexia nervosa: Are they similar? *Eating Disorders: Journal of Treatment and Prevention*, *7*, 181-190.
- Thompson, J. K., & van den Berg, P. (2002). Measuring body image attitudes among adolescents and adults. In T. F. Cash & T. Pruzinsky, *Body image: A handbook of theory, research, and clinical practice* (pp. 142-154). New York: The Guilford Press.
- Tiggemann, M. (2004). Body image across the adult life span: Stability and change. *Body Image*, *1*, 29-41. doi: 10.1016/S1740-1445(03)00002-0
- Tiggemann, M., & Stevens, C. (1999). Weight concern across the life-span: Relationship to self-esteem and feminist identity. *International Journal of Eating Disorders*, *26*, 103-106.
- Toray, T., & Cooley, E. (1997). Weight fluctuation, bulimic symptoms, and self-efficacy for control of eating. *The Journal of Psychology*, *131*, 383-392.
- Tseng, M., Fang, D., Lee, M-B, Chie, W-C, Liu, J-P, & Chen, W. J. (2007). Two-phase survey of eating disorders in gifted dance and non-dance high-school students in Taiwan. *Psychological Medicine*, *37*, 1085-1096. doi: 10.1017/S0033291707000323
- Waternaux, C. M. (1976). Asymptotic distribution of the sample roots for a nonnormal population. *Biometrika*, *63*, 639-645.
- Wertheim, E. H., Martin, G., Prior, M., Sanson, A., & Smart, D. (2002). Parent influences in the transmission of eating and weight related values and behaviors. *Eating Disorders*, *10*, 321- 334. doi: 10.1080/10640260290081722
- Whitbourne, S. K., & Skultety, K. M. (2002). Body image development: Adulthood and aging. In T. F. Cash & T. Pruzinsky (Eds.), *Body image* (pp. 83-90). New York: Guilford Press.
- Wilkins, J. A., Boland, F. J., & Albinson, J. (1991). A comparison of male and female

university athletes and nonathletes on eating disorder indices: Are athletes protected? *Journal of Sport Behavior*, 14, 129-143.

- Williamson, D. A., Netemeyer, R. G., Jackman, L. P., Anderson, D. A., Funsch, C. L., & Rabalais, J. Y. (1995). Structural equation modeling of risk factors for the development of eating disorder symptoms in female athletes. *International Journal of Eating Disorders*, 17, 387-393.
- Wilmore, J. H. (1992). Body weight standards and athletic performance. In K. D. Brownell, J. Rodin, & J. H. Wilmore (Eds.), *Eating, body weight and performance in athletes: Disorders of modern society* (pp. 315-329). Philadelphia: Lea & Febiger.
- Wilson, G. T., & Eldredge, K. L. (1992). Pathology and development of eating disorders: Implications for athletes. In Brownell, K. D., Rodin, J., & Wilmore, J. H. (Eds.), *Eating, body weight, and performance in athletes: Disorders of modern society*. Philadelphia: Lea & Febiger.
- Wilson, G. T., & Fairburn, C. G. (1993). Cognitive treatments for eating disorders. *Journal of Consulting and Clinical Psychology*, 61, 261-269.
- Wilson, G. T., Fairburn, C. G., Agras, W. S., Walsh, B. T., & Kraemer, H. (2002). Cognitive-behavioral therapy for bulimia nervosa: Time course and mechanisms of change. *Journal of Consulting and Clinical Psychology*, 70, 267-274.
doi: 10.1037//0022-006X.70.2.267
- Yates, A. (1991). *Compulsive exercise and eating disorders*. (pp. 1-259). New York: Brunner/Mazel.
- Ziegler, P. J., Khoo, C. S., Sherr, B., Nelson, J. A., Larson, W. M., & Drewnowski, A. (1998). Body image and dieting behaviors among elite figure skaters. *International Journal of Eating Disorders*, 24, 421-427.
- Zucker, N. L., Womble, L. G., Williamson, D. A., & Perrin, L. A. (1999). Protective factors for eating disorders in female college athletes. *Eating Disorders*, 7, 207-218.

VITA

Trisha Karr grew up in Charles City, Iowa. After finishing high school, she attended Luther College in Decorah, Iowa, and completed a double-major in Psychology and Fine Art in 2002. Shortly thereafter she earned her MA degree in Clinical Psychology at Roosevelt University Chicago. During her Master's program, Trisha developed an interest in research and statistical analyses, and thus, decided to pursue a doctoral degree and to enroll in the Developmental Psychology program at Loyola University Chicago in 2005.

While at Loyola, Trisha gained knowledge in research methodology, statistical analyses, and manuscript writing. Through various projects and presentations, her research interests narrowed to include factors related to body image dissatisfaction among diverse populations, such as Muslim women and high school female athletes. She also became interested in advanced statistical analyses for the investigation of complex research questions. Recently, Trisha earned a research position at the Neuropsychiatric Research Institute in Fargo, North Dakota, where she assists with research projects for the examination of factors related to the development of eating disorders.