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Sport Factors, Body Image, and Eating Behaviors in College Student Athletes

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**SPORT FACTORS, BODY IMAGE, AND EATING BEHAVIORS IN COLLEGE
STUDENT ATHLETES**

PROFESSIONAL DISSERTATION

SUBMITTED TO THE FACULTY

OF

**THE SCHOOL OF PROFESSIONAL PSYCHOLOGY
WRIGHT STATE UNIVERSITY**

BY

KELSEY M. MORAN, PSY.M.

**IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE
OF
DOCTOR OF PSYCHOLOGY**

Dayton, Ohio

July, 2019

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**WRIGHT STATE UNIVERSITY
SCHOOL OF PROFESSIONAL PSYCHOLOGY**

June 21, 2018

I HEREBY RECOMMEND THAT THE DISSERTATION PREPARED UNDER MY SUPERVISION BY **KELSEY M. MORAN, PSY.M.** ENTITLED **SPORT FACTORS, BODY IMAGE, AND EATING BEHAVIORS IN COLLEGE STUDENT ATHLETES** BE ACCEPTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PSYCHOLOGY.

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Abstract

Eating disorders are a common psychological disorder with athletes being at a higher risk. The rates of clinical and subclinical (i.e. subthreshold, partial diagnosis, or other specified feeding and eating disorder in DSM-5). There are several sport-specific risk factors that increase the prevalence rate of clinical and subclinical eating disorders and body image concerns. Several eating disorder development models exist for the general population, but one specific sport specific factor: coaches, has been left out, despite their significant impact on athletes. This study examined the relationship between coaching behaviors, eating disorder symptomology, and body image concerns. Potential moderators of teammate pressures, self-esteem, and performance pressures were also examined. 160 NCAA Division 1 student-athletes completed the survey. Results demonstrated a significant relationship between coaching behavior and eating disorder symptomology and body dissatisfaction. Additionally, teammate pressures were found to moderate the relationship between coaching behaviors and eating disorder symptomology. Clinical implications, limitations, and future research directions were discussed.

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Dedication

My time as a collegiate student-athlete is something I reflect back on constantly. Athletics shaped who I am as a person, and my time as a Division 1 student-athlete is something that I cherish. I was fortunate to have a positive experience, filled with fantastic coaches and teammates, but I realize that is not the case for all. I would like to dedicate this dissertation to the student-athletes, and give back to collegiate athletics, in hopes that my passion for collegiate athletics may contribute to positive changes that need to happen in sports.

Chapter I

An Investigation into the Relationship Between Sport Factors, Body Image, and Eating Behaviors

Eating disorders are among the most common psychological disorders experienced by young women (Fairburn, Cooper, Doll, Norman, & O'Connor, 2000; Lewinsohn, Striegel-Moore, & Seeley, 2000). They are characterized by a persistent disturbance of eating or eating-related behavior that results in the altered consumption or absorption of food and that significantly impairs physical health or psychosocial functioning (American Psychiatric Association, 2013).

Anorexia nervosa, bulimia nervosa, and binge-eating disorder are the most prevalent eating disorders in adults (APA, 2013). Anorexia nervosa is characterized by a restriction of energy intake, leading to a significantly low body weight, an intense fear of gaining weight, and a disturbance in the way one's body weight or shape is experienced. Bulimia nervosa is characterized by recurrent episodes of binge eating, accompanied by recurrent inappropriate compensatory behaviors, and one's self-evaluation being unduly influenced by body shape and weight. Binge-eating disorder is characterized by recurrent episodes of binge eating, which is also associated with eating rapidly, feeling uncomfortably full, and feeling disgusted with oneself or guilty afterward. When the presentation of symptoms characteristic of an eating disorder does not meet full criteria for any of the listed eating disorders it may be classified as "other specific feeding or

eating disorder” (i.e. OSFED) (APA, 2013). This diagnosis may also be “subclinical,” “subthreshold,” or a “partial diagnosis” of one of the specific eating disorders.

The current *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5) notes that 0.4% of young females suffer from anorexia nervosa, 1-1.5% from bulimia nervosa, and 1.6% from binge-eating disorder (APA, 2013). Other studies have found rates as high as 2% for anorexia nervosa and 4.6% for bulimia nervosa (Stice, Marti, Shaw, & Jaconis, 2009). Although prevalence rates of eating disorders are not as high as other mental illnesses, research has demonstrated that when considering partial diagnoses, the rates of some forms of eating pathology may actually be much higher than large-scale formal prevalence/incidence studies indicate. Several studies reported partial anorexia nervosa rates ranging from 2.4 to 3.7%, and bulimia nervosa rates ranging from 2.5 to 6.0% (Stice et al., 2009). In a study of 496 females, when considering subclinical and full diagnoses of eating disorders, 12% were found to have met criteria for one or more eating disorders (Stice et al., 2009). Additional research has found that approximately 10% or more of young women report symptoms of eating disorders but not enough symptoms or severity to be clinically diagnosed (Mintz, O’Halloran, Mulholland, & Schneider, 1997). These young women are considered to be subclinical (i.e., a diagnostic criterion is absent, or all features are present but not at sufficient frequency). Subclinical eating disorders are associated with functional impairment, distress, suicide attempts, medical complications, and increased risk for current and future psychiatric and medical problems (Stice et al., 2009; Swanson, Crow, Le Grange, Swendsen, & Merikangas, 2011). Given this prevalence of eating disorders and

disordered eating, it is important to understand what specific factors cause, maintain, and increase the risk for eating disorders.

There are several other antecedents to an eating disorder, such as internalization of the thin ideal, pressure and teasing from family and peers, perfectionism, improper dieting behaviors, and body dissatisfaction (Kluck, 2006; Stice, 2001a; Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999; Thompson & Stice, 2001). Research indicates that body dissatisfaction is the greatest risk factor for development and maintenance of eating disorders at both clinical and subclinical levels (Cohen & Petrie, 2005; Stice & Shaw, 2002). A meta-analysis conducted by Stice and Shaw (2002) found that body dissatisfaction increased disordered eating through elevated dieting and negative affect. Furthermore, body dissatisfaction was found to increase the pressure to be thin from peers or family, the media, or an internalization of a thin-ideal, regardless of whether the pressure was real or perceived. These sociocultural components comprise the Sociocultural Model which highlights the sociocultural ideals regarding beauty and the drive for thinness (Stice, 1994; Thompson & Heinberg, 1999). Researchers have used the interaction of these factors to help understand eating disorder development, which is known as the Dual Pathway Model (Stice, 1994; Stice & Agras, 1998; Stice, 2001a; Stice & Shaw, 2002). This model integrated previously established models of eating disorders and posits that the internalization of the thin ideal leads to body image dissatisfaction, which then leads to dieting and eating disorder symptoms (Stice, 2001a; Stice, 2001b; Striegel-Moore, Silberstein, and Rodin, 1986). The individual factors of the Dual Pathway Model – peers, family, and the media – have been repeatedly empirically validated in the literature (Halliwell & Harvey, 2006; Ouwens, van Strien, Leeuwe, &

van der Staak, 2009; Stice, 2001a; Stice, Pressnell, & Spangler, 2002). The model proposes that these factors transmit sociocultural pressures to fit an unattainable cultural ideal of thinness and beauty (Stice, 1994). The pressures may take many forms including glorification of ultra-slender models, direct messages that one should lose weight, or indirect pressures to conform to the current thin-ideal embraced by Western culture (Stice & Shaw, 2002). The constant communication of these pressures results in an internalization of the ideals (Stice, 1994).

The internalization of the thin-ideal refers to the extent to which an individual cognitively “buys into” socially defined ideals of beauty and engages in behaviors to conform to these ideals (Thompson & Heinberg, 1999). These internalized ideals, when adopted as the standard for beauty can lead to a number of risk factors for eating disorders. First, body dissatisfaction and dietary restraint, which have been linked to increased risk of eating disorders (Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999; Stice, 2001a; Thompson & Stice, 2001). Individuals with body dissatisfaction may engage in dieting because of their belief that it is an effective route for weight loss (Stice, 2001a). Second, body dissatisfaction stemming from internalization of the thin-ideal has also been found to be predictive of negative affect, and increases negative affect, believed to be caused by negative messages from one’s social environment (Stice, 2001a). Even more specifically, data has demonstrated that body dissatisfaction mediates the relationship between the internalization of the thin-deal and the growth of negative affect (Stice, 2001a).

In addition to the sociocultural factors, there are also specific contexts that present a common and heightened focus on one’s body size, shape, and physique. Some

examples of such contexts are family environments (Davis, Shuster, Blackmore, & Fox, 2004) and those in elite aesthetic arts (e.g., ballet). These contexts contribute to increased levels of body dissatisfaction which puts participants in these contexts at risk for developing eating concerns.

Sport is another important shaping context and the one that is the primary focus of this dissertation. Athletes experience two primary types of pressures that increase their risk of developing disordered eating (Chatterton & Petrie, 2013). They are exposed to general societal messages and sport-specific pressures about the size, shape, and functionality of their bodies (Chatterton & Petrie, 2013). This may be challenging for athletes as the nature of their sport might create demands counter to the messages and pressures related to body expectations in Western culture (Beckner & Record, 2016). The combination of societal pressures and athletic demand may lead to an even greater drive for thinness (Beckner & Record, 2016; Chatterton & Petrie, 2013).

Chapter II

Literature Review

Prevalence in Athletics

Athletes are at a heightened risk for the development of body image concerns and eating disorders (de Bruin, 2017; Greenleaf, Petrie, Reel, & Carter, 2010). Athletes not only face typical societal pressures from Western culture but their sport participation places them in a context for increased focus from self, teammates, and coaches on their bodies' appearance and performance (Greenleaf et al., 2010, Thompson & Sherman, 1993). Athletes are subject to body comparisons and body image issues both within and outside of their sports (Franzoi & Klaiber, 2007). There is a drive for athletes to have their bodies at an optimum level to perform and they must also deal with the pressures of society. The sport environment introduces pressure from coaches, comparisons with teammates, performance demands, revealing uniforms, and judging criteria which may lead to heightened body and weight awareness (Greenleaf, 2002; Petrie & Rogers, 2001; Petrie & Sherman, 1999; Reel & Gill, 1996; Ryujin, Breaux, & Marks, 1999; Sundgot-Borgen, 1993; Swoap & Murphy, 1995; Thompson & Sherman, 1999a). Additionally, there are several traits of a "good athlete" (i.e. characteristics that may contribute to enhanced performance) that are associated with traits of disordered eating, which can make it difficult to identify at-risk athletes, and may also facilitate development of disordered eating (Thompson & Sherman, 1999b).

The prevalence of female athletes who meet full eating disorder criteria is

estimated to be as high as 8% (Sundgot-Borgen & Torstveit, 2004). However, the rate of subclinical eating disorders in female athletes range from 14% to 19% (Carter & Rudd, 2005; Sanford-Martens et al., 2005). The prevalence of male athletes who meet full eating disorder criteria is relatively low at 1.1%, which may be attributed to the fact that most male athletes are focused on gaining weight rather than losing weight (Chatterton & Petrie, 2013). However, between 16.6% and 19.2% of male athletes have been found to have symptoms that were at the subclinical level (Petrie et al., 2009; Petrie et al., 2008). Despite low male prevalence rates, they engage in certain weight control behaviors at a much higher frequency often focused on eating, exercising, and gaining muscle mass to gain or maintain a muscular-but-lean body build (Petrie et al., 2008).

Research has found higher levels of clinical and subclinical eating disorders in athletes (Sundgot-Borgen, 1993; Sundgot-Borgen & Torstveit, 2004; Bratland-Sanda, Sundgot-Borgen, 2013). Sundgot-Borgen and Torstveit (2004) found that 8.4% of athletes met the criteria for subclinical eating disorders compared to 2.9% of the non-athletes. Additionally, 5.1% of athletes met criteria for clinical eating disorders whereas only 1.7% of the non-athletes met criteria. Bratland-Sanda and Sundgot-Borgen (2013) found the spectrum of disordered eating to eating disorder prevalence varied from 0 to 19% in male athletes, and from 6 to 45% in female athletes. The difference in prevalence rates between athletes and non-athletes can be explained by multiple factors, which has led to the development of a new sociocultural model.

Theory of Athletic Eating Disorder Development

A model has been developed to understand the influence of different factors on the development of eating disorders. Stice (1994) proposed that internalization of

sociocultural pressures can lead to eating disorders, including the thin-ideal body, focus on appearance, and the importance of appearance for success. While many of the pressures from Stice's model are prevalent within the context of athletics, research has shown that athletes experience unique sport pressures regarding weight, body shape, and performance, thus a model explaining the risk factors and development of eating disorders for non-athletes may not be representative of the athlete experience (Petrie & Greenleaf, 2007).

Petrie and Greenleaf (2007) developed a model to address the gap in theoretical understanding of eating disorders in athletes. This model relied on existing sociocultural framework and integrated findings comparing athletes to non-athletes (Jacobi, Hayward, de Zwaan, Kraemer, & Agras, 2004; Stice, 1994; Stice, 2001; Stice, 2002). This model by Petrie and Greenleaf (2007) suggests that both general factors and sport-specific factors influence the development of eating disorders. Specifically, societal pressures and sport pressures lead to the internalization of the thin-ideal, which then leads to body dissatisfaction, negative affect, and restricted eating, which ultimately leads to disordered eating (Petrie and Greenleaf, 2007). Their model also notes several moderators throughout various points in the model, including self-esteem, self-concept, perfectionism, modeled behaviors, and social supports. While Petrie and Greenleaf's model addresses important sport pressures, there are additional unique, and highly influential, characteristics of the sport context that have not been captured collectively in research models.

Coaching Behavior

While the current models of eating disorder development have addressed the

influence of society and family, the role of coaches has not been integrated. Athletes spend more time with their coaches and teammates than anyone else both of which have been found to be extremely influential on self-perceptions (Kerr, Berman, & De Souza, 2006; Turman, 2008; Weinstein, Smith, & Wiesenthal, 1995). Coaches, in particular, impact athletes' performances, self-confidence, motivation, perceptions of competence (Amorose & Horn, 2000; Horn, 1985; Sinclair & Vealey, 1989; Turman, 2008).

In regard to disordered eating, coaches can play a significant role. Currently, there are no regulations mandated by the National Collegiate Athletic Association (NCAA) as to how involved a college coach may be with nutrition and/or dieting of a student-athlete. Previous research has shown that a coach can positive or negatively influence an athlete's body image and has been linked to student-athletes to engaging in disordered eating (Biesecker & Martz, 1999; Heffner et al., 2003; Thompson, 1987; Thompson & Sherman, 1993). Discussion of weight is common in high level sports (i.e. collegiate and professional), and the manner in which the coach talks about weight, body composition, and dieting can greatly impact the behaviors adopted by athletes (Heffner et al., 2003). Weight related comments can be precipitating factors (i.e. circumstances that can trigger disordered eating) and perpetuating factors (i.e. maintaining factors that keep the eating behaviors disordered) (Sundgot-Borgen, 1994; Bratland-Sanda, Sundgot-Borgen, 2013). Athletes have stated that their coaches' communication about their body composition were key factor in their body dissatisfaction and eating behaviors (Beckner & Record, 2016; Berry & Howe, 2000; Dantas et al., 2018). Female athletes whose coaches make critical and derogatory comments about their body, tell them to lose weight, or indicate that a lower weight and/or body fat reduction could improve their performance are more

likely to experience body dissatisfaction and disordered eating, to use pathogenic weight loss methods, and to have feelings of guilt, shame, and anxiety (Arthur-Cameselle & Quatromoni, 2010; Berry & Howe, 2000; Biesecker & Martz, 1999; Kerr, et al., 2006; Muscat & Long, 2008; Rosen & Hough, 1988; Thompson & Sherman, 1999a). Specifically, when Kerr et al. (2006) surveyed gymnasts, 12% reported that a coach had directly instructed them to lose weight and 44% reported they heard their coach make negative comments about gymnasts' bodies (Kerr et al, 2006). When a gymnast had heard or received a negative comment about her body she was significantly more likely to believe that she needed to lose weight as compared to those who had never received/heard a negative body comment (Kerr et al., 2006). Among the gymnasts who had received or heard negative comments about their bodies, 13% reported that they have an eating disorder and 29% reported that they previously had an eating disorder (Kerr et al., 2006). An athletes' perception that their coach believes they need to lose weight can increase weight pressures and the risk of disordered eating (de Bruin et al, 2007; Harris & Greco, 1990; Thompson & Sherman, 1993). These messages can quickly become ingrained in an athlete's mind and result in unhealthy weight control methods (Kerr et al., 2006). Messages from coaches, while influential in the development of disordered eating, are only one of the sport specific influences.

Teammate Social Influence

The acquisition of disordered eating behaviors can be attributed to modeling and social conformity, especially for individuals who are members of a cohesive unit such as teammates on a sports team (Bratland-Sanda, Sundgot-Borgen, 2013; Crandall, 1988; Kandel, 1980; Stice, 1998; Stice, 2002). Within the team setting, social reinforcement

and imitation can influence behavior (Kandel, 1980; Stice, 1998). Stice (1998) defines social reinforcement for eating disorders as comments or actions of others that serve to support and perpetuate the thin ideal body image for women such as criticism regarding weight and encouragement to diet. Modeling occurs when individuals copy behaviors they see others perform. Within an athletic team, an individual may view respected others engaging in behaviors such as binge eating or expressing certain messages in regard to body image and subsequently be positively perceived by the group. Frequent comments about weight and diet strengthen the relationship between body dissatisfaction and eating pathology (Forney et al., 2012). In fact, Reel et al. (2010) found that teammates noticing weight gain represented the strongest weight pressure for female athletes. Additionally, Filaire, Rouveix, Pannafieux, and Ferrand (2007) found that the main source of pressure regarding body image was from their teammates. It is this exposure and positive social reinforcement through the team that may cause an athlete may adopt pathological behaviors from their teammates (Crandall, 1988; Stice, 1998; Stice, 2002). In a study by de Bruin et al., (2007) it was noted by an athlete that teammates ate the same amount or preferably less than their teammates. These perceived pressures from peers are considered important social factors in the development of disordered eating and can become deeply internalized.

Self-Esteem

When messages from coaches and teammates become internalized by an athlete it can impact self-esteem (Petrie, Greenleaf, Reel, and Carter, 2009). A high self-esteem (i.e., personal judgment of one's overall worth) has been linked to less internalization of unrealistic societal ideals regarding beauty, decreased likelihood to display negative

emotions such as anxiety and depression, increased ability to cope with life stressors effectively, and decreased loneliness (Heatherton & Baumeister, 1991; Rosenberg, 1965). Athletes experiencing eating disorders reported an absence of the previously-mentioned factors when discussing the onset of their eating disorders (Arthur-Cameselle & Quatromoni, 2010). Research shows that 76% of the athletes identified low self-esteem specifically as a factor that contributed to the onset of their eating disorders. Low self-esteem was also reported in the context of body image dissatisfaction and negative mood-states such as depression and loneliness in 82% of the athletes (Arthur-Cameselle & Quatromoni, 2010).

Perfectionism in Performance

In addition to low self-esteem, disappointment in sport performance was reported by 41% of athletes as a factor contributing to the onset of their eating disorder (Arthur-Cameselle & Quatromoni, 2010). Specifically, disappointment with sport performance contributed to feelings of depression or stress which often led to restricting food intake in an effort to lose weight and improve performance. In some cases, excess weight can negatively impact an athlete's performance and as a result many coaches recommend weight and/or body fat reduction for an athlete when performance is not at the expected level (Thompson & Sherman, 1999a). While a reduction in body weight or body fat may improve performance for some athletes, it remains a question if weight loss is effective in this respect in the majority of cases and furthermore places athletes at an increased risk for developing an eating disorder (Thompson & Sherman, 1999a).

Purpose of the Current Study

The primary purpose of this study is to examine the relationship between coaching behavior (i.e. direct and indirect messages regarding an athlete's body, weight, appearance) and the presence of disordered eating and body image concerns in active athletes. Sociocultural models (Jacobi, Hayward, de Zwaan, Kraemer, & Agras, 2004; Stice, 1994; Stice, 2001; Stice, 2002) have been integrated with unique sport characteristics in an attempt to address the development of eating disorders in sport (Petrie & Greenleaf, 2007). However, these models do not address the specific influences of coaches' behavior on the development of eating disorders and body image concerns. Based on past research (Arthur-Cameselle & Quatromoni, 2010; Berry & Howe, 2000; Biesecker & Martz, 1999; Kerr, et al., 2006; Muscat & Long, 2008; Rosen & Hough, 1988; Thompson & Sherman, 1999a), we expect a relationship between coaching behavior, body image concerns, and eating disorders/disordered eating. The second purpose of this study is to examine the influence of teammate social support, self-esteem, and perfectionism in performance, and to investigate if these factors moderate the relationship between coaching behavior, eating disorders and body image concerns.

Hypotheses

This study proposes the following hypotheses:

Hypothesis #1: Negative messages and pressures from a coach (i.e. regarding an athlete's body, weight, and/or appearance) will be positively related to eating disorder symptomology and body image concerns in athletes.

Hypothesis #2: Teammate social influence will moderate the relationship between coaching behavior, eating disorder symptomology, and body image concerns in athletes.

Hypothesis #3: Self-esteem will moderate the relationship between coaching behavior, eating disorder symptomology, and body image concerns in athletes.

Hypothesis #4: Perceived performance will moderate the relationship between coaching behavior, eating disorder symptomology, and body image concerns in athletes.

Chapter III

Method

Participants

Varsity student-athletes at four Division 1 NCAA Universities were recruited as participants in this study. While the purpose of the study is focused on all athletes, student-athletes were chosen as the participants for access purposes. The following inclusion criteria were used: enrolled full-time at a Division 1 NCAA institution and a member of a varsity athletic team at the institution. Both male and female genders and all sports were included as participants. The only exclusion criterion was if a student-athlete was under the age of 18. Two hundred and twenty-nine responses were collected in the online survey. The data set was inspected for missing values, problematic data and random responses. Sixty-nine responses were removed after this analysis, leaving 160 (114 female and 46 male) responses for the final data analysis. The average age of participants was 20 years. One hundred and forty-six participants identified as white, seven as black, three as Hispanic, two as Asian, and two as biracial. Thirty-seven participants were freshman, 37 sophomores, 42 juniors, 39 seniors, three 5th year seniors, and two graduate students.

Materials

A multi-paged survey was administered via an online link to assess the relationship between a coach's behaviors and the presence of eating disorder

symptomology, and body image concerns in student-athletes. The athlete's self-esteem, perceived performance, and influence garnered from teammates was also measured.

Demographics. The demographic information obtained included gender, sport, years of sport participation, race, age, and year at university.

Eating disorder symptomology. Eating Attitudes Test-26 (EAT-26; Garner, Olmstead, Bohr, & Garfinkel, 1982) is a refinement of the original EAT-40 that measures disordered eating based on thoughts and values using a 6-point Likert scale, ranging from 1, *never*, to 6, *always*. The EAT-26 correlates highly with the EAT-40 ($r = 0.98$), has a reliability of 0.90 and a validity of 0.98. Cronbach's alpha for the 26 items was .88.

Body image concerns. Body Assessment Satisfaction Scale (BASS) is a subscale of the Multidimensional Body-Self Relations Questionnaire (MBSRQ; Cash, 1995). It assesses self-attitudinal aspects of body image using a 5-point Likert scale, ranging from 1, *very dissatisfied*, to 5, *very satisfied*. The BASS has an internal consistency of .77 and a test-retest reliability of .86 in a sample of men and women (Cash, 1994). Cronbach's alpha for the BASS items was .83.

Coaching behavior. Family Experiences Related to Food Questionnaire (FERFQ; Kluck, n.d.) is an instrument that assesses an individual's family experiences with food, both through commentary and modeling. The FERFQ was altered, changing "mother" or "father" to "coach" to better gauge an athlete's experiences with food as it relates to their interactions with their coach. It uses a 5-point Likert scale, ranging from 1, *never/not at all important*, to 5, *all the time/very important*. The FERFQ has an internal consistency ranging from .54 to .77 indicating a modest reliability (Kluck, 2006).

Cronbach's alpha for the total scale, commentary sub-scale, and modeling-subscale were .85, .84, and .82, respectively.

Team social influence. Sociocultural Attitudes Towards Appearance Questionnaire (SATAQ-4; Thompson et al., 2011) is a questionnaire designed to assess attitudes and pressures towards one's appearance. The SATAQ-4 was adapted, modifying "family" to "teammates" to better assess the pressures from an athlete's team. It uses a 5-point Likert scale, ranging from 1, *definitely disagree*, to 5, *definitely agree*. The SATAQ-4 was compared to the SATAQ-3, with a reliability of .85, and the SATAQ-4 was significantly correlated with the Multidimensional Body-Self Relations Questionnaire (MBSRQ) (Thompson et al., 2011). Cronbach's alpha for the SATAQ-4 items was .85.

Self-esteem. Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965) measures a global dimension of self-esteem. Participants rated their agreement using a 4-point Likert scale, ranging from 1, *strongly agree*, to 4, *strongly disagree*. Due to how the Likert scale was ordered, a higher score is indicative of lower self-esteem. The scale has a reliability of 0.82, and a validity of 0.87 (Rosenberg, 1965). Cronbach's alpha for the RSE items was .92.

Perfectionism in performance. Sport Multidimensional Perfectionism Scale (Sport-MPS-2; Dunn, Causgrove Dunn, & Syrotuik, 2002) measures facets central to perfectionistic cognition, affect and behavior as it relates to sports. Participants rated their agreement on a 5-point Likert scale, ranging from 1, *strongly disagree*, to 5, *strongly agree*. The scale has a reliability 0.90 of and a validity of 0.70 (Dunn et al., 2002). Furthermore, Gotwals et al., (2010) found that the Sport-MPS-2 was capable of

identifying the link between health perfectionism and competitive trait anxiety.

Cronbach's alpha for the Sport-MPS-2 items was .91.

Procedure

IRB approval was received and then the athletic directors at each institution were contacted via an email explaining the nature and purpose of the study (see Appendix C). Once granted permission by each university athletic director, the survey was distributed to the student-athletes via a link in an email (see Appendix D). The student-athletes had the option to participate in the study and the first two pages of the survey detailed instructions and informed consent to which student-athletes had the option to give consent by clicking "next" or to close the survey at that time.

Design

The design of this study was correlational in nature using six measures, with the dependent variable operationalized as scores on the Eating Attitudes Test (EAT-26; Garner et. al., 1982) and Body Assessment Satisfaction Scale (BASS; Cash, 1995), and the independent variable operationalized as scores on the Family Experiences Related to Food Questionnaire (FERFQ; Kluck, n.d.). Three potential moderating variables were examined: Sociocultural Attitudes Towards Appearance Questionnaire (SATAQ-4; Thompson et al., 2011), Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965), and Sport Multidimensional Perfectionism Scale (Sport-MPS-2; Dunn et. al., 2002).

Chapter IV

Results

Initial Analyses

The analysis occurred in a three-stage process. First, the demographic distributions were calculated along with descriptive data for each measure. The data set was assessed to see if it met certain assumptions and it was screened for univariate outliers and normality. Potential influential cases were examined and found to be within acceptable limits. Means, standard deviations, and bivariate correlations for each measure are presented in Table A1. A Pearson product-moment correlation coefficient was computed for the relationship between the scores on each measure utilized. Coaching behavior showed a significant positive correlation with eating disorder symptomology, and a negative correlation with body satisfaction, which supported our first hypothesis. Teammate pressures and sport pressures showed significant positive correlations with coaching behavior as well. Self-esteem was not correlated with coaching behavior.

For the hierarchical multiple regression analyses, predictor variables (i.e., coaching behaviors and teammate pressures) were mean-centered, and then used to calculate a mean-centered interaction variable (i.e., coaching behaviors x teammate pressures). The first multiple regression was then performed by regressing eating disorder symptomology on coaching behaviors and teammate pressures in the first step and adding coaching behaviors x teammate pressures in the second step. Results can be seen in Table A2. Results showed that the model in step 1 significantly predicted eating disorder

symptomology ($R = .43$, $R^2 = .18$, $F(2, 157) = 17.56$, $p < .001$). As seen, coaching behavior (commentary about eating and body image and modeling these behaviors) had a direct positive relationship with eating disorder symptomology. Thus, more coaching behaviors reported by athletes predicted greater eating disorder symptomology. However, in model 1, teammate pressures did not predict eating disorder symptomology. In the second step of the regression, results showed that the interaction term (i.e., coaching behaviors x teammate pressures) was significant, suggesting that teammate pressures significantly moderated the relationship between coaching behaviors and eating disorder symptomology, and thus supported our second hypothesis. Additionally, in the second step of the regression, coaching behaviors still predicted eating disorder symptomology and teammate pressures again did not predict eating disorder symptomology. This matches the regression coefficients in the first step. Results showed that with the addition of the interaction variable in step 2, the model maintained significance ($\Delta R^2 = .06$, $F(3, 156) = 16.36$, $p < .001$).

A second hierarchical multiple regression was performed by regressing body satisfaction on coaching behaviors and teammate pressures in step 1 and adding and coaching behaviors x teammate pressures in step 2 (see Table A2). Results showed that step 1 of this model significantly predicted body dissatisfaction ($R = .34$, $R^2 = .11$, $F(2, 157) = 10.10$, $p < .001$). As shown in Table A2, coaching behaviors did not have a relationship with body satisfaction, however teammate pressure had a direct negative relationship with body satisfaction. Thus, more teammate pressures reported by athletes predicted lower body satisfaction. In the second step of the regression, results showed that the interaction term (i.e., coaching behavior x teammate pressures) was not

significant, thus not supporting our second hypothesis. Additionally, in the second step of the regression, coaching behaviors again did not predict body satisfaction and teammate pressures again did predict body satisfaction. This matches the regression coefficients in the first step. Results showed that adding the interaction variable in step 2 maintained the significance of the model ($\Delta R^2 = .01$, $F(3, 156) = 7.09$, $p < .001$), however the interaction variable itself was not significant (see Table A2).

A third hierarchical multiple regression was performed by regressing eating disorder symptomology on coaching behaviors and self-esteem in step 1 and adding and coaching behaviors x self-esteem in step 2 (see Table A3). Results showed that step 1 of this model significantly predicted eating disorder symptomology ($R = .52$, $R^2 = .28$, $F(2, 157) = 29.76$, $p < .001$). As shown in Table A3, coaching behaviors had a direct positive relationship with eating disorder symptomology and low self-esteem had a direct positive relationship with eating disorder symptomology as well. Due to scoring of the self-esteem measure, a higher score was indicative of lower self-esteem. Results showed that more coaching behaviors predicted greater eating disorder symptomology and lower self-esteem also predicted higher eating disorder symptomology. In the second step of the regression, results showed that when the interaction term (i.e., coaching behavior x self-esteem) was not significant, thus not supporting our third hypothesis. Additionally, in the second step of the regression, coaching behaviors still predicted eating disorder symptomology and self-esteem again predicted eating disorder symptomology. This matches the regression coefficients in the first step. Results showed that adding the interaction variable in step 2 maintained the significance of the model ($\Delta R^2 = .01$, $F(3, 156) = 20.55$, $p < .001$), however the interaction variable itself was not significant (see

Table A3).

A fourth hierarchical multiple regression was performed by regressing body dissatisfaction on coaching behaviors and self-esteem in step 1 and adding and coaching behaviors x self-esteem in step 2 (see Table A3). Results showed that step 1 of this model significantly predicted body dissatisfaction ($R = .68$, $R^2 = .46$, $F(2, 157) = 67.26$, $p < .001$). As shown in Table A3, coaching behaviors had a direct negative relationship with body satisfaction and low self-esteem had a direct negative relationship with body satisfaction as well. Due to scoring of the self-esteem measure, a higher score was indicative of lower self-esteem. Results showed that more coaching behaviors predicted greater body dissatisfaction and lower self-esteem also predicted higher body dissatisfaction. In the second step of the regression, results showed that the interaction term (i.e. coaching behavior x self-esteem) was not significant, thus not supporting our third hypothesis. Additionally, in the second step of the regression, coaching behaviors still predicted body satisfaction and self-esteem again predicted body satisfaction. This matches the regression coefficients in the first step. Results showed that adding the interaction variable in step 2 maintained the significance of the model ($\Delta R^2 = .00$, $F(3, 156) = 45.17$, $p < .001$), however the interaction variable itself was not significant (see Table A3).

A fifth hierarchical multiple regression was performed by regressing eating disorder symptomology on coaching behaviors and sport pressures in step 1 and adding and coaching behaviors x sport pressures in step 2 (see Table A4). Results showed that step 1 of this model significantly predicted eating disorder symptomology ($R = .44$, $R^2 = .19$, $F(2, 157) = 18.68$, $p < .001$). As shown in Table A4, coaching behaviors had a direct

positive relationship with eating disorder symptomology. Sport pressures did not predict eating disorder symptomology, but it was found to be approaching significance ($p = .05$). Results showed that more coaching behaviors predicted greater eating disorder symptomology. In the second step of the regression, results showed that the interaction term was not significant, thus not supporting our fourth hypothesis. Additionally, in the second step of the regression, coaching behaviors still predicted eating disorder symptomology and sport pressures again did not predict eating disorder symptomology. This matches the regression coefficients in the first step. Results showed that adding the interaction variable in step 2 maintained the significance of the model ($\Delta R^2 = .03$, $F(3, 156) = 12.39$, $p < .001$), however the interaction variable itself was not significant (see Table A4).

A sixth hierarchical multiple regression was performed by regressing body satisfaction on coaching behaviors and sport pressures in step 1 and adding and coaching behaviors x sport pressures in step 2 (see Table A4). Results showed that step 1 of this model significantly predicted body satisfaction ($R = .32$, $R^2 = .10$, $F(2, 157) = 9.02$, $p < .001$). As shown in Table A4, sport pressure had a direct negative relationship with body satisfaction, however coaching behaviors did not predict body satisfaction. Results showed that higher sport pressures predicted lower body satisfaction. In the second step of the regression, results showed that the interaction term was not significant, thus not supporting our fourth hypothesis. Additionally, in the second step of the regression, coaching behaviors did not predict body dissatisfaction and sport pressures predicted body dissatisfaction. This matches the regression coefficients in the first step. Results showed that adding the interaction variable in step 2 maintained the significance of the

model ($\Delta R^2 = .00$, $F(3, 156) = 5.97$, $p < .001$), however the interaction variable itself was not significant (see Table A4).

The nature of the interaction between coaching behavior and teammate pressures predicting eating disorder symptomology was examined through the use of the PROCESS macro for SPSS (Hayes, 2013). Regression lines were plotted at predicted values of one standard deviation above the mean, one standard deviation below the mean, and at the mean (see Figure B1). Simple slopes and were calculated to examine the moderated effect. Results showed that when teammate pressure was low ($B = .12$, 95% CI [-.25, .49], $t = .63$, $p = .53$), the slope of coaching behaviors on eating disorder symptomology was not significantly different from zero. Thus, when teammate pressures are low, coaching behaviors do not predict eating disorder symptomology. When teammate pressure was at the mean ($B = .46$, 95% CI [.20, .71], $t = 3.56$, $p < .001$), the slope of coaching behaviors on eating disorder symptomology was significantly different from zero. Additionally, results evidenced that when teammate pressure was high ($B = .80$, 95% CI [0.53, 1.06], $t = 5.96$, $p < .001$), the slope of pressures on eating disorder symptomology was significantly different from zero. The range of significance of the moderated effect was calculated using the Johnson-Neyman method (see Field, 2013). Results showed that there was a significant moderation effect at the $p < .05$ value when the values of teammate pressures were between 7.63 and 19.99. When the value was below 7.63 then teammate pressures no longer exerted a moderating effect on the coaching behaviors–eating disorder symptomology association. The value of teammate pressures which defined the Johnson-Neyman significance region was 7.63 with 32.5% below and 67.5% above this region.

More Exploratory Analyses

A seventh hierarchical multiple regression was performed by regressing body dissatisfaction on coaching commentary behaviors and teammate pressures in step 1 and adding and coaching commentary behaviors x teammate pressures in step 2 (see Table A5). Coaching commentary behaviors scores were a subscale of the total coaching behavior score. Results showed that step 1 of this model significantly predicted eating disorder symptomology ($R = .42$, $R^2 = .18$, $F(2, 157) = 16.89$, $p < .001$). As shown in Table A5, coaching commentary behaviors had a direct positive relationship with eating disorder symptomology. However, teammate pressure did not have any relationship with eating disorder symptomology. Results showed that more coaching commentary behaviors predicted greater eating disorder symptomology. In the second step of the regression, results showed that the interaction term (i.e., coaching commentary behaviors x teammate pressures) was significant, suggesting that teammate pressures significantly moderated the relationship between coaching commentary behaviors and eating disorder symptomology, and thus supported our second hypothesis. Additionally, in the second step of the regression, coaching commentary behaviors still predicted eating disorder symptomology and teammate pressures again did not predict eating disorder symptomology. This matches the regression coefficients in the first step. Adding the interaction term in step 2 maintained the significance of the model ($\Delta R^2 = .08$, $F(3, 156) = 17.94$, $p < .001$) (see Table A5).

The nature of the interaction between coaching commentary behavior and teammate pressures predicting eating disorder symptomology was also examined through the use of the PROCESS macro for SPSS (Hayes, 2013). Regression lines were plotted at

predicted values of one standard deviation above the mean, one standard deviation below the mean, and at the mean (see Figure B2). Simple slopes and were calculated to examine the moderated effect. Results showed that when teammate pressure was low ($B = -0.08$, 95% CI [-0.70, 0.55], $t = -0.24$, $p = .81$), the slope of pressures on eating disorder symptomology was not significantly different from zero. Thus, when teammate pressures are low, coaching commentary behaviors do not predict eating disorder symptomology. When teammate pressure was at the mean ($B = 0.63$, 95% CI [0.22, 1.04], $t = 3.02$, $p < .001$), the slope of pressures on eating disorder symptomology was significantly different from zero. Additionally, results evidenced that when teammate pressure was high ($B = 1.33$, 95% CI [0.91, 1.76], $t = 6.22$, $p < .001$), the slope of pressures on eating disorder symptomology was significantly different from zero. The range of significance of the moderated effect was calculated using the Johnson-Neyman method (see Field, 2013). Results showed that there was a significant moderation effect at the $p < .05$ value when the values of teammate pressures were between 8.72 and 19.99. When values of teammate pressures were below 8.72, teammate pressures no longer exerted a moderating effect on the coaching commentary behaviors–eating disorder symptomology association. The value of teammate pressures which defined the Johnson-Neyman significance region was 8.72 with 50.0% below and 50.0% above this region.

Chapter V

Discussion

The first purpose of this study was to further investigate the relationship between coaching behaviors and eating disorder symptomology and body image concerns in athletes. It has been well established that athletes are at a higher risk for disordered eating, eating disorders, and body image concerns and show higher rates of clinical and subclinical eating disorders than their non-athlete peers (Beckner & Record, 2016; Bratland-Sanda, Sundgot-Borgen, 2013; Carter & Rudd, 2005; Chatterton & Petrie, 2013; de Bruin, 2017; Greenleaf, Petrie, Reel, & Carter, 2010; Petrie et al., 2009; Petrie et al., 2008; Sanford-Martens et al., 2005; Sundgot-Borgen & Torstveit, 2004). This study found rates comparable with previous research. Additionally, coaching behaviors were associated with eating disorder symptomology and decreased body satisfaction. This study provides correlational data that is consistent with the self-report literature of athletes (Biesecker & Martz, 1999; Bratland-Sanda & Sundgot-Borgen, 2013; Heffner et al., 2003; Turman, 2008; Weinstein, Smith, & Wiesenthal, 1995). These findings further support the influence that coaches can have on their athletes whether through direct statements instructing them to lose weight or derogatory comments about their body or weight (Arthur-Cameselle & Quatromoni, 2010; Berry & Howe, 2000; Biesecker & Martz, 1999; Kerr, et al., 2006; Muscat & Long, 2008; Rosen & Hough, 1988; Thompson & Sherman, 1999a). Results of this study indicate that coaches are highly influential in an

athlete's life and can have a significant impact on an athlete's thoughts and behaviors related to body image and disordered eating.

The second purpose of this study was to explore potential moderators of teammate pressures, sport pressures, and self-esteem on the coaching behavior-eating disorder symptomology/body satisfaction relationship. Bivariate correlations showed that teammate pressures were positively correlated with eating disorder symptomology and negatively correlated with body satisfaction. Regression analyses showed that teammate pressures had a significant moderating effect. Meaning, that the effect of coaching behaviors on eating disorder symptomology depended on the level of teammate pressures experienced as well. More specifically, when teammate pressures were low, this buffered against the impact of coaching behaviors on eating disorder symptomology. As teammate pressures increased so did eating disorder symptomology when coaching behaviors were present. This finding is consistent with research suggesting that an athlete's teammates are highly influential in their perception of self, related to body image and disordered eating but can also serve as a protective factor pressures experienced are considered (Crandall, 1988; Reel et al., 2010; Stice, 1998; Stice, 2002). This finding is very relevant when examining the culture of a team. The culture created by a coach regarding eating and body image can be catastrophic if the culture is negative and the athletes on the team buy into it.

Bivariate correlations showed that sport pressures were positively correlated with eating disorder symptomology and negatively correlated with body satisfaction. This association is in line with previous research (Arthur-Cameselle & Quatromoni, 2010). However, when the regression was conducted, sport pressures were not found to have a

moderating effect on the coaching behavior-eating disorder symptomology or the coaching behavior-body dissatisfaction relationships which may be due to the time of data collection. Sport performance and pressures can be temporally sensitive as the demands of various points in training and in the season may influence the pressures, both performance related and body related, they are currently experiencing.

Additionally, the results of this study did not support the hypotheses regarding the moderating effect of self-esteem on the coaching behaviors-eating disorder symptomology/body satisfaction relationship, and there was moderating effect of self-esteem. The self-esteem values were positively correlated with eating disorder symptomology and negatively correlated with body satisfaction (note: higher scores in self-esteem were indicative of lower self-esteem). These findings are consistent with previous research (Arthur-Cameselle & Quatromoni, 2010; Heatherton & Baumeister, 1991; Rosenberg, 1965). A high self-esteem has been shown to be protective against internalization of societal ideals regarding beauty.

The measure used to assess coaching behavior was the Family Experiences Related to Food Questionnaire (FERFQ). This total composite score was comprised of two subscale scores: commentary and modeling. Bivariate correlations and regression analyses were conducted to examine if one type of behavior was more impactful. Both coaching commentary and coaching modeling was correlated positively with eating disorder symptomology. Both behaviors by coaches were also negatively correlated with body satisfaction. Regression analyses showed that teammate pressures had a significant moderating effect, such that the effect of coaching commentary behaviors on eating disorder symptomology depended on the level of teammate pressures experienced.

Similarly to the total composite of coaching behavior, when teammate pressures were low this buffered against the impact of coaching commentary behaviors on eating disorder symptomology and as teammate pressures increased so did eating disorder symptomology when coaching behaviors were present. This finding again supports previous research that states that an athlete's teammates are highly influential in disordered eating behavior. This study also illuminated that teammates can serve as a protective factor depending on the amount of pressures experienced (Crandall, 1988; Reel et al., 2010; Stice, 1998; Stice, 2002). What was even more intriguing about these findings was that coaching behavior was shown to have a direct influence on eating disorder symptomology whereas teammate pressures demonstrated a direct influence with body dissatisfaction. It is possible that coaches, seen as an authority figure, may be able to exert more pressure over explicit behaviors of an athlete. While teammate pressures may be related to social comparison due to similar age, sex, and performance levels.

Strengths of the Study

There are several strengths to this study. First, the size of the sample in this study is substantial, especially given the ways in which universities protect student-athletes from research requests. Second, an NCAA study (GOALS, January 2016) found that mental health was the number one medical issue facing student-athletes. This study specifically addresses a mental health issue of coaching behaviors on eating disorder symptomology. Furthermore, the results of this study help to further assist in showing the importance of increasing disordered eating prevention interventions and education to include focus on coaches and coaching behaviors.

With regards to specific findings of this study, one strength is the relationship between coaching behaviors and eating disorder symptomology and body dissatisfaction being demonstrated through correlational data, rather than qualitative reporting from athletes. Collegiate student-athletes are often great distances away from their families leading to coaches and teammates becoming surrogate family with coaches often taking on a parental-like role (Amorose & Horn, 2000; Horn, 1985; Sinclair & Vealey, 1989; Turman, 2008). Second, the relationships found between teammate pressures and eating disorder symptomology and body dissatisfaction, as well as sport pressures and eating disorder symptomology and body dissatisfaction, continue to support the existing literature (Arthur-Cameselle & Quatromoni, 2010; Bratland-Sanda & Sundgot-Borgen, 2013; Crandall, 1988; Kandel, 1980; Stice, 1998; Stice, 2002). These findings continue to strengthen the relational power between the social relationships within an athlete's life and disordered eating and body image concerns. Third, building upon the relationship found between coaching behavior and eating disorder symptomology, the moderating effect of teammate pressure was particularly exciting. While correlational in nature, the findings that teammate pressure, when very low (if existent at all), could negate the impact of total coaching behavior and coaching commentary is a very compelling finding. This speaks to the power of social support and the strong relationship previously found between teammates/social environment and eating disorder symptomology (Crandall, 1988; Reel et al., 2010; Stice, 1998; Stice, 2002).

Lastly, as a former Division 1 student-athlete, I had several years of exposure and experience to the culture of collegiate athletics. My past experiences informed my interest in this research topic and specific athletic components to focus on. Additionally,

my background assisted in navigating the athletic world both with measure selection and the participant recruitment process.

Limitations of the Study

There are several limitations that must be considered with this study. First, the nature of the study is correlational, and results must not be interpreted as causal. Second, the context of the sample must be considered. It is possible that a self-selection bias may have occurred, which may influence the strength of findings of this study. Additionally, both men and women were included in the data analysis. While all were student-athletes the sport context creates differences between appearance ideals between sexes (Chapman & Woodman, 2016). Male athletes generally tend to focus on leanness and greater muscle mass rather than a specific drive for thinness. Given this difference in ideals, it is possible that data collected by the measures used in this study may not have accurately captured the levels of distress in both men and women and/or the strength of the findings may be limited. The number of male participants was about one third of the female response rate. The male experience is potentially underrepresented and/or may be distorted by the female experience. Additionally, the findings as they relate to the female experience may be diluted due to the male responses. This study did not include sex-specific hypotheses; thus, no sex-specific data analysis was conducted. Due to the unknown response rate, both sexes were included in the sample, however additional analysis examining sex specific results with this data set may help to further assess this. The measures selected for this study, while statistically sound with a general population, may not be as accurate with athletes (Pope, Gao, Bolter, & Pritchard, 2015). Thus, generalizing these results broadly to student-athletes is not advised and further

investigation into the prevalence and relationship of the variables in this study should be examined in both men and women separately.

Third, this study specifically examined collegiate student-athletes. Broadly speaking, collegiate athletes may be a sample of convenience when considering the entire athletic population, however collegiate athletes, especially division 1 student-athletes are often a highly protected group and it can be very difficult to gain research access to them. Furthermore, while many of the sport specific factors may maintain consistent across athletes and student-athletes, there are also specific collegiate factors that must be considered. There are many demands and pressures that collegiate student-athletes face as a result of being in a college setting that general athletes do not. It is possible that these demands also influence the relationships, but that is beyond this study's findings. Additionally, the age of collegiate athletes and general athletes also typically differs, with student-athletes generally being several years younger. It is possible that both brain and body development play a role in eating disorder development and that is another variable that should be further examined. While the results of this study may be similar for general athletes, any generalization should be done with caution as there are multiple other factors to consider.

Lastly, this sample was comprised of multiple NCAA sports. Research has demonstrated that the body ideals can vary sport to sport (e.g. cross country and wrestling) and within sport (e.g. jumpers and throwers in track and field) (Pope et al., 2015; Thompson & Sherman, 2014). Therefore, the variance within each sport could not be delineated and may have impacted the significance of results. It is important to consider each sport and position or event within the sport when examining body ideals.

Research has shown that eating disorders and weight behaviors within athletes change over the course of a sport season (Petrie & Anderson, 2017). Given that data was collected throughout different points of various sport seasons, the level of eating disorder symptomology and body image concerns potentially varies greatly and may not have accurately or consistently captured the prevalence or severity.

Implications and Future Directions

Clinical. The results of this study have several implications. This study provides further evidence to existing research about the relationship between coaching behaviors, teammate pressures, self-esteem, and sport pressures as they relate to eating disorder symptomology and body dissatisfaction. Thus, being sure to address these factors with both preventative and responsive programming/interventions is important. Programming that seeks to involve and inform coaches may be especially fruitful given the strong relationship consistently found between their behaviors and disordered eating patterns in their athletes. It is unreasonable to expect coaches to avoid weight and body as topics of discussion with athletes, especially as it is directly related to performance. However, it is proposed to do so in a positive, performance enhancing way that does not compromise mental health, physical health, and long-term performance. While programming exists for coaches and teams, research has found that only some of the programming provides meaningful impact and that very little research has been conducted on the efficacy of the programming (Breslin, Shannon, Haughey, Donnelly, & Leavey, 2017; Sebbens, Hasmen, & Wensley, 2016; Turk, Prentice, Chappell, & Shields, 1999). Furthermore, the research that does exist continues to call for more well-designed and controlled intervention studies to validate the programs (Breslin et al., 2017). The NCAA has

released their *Mind, Body and Sport* guide which discusses student-athlete mental health and provides a wealth of information on all areas of mental health (NCAA, 2014). While educational information and assessment guidelines are provided, it lacks programming or prevention guidelines. It would be advantageous to develop new programming and improve upon existing programming aimed at educating coaches of their impact on athletes as well as effective and healthy methods of discussing weight and bodies. This collaboration with coaches could be highly important. While this study may come across as villainizing coaches, we would like to highlight that although coaches can have a negative influence, they can also have an immense positive impact on their athletes as well. A large percentage of coaches are former athletes themselves, and we believe that utilizing their own experiences within educational programming can lead to even more impactful outcomes. It is also important to build upon and increase implementation of existing programming (e.g. Female Athlete Body Project) that specifically targets the team and the individual (Becker, McDaniel, Bull, Powell, & McIntyre, 2012). Future research should study the attitude of coaches towards athletes before and after these interventions are applied. This could provide useful information about what coaching styles, personalities, and interventions are most problematic and/or successful.

While coaches exert a great deal of power over eating behaviors and body image concerns, teammates potentially have an even stronger influence. Working to address the specific team cultures and team behaviors may also complement coach programming. Lastly, the NCAA's best practices (2014) recommend identifying members of the mental health services team, raising awareness of the mental health services available, and engaging in screening and appropriate referral procedures. While each institution will

have different resources available to them, it is important to have sport-competent psychologists on staff or available to provide education to coaches and athletes about healthy eating behaviors, nutrition, and warning signs of problematic behaviors. This is another way to target all parts of the athletic system and may help to provide at-risk athletes with individualized, confidential treatment.

Research. Future research may focus and expand upon this study in a variety of ways. First, reexamining the results of this study for each sex, rather than combined, to see if any relationships are strengthened or weakened and how they vary between the sexes. Second, examining sports separately may shed light on the impact of demands of specific sports on body image. Given different team seasons and the evidence that symptomology changes over the course of a season, administering measures at multiple points throughout a season could provide valuable information. Finally, incorporating multiple measures for each variable may be of value. This study was a mono-method study, and therefore a mono-method bias may exist. It would be helpful to include multiple measurements of each variable and in multiple forms (i.e. quantitative and qualitative). Additionally, given the unique culture of athletics, general and sport specific measures may help to best capture the variables, especially when considering body image and its contextual nature (de Bruin, 2011). Research exploring these idiosyncratic variables in a variety of manners may be extremely helpful in further understanding eating disorder symptomology and body image concerns in athletics and the role of coaches and teammates.

Chapter VI

Conclusion

This study illuminated crucial information regarding the top concern for NCAA student-athletes: mental health. Disordered eating and body image concerns are highly prevalent and have one of the highest mortality rates of any DSM-5 diagnosis (Smink, van Hoeken, & Hoek, 2012). Within a sport context, the prevalence rates increase dramatically as do the risk factors (Sundgot-Borgen, 1993; Sundgot-Borgen & Torstveit, 2004; Bratland-Sanda, Sundgot-Borgen, 2013). While athletics has been shown to have several protective factors for mental health concerns, they also create risk factors (Greenleaf, 2002; Petrie & Rogers, 2001; Petrie & Sherman, 1999; Reel & Gill, 1996; Ryujin, Breaux, & Marks, 1999; Sundgot-Borgen, 1993; Swoap & Murphy, 1995; Thompson & Sherman, 1999a). Coaches are highly influential in some student-athletes behaviors (Biesecker & Martz, 1999). This study demonstrated that disordered eating behaviors are no exception. Additionally, teammates were shown to also have influence while serving as protective factors. If teammate pressures were moderate or high, they further exacerbated the impact of coaching behaviors on eating disorder symptomology. However, if teammate pressures were low, they were able to buffer against the coaching behavior. These findings communicate the ramifications of the team environment (i.e. teammates and coaches). Given these findings it is vital to consider these factors when engaging in any sport programming or interventions, especially when focused on disordered eating and body image. This study also speaks to the importance of

introducing programming targeted at these behaviors, pressures, and culture, if it does not presently exist. Future research must continue to explore the differences in sex, time of season, and sport, to more specifically investigate the roles of coaches and teammates. This study captured a significant component of the athlete experience and it would be unwise to not implement these findings.

Appendix A

Correlation and Regression Tables

Table A1

Means, standard deviations, and correlations for study variables.

	1	2	3	4	5	6	7
1. EAT-26	--	-.40**	.42**	.41**	.23**	.35**	.23**
2. BASS	-.40**	--	-.20**	-.14	-.33**	-.66**	-.29**
3. FERFQ	.42**	-.20**	--	.88**	.37**	.08	.21**
4. FERFQ-Comm	.41**	-.14	.88**	--	.37**	.09	.21**
5. SATAQ-Pressures	.23**	-.33**	.37**	.37**	--	.30**	.28**
6. Self-Esteem	.35**	-.66**	.08	.09	.30**	--	.42**
7. Sport-MPS-2	.23**	-.29**	.21**	.21**	.28**	.42**	--
M	10.61	28.07	15.70	8.73	9.99	19.36	123.90
SD	10.23	5.39	6.36	3.95	5.00	5.82	20.72

Note: EAT-26 = Eating Attitudes Test-26; BASS = Body Assessment Satisfaction Scale; FERFQ = Family Experiences Related to Food Questionnaire; FERFQ-Comm = Commentary subscale of the Family Experiences Related to Food Questionnaire; SATAQ-Pressures = Pressures subscale of the Sociocultural Attitudes Towards Appearance Questionnaire-3; Self-Esteem = Rosenberg Self-Esteem Scale; Sport-MPS-2 = Sport Multidimensional Perfectionism Scale; M = Mean; SD = Standard deviation. Statistics in this table represent non-mean-centered data.

** $p < .01$

Table A2

Hierarchical multiple regression for EAT-26, BASS, FERFQ, and SATAQ-Pressures.

	<i>B</i>	<i>SE B</i>	β	<i>t</i>
Model 1 – EAT				
<u>Step 1</u>				
Intercept	10.61	.74		14.42***
Coaching Behavior	.60	.13	.38	4.83***
Team Pressures	.22	.16	.11	1.40
<u>Step 2</u>				
Intercept	9.82	.75		13.09***
Coaching Behavior	.46	.13	.28	3.56***
Team Pressures	.15	.16	.07	.98
Coach Beh x Team Pressures	.07	.02	.26	3.41**
Model 2 – Body Dissatisfaction				
<u>Step 1</u>				
Intercept	28.069	.40		69.52***
Coaching Behavior	-.07	.07	-.09	-1.06
Team Pressures	-.32	.09	-.30	-3.66***
<u>Step 2</u>				
Intercept	28.21	.43		66.37***
Coaching Behavior	-.05	.07	-.06	-.66
Team Pressures	-.31	.09	-.29	-3.49**
Coach Beh x Team Pressures	-.01	.01	-.09	-1.04

Note: Model 1 = Eating disorder symptomology as criterion variable; Model 2 = Body dissatisfaction as criterion variable; Values represent mean-centered variables for predictor and moderator variables.

*** $p < .001$

** $p < .01$

* $p < .05$

Table A3

Hierarchical multiple regression for EAT-26, BASS, FERFQ, and RSE.

	<i>B</i>	<i>SE B</i>	β	<i>t</i>
Model 1 – EAT				
<u>Step 1</u>				
Intercept	10.61	.69		15.31***
Coaching Behavior	.63	.11	.39	5.70***
Self-Esteem	.57	.12	.32	4.70***
<u>Step 2</u>				
Intercept	10.54	.69		15.19***
Coaching Behavior	.63	.11	.39	5.76***
Self-Esteem	.56	.12	.32	4.68***
Coach Beh x Self-Esteem	.02	.02	.09	1.35
Model 2 – Body Dissatisfaction				
<u>Step 1</u>				
Intercept	28.07	.32		89.16***
Coaching Behavior	-.12	.05	-.14	-2.41*
Self-Esteem	-.61	.05	-.65	-11.11***
<u>Step 2</u>				
Intercept	28.09	.32		88.96***
Coaching Behavior	-.12	.05	-.14	-2.44*
Self-Esteem	-.60	.05	-.65	-11.08***
Coach Beh x Self-Esteem	-.01	.01	-.06	-1.00

Note: Model 1 = Eating disorder symptomology as criterion variable; Model 2 = Body dissatisfaction as criterion variable; Values represent mean-centered variables for predictor and moderator variables.

*** $p < .001$

** $p < .01$

* $p < .05$

Table A4

Hierarchical multiple regression for EAT-26, BASS, FERFQ, and Sport-MPS-2.

	<i>B</i>	<i>SE B</i>	β	<i>t</i>
Model 1 – EAT				
<u>Step 1</u>				
Intercept	10.61	.73		14.50***
Coaching Behavior	.63	.12	.39	5.25***
Perc. Perform	.07	.04	.14	1.95
<u>Step 2</u>				
Intercept	10.64	.75		14.20***
Coaching Behavior	.62	.12	.39	5.22***
Perc. Perform	.07	.04	.14	1.95
Coach Beh x Perc. Perform	-.001	.01	-.01	-.16
Model 2 – Body Dissatisfaction				
<u>Step 1</u>				
Intercept	28.07	.41		69.10***
Coaching Behavior	-.12	.07	-.14	-1.82
Perc. Perform	-.07	.02	-.26	-3.36**
<u>Step 2</u>				
Intercept	28.06	.42		67.51***
Coaching Behavior	-.12	.07	-.14	-1.81
Perc. Perform	-.07	.02	-.26	-3.35**
Coach x Perc. Perform	.00	.00	.00	.06

Note: Model 1 = Eating disorder symptomology as criterion variable; Model 2 = Body dissatisfaction as criterion variable; Values represent mean-centered variables for predictor and moderator variables.

*** $p < .001$

** $p < .01$

* $p < .05$

Table A5

Hierarchical multiple regression for EAT-26, FERFQ-Communication, and SATAQ-Pressures.

	<i>B</i>	<i>SE B</i>	β	<i>t</i>
Model 1 – EAT				
<u>Step 1</u>				
Intercept	10.61	.74		14.37***
Coaching Comm Behavior	.95	.20	.37	4.69***
Team Pressures	.23	.16	.13	1.45
<u>Step 2</u>				
Intercept	9.59	.75		12.84***
Coaching Comm Behavior	.63	.21	.24	3.02**
Team Pressures	.14	.15	.07	.94
Coach C B x Team Pressures	.14	.03	.31	4.09***

Note: Model 1 = Eating disorder symptomology as criterion variable; Values represent mean-centered variables for predictor and moderator variables.

*** $p < .001$

** $p < .01$

* $p < .05$

Appendix B

Moderation Figures

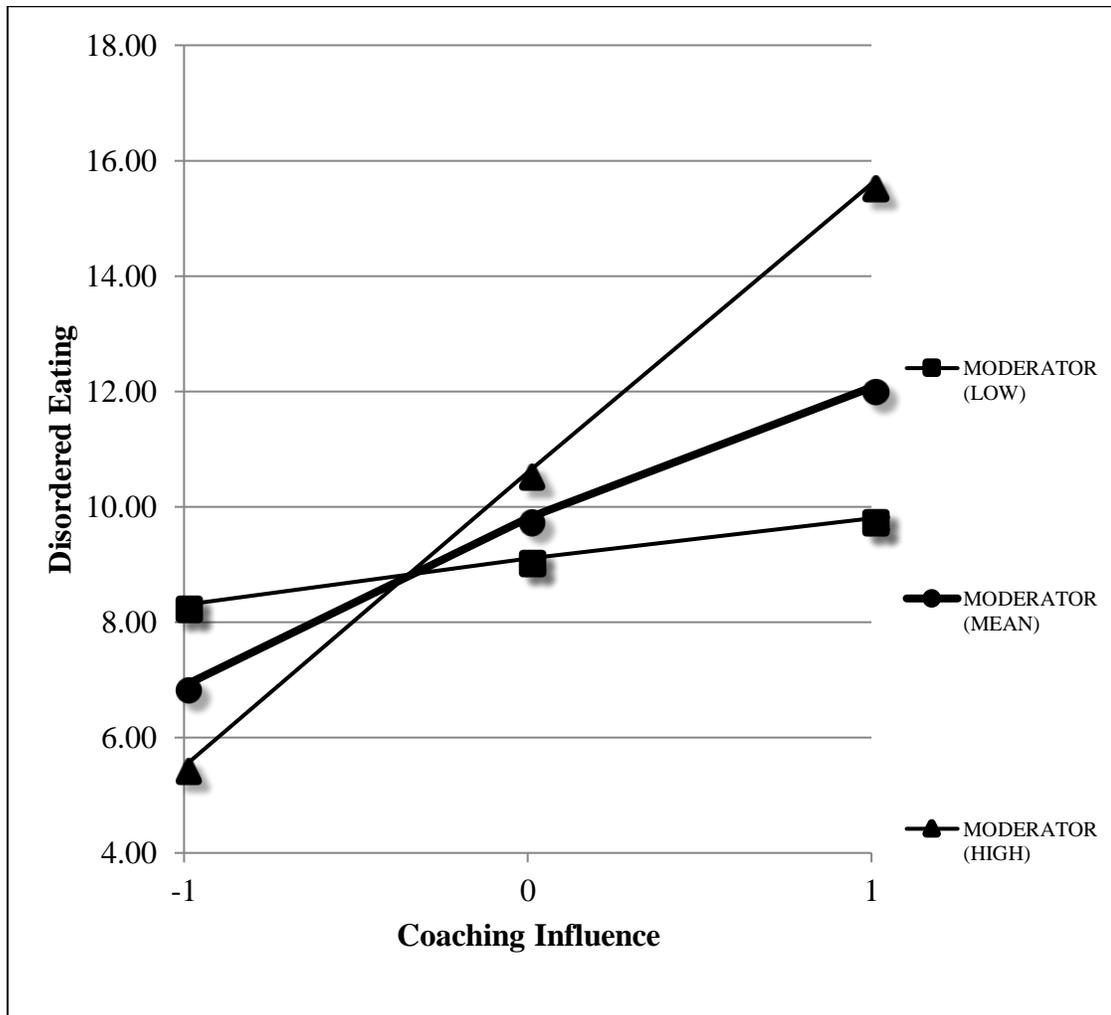


Figure B1. Regression lines for FERFQ, EAT-26, and SATAQ-Pressures.

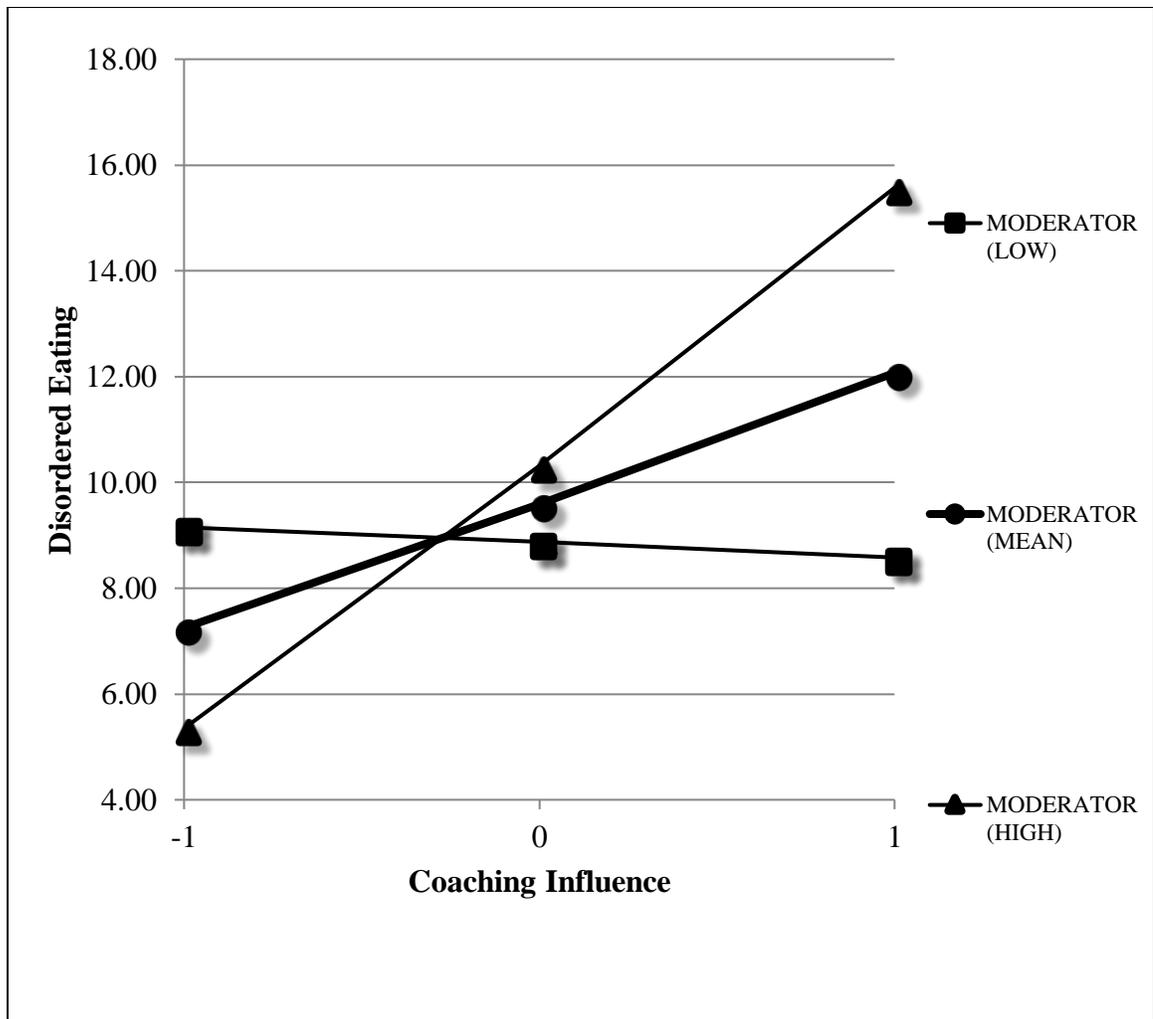


Figure B2. Regression lines for FERFQ-Communication, EAT-26, and SATAQ-Pressures.

Appendix C

Email to Athletic Directors

RE: Student-Athlete Participation Request

Hello XXX

My name is Kelsey Moran and I am clinical psychology doctoral student at Wright State University. I am emailing to inquire if you would be willing forward the following study email/link to your student-athletes. As a former Division 1 student-athlete I am aware how precious their time is, which is why the study should take less than 20 minutes and can be taken on a computer or smart phone. I have IRB approval and the study is designed to explore student-athletes' experiences with their sport, body image and eating behaviors. I hope to find protective factors and would be happy to share my general findings with you once I defend my dissertation. If you have any questions or would like more information please feel free to email me (Moran.40@wright.edu) or my faculty advisor, Dr. Christopher Modica (chris.modica@wright.edu).

Sincerely,

Kelsey Moran Psy. M.

Appendix D

Email to Study Participants

RE: Student-Athletes Needed for Psychological Study (Win a \$50.00 Amazon Gift Card)

Dear Student-Athlete,

Our research team is conducting a research study about student-athletes' experiences with their sport, their body image, and their eating behaviors. We are looking for participants for our research.

At the completion of your participation you may voluntarily choose to enter your name and email address into a drawing to win one of four \$50.00 Amazon gift cards.

The requirements to participate in this study are 1) that you are a student-athlete, 2) that you are a current student at your university, and 3) that you are between 18 and 25 years old. If you choose to participate, you will be asked to respond to several questionnaires entirely online, which will take roughly 20 minutes.

This project has been reviewed by the Wright State University Institutional Review Board (IRB# 6405). Participation in this survey is entirely voluntary and all data acquired will be held in a safe, secure, and password-protected location. It is the full intention of the research team to have each participant's best interest in mind regarding the safety of their information.

If you would like to take this survey, please go to:

https://wright.qualtrics.com/jfe/form/SV_50T0CWglEEfYze5

If you have any questions regarding this study, please contact principal investigator, Kelsey Moran, Psy. M. of the Wright State School of Professional Psychology (email: moran.40@wright.edu).

Thank you for your time and we look forward to your participation!

Sincerely,

Kelsey Moran
Christopher Modica

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