

PERFECTIONISM, PERFECTIONISTIC SELF-PRESENTATION, BODY
COMPARISONS, AND DISORDERED EATING IN
WOMEN'S ARTISTIC GYMNASTICS

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Previous scholarship has found that body image concerns begin at an early age in women's artistic gymnastics (WAG). There have been mixed results concerning the prevalence of disordered eating in WAG. The current study sought to examine the correlation between perfectionism, perfectionistic self-presentation, body comparisons and disordered eating in a gymnast sample. The secondary purpose was to determine if age, level of gymnast competition and race are a factor in perfectionism, body comparisons and disordered eating.

The participants were 42 female gymnasts, between the ages of 12 and 19 from a number of clubs, competing in competitive Level 7-10 USA Gymnastics WAG programs.

All participants completed the Frost Multidimensional Perfectionism Scales (FMPS; Frost, Marten, Lahart, & Rosenblate, 1990); the Perfectionistic Self-Promotion scale of the Perfectionistic Self-Presentation Scales (PSPS; Hewitt & Flett, 1993); the Physical Appearance Comparison Scale (PACS; Thompson, J.K., Heinberg, Altabe, & Tantleff-Dunn, 1999) and the Children's version of the Eating Attitudes Test (ChEAT; Maloney, McGuire, & Daniels, 1988). The results showed that perfectionism was significantly positively correlated with perfectionistic self-presentation, body comparisons, and disordered eating. Perfectionistic self-presentation was also correlated with body comparisons and disordered eating, while body comparisons were also correlated with disordered eating. The results did not differ between groups on race or gymnastics competition level. Results only differed between groups for age on the PACS. The current study demonstrates that perfectionism, perfectionistic self-presentation, body comparisons, and disordered eating were correlated for gymnasts in this sample. The significant correlations between these variables show that further consideration of all of these factors should be taken into account in the gymnastics environment. Recommendations for future research are offered.

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Style manual used

APA Publication Manual (5th edition)

Computer software used

Microsoft Word 2007

SPSS (version 16.0)

TABLE OF CONTENTS

LIST OF TABLES.....	x
CHAPTER I. INTRODUCTION.....	1
Statement of Purpose.....	4
Research Question.....	5
Null Hypotheses.....	5
Delimitations.....	6
Limitations.....	7
Definition of Terms.....	8
CHAPTER II. LITERATURE REVIEW.....	12
Early Onset of Body Image Concerns.....	12
Body Image Concerns and Disordered Eating Increase with Age.....	14
Racial differences in disordered eating.....	14
Prevalence of eating disorders among female athletes.....	15
Lack of support for high prevalence of ED's in female athletes.....	16
Support for a high prevalence of disordered eating in female athletes.....	19
Parent Comments.....	25
Perfectionism.....	28
Perfectionistic self-presentation.....	33

Body Comparisons.....	36
Summary.....	40
CHAPTER III. METHOD.....	42
Participants.....	42
Measures.....	43
Procedures.....	48
Analysis.....	49
CHAPTER IV. RESULTS.....	50
Demographic Data.....	51
Psychological Variables.....	52
Correlation Results.....	53
MANOVA Results.....	54
Summary.....	55
CHAPTER V. DISCUSSION.....	58
Sample.....	58
Perfectionism.....	59
Perfectionistic Self-Presentation.....	61
Body Comparisons.....	62
Disordered Eating.....	63
Demographic Results	64
Implications.....	65
Limitations and Future Directions.....	67

REFERENCES.....	70
APPENDIX A. DSM-IV-TR Diagnostic Table Examples.....	78
APPENDIX B. Demographic Information.....	80
APPENDIX C. Reference Sheet.....	81
APPENDIX D. Informed Consent Documents for Alabama.....	82
APPENDIX E. Informed Consent Documents for Georgia.....	86

LIST OF TABLES

Table 1. Frequencies for Race.....	51
Table 2. Frequencies for Age.....	51
Table 3. Frequencies for Gymnastics Competition Level.....	52
Table 4. Means, Standard Deviations (SD) and Standard Errors (SE) for the MPS, MPS subscales, PSPS, PACS and CHEAT.....	53
Table 5. Pearson Correlations.....	54
Table 6. MANOVA Results by Race.....	54
Table 7. MANOVA Results by Gymnastics Level.....	55
Table 8. MANOVA Results by Age Category.....	55

INTRODUCTION

Previous scholarship has posited that girls and young women participating in competitive WAG may be at risk for disordered eating. Previous research has found that body image concerns begin at an early age for many girls in the general population and that gymnasts express greater concern about weight and body shape at the age of 7 (after two years of participation in gymnastics) than other girls at the age of 5 (who were beginning gymnastics). This may have been due to the effects of gymnastics participation on the gymnasts, or it could have been simply a natural progression of age. The research did not look at samples beyond the age of 7 (Davison, Earnest, & Birch, 2002; Poudevigne et al., 2003; Wood, Becker, & Thompson, 1996). There has been inconsistency in the literature regarding prevalence of disordered eating in athletes generally and in WAG. Some studies have concluded that eating disorders are not any more prevalent in female athletes than in the general population (e.g., Bachner-Melman, Zohar, Ebstein, Elizur, & Constantini, 2006; Hausenblas & Symons Downs, 2001). However, other studies have shown a high prevalence of disordered eating behaviors (but not clinical eating disorders) in female athletes, particularly in sports such as WAG (Engel, Johnson, Powers, Crosby, Wonderlich, Wittrock, et al., 2003; Johnson, Powers, & Dick, 1999; Kerr, Berman, & De Souza, 2006; Smolak, Murnen, & Ruble, 2000; Tofler, Stryer, Micheli, & Herman, 1996).

Schwarz, Gairrett, Aruguete and Gold (2005) investigated the difference in eating attitudes, body dissatisfaction, and perfectionism in both female athletes and non-athletes in a number of different sports at the collegiate level. Body dissatisfaction was greater among non-athletes than athletes. However, athletes in judged, aesthetic sports showed a greater incidence of dieting than those in refereed, non-aesthetic sports. Athletes also scored higher on perfectionism than non-athletes. Perfectionism was positively associated with general eating pathology, dieting and bulimia. The study concluded that female athletes who are perfectionists and participate in a judged, aesthetic sport may be at heightened risk for disordered eating (Schwarz, Gairrett, Aruguete, & Gold, 2005).

In light of this, the current study reviewed what has been written on risk factors for disordered eating in the general population, while focusing on how this may be applicable to understanding the nature of the problem in the gymnastics environment. The literature showed that risk factors for disordered eating have been linked to perfectionism and social comparisons. Perfectionism is defined by Frost, Marten, Lahart, and Rosenblate (1990) as the desire or need to be perfect or attain perfection. Traits such as perfectionism, conscientiousness, asceticism, and suppression or denial of fatigue, pain, and hunger, are valued in the environments that create and surround competitive athletes. However, many of these traits, and in particular perfectionism, are also characteristics of those who have disordered eating, possibly explaining risk factors specific to the athletic environment (Thompson & Sherman, 1999b).

The father's role in the creation of risk factors involves neglecting the needs of his daughter, at the same time as contributing to perfectionism (Fitzgerald & Lane, 2000).

Both mothers' and fathers' criticism of attractiveness were correlated with disordered eating behaviors and general criticism was correlated with perfectionism. Communication patterns within the family also influence perfectionism (Miller-Day & Marks, 2006; Snizek, 2006). Perceived pressure from parents to be thin was strongly correlated with perfectionist behaviors. However, parental expectations (expecting a successful child) that are part of a caring, supportive family environment, may serve as a protective factor against these risks (Young, Clopton, & Bleckley, 2004).

Perfectionism has been examined in various dimensions in terms of disordered eating risk factors. Patients with anorexia nervosa tend to be perfectionist and perfectionism persists after weight restoration (Bastiani, Rao, Weltzin, & Kaye, 1995). Perfectionism may be a genetically mediated personality trait that is transmitted through families and increases risk factors for disordered eating (Woodside et al., 2002). Different forms of perfectionism have been related to body image dissatisfaction, drive for thinness, ineffectiveness and diet, as well as, body image (Hewitt, Flett, & Ediger, 1995). Some perfectionistic striving in disordered eating seems to be motivated by strong needs to conform to a model or ideal of perfection that is demanded by the self and perceived as being demanded by others (Hewitt et al., 1995).

Social comparison theory posits that individuals establish their own sense of identity by making comparisons between themselves and others who have certain valued attributes (Festinger, 1954). Making regular upward social comparisons (realistic or unrealistic comparisons) for the purpose of self-evaluation has been shown to lower self-esteem (Stormer & Thompson, 1995). Specifically, social comparisons, of a self-

evaluative nature (e.g., a 16- year-old working class high school student compares her weight and shape to that of a famous ‘supermodel’ that has appeared in *Cosmopolitan* magazine) may lead to greater body image disturbances in individuals that already have ‘appearance-related-self-discrepancies’ (Halliwell & Dittmar, 2005). The tendency to make such upward social comparisons (better described as body comparisons in eating disorder research) has been predicted by family concern with weight, perfectionism, competitiveness, and public self-consciousness (Schutz, Paxton, & Wertheim, 2002).

In sum, there is mixed evidence regarding prevalence of disordered eating in WAG. Moreover risk factors for disordered eating in WAG have not been thoroughly researched. Additionally, many studies have addressed this subject in young children, elite female gymnasts and college gymnasts, but only one or two studies have conducted research on adolescent girls participating in highly competitive WAG that was not at the elite international level (i.e. gymnasts competing in USA Gymnastics Level 7-10 in preparation for the elite level of gymnastics). The present study aims to understand how perfectionism, and feeling a need to present as perfect in the gymnastics environment may be correlated with engaging in a greater number of body comparisons, and to investigate how these variables are correlated with disordered eating in a female gymnast sample.

Statement of Purpose

The purpose of this study is to examine the correlations between perfectionism, perfectionistic self-presentation, body comparisons and disordered eating in a gymnast

sample. The secondary purpose is to determine if age, level of gymnast competition and race are a factor in perfectionism, body comparisons and disordered eating.

Research Question

Will female gymnasts who exhibit high levels of perfectionism and a desire to present as perfect engage in upward social comparisons, and will this be correlated with disordered eating?

Null hypotheses

1. Scores on the Multidimensional Perfectionism Scale (MPS; Frost et al., 1990) will not be significantly positively correlated with scores on the Perfectionistic Self Promotion scale of the Perfectionistic Self-Presentation Scale (PSPS; Hewitt & Flett, 1993).
2. Scores on the Multidimensional Perfectionism Scale (MPS; Frost et al., 1990) will not be significantly positively correlated with scores on the Physical Appearance Comparison Scale (PACS; Thompson, J.K. et al., 1999).
3. Scores on the Multidimensional Perfectionism Scale (MPS; Frost et al., 1990) will not be significantly positively correlated with scores on the Children's version of the Eating Attitudes Test (ChEAT; Malone, McGuire, & Daniels, 1988).
4. The PACS scores will not be significantly positively correlated with scores on the PSPS.
5. The PACS scores will not be significantly positively correlated with scores on the ChEAT.

6. The PSPS scores will not be significantly positively correlated with scores on the ChEAT.
7. There will not be significant differences between the participants on the MPS, PSPS, PACS, and the ChEAT based on age.
8. There will not be significant differences between the participants on the MPS, PSPS, PACS, and the ChEAT based on race.
9. There will not be significant differences between the participants on the MPS, PSPS, PACS, and the ChEAT based on gymnastics competition level.

Delimitations

The study was delimited by the following aspects:

1. Participants had to be females from ages 12 to 19 who are currently participating in competitive Level 7-10 WAG programs at a number of gymnastics clubs across the southeastern United States.
2. After obtaining Institutional Review Board (IRB) approval for the study, potential participants were identified in the following manner: The lead researcher, contacted WAG coaches at a number of gymnastics clubs that have gymnasts competing in Levels 7-10 of WAG. After obtaining head coaches' consent to recruit volunteers, information regarding the study was presented to parents (or legal guardians) and gymnasts at an informational meeting at those clubs. Gymnasts and parents were offered, the opportunity to volunteer to participate and allow their daughter to participate in the study. Only those

participants who had consented to be in the study and obtained consent from their legal guardian were eligible to participate in the study.

Limitations

The study was limited by the following aspects:

1. It was not ascertained if any potential risk factors were present among younger gymnasts, competing in Levels 1-6, or gymnasts participating in Elite international level gymnastics or collegiate programs.

2. Gymnasts who exhibit high risk factors for disordered eating may not have been recruited for participation, that is, may not have been 'sampled' or may have been 'underrepresented' in this sample, because coaches who are concerned about certain athletes or who 'run' certain types of programs may have denied consent to recruit volunteers from their programs, or parents may have refused to provide consent for their daughters' participation in the study.

Additionally, the gymnast herself may have refused to sign an informed consent document because of a perception that she might be treated differently as a result of participation in the study.

3. Although this study used reliable and valid instruments (e.g., the MPS), the methodology relies on the honesty of volunteers in reporting information and also on their accuracy in reporting retrospective information.

4. The geographical limitations of the study may have to a sample that is not representative of the diversity of individuals participating in WAG nationwide.

Definitions

Body image. Body image is defined as a construct that comprises a mixture of self-perceptions, ideas and feelings about, and behaviors in regard to one's physical attributes. It is a multidimensional concept that encompasses perceptual, attitudinal, affective, and behavioral components (Cooper, Taylor, Cooper, & Fairburn, 1987). Disturbances in these components are termed 'body image concerns.' These disturbances can entail over-evaluation of one's appearance in defining sense of self; internalization of unrealistic ideals of beauty, success, and power; a negatively distorted view of one's appearance in relation to those ideals; and body image dissatisfaction. These body image concerns can adversely affect psychological well-being and quality of life (Striegel-Moore & Franko, 2002).

Disordered eating. Persons with disordered eating may engage in a wide range of harmful behaviors, from food restriction to bingeing and purging, in order to lose weight or maintain a thin physique. These persons do not usually meet the criteria for anorexia nervosa or bulimia nervosa that are listed in the *Diagnostic and Statistical Manual of Mental Disorders, 4th Edition-Text Revision* (DSM-IV-TR; American Psychiatric Association, 2000). These behaviors may also frequently fall under the category of a subclinical eating disorder as defined below (Hobart & Smucker, 2000).

Eating disorders and disordered eating. The Eating Disorders: The recognized eating disorders are characterized by severe disturbances in eating behavior. As codified in the *Diagnostic and Statistical Manual of Mental Disorders, 4th Edition-Text Revision* (DSM-IV-TR, 2000), the two best known eating disorders are Anorexia Nervosa and

Bulimia Nervosa (see Appendix A). Anorexia Nervosa is characterized by a refusal to maintain a minimally normal body weight. Bulimia Nervosa is characterized by repeated episodes of binge eating followed by inappropriate compensatory behaviors such as self-induced vomiting; misuse of laxatives, diuretics, or other medications; fasting; or excessive exercise. An ‘undue influence’ of weight and shape on self-concept, and a disturbance in perception of body shape and weight are an essential feature of both Anorexia Nervosa and Bulimia Nervosa. The most common type of eating disorder seen in clinical practice is an Eating Disorder Not Otherwise Specified (EDNOS; DSM-IV-TR, 2000). This category is provided for coding disorders that meet most, but not all of the criteria for a specific Eating Disorder (DSM-IV-TR, 2000). This set of disorders is sometimes referred to as ‘subclinical’, but available evidence indicates that these disorders are, in general, serious enough that this adjective is a misnomer (Murphy, Perkins, & Schmidt, 2005).

Dimensions of perfectionism

Although “perfection” and “perfectionism” are linguistic and motivational concepts that most people have little trouble understanding and applying, experts continue to struggle with basic questions about the components of perfectionism and whether being a perfectionist is a healthy or unhealthy characteristic. Most researchers now acknowledge that perfectionism has multiple dimensions, some of which are adaptive and some of which are maladaptive (Frost et al., 1990; Hewitt & Flett, 1991). With respect to the most direct applications to negative body image and risk for eating disorders, multidimensional perfectionism concerns the desire or “need” to achieve the

highest standards of performance, combined with critical evaluations of one's performance. These people often feel that they cannot fulfill their parent's expectations, which they have internalized, and thus they expect excessive criticism of their performance and achievements (Frost et al., 1990; Purdon, Antony, & Swinson, 1999).

Perfectionistic self-presentation. Perfectionism, as defined by Frost et al. (1990) and Hewitt and Flett (1991), describes the psychological features of the desire or need to *be* perfect or *attain* perfection. Perfectionistic self-presentation reflects the need to *appear* to be perfect, and consequently this construct focuses on how perfectionists behave when expressing their supposed perfection to others. According to Hewitt et al. (1995), there are three key facets to perfectionistic self-presentation. First, *perfectionistic self-promotion* involves actively proclaiming one's successes, strengths and achievements to others. Second, *nondisclosure of imperfection* concerns a reluctance to verbally admit to personal shortcomings, and third, *non-display of imperfection* entails an avoidance of behavioral displays of imperfection.

Aesthetic Sports and Non-Aesthetic Sports

Aesthetic sports are subjective, usually individual, with outcomes that are based on a score given by a judge. They are focused on appearance, and thus often entail concerns about weight and body shape (e.g. gymnastics, diving, cheerleading). Part of the judges scoring is based on self-presentation, thus making it an aesthetic sport. Non-aesthetic sports are generally those that are not focused on weight (for the purposes of appearance) or appearance (e.g. basketball, soccer, football). They are objective sports that are often

played on a team and have a score based on goals or points scored (Schwarz et al., 2005; Kerr et al., 2006)

LITERATURE REVIEW

The following review provides an overview of the literature relating to the current study. The review briefly summarizes early onset of body image concern and prevalence of disordered eating among gymnasts. This is provided as the rationale for looking at risk factors that might be correlated with disordered eating in this population. The review moves to look at perfectionism, perfectionistic self-presentation and social comparisons.

Early Onset of Body Image Concerns

Davison et al. (2002) found that girls who participated in aesthetic sports reported greater weight concerns than girls in non-aesthetic sports. In addition, girls who participated in aesthetic sports reported greater weight concerns than girls who did not participate in any sports at ages 5 and 7 years. It was also found that girls participating in aesthetic sports reported greater concern about weight at the age of 7 compared to concerns reported by 5-year-old girls. This research suggests that participation in aesthetic sports may foster a higher focus on weight and body shape among girls even at such a young age. The authors did caution that it is possible that girls may be concerned about their weight as a result of their participation in aesthetic sports, or they may participate in aesthetic sports as a result of their concern, or their parents' concern about the daughter's weight (Davison et al., 2002).

A study conducted by Poudevigne et al. (2003) sheds light on this question. The study found that the body image perceptions of girls between the ages of 4 and 8 years

beginning their first artistic gymnastics class did not differ from non-gymnast controls matched on age and percentage body fat measured by dual energy x-ray absorptiometry (DEXA scan). Self-perceptions on the Body Figure Rating Scale (BFRS) also did not differ from non-gymnast controls. The authors posit that this casts doubt on the idea that young girls who are dissatisfied with their body and want to be smaller are more likely to enroll in gymnastics classes than girls without this type of body dissatisfaction (Poudevigne et al., 2003).

In general, it is accepted that body dissatisfaction is more prevalent among females. Wood et al., (1996) assessed body image dissatisfaction among 109 male and 95 female preadolescent children. Girls reported significantly greater dissatisfaction with their bodies than boys and indicated that they desired to be thinner than their current figures. By the 8 to 10-year age range, girls already displayed statistically significantly lower self-esteem than boys. The results suggest that females' dissatisfaction with their current figure begins before adolescence, and that this has implications for other realms of self-evaluation (Wood et al., 1996).

All of the evidence suggests that body image concerns begin at an early age for many girls. However, girls who begin gymnastics do not appear to have greater body image concerns than non-participants, but many gymnasts expressed greater concern at age 7 than age 5 about their bodies. The study was longitudinal in nature. Measures for similar ages in the general population were not found in this review. Clearly, there is need for more research on adolescent female gymnasts, as the literature lacks this.

Body Image Concerns and Disordered Eating Increase with Age

O'Dea and Abraham (1999) found that after menarche (onset of menstruation) females had increased personal expectations and were dissatisfied with weight and shape changes. Young postmenarcheal females who were high achievers and had high levels of trait anxiety were more likely to have lower weight than premenarcheal females. (O'Dea & Abraham, 1999).

A study by Van Tonder (2004) found that disordered eating behaviors increased with age in black and white females, but particularly among black females in South Africa. This was specifically linked to bulimic behaviors as measured on the EAT-26 and the EDI. While the sample may be different to that in the United States, it is still another finding that adds a reason for further investigation into the relationship between disordered eating and age.

Racial differences in disordered eating

Neumark-Sztainer et al. (2002) found that weight-related concerns and behaviors measured by Body Mass Index (BMI), demographic information, and the Body Shape Dissatisfaction scale were prevalent among all racial groups and both genders in a large cross-sectional study.

Roberts et al. (2006) found in a meta-analytic review of disordered eating and race, that overall black females had more favorable evaluations on various body image measures than white females, with race offering a possible protective factor from weight concerns. Although it was demonstrated that differences are beginning to diminish between ethnic groups on weight-focused measures (e.g. measures that look at disordered

eating behaviors such as the EDI and EAT-26), the ethnic differences have actually increased on global body image measures (e.g. measures that look at body image concern and other non-weight related concerns). Of interest also, was that among all groups, body dissatisfaction and disordered eating appeared to increase with age, with college-aged women reporting the greatest concerns (Roberts et al., 2006).

Franko et al. (2007) found that there were significant differences in the types of disordered eating behaviors reported by different ethnic groups. On a self-report screening questionnaire used in college student health centers, it was found that Asian American females reported less diuretic use than other groups, while Native Americans more frequently reported laxative abuse and other purging behaviors such as exercise than other racial groups. Similarly, white participants reported more binge episodes compared to matched African American participants in the study. The authors recommended that researchers and clinicians pay closer attention to understanding racial differences in disordered eating in the future (Franko et al., 2007).

Prevalence of eating disorders among female athletes

A body of research has been conducted on the prevalence of eating disorders among female athletes. Tofler et al. (1996) summarized studies that estimated the prevalence of eating disorders in the general population to be about 1% for anorexia nervosa and around 3% for bulimia. However, an epidemiological review by Hoek and van Hoeken (2003) reported an average prevalence rate of 0.3% for anorexia nervosa and 1% for bulimia nervosa in the general population. Tofler et al. (1996) reviewed a number of studies and reported that the prevalence of disordered eating (not necessarily clinical

eating disorders) among female athletes lies between 15% and 62%. The study discusses how pressure from parents, coaches and judges influences female gymnasts' pursuit of a prototypic mesomorphic body appearance. In addition, the subjective judging of gymnasts and how they look may indirectly contribute to the development of eating disorders (Tofler et al., 1996).

Lack of support for a high prevalence of eating disorders in female athletes

In a meta-analysis of female athletes and eating problems, Smolak et al. (2000) concluded that there appear to be circumstances in which sports participation by women constitutes a risk factor for certain elements of eating problems (e.g, in lean sports such as dance, where lean muscle is emphasized) while in other sports (e.g, in non-lean sports, where less focus on lean mass is emphasized), athletic participation may be protective against eating problems. Several groups were at higher risk than non-athletes, especially those in elite lean sports (elite sport being generally defined as the highest level of national or international competition). However, gymnasts, swimmers and runners did not differ from non-athletes. The authors caution that while efforts by USA Gymnastics in the mid 1990s may have reduced the prevalence of eating problems among gymnasts, it is just as likely that the heightened attention of the problems in gymnastics has led coaches and gymnasts to be less forthcoming in reporting disordered eating for fear of continuing to damage the sport's reputation. Those participating in non-elite, non-lean sports or high school sports may receive a protective effect from athletic participation (Smolak et al., 2000).

A meta-analysis by Hausenblas and Symons Downs (2001) reported that athletes generally reported a more positive body image than control groups across studies, and the magnitude of this effect was small. Several possible moderating effects of the results were examined. Firstly, Body Mass Index (BMI) did not moderate the effect size. Age also failed to moderate the effect size; irrespective of age athletes reported a more positive body image than nonathletes. Secondly, overall effect sizes indicated that the athletes had a more positive body image than the control groups used in studies. Thirdly, a small effect size was found for studies in which the general population was included for comparison purposes, versus a moderate effect size for studies that contained normative data. Fourth, athletes competing in endurance, aesthetic, and ball game sports did not differ in the magnitude of the effect for body image concerns compared to the control groups. Thus, sport-type failed to moderate body image concerns despite other research that has posited that aesthetic athletes are more prone to pressure to attain an ideal body shape (e.g., Sundgot-Borgen & Larsen, 1993). Lastly, by comparison with the general population, collegiate athletes had a more positive body image than intramural athletes. The overall outcomes of the meta-analysis were that athletes reported a more positive body image than nonathletes (Hausenblas & Symons Downs, 2001).

Kirk, Singh and Getz (2001) compared the prevalence of eating disorder behaviors between female college athletes (n =206) and female college non-athletes (n =197). The athlete group consisted of athletes from 10 elite NCAA Division sports at one university, as well as 1 non-varsity dance team from that university. The sports studied included volleyball, soccer, tennis, cheerleading, softball, lacrosse, cross-country, track and field,

swimming and diving, basketball and high-tech dance. The non-athlete group had a higher percentage of women meeting criteria for eating disorder behavior (15.2%) than the athlete group (10.7%), although the difference in the two percentages was not statistically significant. The results of the study did not support the hypothesis that college athletes have a higher risk for eating disorders. There were no samples of gymnasts, divers or figure-skaters in the study (Kirk, Singh, & Getz, 2001).

In a recent study, Bachner-Melman et al. (2006) used a large number of eating disorder measures to determine how anorexic-like the symptoms in aesthetic athletes were and to investigate the personality profiles of the aesthetic athletes (the authors used this definition to apply to both gymnasts and ballet dancers). The study used measures investigating eating disorder behaviors, as well as perfectionism traits and a question about facial attractiveness in anorexia nervosa patients, aesthetic athletes, non-aesthetic athletes and a control group. The study contained 31 anorexia nervosa patients (it is not specified if these were athletes or not) from a community sample. The second group contained 111 aesthetic athletes, who trained for a minimum of 10 hours per week and performed regularly. Ninety-seven of the 'aesthetic athletes' were dancers, nine were gymnasts, two were acrobats, and three were synchronized swimmers. Another group contained 68 current non-aesthetic athletes, training for a minimum of 10 hours per week and competing at a high level in their respective sports. This group was comprised of thirty two endurance athletes (defined in the study as distance runners and swimmers), 23 basketball players or volleyball players and 8 that competed in fencing, sailing or the martial arts (exact numbers for each sport were not specified). A control group

containing 248 women who were neither anorexia nervosa patients, nor athletes was also recruited from the local community. The results showed that aesthetic athletes did not differ from female controls in terms of anorexic symptoms and personality profiles and also did not compare with anorexic patients, who were also participants in the study. Once again, a theme emerged that being a non-aesthetic athlete appeared to promote self-esteem and serve as a protector against eating disorders. This study was limited as it used mainly female dancers rather than a wider range and greater number of competitive aesthetic athletes. The survey was done in Israel, thus differing in ethnic, social and cultural backgrounds to those surveys that have taken place elsewhere. Those being recruited were told what the design of the study was; thus those with eating problems may have chosen not to participate. The prevalence of eating disorders may have been lower in this study than others due to the limitations outlined (Bachner-Melman et al., 2006).

Support for high prevalence of disordered eating in female athletes

While some studies have failed to demonstrate a high prevalence of eating disorders in female athletes, the following studies report a high level of disordered eating behaviors (but not clinical eating disorders) in female athletes, specifically in female aesthetic athletes.

Engel et al. (2003) conducted a study of eleven sports at elite Division I collegiate programs at eleven different institutions. The study was comprised of 1445 participants (562 females, 883 males) competing in football, basketball, track, swimming, gymnastics, wrestling, cross country, crew, tennis, Nordic skiing, and volleyball. Out of the eleven

sports surveyed and included in the analysis, wrestling and gymnastics demonstrated elevated levels of drive for thinness, food restriction, and purging behavior compared to other sports. An athlete's chosen sport, along with their perceptions of normative eating and weight regulatory behaviors within their sport prove to be significantly correlated with various disordered eating parameters. For example, restrictive eating was significantly associated with an athlete's perception that other members of their team were dieting in excess in order to control weight (Engel et al., 2003).

Johnson, Powers and Dick (1999) conducted a survey of 1,445 student athletes from 11 Division I schools across the country (the same sample as used in Engel et al., 2003) using a 133-item questionnaire. The results showed that only 1.1% of the female (and 0% of male) athletes met the DSM-IV diagnostic criteria for bulimia nervosa, while none of the students met DSM-IV criteria for anorexia nervosa. However, large problems were reported with subclinical eating disorders. Firstly, 9.2% of females and 0.1% of males identified as having significant problems with bulimic behaviors. Furthermore, 2.85% of the females and 0% of the males reported significant problems with anorexic behaviors. In addition, 10.85% of female athletes and 13.02% of the male athletes reported binge eating at least once per week. Lastly, 5.52% of the females and 2.04% of the males reported purging behavior through use of vomiting, laxatives or diuretics at least once per week. Of critical importance was the high level of subclinical and at risk eating disorder behaviors among female athletes. The results of the study suggested that some female athletes could be at high risk for disordered eating (Johnson, Powers & Dick, 1999).

Hausenblas and Carron (1999) reviewed eating disorders indices as they relate to athletes. The study was a meta-analytic review looking at bulimia nervosa indices, anorexia nervosa indices and drive for thinness. It was reported that female athletes revealed small effect sizes for bulimia and anorexia indices ($\eta^2 = 0.16$ and 0.12 , respectively) compared to control groups. Conversely, however, female athletes generally were not characterized by a greater drive for thinness. In terms of a search for moderator variables, it was reported that the subgroup of athletes self-reporting the most eating disorders related indices were aesthetic athletes. Relative to females in the general population, females in aesthetic sports reported more anorexic indices ($\eta^2 = 0.38$) and drive for thinness indices ($\eta^2 = 0.09$). The mean effect size for the anorexic indices was significantly higher for aesthetic athletes ($\eta^2 = 0.38$) than ball-game athletes ($\eta^2 = -.17$) and endurance athletes ($\eta^2 = -0.04$) (Hausenblas & Carron, 1999). These results are important in light of the current study as they demonstrate that risk factors for disordered eating may be greater in female aesthetic athletes than non-aesthetic athletes or control groups.

Heffner, Ogles, Gold, Marsden, and Johnson (2003) conducted a survey of college coaches on nutrition and eating in female college athletes. Six hundred coaches were chosen to participate in the study; 303 returned questionnaires, of which 18.1% were gymnastics coaches. Of those who returned the survey, male coaches expressed more agreement when compared with female coaches, that recent concern about eating disorders in athletes had been exaggerated. Gymnastics coaches expressed less agreement with the statement, 'it is important to keep track of athletes' weights than did

other coaches. On the other hand, gymnastics coaches indicated greater agreement than other coaches that it is important for coaches and athletes to collaboratively set a goal weight for performance. More gymnastics coaches agreed that losing weight can impair an athlete's performance due to strength loss. However, analysis by sport showed that gymnastics coaches engaged in more monitoring and weight management behaviors than coaches of other sports. It is unclear if they monitor weight out of concern of it going too low or too high. Gymnastics coaches also reported more eating and weight problems in their gymnasts. Of all coaches, 44% reported weighing athletes, 44% frequently assessed athletes' body fat composition and 30% suggested losing weight through restriction of food intake or extra exercise. The study showed that a significant proportion of NCAA coaches have unhealthy attitudes and behaviors concerning their athletes' weight and may be creating body image and weight concerns for them (Heffner et al., 2003). The behaviors reported here, if prevalent at both club and college level might lead to gymnasts feeling a need to present as perfect in the gymnastics environment, and merits further study.

Kerr et al. (2006) investigated the perspectives of athletes, coaches, parents and judges on disordered eating in women's gymnastics with a particular emphasis on weight-related teasing and body disparagement. This included recruitment of 95 female gymnasts between the ages of 11 and 20 years of age. Male and female coaches of these gymnasts ($N = 28$) were included, with a response rate of 19%. Twenty female gymnastics judges participated, with a response rate of 57%. Additionally, fifteen retired Elite gymnasts (response rate = 67%) took part. A critical outcome was the disparity in

perspectives of what each person was doing or saying to gymnasts. In the results, 92% of parents did not suspect their daughters of having an eating disorder, but 34% of the parents were concerned about their daughter's eating patterns. Furthermore, 81% of parents believed that coaches managed issues related to gymnasts' weight control appropriately; but 15% of parents reported that a coach had told their daughter to lose weight and 16% said that a coach had made negative remarks about a gymnast's body. Of judges surveyed, 35% reported seeing unhealthy eating and weight control practices including self-induced vomiting among gymnasts, while traveling with them. Additionally, 20% of the judges had observed coaches encouraging these unhealthy practices, while 60% of the judges believed they needed to intervene more often between coaches and gymnasts and possibly change the judging system to reduce emphasis on appearance. Critically, only 19% of coaches responded to the survey. Of these, 54% said they determined if a gymnast needed to lose weight by visual appearance alone. None of the coaches admitted to regular weighing of gymnasts, while 82% of them said that other coaches engage in this practice frequently. Gymnasts reported that as a result of comments and practices in the gymnastics environment, they desired to lose weight; 35% of the gymnasts surveyed reported a desire to lose an average of 11 pounds, which would leave them with a BMI of 17.5 (below the BMI of 19, considered underweight). Of those surveyed, 3% reported having or had an eating disorder, while 18% said they felt that they have disordered eating behavior. Forty four percent of gymnasts reported that coaches had made negative comments about their bodies, while 12% reported that a coach had instructed them to lose weight. Of those gymnasts who had received or heard

disparaging body comments, 13% reported that they have or had an eating disorder, while 29% reported disordered eating behavior; for those who had not received or heard negative body comments these figures were 0% and 13% respectively. Interestingly, the retired gymnasts reported higher body image related concerns than the current gymnasts. The authors suggest it was possibly because they had less fear of the implications of parting with this information since they weren't competing anymore. However, the natural changes that occurred to their bodies (e.g., weight gain, loss of muscle mass) may have also made them more concerned about their bodies after they had finished competing. Forty percent said they were told to lose weight by a coach during their career. Twenty percent believed they have or had an eating disorder, while 73% reported disordered eating behavior. Thus, a large proportion of the retired gymnasts reported some form of disordered eating (Kerr et al., 2006). These results show the inconsistencies in the coaches, parents, judges and athletes response and warrant further investigation.

A study by Schwarz et al. (2005) investigated the difference in eating attitudes, body dissatisfaction, and perfectionism in both female athletes and non-athletes in a number of different sports at the collegiate level. The study included 103 females from a community college and a small private women's college in the Midwest. Fifty three percent of the women were non-athletes. While the authors defined participants as 'college athletes', they do not discuss if any of the participants from the small private women's college were participating in NCAA sports or if they are intramural athletes. The sports the athletes participated in are also not defined with the exception of diving

and basketball, although the authors refer to ‘judged sports’ and ‘refereed sports’, more often referred to as aesthetic and non-aesthetic sports in the literature. The results indicated that body dissatisfaction was greater among non-athletes than athletes. However, athletes in judged, aesthetic sports showed a greater incidence of dieting than those in refereed, non-aesthetic sports. Athletes also scored higher on perfectionism than non-athletes. Perfectionism was positively associated with general eating pathology, dieting and bulimia. The study concluded that female athletes who are perfectionists and participate in a judged, aesthetic sport may be at heightened risk for disordered eating (Schwarz et al., 2005).

The studies reviewed in this section indicate that while there is not much evidence of a greater prevalence of eating disorders in female athletes than non-athletes, that disordered eating behaviors are a significant problem for female athletes. This has been demonstrated to be particularly true in aesthetic, lean sports such as gymnastics. These studies also provide evidence of comments that could lead to perfectionism or feeling a need to present as perfect, as indicated in the literature below. Further research on the nature of disordered eating in WAG is merited, particularly in adolescent samples, where Kerr et al. (2006) have reported high levels of disordered eating behavior.

Parent Comments

Mother. Abramovitz and Birch (2000) found that five-year-old girls’ ideas about dieting are predicted by their mothers’ dieting. Of 197 girls and their parents who participated, girls whose mothers reported current or recent dieting were more than twice as likely to articulate ideas, concepts and beliefs about dieting. It was unearthed that the

transmission of information about dieting from mothers to daughters begins early, before girls actually begin to adopt dieting behaviors. Mothers' weight concern in the study was a significant predictor of daughters' weight concern. In the study, 7% of the five year olds had already been on a diet. While many of the participants were too young to have engaged in dieting behaviors, many of them had developed ideas, beliefs and concepts about dieting; with their mothers being the primary source of information about dieting (Abramovitz & Birch, 2000).

Reardon (2003) investigated the influence of maternal attitudes and behaviors on the development of weight concern, body dissatisfaction and weight control behaviors among first through fifth-grade girls. Elevated levels of maternal encouragement to lose weight or diet and maternal modeling significantly predicted elevated levels of girls' weight concern, weight control behaviors, and body dissatisfaction. Elevated levels of internalized criticism significantly predicted elevated levels of girls' weight concern and weight control behaviors, but did not predict elevated levels of body dissatisfaction (Reardon, 2003).

Father. Fitzgerald and Lane (2000) note that many theories concerning risk factors for disordered eating have focused on the mother and daughter relationship. However an increasing amount of work has been conducted regarding the relationship with the father.

It was concluded that the father's role in the development of risk for eating disorders often involves his neglect of his daughter's needs, while positively contributing to the personality components (such as perfectionism) that are associated with these risks (Fitzgerald & Lane, 2000).

Mother and father. Sniezek (2006) examined parental criticism and eating disturbance in adolescent females. The relationship between parental criticism and risk factors for disordered eating was examined in addition to the effectiveness of the parental portion of a prevention program. Results indicated a significant relationship between parental criticism and risk factors for disordered eating. Both mothers' and fathers' criticisms of attractiveness were correlated with disordered eating behaviors, and general criticism was correlated with perfectionism. Fathers' general criticism was correlated with disordered eating behaviors (Sniezek, 2006).

Research shows that mothers of daughters with bulimia are often critical of their daughters' weight and physical attractiveness and that they often have a history of dieting and disordered eating behaviors themselves (Pike & Rodin, 1991). Young et al. (2004) examined perfectionism, low self-esteem and family factors as predictors of bulimic behavior. The study found that low self-esteem was not correlated with bulimic behavior, indicating that body dissatisfaction is a more important predictor of bulimic behavior than general feelings of low self-esteem. Perceived pressure from family members to maintain a thin body shape was significantly correlated with increases in bulimic behavior. However, parental expectations were found to be significantly correlated with lower levels of bulimic behavior. This finding contradicted past findings (Young et al., 2004). This research has several implications for the current study. Firstly, it appears that perceived pressure from parents to be thin can create perfectionist behaviors and put young women at risk for negative body image and disordered eating behaviors, but high parental expectations may not cause this to happen. In fact high

parental expectations that are part of a caring, supportive environment might serve as a protective factor against these risks. Parental comments and expectations may be two of a number of components that influence perfectionism in young females.

Perfectionism

Dimensions of perfectionism. Perfectionism has been described as “the practice of demanding of oneself or others a higher quality of performance than is required by the situation” (English & English, 1958). Perfectionism is not a matter of having high standards, rather it is present when the high standards “are accompanied by tendencies for overly critical evaluation’s of one’s behavior” (Frost et al., 1990). It has been suggested that the common central features of both anorexia nervosa and bulimia nervosa (especially striving for a ‘perfect’ weight or body shape) are inherently perfectionistic (Goldner, Cockell, & Srikaneswaran, 2002). One proposal for the treatment of eating disorders has identified perfectionism as a key maintenance mechanism that may help to account for the persistence of severe eating disorders (Fairburn, Cooper, & Shafran, 2003). There are a number of other key definitions of perfectionism. Unidimensional perfectionism concerns the setting of excessively high standards of performance accompanied by overly critical self-evaluations. Achieving 95% or even 99% is seen as complete failure because it is not perfect (Pacht, 1984).

Franco-Paredes, Mancilla-Diaz, Vazquez-Arevalo, Lopez-Aguilar, and Alvarez-Rayon (2005) conducted a review of the literature on perfectionism and eating disorders. Perfectionism, as measured on the MPS, concerns the desire to achieve the highest standards of performance, combined with critical evaluations of one’s performance.

These people often feel that they cannot fulfill their parent's expectations, and expect excessive criticism of their performance and achievements (Frost et al., 1990; Purdon et al., 1999). Perfectionism as measured in a multidimensional manner on the MPS is considered to have some of the most direct applications to negative body image and risk for eating disorders.

The Frost MPS (Frost et al., 1990) was the first of two multidimensional perfectionism scales, the other being produced by Hewitt & Flett (1991). The Frost et al. (1990) scale contains six subscales. Concern over Mistakes (CM) reflects negative reactions to mistakes; Personal Standards (PS) reflects setting very high standards and excessive importance placed on these standards for self-evaluation; Parent Expectations (PE) is the belief that one's parents set very high standards; Parental Criticism (PC) reflects the perception that one's parents are (or were) overly critical; Doubting of Actions (D) concerns doubting one's ability to accomplish tasks; and Organization (O) reflects the importance placed on being orderly (Frost et al., 1990). Perfectionism, as measured on the MPS, concerns the desire to achieve the highest standards of performance, combined with critical evaluations of one's performance. These people often feel that they cannot fulfill their parent's expectations, and expect excessive criticism of their performance and achievements (Frost et al., 1990; Purdon et al., 1999).

Normal perfectionism (or adaptive perfectionism) concerns people who derive a sense of pleasure from the labors of effort and who feel a degree of freedom to be less precise in certain situations. Neurotic perfectionism (or maladaptive perfectionism) on the other hand concerns the demand of a higher level of performance than it is possible

for the person to achieve (Hamachek, 1978). Maladaptive perfectionists have a tendency to set excessively high standards for performance and are preoccupied with and overly critical of their own mistakes (Frost et al., 1990). Research suggests that on the Frost MPS, concern over mistakes, parent criticism, parental criticism and doubts about actions are generally associated with maladaptive perfectionism (Enns & Cox, 2002). On the other hand, Personal Standards and Organization have been correlated with adaptive perfectionism, particularly in athlete samples (Frost & Henderson, 1991). This is in line with a review that took six traits from literature on anorexia nervosa and compared them with six corresponding traits from literature on the athletic environment. The comparisons revealed several similarities between athlete and anorexic traits. The conclusion of the study was that 'good athlete' traits may make it more difficult to spot some athletes who might be at risk for developing disordered eating (Thompson & Sherman, 1999b).

Bastiani et al. (1995) conducted one of the earliest studies on perfectionism in anorexia nervosa, using a number of measures, including the perfectionism subscale of the Eating Disorders Inventory (EDI) and the Multidimensional Perfectionism Scales (MPS). A total of 19 female anorexic patients were surveyed as two groups, the first when underweight ($n=11$), the other within four weeks of return to healthy body weight ($n=8$). Ten healthy women were included as a control group. There was no difference between groups for parental expectations. The two measures demonstrated that patients with anorexia nervosa are perfectionist and that perfectionism persists after weight restoration. The Frost and Hewitt MPS scales, suggested that anorexics experience their

perfectionism as self-imposed, not as a response to the expectations of others, however this was in disagreement with the results on the EDI Perfectionism subscale and other studies below that demonstrate that perfectionism is often in response to the expectations of others. Anorexic patients post weight-restoration were only different from the control group on the EDI subscales of perfectionism. Further investigation of perfectionism in anorexia nervosa was recommended (Bastiani et al., 1995).

Woodside et al. (2002) compared the personality and eating-related traits in parents of patients with eating disorders, with age-band matched healthy controls. By looking at a large, diverse sample ($n = 196$ relative pairs) the study aimed to investigate genetic phenotypic definitions alongside the Frost MPS scores. The study sought insight into temperamental traits that might be transmitted through families that have an increased risk for the development of eating disorders. Mothers of the patients showed elevated levels of perfectionism on the MPS and more concerns about weight and shape on the Eating Disorders Inventory (EDI) compared to controls. Mothers that had daughters with diagnoses other than the restricting subtype of anorexia nervosa showed elevated levels of perfectionism on the MPS. The authors concluded that perfectionism may be a worthwhile candidate for a transmissible trait that may be of etiological relevance to anorexia nervosa and one that may assist in refining the phenotypic definition of anorexia nervosa for future genetic studies (Woodside et al., 2002).

Bardone-Cone et al. (2007) conducted a recent, concise review on perfectionism and eating disorders. The review encompassed 55 papers published between 1990 and 2005 that assessed perfectionism in patients with eating disorders. In addition, a comparison

was made with perfectionism papers in the anxiety and depressive disorder literatures. The eating disorder studies reviewed showed a consistent pattern of elevated levels of maladaptive and achievement striving perfectionism in both anorexia nervosa and bulimia nervosa patients, with the pattern being most consistent in anorexic patients. The review also found that the aspect of perfectionism associated with the tendency to interpret mistakes as failures is most strongly associated with eating disorders rather than being generally associated with psychological disorders (e.g., Bulik et al., 2003; Cockell et al., 2002). Studies have also found that recovery from anorexia nervosa or bulimia nervosa is not accompanied by reductions in maladaptive or achievement striving perfectionism, and scores remain elevated in recovered participants (Bastiani et al., 1995; Kaye et al., 2004; Lilenfeld et al., 2000). In terms of premorbid perfectionism, one study found that individuals with bulimia nervosa had higher rates of childhood perfectionism (retrospectively assessed) than a healthy control group, but not compared to a more general psychiatric control group (Fairburn et al., 1998). A second study showed that individuals with anorexia nervosa had higher rates of childhood perfectionism (retrospectively assessed) than the healthy control group or the psychiatric group, but that childhood perfectionism levels did not differ from the bulimia nervosa group (Fairburn et al., 1999). In addressing family findings related to perfectionism and eating disorders, the never-ill (i.e., never diagnosed with an eating disorder) relatives of bulimia nervosa patients had higher EDI-Perfectionism scores than never-ill relatives of control patients, as well as significantly higher scores on the Frost MPS (Lilenfeld et al., 2000). The authors concluded in summing the perfectionism and eating disorders section that the

literature hitherto suggests that eating disorders are characterized by high-level perfectionism, which endures after recovery and appears to have strong familial correlations as well as being correlated with a predispositional significance for the development of eating disorders (Bardone-Cone et al., 2007).

Perfectionistic self-presentation. Perfectionistic self-presentation, the need to appear to be perfect, focuses on how perfectionists behave when expressing their supposed perfection to others. There are three key facets to perfectionistic self-presentation: perfectionistic self-promotion, nondisclosure of imperfection and nondisplay of imperfection. Perfectionistic self-promotion involves actively proclaiming one's successes, strengths and achievements to others. Nondisclosure of imperfection entails a reluctance to verbally admit to personal shortcomings, whereas nondisplay of imperfection entails an avoidance of behavioral displays of imperfection. It was reported that all three facets were related to increased body image avoidance, decreased appearance self-esteem and risk factors for disordered eating behaviors (Hewitt et al., 1995; Hewitt et al., 2003).

McGee, Hewitt, Sherry, Parkin, and Flett (2005) found that all three dimensions of perfectionistic self-presentation were related to risk for eating disorder symptoms. Perfectionistic self-presentation was correlated with eating disorder risks in women who were dissatisfied with their bodies, but it was not correlated with eating problems in women who liked their bodies and found little discrepancy between actual and ideal appearances. Specifically, actively promoting one's strengths, eschewing overt displays

of imperfection and refusing to tell others about one's shortcomings were all correlated with disordered eating (McGee et al., 2005).

Cockell et al. (2002) examined both trait and self-presentational perfectionism among women with anorexia nervosa, in order to gain a better understanding of the correlations with disordered eating. Using a mixture of quantitative and qualitative measures on a group of anorexic patients and two other control groups (one with other psychiatric disorders and one with no psychiatric problems), the authors found a number of key factors. Women with anorexia had significantly elevated levels of self-oriented and socially prescribed perfectionism on the multidimensional trait scales, compared to the two control groups. The level of socially prescribed perfectionism in the group of anorexic women was ($M = 79.4$), substantially higher than the scores for underweight restrictor anorexics ($M = 60$) and weight-restored anorexics ($M = 41$) (Bastiani et al., 1995). Cockell and colleagues reported findings indicating that the motivation to meet one's own or perceived others' expectations of perfection distinguishes women with anorexia nervosa from those with other psychological disorders. Correlated with this was a strong need to present an image of perfection to others or avoid revealing perceived imperfections in the self, and these concerns were not simply a function of distress. The results indicated that levels of perfectionistic self-promotion, as well as nondisplay and nondisclosure of imperfection are particularly salient among women with anorexia nervosa. Thus, the self-presentation concerns of those with anorexia nervosa may be quite idealistic and are focused on displaying perfection and avoiding flaws and mistakes that may be apparent to others (Cockell et al., 2002).

Hewitt et al. (1995) studied the personal, social and self-presentational dimensions of perfectionism in relation to disordered eating behavior. The results demonstrated that whereas self-oriented perfectionism was related only to anorexic tendencies and attitudes, social dimensions of perfectionism were related to both disordered behaviors and self-esteem. The authors point out that the finding that socially prescribed perfectionism is broadly related to disordered eating patterns and concerns about appearance and self-esteem lends support to other conceptualizations; suggesting that some perfectionistic striving seen in disordered eating behavior is motivated by strong needs to conform to a model or ideal of perfection that is perceived as demanded by the self and others. In terms of perfectionistic self-presentation, the study demonstrates that strong needs to present an image of perfection to others or avoid revealing imperfections are related to concerns about social reactions to or evaluations of one's appearance, as well as, specific eating disorder behaviors (Hewitt et al., 1995).

Of specific relevance to athletes, Flett and Hewitt (2005) noted that when evaluating perfectionism among athletes, the extent to which they are focused excessively on self-presentational issues must be considered. The authors discussed how some individuals are very concerned about making an impression on others, and when they are in social situations, they often seek to portray themselves in as positive a light as possible. The authors also note that excessive self-presentational concerns "can contribute to health problems, including eating disorders and a quest for bodily perfection" (Flett and Hewitt, 2005). The authors point out that correlations between perfectionism and perfectionistic self-presentation have not been investigated in athletes thus far. However, initial research

in the general population has found that perfectionistic self-presentation is elevated in patients with eating disorders, and perfectionistic self-presentation also accounts for many forms of psychological distress including depression, anxiety, and negative feelings regarding physical appearance (Hewitt et al., 2003).

In sum, perfectionism has been tied both directly and indirectly to risk factors for disordered eating. Patients with anorexia nervosa are perfectionist and perfectionism persists after weight restoration. Mothers of daughters with eating disorders have shown elevated levels of perfectionism and concerns about weight and shape. Perfectionism may be a genetically mediated personality trait that is transmitted through families. Some perfectionistic striving in disordered eating seems to be motivated by strong needs to conform to a model or ideal of perfection that is perceived as demanded by the self and others. Strong needs to present an image of perfection to others or avoid revealing imperfections are related to concerns about social reactions to or evaluations of one's appearance as well as specific disordered eating behaviors. Lastly, it emerged that 'good athlete' traits such as perfectionism are also characteristics of those who have disordered eating, possibly explain risk factors specific to the athletic environment.

Body Comparisons

It has been reported by Bardone-Cone et al. (2007) that the specification of any explanatory mechanism leading from perfectionism to an eating disorder is largely missing from the literature. One of the possible mechanisms focuses on the role of perfectionism in attempts to attain and maintain social status or rank. As already noted, high levels of maladaptive perfectionism involve doubts about the quality of one's

behavior, excessive concerns over mistakes, and heightened sensitivity to the expectations of others. It has been proposed that these characteristics may lead to searching for more objective or external sources of self-validation. This may include feedback in the form of comparisons on easily quantifiable dimensions, such as body weight. A number of studies have found that perfectionism predicted heightened body comparisons among girls (Schutz et al., 2002) and correlated with social rank variables such as shame, submissive behavior, defeat, and negative evaluations of social comparisons (Wyatt & Gilbert, 1998).

Social comparison theory emerged in the 1950s when Festinger (1954) posited that individuals establish their own personal sense of identity by making comparisons between themselves and others who have certain valued attributes. In other words, it involves a general process of comparing qualities in the self to same qualities in other individuals. Four key postulates of social comparison theory are: “(a) that individuals have a drive to evaluate their opinions and abilities for the purpose of self-evaluation; (b) in the absence of physical realities or standards of comparison, individuals seeks to compare their opinions and abilities with those of others; (c) that people prefer comparisons with similar others; and (d) that people have a unidirectional drive upward such that they seek comparisons with slightly superior others in order to obtain information on how to improve themselves” (Schutz et al., 2002). In terms of body image, Schutz and colleagues have said that the term ‘body comparison’ may better describe the upward social comparisons that are made. Body comparison focuses on one specific quality, the individual’s body or aspects of the body (e.g., weight, shape and

size). Women often make comparisons with their mothers, siblings, female authority figures, friends/peers and media figures.

Females who have concerns about their own bodies make more social comparisons and are of the belief that most people are just as preoccupied with their image as they are. Making regular social comparisons has been correlated with lower body self-esteem. (Stormer & Thompson, 1996). Social comparisons encourage young women who have body concerns that their exaggerated body image concerns are common to a lot of young women (Stormer & Thompson, 1996). Body comparisons have also been correlated with body dissatisfaction and disordered eating (Heinberg & Thompson, 1992a, 1992b, 1995; Stormer & Thompson, 1996; Striegel-Moore et al., 1986; Thompson & Heinberg, 1993).

Halliwell and Dittmar (2005) carried out a study on social comparisons with idealized bodies in the media. Festinger's original theory espoused that females only make subjective comparisons with people around them in the absence of objective information about what is normal. However, further advances in social comparison theory showed that subjective social comparisons can occur even when objective information about 'normality' is available and that individuals engage in upward social comparisons for self-improvement as well as self-evaluation (Ruble, 1983; Marsh & Parker, 1984). Halliwell and Dittmar reported that the impact of upward social comparisons, which are of a self-evaluative nature, may lead to greater body image disturbances in individuals that already have 'appearance-related-self-discrepancies' (Halliwell and Dittmar, 2005).

Schutz, et al. (2002) conducted a study describing potential contributors to, and consequences of, body comparison tendency. Social comparisons, in the form of body comparison tendency were significantly correlated with a number of variables including family concern with weight, perfectionism, competitiveness and public self-consciousness. The authors note that perfectionism and competitiveness are traits associated with a heightened self-evaluative drive, and could be correlated with social comparison tendencies (Schutz et al., 2002). This study provides a crucial link in understanding how social comparisons help to supply ideals in perfectionism, and may be of particular relevance in the gymnastics environment. No study has previously attempted to investigate the correlations that may be present here. However, Thompson and Sherman (1999a) suggest that comparisons may be related to “competitive thinness”, which can occur both inside and outside of sport. This competitive thinness may be of particular importance in a judged aesthetic sport. Secondly, if a losing aesthetic athlete compares herself to a winning aesthetic athlete she could possibly associate her thinness with producing better performance, and therefore strive to lose weight. This might lead to engaging in disordered eating behaviors to reduce weight. The fact that gymnasts also have to wear revealing uniforms may also factor into the body comparisons that they make (Thompson & Sherman, 1999a). Overall body comparisons are important to the current study as young women frequently use them to find ‘perfect ideals’ that they need in order to present as perfect. Perfectionist gymnasts who feel a need to present as perfect in the gymnastics environment, and the general social environment may engage in more body comparisons in search of ideal models. Body comparisons along with

perfectionism have been correlated with disordered eating. The current study aims to investigate how perfectionism, the need to present as perfect, and body comparisons are correlated with disordered eating in a female gymnast sample.

Summary

In conclusion, a number of important studies relating to the early onset of body image concern, prevalence of disordered eating in WAG, parental comments, perfectionism and social comparison have been reviewed. Young girls in aesthetic sports reported greater weight concerns than young girls in nonaesthetic sports. Girls beginning gymnastics at 4 and 8 years did not differ from non-gymnast controls in terms of body image. Some studies stated that athletes did not differ from non-athletes in terms of prevalence and that aesthetic athletes did not differ from female controls in terms of anorexic symptoms. On the other hand, many studies demonstrated that athletes, specifically aesthetic athletes, experienced significant problems with disordered eating. Also, a study of eating disorders indices concluded that disordered eating risks were greater in female aesthetic athletes than non aesthetic athletes or control groups.

Perfectionism has been repeatedly identified as a central feature of anorexia nervosa and bulimia nervosa. The perfectionist traits required of a good athlete are similar to those that are present in anorexia nervosa. In terms of the possible explanatory mechanisms leading from perfectionism to an eating disorder, one possible mechanism focuses on the role of perfectionism in attempts to attain and maintain social status or rank. The process of searching for more objective or external sources of self-validation may include feedback in the form of body comparisons. Perfectionism has been

associated with engaging in a greater number of body comparisons among females.

Perfectionistic self-presentation has been correlated with disordered eating in women that experienced body dissatisfaction. Perfectionistic self-promotion, nondisplay and nondisclosure of perfectionism are salient among anorexic patients. Critically, the potential for links between perfectionism, perfectionistic self-presentation, and disordered eating in athletes has been proposed by Flett and Hewitt (2005). Further research has been suggested to test this hypothesis. In addition, a number of studies found racial, age, and level of competition differences in terms of correlations with disordered eating. Further research has been recommended on these demographic differences. Thus the current study seeks to examine the correlation between perfectionism, perfectionistic self-presentation, body comparisons and disordered eating in a gymnast sample. The secondary purpose is to determine if age, level of gymnast competition and race are a factor in perfectionism, body comparisons and disordered eating.

METHOD

Participants

Participants for this study included approximately 50 female gymnasts, ages 12-19-years-old, competing in competitive Level 7-10 WAG at a number of gymnastics clubs. More precisely, the participants were active participants in the competitive gymnastics at different clubs across the southeastern United States. The head coaches at a 20 WAG clubs were contacted to get their consent to recruit volunteers from their club. In the case of the coach providing consent, gymnasts at that club were eligible to be recruited as volunteers for the study. Five coaches agreed to have their clubs used as sites for recruiting participants. This study was submitted for approval by the Institutional Review Board at Auburn University. Once the study was approved by the IRB, meetings were organized at each club to give information to parents and gymnasts about the study. No coaches were present at the meeting, in order to avoid the risk of coercion. All gymnasts (and all parents of gymnasts that had not reached the age of majority in the state in which the study was conducted) were required to complete an Informed Consent form. No data can be produced on the gymnast participation rate at clubs that were used as data collection sites as data was not collected on how many gymnasts participated in Level 7 – 10 WAG at each club.

Measures

The following four measures were completed to measure perfectionism, perfectionistic self-presentation, body comparisons and disordered eating. In addition, demographic information pertaining to age, race and level of gymnastics competition (i.e. Level 7, 8, 9 or 10) was collected.

Frost multidimensional perfectionism scales. The first measure to be completed was the Frost Multidimensional Perfectionism Scales (Frost MPS; Frost et al., 1990). The Frost MPS is a 35-item questionnaire comprised of six factor analytic (dimensional) subscales: Concern over Mistakes (CM) (e.g., ‘If I fail partly, it is as bad as being a complete failure.’); Personal Standards (PS) (e.g., ‘I set higher goals for myself than most people.’); Parent Expectations (PE) (e.g., ‘My parents want me to be the best at everything.’); Parental Criticism (PC) (e.g., ‘I never felt like I could meet my parents standards.’); Doubting of Actions (D) (e.g., ‘Even when I do something carefully, I feel that it is not quite done right.’); and Organization (O) (e.g., ‘I try to be an organized person.’). Convergent validity of the Frost MPS has been demonstrated through positive, statistically significant, correlations between the Frost MPS and other perfectionism scales, such as the Burns Perfectionism Scale (Burns, 1980). Participants rate each item on a 5-point Likert scale from 1 (‘Strongly Disagree’) to 5 (‘Strongly Agree’). Good internal reliability has also been reported (Cronbach’s $\alpha = .90$ for Frost MPS total; Cronbach’s α for each subscale: CM = .88; PS = .83; PE = .84; PC = .84; D = .77; and O = .93) (Frost et al., 1990). The six subscales of the 35 item questionnaire are scored by summing the items in each subscale. In addition, there is an overall perfectionism score,

which is the sum of the subscales except for Organization. For the purposes of the current study, all subscales except Organization (O) were included in the descriptive data. However, only the total perfectionism score was calculated for the purposes of data analysis (the total perfectionism score does not include the O subscale). The Concern over Mistakes (CM) subscale is scored by summing items 9,10,13,14,18,21,23,25, and 34. Personal Standards (PS) are scored by summing items 4,6,12,16,19,24, and 30. The Parent Expectations (PE) scale is scored by summing items 1,11,15,20, and 26. The Parental Criticism (PC) scale is scored by summing items 3,5,22, and 35. Doubting of Actions (D) is scored by summing items 17,28,32, and 33. The subscales were then summed to find the overall perfectionism score. The O subscale, which was not calculated for this study would be calculated by summing items 7, 8, 27, 29, and 31.

Perfectionistic self-presentation scale. The second measure to be completed was the Perfectionistic Self-Presentation Scale (PSPS; Hewitt & Flett, 1993). The PSPS is a 27-item measure of three factorial dimensions of PSP. The *Need to Appear Perfect* subscale measures the desire to present oneself as perfect to others (e.g., “It is very important that I always appear to be ‘on top of things’”). The *Avoid Appearing Imperfect* subscale measures the desire to avoid appearing imperfect to others (e.g., “I do not want other people to see me do something unless I am very good at it”). The *Avoid Disclosure of Imperfection* subscale measures the need to avoid public admissions of imperfection or failures (e.g., “I try to keep my faults to myself”). Subjects rate their agreement with items on a 7-point Likert scale from 1 (‘Disagree Strongly’) to 7 (‘Agree Strongly’), with higher scores indicating greater PSP. The validity and reliability have been demonstrated

(Hewitt, Flett, & Ediger, 1995). A large body of research supports the factor structure, reliability, and validity of the PSPS in diverse samples (Hewitt & Flett, 1993; Hewitt et al., 1995; Hewitt et al., 2003; Rudiger, Cash, Roehrig, & Thompson, J.K., 2007). For example, reliability, internal consistency, and test–retest reliability have been shown to be high, with alpha coefficients of .86, .83, and .78, and test-retest reliability between respective PSPS subscales over 3 weeks of .83, .84, and .74, for perfectionistic self-promotion, nondisplay of imperfection, and nondisclosure of imperfection, respectively (Hewitt et al., 2003). In the current study only the Perfectionistic Self-Promotion (*Need to Appear Perfect*) scale was completed by the participants. This was because this subscale is most directly related to the type of physical perfection that is expected of female gymnasts, rather than needing to avoid appearing imperfect or nondisclosure of imperfection, gymnasts generally simply need to appear to be perfect. Hewitt et al. (2003) have also described this subscale as being of particular relevance to the study of perfectionism in athletes.

The Perfectionistic Self-Promotion subscale is scored by summing items 5,7,11,15,17,18,23,25,26, and 27 on the full PSPS. Items 11 and 18 are reversed. In the current study the items were labeled 1-10, with item 3 and 6 being reversed.

Physical appearance comparison scale. The Physical Appearance Comparison Scale (PACS; Thompson, J.K. et al., 1999) assesses weight-and shape related body comparisons. Participants rate on a 6-point Likert scale ranging from 1 (never) to 6 (always), how often they compare different weight- and shape-related parts of their bodies to those of peers, mothers, siblings and media models. The scale has been used to

assess characteristic (dispositional) body-comparison tendencies and has good demonstrated reliability and validity (Thompson et al., 1999). A more recent study assessed internal reliability (Cronbach's alpha = .95) (Schutz et al., 2002). The scale contains five items: (1) At parties or other social events, I compare my physical appearance to the physical appearance of others, (2) The best way for a person to know if they are overweight or underweight is to compare their figure to the figure of others, (3) At parties or other social events, I compare how I am dressed to how other people are dressed, (4) Comparing your "looks" to the "looks" of others is a bad way to determine if you are attractive or unattractive and (5) In social situations, I sometimes compare my figure to the figures of other people. For the purposes of the current study, questions 1 and 3 were reworded to make them applicable to the gymnastics environment: (1) In the gym, or at social events, I compare my physical appearance to the physical appearance of others and (3) In the gym, or at social events, I compare how I am dressed to how other people are dressed. The measure is scored by summing items 1 to 5. Item 4 is reverse scored.

The children's version of the eating attitudes test. The final measure to be completed was the Children's Version of the Eating Attitudes Test (ChEAT; Maloney, McGuire, & Daniels, 1988). The measure consists of 26 items answered on a 6-point Likert scale ranging from 6 (always) to 1 (never). It is a modified version of the The Eating Attitudes Test 26 scale that has been previously developed for use in older populations (EAT-26: Garner et al., 1982). It consists of subscales derived from factor analysis: *Dieting* - 13 items, including items related to food avoidance and preoccupation with body image,

(e.g., “Engage in dieting behavior”; “Particularly avoid foods with high carbohydrate content”), *Bulimia and Food Preoccupation* - 6 items related to eating binges, vomiting, and preoccupation with food (e.g., “Vomit after I have eaten,”; “Feel that food controls my life”) and *Oral Control* - 7 items measuring eating behaviors and social pressure to gain weight e.g., “Cut my food into small pieces,”; “Other people think that I am too thin”). The 26-item version correlated highly with the original 40-item scale ($r = 0.98$). The reliability (internal consistency) of the EAT-26 for the anorexia nervosa group studied was reported as $r = 0.90$ ($p < 0.001$). The validity of the EAT-26 instrument was confirmed by means of checking validity and reliability in comparison with a number of previous instruments including the EAT-40 (Garner et al., 1982). In the current study only the total ChEAT score was calculated for data analysis, not the subscales. The total score was achieved by assigning a 6 to the most pathological answers and a 1 to the least disordered answers (e.g., on question eleven “I think a lot about wanting to be thinner”, a 6 would be assigned to “Always”, while a 1 would be assigned to “Never”). Item twenty five (“I enjoy trying new rich foods”) was reverse scored. The sum was taken for a total score.

Demographic data. After completion of all four measures, demographic information pertaining to age race, and level of gymnastics competition was requested (see Appendix B).

Procedures

This study was submitted for approval by the Institutional Review Board at Auburn University. Once the study was approved by the IRB, team meetings were organized at each club.

After coaches consented to participate in the study, copies of the informed consent forms along with general information were sent to each gym to be distributed by a gym administrator. Five out of twenty coaches contacted consented to have their clubs used to recruit participants. A meeting was then scheduled to present information about the study to parents and gymnasts, collect informed consent forms and complete the questionnaire. No coaches were present at the meeting, in order to avoid the risk of coercion. The information was presented by the researcher. The questionnaires were completed anonymously, therefore it was not possible to identify individuals. The lead researcher was responsible for data collection at all five sites that were visited. After receiving the informed consent forms, volunteering gymnasts were assembled in a room with the presence of a second adult who was neither a coach of the participants nor a parent of the participants. The battery of measures was completed. The scales were completed in the order they are described in the *Measures* section: the Frost MPS, followed by the PSPS, the PACS, and then the ChEAT. Once completed, all surveys were put into an envelope. A detachable debriefing sheet containing a referral list of health and psychological services available to participants in their local area was provided (Appendix C).

Analysis

Pearson Correlation Coefficients were used to examine relationships between the perfectionism, perfectionistic self-presentation, body comparisons, and disordered eating as measured by the MPS, the PSPS, the PACS, and the ChEAT. Three separate MANOVAs were used to examine differences between the participants regarding age, race, and gymnastics competition level. Scores on the MPS, PSPS, PACS and the ChEAT served as the dependant variables and age, race and competition level served as the factors. Alpha level was set at .05 a priori. All analysis was conducted using SPSS version 16.

RESULTS

The purpose of this study was to examine the correlation between perfectionism, perfectionistic self-presentation, body comparisons and disordered eating in a gymnast sample. The secondary purpose was to determine if age, level of gymnast competition and race are a factor in perfectionism, body comparisons and disordered eating.

Participants were recruited by contacting the owners or head coaches of twenty gymnastics clubs in Alabama and Georgia. After obtaining coach approval to recruit volunteers from their club, five data collection sites were submitted to the Institutional Review Board as part of the approved protocol. The gymnasts were between the ages of 12 and 19. The sample contained competitive participants in USA Gymnastics Level 7-10 WAG. Copies of the informed consent forms along with information were then sent to each gym to be distributed by a gym administrator. The lead researcher was responsible for data collection at all five sites that were visited. After receiving the informed consent forms, volunteering gymnasts were assembled in a room with the presence of a second adult who was neither a coach of the participants nor a parent of the participants. The gymnasts then completed all four measures and the completed surveys were placed in a sealed envelope for later analysis. A total of 50 participants returned the questionnaire packet. No data can be produced on the gymnast participation rate at clubs that were used as data collection sites as data was not collected on how many gymnasts participated in Level 7 – 10 WAG at each club.

A total of 8 surveys were not used in the analysis because participants did not complete all of the items on the survey ($n = 3$) and participants later identified themselves in the demographic information as being under 12 years of age ($n = 5$). The resulting sample ($N = 42$) is from one gymnastics club in Alabama and four gymnastics clubs in Georgia.

Demographic Data

The racial demographics for this sample are 35 white females, 6 black females and one Asian female.

Race	Frequency	Percent	Cumulative Percent
White	35	83.3	83.3
Black	6	14.3	97.6
Asian	1	2.4	100.0
Total	42	100.00	

The participants ranged in age from 12-18 years and participated in USA Gymnastics Level 7-10 WAG.

Age	Frequency	Percent	Cumulative Percent
12	13	31.00	31.00
13	6	14.30	45.30
14	11	26.20	71.50
15	5	11.90	83.40
16	5	11.90	95.30
17	1	2.40	97.70
18	1	2.40	100.10
Total	42	100.00	

Table 3: Frequencies: Gymnastics Competition Level

Level	Frequency	Percent	Cumulative Percent
7	10	23.8	23.8
8	15	35.7	59.5
9	10	23.8	83.3
10	7	16.7	100.0
Total	42	100.0	

Psychological Variables

The measures completed were: the Multidimensional Perfectionism Scales (Frost MPS; Frost et al., 1990), which measures six different kinds of perfectionism: Concern over Mistakes (CM), Personal Standards (PS), Parent Expectations (PE), Parental Criticism (PC), Doubting of Actions (D) and Organization (O). For the purposes of the current study only the total score (the total perfectionism score does not include the O subscale) has been included in the final analysis. The second measure was The Perfectionistic Self-Promotion subscale of the Perfectionistic Self-Presentation Scale (PSPS; Hewitt & Flett, 1993). The subscale measures the extent to which the participant feels the need to present as perfect for the purposes of self-promotion. The third measure was The Physical Appearance Comparison Scale (PACS; Thompson, J.K. et al., 1999). The PACS measures the types and extent of body comparisons that the participating individual makes. The final measure was the Children’s Version of the Eating Attitudes Test (ChEAT; Maloney, McGuire, & Daniels, 1988). In the current study only the ChEAT total score was used. The ChEAT measures disordered eating behaviors. The

descriptive data (i.e., mean, standard deviation, minimum values, and maximum values) for all of the above variables used in the analysis are presented in Table 4.

Table 4. Means, Standard Deviations (SD) and Standard Errors (SE) for the MPS, MPS subscales, PSPS, PACS and CHEAT.

	Minimum	Maximum	Mean	SD	SE
MPSTOTAL	47.00	110.00	78.36	18.02	2.78
MPSCM	11.00	36.00	21.21	7.44	1.15
MPSPS	15.00	33.00	24.90	5.07	.78
MPSPE	6.00	24.00	15.07	5.08	.78
MPSPC	4.00	18.00	8.55	4.06	.63
MPSD	4.00	17.00	8.62	3.09	.48
PSPSTOTAL	22.00	66.00	42.79	11.61	1.79
PACSTOTAL	6.00	23.00	14.80	3.66	.56
CHEATTOTAL	37.00	134.00	63.93	19.65	3.03

Correlation Results

Pearson Correlation Coefficients were used to examine relationships between perfectionism, perfectionistic self-presentation, body comparisons, and disordered eating as measured by the MPS, the PSPS, the PACS, and the ChEAT. Scores on the MPS were significantly positively correlated with scores on the Perfectionistic Self-Presentation Subscale of the PSPS ($r = .793, p < 0.01$). Scores on the MPS were significantly positively correlated with scores on the PACS ($r = .566, p < 0.01$). Scores on the MPS were significantly positively correlated with scores on the ChEAT ($r = .583, p < 0.01$). Scores on the PACS were positively correlated with scores on the PSPS ($r = .388, p < 0.05$). Scores on the PACS were significantly positively correlated with scores on the ChEAT ($r = .539, p < 0.01$). Scores on the PSPS were positively correlated with scores on the ChEAT ($r = .409, p < 0.01$).

Table 5. Pearson Correlations

	MPSTOT	PSPSTOT	PACSTOT	CHEATTOT
MPSTOTAL	1.0			
PSPSTOTAL	.793**	1.0		
PACSTOTAL	.566**	.388*	1.0	
CHEATTOTAL	.583**	.409**	.539**	1.0

* = Correlation is significant at the 0.05 level (2-tailed).

** = Correlation is significant at the 0.01 level (2-tailed).

MANOVA Results

A MANOVA was used to examine differences in the MPS scales, PSPS scale, PACS scale and CHEAT scales between race (white and black). The one Asian participant was not included in this analysis due to a low sample size ($n=1$). The scores on the scales were not significantly different between whites and blacks.

Table 6: MANOVA Results by Race

	<i>F</i>	<i>Sig.</i>
MPSTOTAL	.575	.568
PSPSTOTAL	.699	.503
PACSTOTAL	1.042	.362
CHEATTOTAL	.491	.616

A MANOVA was used to examine differences in the MPS scales, PSPS scale, PACS scale, and ChEAT scales between gymnastics competition levels. These levels included USA Gymnastics competitive Optional Levels 7-10. Level 7 is the first highly competitive competition level that gymnasts train in after completing compulsory levels 1-6 of competition. The necessary training and skills required increase with each level up to Level 10, which is the highest level a gymnast can compete at before becoming an

International Elite competitor or a Collegiate Gymnast. The score on the MPS, PSPS, PACS, and ChEAT were not significantly different between gymnastics competition levels.

	<i>F</i>	Sig.
MPSTOTAL	.262	.852
PSPSTOTAL	.347	.792
PACSTOTAL	.510	.677
CHEATTOTAL	1.185	.328

A MANOVA was used to examine differences in the MPS scales, PSPS scale, PACS scale, and ChEAT scales between different age categories. For the purposes of analysis, participants were grouped into three age categories: 12-14, 15-16, and 17-18 to avoid a cell size of 1. The scores on the scales were not significantly different between age categories except on the PACS scale ($p = .032$).

	<i>F</i>	Sig.
MPSTOTAL	1.160	.324
PSPSTOTAL	1.246	.299
PACSTOTAL	3.762	.032
CHEATTOTAL	1.263	.294

Summary

Ho1: Scores on the MPS will not be correlated with scores on the PSPS. This hypothesis was rejected. MPS scores were significantly positively correlated with scores on the PSPS ($r = .793, p < 0.01$).

Ho2: Scores on the MPS will not be correlated with scores on the PACS. This hypothesis was rejected. MPS scores were significantly positively correlated with scores on the PACS ($r = .566, p < 0.01$).

Ho3: Scores on the MPS will not be correlated with scores on the ChEAT. This hypothesis was rejected. MPS scores were significantly positively correlated with scores on the ChEAT ($r = .583, p < 0.01$).

Ho4: Scores on the PACs will not be correlated with scores on the PSPS. This hypothesis was rejected. PACS scores were significantly positively correlated with scores on the PACS ($r = .388, p < 0.05$).

Ho5: Scores on the PACS will not be correlated with scores on the ChEAT. This hypothesis was rejected. PACS scores were significantly positively correlated with scores on the ChEAT ($r = .539, p < 0.01$).

Ho6: Scores on the PSPS will not be correlated with scores on the ChEAT. This hypothesis was rejected. PSPS scores were significantly positively correlated with scores on the ChEAT ($r = .409, p < 0.01$).

Ho7: The scores on the MPS, PSPS, PACS and ChEAT will not be significantly different based on race. This hypothesis failed to be rejected. The scores on the scales were not significantly different between whites and blacks (MPS $p = .568$; PSPS $p = .503$; PACS $p = .362$; ChEAT $p = .616$).

Ho8: The scores on the MPS, PSPS, PACS and ChEAT will not be significantly different based on gymnastics competition level. This hypothesis failed to be rejected.

The scores on the scales were not significantly different between Levels 7-10 (MPS $p = .852$; PSPS $p = .792$; PACS $p = .677$; ChEAT $p = .328$).

Ho9: The scores on the MPS, PSPS, PACS and ChEAT will not be significantly different based on age category. This hypothesis failed to be rejected, except for PACS scores. The scores were not significantly different between age categories except on the PACS (MPS $p = .324$; PSPS $p = .299$; PACS $p = 0.32$; ChEAT $p = .294$)

DISCUSSION

Sample

The purpose of this study was to examine the correlation between perfectionism, perfectionistic self-presentation, body comparisons and disordered eating in a gymnast sample. The secondary purpose was to determine if age, level of gymnast competition and race are factors in perfectionism, body comparisons and disordered eating. The study examined a sample of 42 female gymnasts, aged 12-18 who are participating in USA Gymnastics Level 7-10 (competition level). Approximately 150 gymnasts were originally sought for the study, however only 50 gymnasts originally participated and only 42 participant's data was usable due to incomplete data and age delimitations. Twenty gymnastics clubs were contacted about the study, however only five coaches provided consent for their club to be used as a site to recruit volunteers to participate in the research. No data can be produced on the gymnast participation rate at clubs that were used as data collection sites, as data was not collected on how many gymnasts participated in Level 7 – 10 WAG at each club. The resulting sample size may be smaller than the original projected sample size, because many coaches were reluctant to have their gymnasts participate despite assurances about IRB protections. For example, one coach believed that the study might negatively affect performance if the gymnast perceived that it was okay for her to be at a full healthy weight that might inhibit performance. Most coaches cited traditional fears about interfering with performance or

uncovering a health issue they would prefer not to have uncovered. At sites that were approved for data collection, similar reluctance was often met from parents for the same reasons, despite reassurances about the purposes of the study and the protections provided in the IRB protocol.

Perfectionism

In terms of perfectionism it was hypothesized that high levels of perfectionism would be significantly correlated with perfectionistic self-presentation, body comparisons, and disordered eating as demonstrated on the respective scales: the MPS, PSPS, PACS, and the ChEAT. The results of the current study showed that perfectionism was significantly positively correlated with perfectionistic self-presentation, body comparisons, and disordered eating.

The results demonstrated that perfectionism, measured by the MPS, was significantly positively correlated with perfectionistic self-presentation, measured by the PSPS. This result suggests that gymnasts' perfectionism is related to a need to present oneself as perfect in all situations. This self-promotion involves actively proclaiming one's successes, achievements and strengths to others in order to appear as perfect in all situations. This result is in accordance with past studies that showed correlations between perfectionism and perfectionistic self-presentation in the general population (e.g. Hewitt et al., 1995; Woodside et al., 2002). Similar to the current study, the need to present an image of perfection has also been understood in other studies as being related to avoiding revealing perceived imperfections in the self (Cockell et al., 2002; Hewitt et al., 1995). These results suggest a relation between perfectionism and perfectionistic

self-presentation, as the gymnasts may seek to present themselves as perfect in order to fulfill the perfectionist standards they expect of themselves or that their coaches or parents expect of them. In turn the gymnasts may seek a method to find ideals to copy in order to be able present their bodies as perfect. Body comparisons may be one such method.

In the current study perfectionism was also significantly positively correlated with body comparisons, measured by the PACS. This may suggest that perfectionist gymnasts may engage in body comparisons in social situations in order to obtain comparative information on what the perfect ideal is that they should strive for. These results agree with studies that have found that perfectionism predicted heightened body comparisons among girls. In previous studies, it has been proposed that doubts about the quality of one's behavior, excessive concerns over mistakes, and heightened sensitivity to the expectations of others may lead to these body comparisons (Schutz et al., 2002). In terms of perfectionism and heightened body comparisons, these have also been correlated with social rank variables such as shame, submissive behavior, defeat, and negative evaluations of social comparisons. It has been proposed that these characteristics may lead to searching for more objective or external sources of self-validation (Wyatt & Gilbert, 1998). In the current sample, competitive gymnasts may have displayed these characteristics in the gym either as a result of direct concerns about their body or because of negative evaluations of the performance that may or may not have been related to their physical shape or appearance.

Finally, in the current study perfectionism was significantly positively correlated with disordered eating, measured by the ChEAT. Such a result posits that perfectionism in female gymnasts may be related to the perfectionist traits that form part of the core of disordered eating symptoms. This finding is similar to those of other studies that have demonstrated relationships between perfectionism and disordered eating. These studies have shown correlations between perfectionism, perfectionistic self-presentation, and disordered eating as is evidenced in the current study (Hewitt et al., 1995; Woodside et al., 2002). Thus, the current study suggests that the correlations between perfectionism and perfectionistic self-presentation, body comparisons and disordered eating may help to explain how these variables interact with each other in WAG to create a set of psychological stressors that affect female gymnasts.

Perfectionistic Self-Presentation

It was hypothesized that perfectionistic self-presentation would be significantly correlated with perfectionism, body comparisons, and disordered eating as measured on the MPS, PSPS, PACS, and the ChEAT. The current study found that perfectionistic self-presentation was significantly positively correlated with perfectionism, body comparisons, and disordered eating. Firstly, perfectionistic self-presentation was significantly positively correlated with perfectionism. The study also found that perfectionistic self-presentation was significantly positively correlated with body comparisons. No published studies were identified that have investigated specific correlations between perfectionistic self-promotion and body comparisons. However, such results may be similar to findings on correlations between perfectionism and body

comparisons (e.g. Schutz et al., 2002; Wyatt & Gilbert, 1998). The findings in the current study may suggest that, similarly to the use of body comparisons to find characteristics that fit the perfect ideal, the correlations between perfectionistic self-presentation and body comparisons may suggest the possibility of a more direct relationship of using body comparisons in order to find the ideals to use in order to appear as perfect.

Lastly, perfectionistic self-presentation was significantly positively correlated with disordered eating. This result may suggest that in order to appear physically perfect, a competitive female gymnast may engage in disordered eating behaviors in order to change their physical appearance. These findings are in agreement with those in similar studies where perfectionistic self-promotion has been related to risk factors for disordered eating behaviors. Similarly to the current study, previous scholarship found that actively promoting one's strengths, eschewing overt displays of imperfection and refusing to tell others about one's shortcomings have all been correlated with disordered eating (McGee et al., 2005). Of particular relevance to the current study, perfectionistic striving seen in disordered eating behaviors may be motivated by needs to conform to a model or ideal of perfection that is perceived as being demanded by the self and others (Hewitt et al., 1995; Hewitt et al., 2003). In the current sample of female gymnasts this perfectionistic ideal may be demanded by the self but might also be perceived as being demanded by coaches or parents.

Body Comparisons

It was also hypothesized that body comparisons would be correlated with perfectionism, perfectionistic self-presentation, and disordered eating. The results of the

current study demonstrated that body comparisons were significantly positively correlated with perfectionism, perfectionistic self-presentation, and disordered eating. Firstly, body comparisons were significantly correlated with perfectionism, as well as perfectionistic self-presentation as previously discussed. The current study also unearthed that body comparisons were significantly positively correlated with disordered eating. This finding suggests that the current female gymnast sample may engage in disordered eating in order to attain certain physical qualities they have observed through engaging in body comparisons. These findings are similar to those in general population samples that have found correlations between body comparisons and disordered eating (Heinberg & Thompson, 1992a, 1992b, 1995; Stormer & Thompson, 1996; Striegel-Moore et al., 1986; Thompson & Heinberg, 1993). It is likely that the findings are similar because female gymnasts are not only subject to body comparisons in the gym, but they are also likely to be subjected to similar body comparison opportunities as the general population when they are outside the gym.

Disordered Eating

It was hypothesized that disordered eating would be correlated with perfectionism, perfectionistic self-presentation, and body comparisons. The current study, as already described showed that disordered eating was correlated with perfectionism, perfectionistic self-presentation, and body comparisons. Overall these correlations agree with one specific study that found that female athletes who are perfectionists and participate in a judged, aesthetic sport may be at heightened risk for disordered eating. It has previously been reported that female athletes exhibited perfectionism and the

perfectionism was correlated with general eating pathology (Schwarz et al., 2005).

Demographic Results

It was also hypothesized that there would be significant differences on the MPS, PSPS, PACE and ChEAT between the participants based on race, gymnastics competition level, and age. However, MANOVA results demonstrated that there were no significant differences between the participants based on race on the MPS, PSPS, PACS, and ChEAT. Other studies have not investigated differences based on race regarding all of these correlations. However, mixed results have been found in terms of differences in disordered eating prevalence and symptoms between racial groups in studies of the general population. Some studies have found that there are significant differences between racial groups (e.g., Franko, 2007; Franko, Becker, Thomas, & Herzog, 2007; Roberts et al., 2006). Other studies have found fewer differences between racial groups (e.g., Neumark-Sztainer et al., 2002). There were also no significant differences between the participants based on gymnastics competition level on the MPS, PSPS, PACS, or the ChEAT. Only one of these findings is at odds with past studies. Picard (1999) found a relationship between female collegiate athletes participating at a higher competition level and disordered eating. The difference between that and the current study may be explained by the fact that these were adolescent athletes that were not at the elite or collegiate level.

There were no significant differences between the participants based on age on the MPS, PSPS, or the ChEAT. However, there were significant differences between the participants based on age on the PACS scale. This may be explained simply due to the

older gymnasts spending more time in the gym and at middle-school or high school social events where they have more interactions in which to make body comparisons.

Implications

The results of the current study have several implications. This is the first study to look at specific correlations between perfectionism, perfectionistic self-presentation, body comparisons, and disordered eating. It is also the first study to look at these variables in this specific population. No other study has examined these traits in a group of female gymnasts, competing at the highest USA Gymnastics Optional Levels 7-10, between the ages of 12 and 19. Unlike past scholarship which has attempted to address how prevalent disordered eating is in WAG, the current study recognized that regardless of how prevalent disordered eating is in WAG, it certainly is something that some gymnasts experience. The current study hypothesized that reports of perfectionism, perfectionistic self-presentation, and body comparisons would be significantly correlated with disordered eating in this gymnast sample. The significant correlations between perfectionism, perfectionistic self-presentation, body comparisons, and disordered eating all have considerable implications. The correlations demonstrate relationships between these variables and may provide a better understanding of some of the background factors involved in disordered eating in female gymnasts. The MANOVA results showed that there were no significant differences between the participants on any variable in terms of race. This may suggest that race does not afford any protective factor in terms of perfectionism, body comparisons, or disordered eating in what is a primarily white sport. The MANOVA results also demonstrated that there were no significant differences

between the participants on any variable in terms of gymnastics competition level. There is also some suggestion that perfectionism, body comparisons, and disordered eating may not differ with gymnastics competition level, possibly meaning that increased level of competition does not make any of these factors any stronger. The same is true for age. With the exception of body comparisons there is no evidence that there are any significant differences between gymnasts on these variables based on age. Being older only seemed to demonstrate a significant difference for body comparisons. As described above, this may be largely due to the older gymnasts spending more time in the gym and at middle-school or high school social events where they have more interactions in which to make body comparisons. The current study demonstrates that perfectionism, perfectionistic self-presentation, and body comparisons, were correlated with disordered eating for gymnasts in this sample. The significant correlations between these variables show that further consideration of all of these factors should be taken into account in the gymnastics environment. Encouraging perfectionism in gymnastics, promoting perfectionistic self-presentation for the purposes of pleasing coaches or judges, and encouraging social comparisons with other gymnasts could all be related to risk factors for disordered eating.

In terms of the practical significance of these findings, it is important for coaches and parents to recognize that disordered eating is only a problem for a limited number of gymnasts. However, whenever a gymnast exhibits sudden extreme weight loss, or is overheard discussing dieting or unsafe weight loss techniques, coaches should ensure that they take appropriate action and discuss their concerns with parents or the gymnasts.

Coaches should also make themselves familiar with materials provided by various sports governing bodies and college athletic programs on how to deal with disordered eating in athletes. Sadly there is a lack of materials for adolescent athletes (Georgia Sports Nutrition, 2006; NCAA, 2007). Similarly, parents should ensure that they express any concerns to their daughter or coaches about any issues. Referring to the resources mentioned above as well as seeking professional guidance from a psychologist, nutritionist, or a family doctor is also important.

When it comes to a preventative side, perfectionism, perfectionistic self-presentation, and body comparisons are factors that are often demanded by WAG. Coaches and parents could ensure that they use a mixture of positive and negative reinforcement when assessing a gymnast's performance. Encouraging correct techniques and training, and providing a mixture of positive and negative reinforcement are less likely to create issues than merely demanding what may be unrealistic perfectionism. Rather than encouraging or permitting body comparisons, coaches and parents could ensure that they only allow gymnasts to compare themselves with each other for the purposes of "mirroring" to learn a new skill. All of these things could lead to increased performance for the gymnast and reduce the risk of promoting high levels of perfectionism, perfectionistic self-presentation, and body comparisons that could be related to a potential for disordered eating.

Limitations and Future Directions

There were several limitations to the current study. Firstly, the study resulted in a small sample size of 42 participants. It is also important to note that the age categories

assigned in the analysis led to a small cell size. Future research would merit from a larger sample size. However, this factor is not easy to overcome due to the resistance of many coaches and parents to have their gymnasts participate in such research. More work needs to be done to reassure parents and coaches that researchers are only trying to investigate and improve the health of gymnasts, they are not trying to reduce their performance. The study was also limited to gymnasts of a very specific age group (12 to 19 years of age) and gymnasts participating in USA Gymnastics Level 7-10 competitive gymnastics. Future research could expand to include younger gymnasts, although investigation would need to be done to ensure that the current measures are valid and reliable in younger children. It would also be of merit to include gymnasts participating in lower, “compulsory” levels of USA Gymnastics to see if similar problems exist at levels where less training and competition occur. A longitudinal study could also help to determine when these problems might begin to occur and under what conditions. It is important to note that, as the current sample demonstrates, age and competition level are not always directly related. It is not uncommon to have a 14 year-old participating in Level 6 or a 9 year-old competing at Level 8. The geographical limitations of the study may have also led to a sample that was not representative of the diversity of individuals participating in WAG nationwide. Further research could seek to expand to a more nationally representative sample.

In terms of future recommendations that emerge from the results of the current study, further research should be conducted to investigate possible links between these four variables. For example, by means of a path analysis with a larger sample, to

understand how each variable may lead to each other. A more in-depth look at perfectionist traits and parent and coach criticisms might also elicit better information about the nature of psychological issues in female gymnasts. It is also worth looking more at the factor of race in WAG. Since race was not a protective factor from psychological concerns in this sport, one could investigate the effects of a non-white gymnasts participating in a primarily white sport. Since there are mixed results in different studies regarding correlations between sports competition level and disordered eating, more research also needs to be conducted to shed better light on this. Once some of these factors have been looked at in more detail, it should be possible to begin research into the development of prevention programming that can seek to reduce the influence of these variables on the psychological well-being and performance of female gymnasts.

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APPENDICES

APPENDIX A: DSM-IV-TR DIAGNOSTIC TABLES EXAMPLE

Diagnostic criteria: Anorexia Nervosa

- A. Refusal to maintain body weight at or above a minimally normal weight for age and height(e.g., weight loss leading to maintenance of body weight less than 85% of that expected;
- B. Intense fear of gaining weight or becoming fat, even though underweight.
- C. Disturbance in the way in which one's body weight or shape is experienced, undue influence of body weight or shape on self-evaluation, or denial of the seriousness of the current low body weight.
- D. Amenorrhea, i.e., the absence of at least three consecutive menstrual cycles.

Diagnostic criteria: Bulimia Nervosa

- A. An episode of binge eating is characterized by both of the following:
 - 1. eating, in a discrete period of time an amount of food that is definitely larger than most people would eat.
 - 2. a sense of lack of control over eating during the episode (e.g., a feeling that one cannot stop eating or control what or how much one is eating)
- B. Inappropriate compensatory behavior in order to prevent weight gain, including self-induced vomiting; misuse of laxatives, diuretics, enemas, or other medications; fasting; or excessive exercise.
- C. The binge eating and inappropriate compensatory behaviors both occur, on average, at least twice a week for 3 months.
- D. Self-evaluation is unduly influenced by body shape and weight.

The disturbance does not occur exclusively during episodes of Anorexia Nervosa

Appendix B

Demographic Information

Please complete the following information:

Age
Ethnicity (your race or nationality)
Gymnastics competition level (e.g. Level 7)

Appendix C

Reference sheet: Please remove and keep this form

If you would like more information on body image and eating attitudes, please refer to the following resources that can provide you with general information and professional referral options in your area. Please note that any costs associated with obtaining professional services will be you or your daughter's responsibility.

Eating Disorders Information Network (EDIN), Atlanta, Georgia: Comprehensive information for Georgia and Alabama residents.

Website: www.myedin.org Telephone: 404-816-3346

National Eating Disorders Association: Comprehensive resources on body image and eating disorders as well as free professional referrals.

Website: www.edap.org Telephone: 1-800-931-2237

Academy for Eating Disorders (AED): Treatment professionals' database.

Website: www.aedweb.org

Appendix D

Informed Consent Documents for Alabama

Parental Permission/ Minor Assent For a Research Study entitled Perfectionism, social comparisons and eating attitudes in Women's Artistic Gymnastics.

Your daughter has been invited to participate in a research study that investigates the development of psychological issues in Women's Artistic Gymnastics. This study is being conducted by Alan Duffy, Graduate Student in the Department of Kinesiology at Auburn University with the assistance of Dr. Danielle Wadsworth, Assistant Professor in the Department of Kinesiology at Auburn University. The goal of this study is to identify correlates of social and psychological behaviors in disordered eating in WAG. Your daughter was identified as a possible participant because she is currently participating in Optional Level 7-10 Women's Artistic Gymnastics.

To participate in a research study, the state of Alabama requires all individuals under the age of 19 to provide consent from a parent or legal guardian. If you allow your daughter to participate, she will be asked to complete a survey that investigates perfectionism, body comparisons and eating habits. You may view a blank copy of the survey before your daughter completes it, however, your daughter's responses will remain confidential on the survey she completes. Your daughter's total participation time will not exceed one hour. Your daughter will not receive any compensation for her participation.

The risks for participation in the study are minimal. The minimal risks are risk of coercion, risk of breach of confidentiality and the risk of mild psychological discomfort. To reduce the risk of coercion, no coaches will be involved in recruitment or data collection. To reduce the risk of breach of confidentiality, the participants will be given some privacy from their parents or guardians and from other participants. Parents or guardians will be dismissed to another room during survey completion. During survey completion, adequate space will be given to each participant to guard against viewing other participants' answers and to prevent discussion with other participants. If your daughter feels any mild psychological discomfort answering any of the survey questions, she is free to refuse to answer any questions she is not comfortable with. She also can withdraw completely from the study at any time. If your daughter would like to speak to a health professional about anything after completion of the surveys, a reference list is attached to this document. You or your daughter would be responsible for any costs associated with obtaining any professional services after participation.

Any information obtained in connection with this study will be held anonymously. Only the primary researchers will have access to the data. Your daughter's answers will not be identifiable and will not be shared with you or with the coaching staff of the gym.

There is no direct benefit to be gained from participating. The benefit to other gymnasts in the future is that your daughter is providing initial research for the possible development of a preventative program for body image and eating disorders in female gymnasts. We cannot promise you that your daughter will receive any or all of the benefits described.

Your daughter may withdraw from the project at any time by not finishing the survey. However, once the survey has been turned in to the investigator, the data will not be able to be withdrawn since there will be no way to identify the participant's survey.

Your decision whether or not to allow your daughter to participate will not jeopardize your daughter's position on the gymnastics team. Your daughter's participation in this study is entirely voluntary. Nobody will be informed of the decision to participate, not to participate, or withdraw. The decisions to participate or not to participate will not affect you or your daughter's relations with Auburn University, the Department of Kinesiology, or your gymnastics facility, coaches or staff.

If you or your daughter have any questions you may contact Alan Duffy, 334-332-8684 or duffyam@auburn.edu or Danielle Wadsworth, 334-844-1836 or wadswdd@auburn.edu who will be happy to answer them. You will be provided a copy of this form to keep.

For more information regarding you or your daughter's rights as a research participant you may contact the Auburn University of Human Subjects Research or the Institutional Review Board by phone on 334-844-5966 or email either hsubjec@auburn.edu or IRBChair@auburn.edu

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE WHETHER OR NOT YOU WISH TO ALLOW YOUR DAUGHTER TO PARTICIPATE IN THIS RESEARCH STUDY. YOUR SIGNATURE INDICATES YOUR WILLINGNESS TO PARTICIPATE.

Participant's signature (Assent) Date _____
Parent's/Legal Guardian's signature Date

PRINT name

PRINT name

Investigator's signature Date

PRINT name

Informed Consent
For a Research Study entitled
Perfectionism, social comparisons and eating attitudes in Women's Artistic
Gymnastics.

You have been invited to participate in a research study that investigates the development of psychological issues in Women's Artistic Gymnastics. This study is being conducted by Alan Duffy, Graduate Student in the Department of Kinesiology at Auburn University with the assistance of Dr. Danielle Wadsworth, Assistant Professor in the Department of Kinesiology at Auburn University. The goal of this study is to identify correlates of social and psychological behaviors in disordered eating in WAG. You have been identified as a possible participant because you are currently participating in Optional Level 7-10 Women's Artistic Gymnastics.

If you have reached the age of 19, the age of majority in Alabama, you must complete your own informed consent. If you have not reached this age, you and a parent or guardian will need to complete a Parental Permission/ Minor Assent form before participation.

The risks for participation in the study are minimal. The minimal risks are risk of coercion, risk of breach of confidentiality and the risk of mild psychological discomfort. To reduce the risk of coercion, no coaches will be involved in recruitment or data collection. To reduce the risk of breach of confidentiality, the participants will be given some privacy from their parents or guardians and from other participants. Parents or guardians will be dismissed to another room during survey completion. During survey completion, adequate space will be given to each participant to guard against viewing other participants' answers and to prevent discussion with other participants. If you feel any mild psychological discomfort answering any of the survey questions, you are free to refuse to answer any questions you are not comfortable with. You also can withdraw completely from the study at any time. If you would like to speak to a health professional about anything after completion of the surveys, a reference list is attached to this document. You would be responsible for any costs associated with obtaining any professional services after participation.

Any information obtained in connection with this study will be held anonymously. Only the primary researchers will have access to the data. Your answers will not be identifiable and will not be shared with you or with the coaching staff of the gym.

There is no direct benefit to be gained from participating. The benefit to other gymnasts in the future is that you are providing initial research for the possible development of a preventative program for body image and eating disorders in female gymnasts. We cannot promise you that you will receive any or all of the benefits described.

You may withdraw from the project at any time by not finishing the survey. However, once the survey has been turned in to the investigator, the data will not be able to be withdrawn since there will be no way to identify the participant's survey.

Your decision whether or not to participate will not jeopardize your position on the gymnastics team. Your participation in this study is entirely voluntary. Nobody will be informed of the decision to participate, not to participate, or withdraw. The decisions to participate or not to participate will not affect your relations with Auburn University, the Department of Kinesiology, or your gymnastics facility, coaches or staff.

If you have any questions you may contact Alan Duffy, 334-332-8684 or duffyam@auburn.edu or Danielle Wadsworth, 334-844-1836 or wadswdd@auburn.edu who will be happy to answer them. You will be provided a copy of this form to keep.

For more information regarding you or your daughter's rights as a research participant you may contact the Auburn University of Human Subjects Research or the Institutional Review Board by phone on 334-844-5966 or email either hsubjec@auburn.edu or IRBChair@auburn.edu

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE WHETHER OR NOT YOU WISH TO PARTICIPATE IN THIS RESEARCH STUDY. YOUR SIGNATURE INDICATES YOUR WILLINGNESS TO PARTICIPATE.

Participant's signature Date

Investigator's signature Date

PRINT name

PRINT name

Appendix E

Informed Consent For a Research Study entitled Perfectionism, social comparisons and eating attitudes in Women's Artistic Gymnastics.

You have been invited to participate in a research study that investigates the development of psychological issues in Women's Artistic Gymnastics. This study is being conducted by Alan Duffy, Graduate Student in the Department of Kinesiology at Auburn University with the assistance of Dr. Danielle Wadsworth, Assistant Professor in the Department of Kinesiology at Auburn University. The goal of this study is to identify correlates of social and psychological behaviors in disordered eating in WAG. You have been identified as a possible participant because you are currently participating in Optional Level 7-10 Women's Artistic Gymnastics.

If you have reached the age of 18, the age of majority in Georgia, you must complete your own informed consent. If you have not reached this age, you and a parent or guardian will need to complete a Parental Permission/ Minor Assent form before participation.

The risks for participation in the study are minimal. The minimal risks are risk of coercion, risk of breach of confidentiality and the risk of mild psychological discomfort. To reduce the risk of coercion, no coaches will be involved in recruitment or data collection. To reduce the risk of breach of confidentiality, the participants will be given some privacy from their parents or guardians and from other participants. Parents or guardians will be dismissed to another room during survey completion. During survey completion, adequate space will be given to each participant to guard against viewing other participants' answers and to prevent discussion with other participants. If you feel any mild psychological discomfort answering any of the survey questions, you are free to refuse to answer any questions you are not comfortable with. You also can withdraw completely from the study at any time. If you would like to speak to a health professional about anything after completion of the surveys, a reference list is attached to this document. You would be responsible for any costs associated with obtaining any professional services after participation.

Any information obtained in connection with this study will be held anonymously. Only the primary researchers will have access to the data. Your answers will not be identifiable and will not be shared with you or with the coaching staff of the gym.

There is no direct benefit to be gained from participating. The benefit to other gymnasts in the future is that you are providing initial research for the possible development of a preventative program for body image and eating disorders in female gymnasts. We cannot promise you that you will receive any or all of the benefits described.

You may withdraw from the project at any time by not finishing the survey. However, once the survey has been turned in to the investigator, the data will not be able to be withdrawn since there will be no way to identify the participant's survey.

Your decision whether or not to participate will not jeopardize your position on the gymnastics team. Your participation in this study is entirely voluntary. Nobody will be informed of the decision to participate, not to participate, or withdraw. The decisions to participate or not to participate will not affect your relations with Auburn University, the Department of Kinesiology, or your gymnastics facility, coaches or staff.

If you have any questions you may contact Alan Duffy, 334-332-8684 or duffyam@auburn.edu or Danielle Wadsworth, 334-844-1836 or wadswdd@auburn.edu who will be happy to answer them. You will be provided a copy of this form to keep.

For more information regarding you or your daughter's rights as a research participant you may contact the Auburn University of Human Subjects Research or the Institutional Review Board by phone on 334-844-5966 or email either hsubjec@auburn.edu or IRBChair@auburn.edu

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE WHETHER OR NOT YOU WISH TO PARTICIPATE IN THIS RESEARCH STUDY. YOUR SIGNATURE INDICATES YOUR WILLINGNESS TO PARTICIPATE.

Participant's signature Date

Investigator's signature Date

PRINT name

PRINT name

**Parental Permission/ Minor Assent
For a Research Study entitled
Perfectionism, social comparisons and eating attitudes in Women's Artistic
Gymnastics.**

Your daughter has been invited to participate in a research study that investigates the development of psychological issues in Women's Artistic Gymnastics. This study is being conducted by Alan Duffy, Graduate Student in the Department of Kinesiology at Auburn University with the assistance of Dr. Danielle Wadsworth, Assistant Professor in the Department of Kinesiology at Auburn University. The goal of this study is to identify correlates of social and psychological behaviors in disordered eating in WAG. Your daughter was identified as a possible participant because she is currently participating in Optional Level 7-10 Women's Artistic Gymnastics.

To participate in a research study, the state of Georgia requires all individuals under the age of 18 to provide consent from a parent or legal guardian. If you allow your daughter to participate, she will be asked to complete a survey that investigates perfectionism, body comparisons and eating habits. You may view a blank copy of the survey before your daughter completes it, however, your daughter's responses will remain confidential on the survey she completes. Your daughter's total participation time will not exceed one hour. Your daughter will not receive any compensation for her participation.

The risks for participation in the study are minimal. The minimal risks are risk of coercion, risk of breach of confidentiality and the risk of mild psychological discomfort. To reduce the risk of coercion, no coaches will be involved in recruitment or data collection. To reduce the risk of breach of confidentiality, the participants will be given some privacy from their parents or guardians and from other participants. Parents or guardians will be dismissed to another room during survey completion. During survey completion, adequate space will be given to each participant to guard against viewing other participants' answers and to prevent discussion with other participants. If your daughter feels any mild psychological discomfort answering any of the survey questions, she is free to refuse to answer any questions she is not comfortable with. She also can withdraw completely from the study at any time. If your daughter would like to speak to a health professional about anything after completion of the surveys, a reference list is attached to this document. You or your daughter would be responsible for any costs associated with obtaining any professional services after participation.

Any information obtained in connection with this study will be held anonymously. Only the primary researchers will have access to the data. Your daughter's answers will not be identifiable and will not be shared with you or with the coaching staff of the gym.

There is no direct benefit to be gained from participating. The benefit to other gymnasts in the future is that your daughter is providing initial research for the possible development of a preventative program for body image and eating disorders in female

gymnasts. We cannot promise you that your daughter will receive any or all of the benefits described.

Your daughter may withdraw from the project at any time by not finishing the survey. However, once the survey has been turned in to the investigator, the data will not be able to be withdrawn since there will be no way to identify the participant's survey.

Your decision whether or not to allow your daughter to participate will not jeopardize your daughter's position on the gymnastics team. Your daughter's participation in this study is entirely voluntary. Nobody will be informed of the decision to participate, not to participate, or withdraw. The decisions to participate or not to participate will not affect you or your daughter's relations with Auburn University, the Department of Kinesiology, or your gymnastics facility, coaches or staff.

If you or your daughter have any questions you may contact Alan Duffy, 334-332-8684 or duffyam@auburn.edu or Danielle Wadsworth, 334-844-1836 or wadswdd@auburn.edu who will be happy to answer them. You will be provided a copy of this form to keep.

For more information regarding you or your daughter's rights as a research participant you may contact the Auburn University of Human Subjects Research or the Institutional Review Board by phone on 334-844-5966 or email either hsubjec@auburn.edu or IRBChair@auburn.edu

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE WHETHER OR NOT YOU WISH TO ALLOW YOUR DAUGHTER TO PARTICIPATE IN THIS RESEARCH STUDY. YOUR SIGNATURE INDICATES YOUR WILLINGNESS TO PARTICIPATE.

Participant's signature (Assent) Date _____
Parent's/Legal Guardian's signature Date

PRINT name _____
PRINT name

Investigator's signature Date

PRINT name