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SOCIAL PHYSIQUE ANXIETY AND Q-EDD BASED DISORDERED EATING
IN FEMALE AESTHETIC ATHLETES

by

ANDREA K. COOPER

THESIS

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ABSTRACT

The purpose of this study was to examine social physique anxiety (SPA) and disordered eating in female aesthetic athletes. Participants included 144 female competitive athletes ($M = 19.0$ years, $SD = 2.08$) from the four aesthetic sports of synchronized swimming, figure skating, jazz dance, and gymnastics. The participants completed the SPA scale (SPAS) and the Questionnaire for Eating Disorder Diagnoses (Q-EDD) (which is a new more accurate measure to assess disordered eating) that has not previously been used with female aesthetic athletes. Results revealed that 59.7% of the participants were classified in the asymptomatic category, 29.9% in the symptomatic category, and 10.4% in the eating disordered category. For the two Q-EDD subcategories, there were no participants classified in the chew/spitting category, and three participants classified in the exercise bulimia nervosa category. Also, it was shown that that the eating disordered group and the symptomatic group had significantly higher SPA than the asymptomatic group. Thus, these results indicate that in this subpopulation of athletes, there are many who display eating disorder symptomatology, and suggest that interventions that target SPA and disordered eating in these athletes are needed.

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS.....	iii
ABSTRACT.....	iv
PART ONE: EMPIRICAL, THEORETICAL, AND METHODOLOGICAL	
CONSIDERATIONS	
CHAPTER	
I INTRODUCTION.....	2
II REVISED REVIEW OF LITERATURE.....	
Eating Disorders.....	4
Athletes.....	5
Aesthetic Athletes.....	7
Factors.....	8
Social Physique Anxiety.....	10
Gaps in the Literature.....	14
Summary.....	18
Purpose.....	19
Hypotheses.....	20

III	REVISED METHODOLOGY.....	21
	Participants.....	21
	Materials.....	21
	Procedure.....	24
	Data Analysis.....	25
	Limitations.....	26

PART TWO: PRESENTATION OF THE ARTICLES

IV	USING THE Q-EDD TO ASSESS THE PREVALENCE OF DISORDERED EATING IN FEMALE AESTHETIC ATHLETES.....	29
	Abstract.....	30
	Introduction.....	31
	Methodology.....	34
	Results.....	37
	Discussion.....	38
	References.....	43
V	SOCIAL PHYSIQUE ANXIETY AND Q-EDD BASED DISORDERED EATING AMONG FEMALE AESTHETIC ATHLETES.....	50
	Abstract.....	51
	Introduction.....	52
	Methodology.....	57

Results.....	61
Discussion.....	62
References.....	65
Tables.....	70

PART THREE: CONTRIBUTION OF COLLABORATORS

VI STATEMENT OF CONTRIBUTION OF COLLABORATORS.....	73
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PART FOUR: REFERENCES AND APPENDIXES

REFERENCES.....	76
-----------------	----

APPENDIXES

A Social Physique Anxiety Scale.....	86
B Questionnaire for Eating Disorder Diagnoses.....	87
C Ethics Committee Approval.....	90
D Athlete Information Sheet.....	93
E Eating Information Sheet.....	94
F Contact List.....	95

**PART ONE: EMPIRICAL, THEORETICAL AND METHODOLOGICAL
CONSIDERATIONS**

CHAPTER I

INTRODUCTION

The relationship between athletic participation and eating problems has been a topic of increasing research. Some researchers have found that sport participation is associated with lower levels of disordered eating (e.g., Kurtzman, Yager, Landsverk, Wiesmeier, & Bodurka, 1989), while others have found that athletic participation is linked to a higher incidence of eating problems (e.g., Benson, Allemann, Theintz, & Howald, 1990; Davis & Cowles, 1989; Sundgot-Borgen, 1993). Finally, there are still others that have reported that there are no differences between athletes and non-athletes for eating disorder symptoms (e.g., Harris & Greco, 1990).

A meta-analysis by Hausenblaus and Carron (1999), however, showed that these divergent results were linked to the type of sport. More specifically, athletes participating in weight-matched sports or sports that have a major aesthetic component may feel additional weight loss pressure compared to athletes participating in other types of sports. For example, it has been shown that in sports such as gymnastics and figure skating (aesthetic sports) there may be a higher prevalence of disordered eating (Hausenblaus & Carron, 1999; Taylor & Ste-Marie, 2001). In aesthetic sports, a physique that is long, lean and often almost pre-pubescent is seen as ideal. This ideal body, however, is unrealistic and often unattainable. As a result, some athletes resort to disordered eating tendencies in an attempt to achieve it, and if these unhealthy eating behaviors are not dealt with early, they may then develop into diagnosable eating disorders.

Currently, researchers are focused on determining the factors that are related to this increased prevalence of disordered eating in female aesthetic athletes. Some

researchers have examined factors within the individual (e.g., Hausenblaus & Mack, 1999; Petrie, 1993), while others have examined factors that are external to the athlete (e.g., Bottamini, 2000; Reel & Gill, 1996). Research in this area is embedded in a multidimensional theoretical framework. Several factors are recognized as being associated with disordered eating behaviors. These factors can be biogenetic, psychosocial, and sociological variables (Reel & Gill, 1996). A relatively new concept that is being proposed as a factor in the aesthetic sport population is the psychosocial variable - social physique anxiety (SPA). This is a concept that relates to the stress experienced when an individual perceives that his/her body shape or figure is being negatively evaluated by others (Hart, Leary, & Rejeski, 1989).

One purpose of this research study is to examine if SPA differs among female aesthetic athletes as a function of the level of disordered eating. Disordered eating will be measured using the Questionnaire for Eating Disorder Diagnoses (Q-EDD), a relatively new tool that has yet to be used with this specific population. This new more accurate assessment tool has the unique feature of categorizing a wide range of disordered eating tendencies. Therefore, another purpose of the research will be to examine in which Q-EDD categories do the female aesthetic athletes fit. Finally, this research will assist in determining if two specific diagnoses yielded by the Q-EDD scoring manual, chew/spitting and exercise bulimia nervosa, should remain as distinct diagnoses or whether these should be reclassified.

CHAPTER II

REVISED REVIEW OF LITERATURE

In the next several sections, eating disorders, and the prevalence of disordered eating among athletes, more specifically aesthetic athletes will be examined. Several factors linked with disordered eating including pressure from the coach, self-esteem and body image will be discussed. SPA as a factor will also be examined with a review of the research that has looked at the relationship between SPA and disordered eating in female aesthetic athletes. Finally, the use of the Questionnaire for Eating Disorder Diagnoses (Q-EDD) as a measure of disordered eating will be discussed.

Eating Disorders

According to the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders fourth edition (1994), eating disorders are characterized by severe disturbances in eating behavior. The *DSM-IV* (1994) further defines two specific eating disorders: anorexia nervosa and bulimia nervosa. The essential features of anorexia nervosa are that the individual refuses to maintain a normal body weight, is intensely afraid of gaining weight, and exhibits a significant disturbance in the perception of the shape or size of his or her body. The essential features of bulimia nervosa are binge eating and inappropriate compensatory methods to prevent weight gain. In addition, the self-evaluation of individuals is excessively influenced by body shape and weight. A third group of eating disorders specified by the *DSM-IV* (1994) is the Eating Disorder Not Otherwise Specified (EDNOS) category, which is for disordered eating that does not meet the criteria for any specific eating disorder. Over 90% of eating disordered cases occur in females, with the prevalence of anorexia nervosa among females in late

adolescence and early adulthood estimated between 0.5% and 1.0% and for bulimia nervosa, a slightly higher prevalence rate of between 1.0% and 3.0% (DSM-IV, 1994). However, it is important to note that these rates may be more prevalent in certain female populations (DSM-IV, 1994).

Individuals displaying some symptoms of disordered eating, but not so extreme as to be classified as having a diagnosable eating disorder, are becoming increasingly common (Shaw & Garfinkel, 1990). Much of the current research is focused on identifying not only those with diagnosable eating disorders but also those displaying eating disorder symptomatology (Smolak, Murnen, & Ruble, 2000). If these individuals are identified early and given the necessary intervention, it is hoped that the development of diagnosable eating disorders can be avoided (Hausenblaus & Carron, 1999; Mintz, O'Halloran, Mulholland, & Schneider, 1997; Petrie, 1993).

Athletes

Eating disorders may be more prevalent for some female athletes than for the general female population. Athletes not only face the same factors that place the general population at risk for eating disorders, but they also face additional pressures within the sport environment. Specifically, pressures to lose weight from people within the sport context, such as coaches, judges, or teammates are likely to exist. Unfortunately, these athletes usually pursue this weight loss through dieting- the main precursor to the development of an eating disorder (Thompson & Sherman, 1993).

Another explanation for why athletes may be at increased risk for eating disorders is that many of the traits that are characteristic of individuals with eating disorders are also the traits found in elite athletes. Both are willing to work hard or too hard, are

perfectionistic, have a high need for success or superior performance, and are able to endure pain or discomfort (Hausenblaus & Carron, 1999; Smolak et al., 2000; Thompson & Sherman, 1993). Thus, these characteristics thought to be beneficial for athletic performance also correspond with factors that place individuals at increased risk for eating disorders.

Data concerning the prevalence rates for eating disorders in female athletes in general have been contradictory. Some studies have identified female athletes as a population more at risk of developing eating disorders than the general population (Burkes-Miller & Black, 1988; Clark, Nelson, & Evans, 1988; Gadpaille, Sanborn, & Wagner, 1987; Smolak et al, 2000; Sundgot-Borgen, 1993). Others, however, have found that although female athletes may be preoccupied with weight, the prevalence rates for these individuals seem to be similar to those found in the general population (Harris & Greco, 1990; Selby, Weinstein, & Bird, 1990; Sherman & Thompson, 1991; Weight & Noakes, 1987; Wilkins, Boland, & Albinson, 1991).

There may be several factors that play a role in the contradictory nature of these results. The most important factor, however, may be that there are subpopulations of athletes that are at a greater or lesser risk of developing eating disorders. These subpopulations may be biasing the prevalence data for the entire athletic population because they are represented differently across studies (Thompson & Sherman, 1993). Some researchers have shown that the highest prevalence of eating disorders is found in female athletes competing in weight-matched sports such as wrestling and judo (Stoutjesdyk & Jevne, 1993; Sundgot-Borgen, 1994) and in sports that have a major aesthetic component such as figure skating and gymnastics (Petrie, 1993; Sundgot-

Borgen, 1994; Taylor & Ste-Marie, 2001). Because athletes from these types of sports are often included in the general athlete sample, the prevalence rates for the general athletic population are likely affected by these subpopulations, leading to the contradictory results among the research. Despite these varied findings, researchers have shown that female aesthetic athletes are an at-risk population (Petrie, 1993; Sundgot-Borgen, 1994; Taylor & Ste-Marie, 2001).

Aesthetic Athletes

Female aesthetic-sport athletes may feel additional pressure to maintain an ideal body size due to several factors. First of all, a small thin body is required for performance reasons. In sports such as figure skating and gymnastics, the athlete must complete quick twists and turns through the air. Researchers have shown that leanness can contribute to a quicker rotation in the air (Niinimaa, 1982) and that a low body weight is positively correlated with obtaining greater vertical heights in sports like figure skating (Black, 1991). Because these movements are made more difficult with larger, heavier bodies, a small lean body is strongly encouraged.

Another reason aesthetic athletes may experience additional weight loss pressures is due to the subjective component in the judging system. In aesthetic sports, unlike in other sports that are only judged objectively, there is the opportunity for the judge's opinion to be reflected in the athlete's marks. The judges may explicitly or implicitly emphasize the athlete's body size and appearance through their marking (Hausenblaus & Carron, 1999). Because of this, the athlete may feel that in order to be judged favourably, she must obtain and maintain the ideal body size.

Finally, athletes in aesthetic sports may experience weight-loss pressure due to the attire they wear. In aesthetic sports such as synchronized swimming or gymnastics, the athlete must wear bathing or gym suits. This attire is tight and revealing and may draw attention to the athlete's body flaws. As a result, the athlete may feel that others are evaluating their bodies negatively (Benson & Taub, 1993), and may feel pressure to attain a more desirable body size in order to avoid this negative scrutiny.

Given that these athletes have been targeted as a population at risk for eating disorders, it is important to learn more about the types of eating disorders suffered, as well as the factors involved. These issues are discussed in the subsequent sections.

Factors

Researchers have begun to examine those factors, both internal and external to the athlete, that may be placing the athlete at a higher risk for eating disorders (Borgen & Corbin, 1987; Burkes-Miller & Black, 1991; Harris & Greco, 1990; Petrie, 1993; Reel & Gill, 1996; Sundgot-Borgen, 1994; Thompson & Sherman, 1993). Common variables that have been studied as factors associated with disordered eating have been pressure from the coach, self-esteem, and body image.

A relevant factor linked with disordered eating is external social pressure, with one source being the coach. The research that has been conducted in this area has revealed that the coach can play a significant role in an athlete's development of an eating disorder (Berry & Howe, 2000; Bottamini, 2000; Rosen & Hough, 1988; Taylor, 1998; Williamson, Netemeyer, Jackman, Anderson, Funsch, & Rabalais, 1995).

Sundgot-Borgen (1994), for example, studied a group of female aesthetic athletes from a variety of sports and found that a significant number of the athletes who were dieting to

improve their performance had been told by their coach to lose weight. Similarly, in Rosen and Hough's (1988) study with female college gymnasts, two thirds of the gymnasts were told by their coaches that they were too heavy, and subsequently 75% of these athletes resorted to unhealthy weight control methods in an attempt to lose weight. Finally, Taylor's (1998) study with figure skaters found the coach to be one of the most significant sources of weight loss pressure, and when the skaters perceived high weight loss pressure from external sources, they tended to place more pressure on themselves to lose weight.

Self-esteem refers to the extent to which a person feels positive about himself or herself (Lindeman, 1994). Self-esteem is an important psychological factor that has been associated with disordered eating. Low self-esteem has been shown to be common in individuals with eating disorders, and because of its association with heightened self-awareness, it may be a factor linked to the development of an eating disorder (Lindeman, 1994). Mintz and Betz (1988) found disordered eating to be strongly correlated with low self-esteem in college women. Similarly, Vadocz and Malina (in press) also found a strong correlation with their study on figure skaters. These conclusions support much of the previous literature on the relationship between self-esteem and disordered eating (Berry & Howe, 2000; Davis & Cowles, 1989; Neumark-Sztainer, Beutler, & Palti, 1996; Petrie, 1993).

Closely associated with self-esteem is body image. According to Cash and Pruzinsky (1990), body image is a multidimensional construct broadly describing internal, subjective representations of physical appearance and experience. Many researchers have found a relationship between body image problems and eating

disturbances (e.g., Rosen, 1990; Thompson, 1990). For example, in a 2-year longitudinal study, Garner, Garfinkel, Rockert, and Olmstead (1987) found that only body image dissatisfaction and restrictive eating tendencies predicted the development of disordered eating in ballet students. In addition, Williamson et al. (1995) found that the interaction between body image and other factors (e.g., sociocultural pressures for thinness, athletic performance anxiety, and negative self-appraisal of athletic achievement) enhanced the probability of disordered eating in female athletes. Because the relationship between body image problems and eating disorders has been consistently shown, the current *DSM-IV* (1994) has included body image disturbances as a primary defining feature in anorexia nervosa and bulimia nervosa.

Social Physique Anxiety (SPA)

SPA, although conceptually distinct, is related to the concept of body image (Hart et al., 1989), and has also been correlated with self-esteem (Diehl, Johnson, Rogers, & Petrie, 1993). This factor is of particular interest to the current study.

Researchers have suggested that individuals with disordered eating tendencies are afraid of negative evaluation that may originate from a fear that others will perceive their weight or physical appearance as inconsistent with social norms (Bulik, Beidel, Duchman, Weltzin, & Kaye, 1991). This notion of the fear of negative evaluation is similar to the concept of SPA developed by Hart et al. in 1989. SPA is a subtype of social anxiety and is related to physical self-perceptions (Fox, 1997). It is a construct that relates to the stress experienced when an individual perceives that his/her body shape or figure is being negatively evaluated by others (Hart et al., 1989).

A Social Physique Anxiety Scale (SPAS) was developed by Hart et al. (1989). Their rationale for developing the SPAS was that most researchers were focused on people's perceptions of and feelings about their bodies (e.g., body image), and little consideration had been given to people's concerns with others' perceptions of their bodies. Compared to people who are low in SPA, those who are highly anxious often avoid situations in which their physique is under the scrutiny of others, become very distressed when their physiques are on display, avoid activities that accentuate their physiques, suffer depression related to their bodies, and attempt to improve their physiques through a variety of means, some of which may be harmful (Hart et al., 1989). SPA has been found to be correlated with eating disorder symptomatology in the general population (Diehl, Johnson, Rogers, & Petrie, 1998; Haase & Prapavessis, 1998), and the general athletic population (Haase & Prapavessis, 1998, 2001; Whitehead, Bratud, Eklund, 1998).

Research has also focused on the relationship between SPA and disordered eating in aesthetic-sport athletes. It would seem that SPA would be a particularly relevant factor to examine because in aesthetic sports the athlete wears revealing attire that places her body constantly under scrutiny. This may then lead the athlete to feeling that her body is being evaluated negatively by the public (Borgen & Corbin, 1987; Hausenblaus & Mack, 1999; Reel & Gill, 1996). Those athletes in aesthetic sports may even have higher SPA than other athletes due to the fact that there is a subjective evaluation component in the judging system. If the athlete feels her body is being evaluated negatively by the judges, and that her rank in the competition could be affected by this, SPA could develop which

could then lead to disordered eating behaviors in an attempt to be evaluated more positively (Haase, Prapavessis, & Owens, 2002).

There have been six studies (only four of which are published articles) that have examined the relationship between social physique anxiety and disordered eating among aesthetic athletes. Reel and Gill (1996) examined SPA as a factor related to eating disorder symptoms, as measured by the Eating Disorder Inventory (EDI, Garner, Olmstead, & Polivy, 1983). The participants included 157 high school and college cheerleaders. It was found that the high school and college cheerleaders differed significantly with respect to SPA, with the high school cheerleaders having greater SPA. A stepwise multiple regression with body dissatisfaction, perfectionism, and the Social Physique Anxiety Scale (SPAS, Hart et al., 1989) entered in this order, and the drive for thinness subscale of the EDI entered as the dependent variable, was shown to be significant ($R^2 = .56, p < .001$). Overall, it was concluded that those with higher SPA reported more unhealthy eating behaviors. This same conclusion was reached in Chad and Spink's (1996) study with figure skaters. These researchers conducted hierarchical regression analyses and found that age and social physique anxiety contributed significantly ($R^2 = .24, p < .05$) to the drive for thinness subscale of the EDI.

Haase and Prapavessis (2001) examined another population of aesthetic athletes, that of divers and aerobic competitors ($n = 27$ and 36 , respectively). The researchers also collected data on three other female groups: weight restricted athletes (rowers), non-physique-salient athletes (soccer players), and non-athletes. They compared SPA and disturbed eating attitudes, as measured by the Eating Attitudes Test (EAT; Garner & Garfinkel, 1979) among the four groups of participants. It was found that the four groups

did not differ significantly with respect to SPA. Correlations were performed for SPAS and EAT scores for the four groups of participants, and revealed medium to large correlations (r values ranging from .35 to .55, $p < .05$).

Hausenblaus and Mack (1999) also studied a sample of divers ($n = 36$), as well as athletic (volleyball, soccer & lacrosse, $n = 39$) and nonathletic ($n = 39$) control groups for the relationship between SPA and eating disorder symptoms. The Eating Disorder Inventory-2 (EDI-2; Garner, 1991) was used as the measure for eating disorder symptoms. An ANOVA revealed that the SPAS scores differed significantly across the three groups, and the post-hoc analysis showed that the aesthetic sport group had significantly lower SPAS scores than the other two groups, contrary to their prediction. A stepwise multiple regression was also conducted, and it was found that SPA could be significantly predicted by the body dissatisfaction, drive for thinness, and the ineffectiveness subscales of the EDI-2.

Due to their unexpected SPA findings, Hausenblaus and Mack (1999) encouraged a replication of the study and thus a similar study was carried out by Clark, Findlay, Ste-Marie, and Simard (2002). These researchers included synchronized swimmers in addition to divers ($n = 54$, in total) for the aesthetic sport group. A non-aesthetic athletic control group ($n = 61$) was also included that was comprised of race swimmers, as well as a non-aesthetic athletic group ($n = 31$) comprised of athletes in other sports. In that study, Clark et al. (2002) found the aesthetic and non-aesthetic aquatic sport athletes to have lower SPAS scores than the athlete control group, although these differences were not significant. A stepwise multiple regression was also conducted and it was determined that two of the three EAT subscales were significant predictors of SPAS scores.

Finally, Vadocz and Malina (in press) looked at the relationship between self-concept, SPA, and physical characteristics with eating disorder symptoms, as measured by the EDI, among a sample of 114 figure skaters. Correlations between each EDI subscale and the SPAS were found to be positive and moderate, with r values ranging from .17 to .60. Hierarchical stepwise regression analyses with age entered at step one, BMI at step two, and the SPAS at step three, revealed that the SPAS significantly predicted six of the eight subscales of the EDI.

Gaps in the Literature

Based on the review of literature, gaps have been revealed and will be addressed in the current study. First of all, published studies on SPA and disordered eating among aesthetic athletes have only been examined with respect to specific aesthetic populations (i.e., divers ($n = 27$ & 36), cheerleaders ($n = 157$), and figure skaters ($n = 114$)); therefore generalizability is limited (Petrie, 1993). Each sport may have its own unique pressures and therefore the relationship between SPA and disordered eating may vary from sport to sport. Also, half of these studies used divers as the aesthetic-sport population. However, by incorporating athletes from a variety of other aesthetic sports a more generalized understanding of the relationship between SPA and disordered eating among aesthetic athletes is possible. Therefore, this study will consist of a sample of participants from a wider base of aesthetic sports, namely, synchronized swimming, figure skating, jazz dance, and gymnastics.

Another gap noted in the literature is that all the researchers that have examined the relationship between SPA and disordered eating have used either the EAT or the EDI/EDI-2. There are, however, certain restrictions with these measures. For example,

the EAT was originally developed in 1979 to measure symptoms of anorexia nervosa, however, at this time eating disorders were not yet included in the *DSM* (DSM-II, 1968). It was not until the following year that eating disorders were first included in the *DSM* (DSM-III, 1980), and with each subsequent edition, the criteria for anorexia nervosa has changed. Therefore, the EAT does not reflect the current criteria for anorexia nervosa. In fact, the EAT has been found to have a high false-positive rate; individuals are diagnosed with anorexia nervosa according to the EAT, but not found to be so when diagnosed through a clinical interview, the best assumed method for diagnosis (Johnson-Sabine, Wood, & Patton, 1988; Meadows, Palmer, Newball, & Kenrick, 1986).

Further, because many of the EAT items include symptoms of bulimia nervosa, some researchers have used the EAT to measure symptoms of both anorexia and bulimia nervosa (Hesse-Biber, 1989; Seiver, 1994). This is problematic because the EAT has never been explicitly validated as a measure of bulimia nervosa, and is not able to differentiate between anorexia nervosa and bulimia nervosa (Williamson, 1990; Williamson, Anderson, Jackman, & Jackson, 1995). The EAT has also been used to assess eating disorders not otherwise specified (EDNOS, Mintz & O'Halloran, 2000), however these researchers found that some individuals diagnosed with EDNOS according to a clinical interview did not score above the cut-off point of the EAT, and therefore were missed by the scale. These issues with the EAT make it a questionable tool to be used in the identification of at risk populations for eating disorders.

The EDI/EDI-2 is another popular scale used to measure disordered eating, however, it too is restricted in what it can measure. Similar to the EAT, both versions of the EDI provide a cut-off point for diagnosing eating disorders, and are not able to

differentiate between those scoring above the cut-off, that is between anorexia nervosa and bulimia nervosa (Williamson, 1990; Williamson et al., 1995). Both versions are also not able to differentiate between individuals scoring in the non-eating disordered range of the scale, that is, those with some disordered eating behaviors, but not at the diagnosable level, are viewed no differently than those with no disordered eating behaviors. We question whether this is appropriate, and argue, in fact, that it would be useful to capture the population of individuals that have eating disorder symptomatology. This is thought to be valuable because perhaps if these individuals were identified and given the necessary intervention, the development of a diagnosable eating disorder could be avoided (Hausenblaus & Carron, 1999; Mintz et al., 1997; Petrie, 1996).

As a final issue, because the criteria for bulimia nervosa have changed since the development of both versions of the EDI, the subscale utilized for diagnosis of bulimia nervosa no longer reflects the current criteria. This subscale only contains questions about self-induced vomiting, while the *DSM-IV* (1994) now includes a wide variety of behaviors, such as fasting and excessive exercise. Thus, as argued with the EAT, the use of the EDI/EDI-2 to study at risk populations may not capture the complete picture. As such, continued study of at risk populations with newly developed measures addressing the above stated weaknesses is important.

Mintz et al. (1997) developed the Questionnaire for Eating Disorder Diagnoses to address these restrictions by operationalizing the current *DSM* criteria - the *DSM-IV*, into a self-report format. By following the Q-EDD scoring manual, the participants are placed into either the asymptomatic, symptomatic, or eating disordered category.

At the most general level are the diagnostic categories of eating disordered and non-eating disordered. The non-eating disordered category is composed of two other categories: asymptomatic and symptomatic. To be assigned in the asymptomatic category, the participant must respond negatively to all *DSM-IV* eating disorder criteria and must also respond negatively to the use of strict dieting and appetite control pills. Although these latter two behaviors are not part of the *DSM-IV* criteria, individuals with eating disorders or who are at risk for eating disorders often engage in these behaviors (Lachenmeyer & Muni-Brander, 1988; Moreno & Thelen, 1993). Finally, to be assigned in the symptomatic category, the participant must report engaging in some eating disordered behaviors, therefore is not asymptomatic, but does not fit all the criteria for a diagnosable eating disorder.

The eating disordered category consists of six more specific diagnostic categories: two reflecting the *DSM-IV* diagnoses of anorexia and bulimia nervosa (which can be further broken to reflect the *DSM-IV* subtypes) and four reflecting the *DSM-IV* EDNOS descriptions of subthreshold bulimia, menstruating anorexia, nonbinging bulimia, and binge-eating disorder. The participant needs to meet all of the *DSM-IV* criteria for anorexia or bulimia nervosa in order to receive this same label by the Q-EDD scoring manual. There was, however, some degree of subjectivity in defining the EDNOS groups, because the *DSM-IV* uses the term 'regular use', however does not provide a description of what this entails. Therefore, the authors of the Q-EDD created strict operational definitions for the EDNOS groups. Although the *DSM-IV* contains six EDNOS groups, only four were operationalized by the Q-EDD. Normal-weight anorexia was not included in the Q-EDD because of the difficulty in operationalizing 'significant weight loss' into a

pencil-and-paper measure, and chew-spitting was not operationalized because preliminary clinical interviews indicated that few participants responded ‘yes’ to this question and that these participants indicated that they spit out food because it did not taste good.

In the Q-EDD scoring manual, the authors have an additional word about two of the diagnoses yielded by the scoring manual: the chew/spitting and the exercise bulimia nervosa categories. A person with chew/spitting is an EDNOS diagnosis and defined as an individual who chews food but then spits it out to prevent weight gain. A participant placed in the exercise bulimia nervosa category meets all the criteria for bulimia nervosa and more specifically, the criteria regarding inappropriate compensatory behavior is met by excessive exercise alone. Because the authors had very few respondents who engaged in these two types of behaviors, the authors advised either eliminating these individuals from the study or placing them in different diagnostic categories. A purpose of the current study, therefore, will be to examine the frequency of individuals engaging in these types of behaviors to determine if these categories should remain separate or if the advice of the authors should be followed.

Although the Q-EDD has been used as a diagnostic tool among various populations (e.g., Mulholland, 2001; Smart, 1999; Southerland, 2000), it has yet to be used with female athletes in aesthetic sports. Thus, this study will be the first to use the Q-EDD with this specific population.

Summary

In summary, female aesthetic athletes have been identified as a population at risk for eating disorders. It is important to determine the factors that may be linked with

disordered eating in this population of athletes. A relatively new measure of disordered eating that will be used in this study is the Q-EDD. The Q-EDD is valuable because it allows researchers to identify a wide range of disordered eating individuals. This study will be the first to use this measure with a female aesthetic athlete population, thus providing an understanding of the different categories represented by this population. Past researchers that have examined the relationship between SPA and disordered eating among aesthetic athletes have used disordered eating measures that have certain restrictions. The Q-EDD was developed to address the restrictions of these existing measures. As well, the current study will collect frequency data on two of the more rare diagnoses yielded by the Q-EDD scoring manual to determine if individuals engaging in these types of behaviors should be placed in the corresponding diagnostic categories, be eliminated from the study or be placed in different diagnostic categories. Finally, past studies that have explored the relationship between SPA and disordered eating among aesthetic athletes, have focused on a single aesthetic sport, which limits the generalizability of the results. This study will address this gap, by including aesthetic athletes from a variety of sports to allow for a more generalized understanding of the relationship among this population. Therefore, the research questions for this study are:

- 1) In what categories of the Q-EDD are female aesthetic athletes represented?
- 2) What is the relationship between SPA and disordered eating, as measured by the Q-EDD?
- 3) Should the two categories of chew/spitting and exercise bulimia nervosa remain as distinct categories in the Q-EDD?

We have no specific predictions concerning the distribution of athletes across the Q-EDD categories. We do hypothesize though, that the eating disordered group will have the highest SPA and that the asymptomatic group will have the lowest SPA, and that there will be significant differences between each of the three groups, with respect to SPA. Finally, we hypothesize that the exercise bulimia nervosa category will remain distinct, however, we have no predictions regarding the chew/spitting category.

CHAPTER III

REVISED METHODOLOGY

Participants

The participants will consist of 144 female athletes aged 16 to 24 years ($M = 19.0$ years, $SD = 2.08$) from the aesthetic sports of synchronized swimming, figure skating, jazz dance, and gymnastics, with 36 participants in each sport. All of these athletes will be at the competitive level with approximately equal numbers of participants at the provincial/national level and at the University level. The minimum age was chosen because the athletes do not need parental consent to participate in the study. The type of sampling that will be used will be non-random sampling, specifically a combination of purposive, convenience and snowball sampling. Purposive sampling will be used because the study will be examining only aesthetic-sport athletes fitting a specific profile. Therefore the participants must possess this necessary information in order to participate. Convenience sampling is also involved because the participants will be those that will be available to partake in the study through such means as personal contacts at local clubs. Finally, snowball sampling will be used because some of the participants will be recruited through relationships with other participants.

Materials

Demographic information. A demographic information sheet that includes information on age, sex, race, height and weight (used to calculate BMI), sport, and competitive level (provincial, national, University) will be used.

Questionnaire for Eating Disorder Diagnoses (Q-EDD). Disordered eating will be measured using the Q-EDD. The Q-EDD is a self-report questionnaire that contains 50

questions and requires approximately 5 to 10 minutes to complete. The Q-EDD collects frequency data for individual behaviors such as laxative abuse, and assigns categorical labels such as asymptomatic, symptomatic, and eating disordered. A scoring manual that consists of flowchart decision rules based on *DSM-IV* criteria determines the categorical labels. There are two general diagnostic categories: non-eating disordered and eating disordered. The non-eating disordered category is composed of two more specific categories: asymptomatic (i.e., no eating disorder symptoms) and symptomatic (i.e., some eating disorder symptoms but no *DSM-IV* diagnosis). The eating disordered category consists of six more specific diagnostic categories: two reflecting the *DSM-IV* diagnoses of anorexia and bulimia nervosa (which can be further broken to reflect the *DSM-IV* subtypes) and four reflecting the *DSM-IV* EDNOS descriptions of subthreshold bulimia, menstruating anorexia, nonbinging bulimia, and binge-eating disorder.

To be assigned in the asymptomatic category, the participant must respond negatively to all *DSM-IV* eating disorder criteria and must also respond negatively to the use of strict dieting and appetite control pills. Although these latter two behaviors are not part of the *DSM-IV* criteria, individuals with eating disorders or who are at risk for eating disorders often engage in these behaviors (Lachenmeyer & Muni-Brander, 1988; Moreno & Thelen, 1993). Finally, to be assigned in the symptomatic category, the participant must report engaging in some eating disordered behaviors, therefore is not asymptomatic, but does not fit all the criteria for a diagnosable eating disorder.

Validity for the Q-EDD was tested and established by Mintz et al. (1997). Experts in the field established content validity during the scale's development. Convergent validity was demonstrated by significant correspondence between Q-EDD

diagnoses and scores on the Bulimia Test - Revised (BULIT-R) and the EAT. There was excellent accuracy between the Q-EDD and both the clinical interviews and clinician judgments, thus providing support for criterion validity. Finally, for incremental validity, when differentiating between those with and without bulimia nervosa, the BULIT-R and the Q-EDD performed quite similarly, except for positive predictive power (considered most important by Widiger, Hurt, Frances, Clarkin, & Gilmore, 1984) in which the Q-EDD performed superiorly. Test-retest reliabilities, although not high, were found to be within the expected range, given that eating disorder symptoms are not temporally stable phenomenon (Fairburn, Phil, & Beglin, 1990).

Social Physique Anxiety Scale. The Social Physique Anxiety Scale is a 12-item self-report scale designed by Hart et al. (1989) to assess the degree to which people become anxious when others observe or evaluate their physiques. On items such as “In the presence of others, I feel apprehensive about my physique/figure”, individuals indicate the degree to which the statement is characteristic of themselves on a 5-point Likert-type scale with responses ranging from not at all (1) to extremely (5). Scores can range from 12-60, with higher values indicating greater social physique anxiety. In using the SPAS with undergraduate samples, Hart et al. (1989) demonstrated internal consistency (Cronbach’s alpha) and 8-week test-retest reliability/stability with values of .90 and .82, respectively. The researchers also established content validity, criterion-related validity, and construct validity by demonstrating that SPAS scores correlated with other measures involving evaluative concerns.

Procedure

A larger project is being conducted in the researcher's laboratory at the time of this study, and data from 50 (36 athletes from synchronized swimming, 11 from figure skating and 3 from gymnastics) aesthetic athletes has already been collected. This data will be used for the present study and 94 more aesthetic athletes will be recruited over a period of four to six months. As part of the larger study, three questionnaires will be distributed to the participants, however, only two of the questionnaires will be used for the current study.

The head coaches of major figure skating, gymnastics, and dance clubs in Eastern Ontario will first be contacted by phone or through e-mail. In addition, Ontario University coaches that teach aesthetic sports will be contacted for recruitment. Finally, known aesthetic-sport athletes will be approached to participate and to determine if they know other aesthetic athletes that will be interested in participating in the study.

Once permission is gained from the head coach, a day and time will be organized in which all of the athletes at the club will be brought together, and the researcher will personally distribute the questionnaires to the participants. Prior to administering the questionnaires, the participants will be told the questionnaires will take approximately 15 to 20 minutes to complete. They will also be told not to write their names on any of the questionnaires, that their results will be kept confidential, and that they can terminate their participation at any time, and are free to do so without any reprisal from the researcher. The participants will be asked to complete the questionnaires as honestly and accurately as possible and not to confer with each other during the process. The researcher will remain in the room for the duration of the completion to answer any

questions and to ensure that the participants are working independently. To further increase the likelihood of the participants responding honestly, they will be instructed to place their anonymously completed questionnaires into an envelope provided, and to return the envelope directly to the researcher. Because there is some concern that completing the questionnaires will raise awareness concerning eating disorders, all the participants will be given an information sheet with the names, website addresses, and phone numbers of local organizations that can provide assistance to those with eating disorders. In addition, an information sheet on the dangers of disordered eating and tips for healthy eating will be provided. Finally, the participants will be thanked for their contribution. The envelopes will be brought to the secure laboratory personally, where the data will be entered into a computer. Only authorized people will have access to the laboratory and the results.

Data Analysis

To answer the first research question, a cross-tabulation and chi-square analysis will be performed to view the frequencies of the athletes across the three broad categories of the Q-EDD: eating disordered, symptomatic, and asymptomatic. Next, to determine the relationship between the SPAS and the Q-EDD, a one-way analysis of variance will be performed with SPAS serving as the dependent variable. Finally, to address the third research question, two or more participants classified in each category will provide evidence that the category should remain distinct. This frequency was chosen because two out of one hundred and forty-four participants would represent 1.4%, and the prevalence rate for bulimia nervosa (exercise bulimia nervosa is a subtype of bulimia nervosa) is between 1-3% (DSM-IV, 1994). While the prevalence rate for EDNOS

(chew/spitting is a type of EDNOS) is not provided in the *DSM-IV* (1994), it is said that it occurs more frequently than diagnosable eating disorders. Therefore, the minimum frequency of two for each category is seen as appropriate.

Limitations

It is important to note that there are certain limitations with this study. Firstly, it is recognized that both of the measures in this study are self-report questionnaires, and therefore the researcher may not know if the responses are entirely accurate. Some athletes may not have been forthcoming in their answers for fear of the consequences if their parents, peers, or coaches discover that they have disordered eating tendencies (Petrie, 1993). Although this limitation is recognized, the researcher believes that these are the most appropriate measures since the questionnaires are demonstrated to be valid, reliable, and are quick and easy to administer. Secondly, because the participants are all volunteers it is possible that the sample may not be an accurate representation of the aesthetic sport population. It may be that those who are comfortable with themselves and their eating habits are more likely to volunteer, and those who have body image dissatisfaction or disordered eating tendencies are less likely to participate in the study. Thirdly, due to time constraints only social physique anxiety was studied as a factor related to disordered eating, although it was recognized that there were likely many related factors. Finally, with a sample size of 144 athletes, it is possible that this number of participants is not a sufficient sample of the population. However, given the time constraints and the difficulty in recruiting participants due to the sensitive nature of the topic, it is felt that this is a suitable number for the study.

PART TWO: PRESENTATION OF THE ARTICLES

CHAPTER IV

PRESENTATION OF ARTICLE 1

This chapter contains the manuscript entitled “Using the Q-EDD to Assess the Prevalence of Disordered Eating in Female Aesthetic Athletes”. This article addresses the results of the Q-EDD categories. I plan to submit this manuscript to the *International Journal of Eating Disorders*.

Running head: DISORDERED EATING IN FEMALE AESTHETIC ATHLETES

Using the Q-EDD to Assess the Prevalence of Disordered Eating
in Female Aesthetic Athletes

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Abstract

The Questionnaire for Eating Disorder Diagnoses (Q-EDD) is a clinical tool developed by Mintz, O'Halloran, Mulholland, and Schneider (1997). The Q-EDD has yet to be used with female athletes in aesthetic sports (Mulholland, 2001; Smart, 1999; Southerland, 2000). One hundred and forty-four female competitive aesthetic athletes ($M = 19.0$ years, $SD = 2.08$) from four sports (synchronized swimming, figure skating, jazz dance, and gymnastics) completed the Q-EDD. Of these, 59.7% were classified in the asymptomatic category, 29.9% in the symptomatic category, and 10.4% in the eating disordered category. These results indicate that many female athletes in aesthetic sports have eating disorder symptomatology. Such results suggest that individuals interacting with female aesthetic athletes need to develop and implement interventions targeted at decreasing the prevalence of disordered eating. A secondary purpose was to investigate the need for two subcategories of the Q-EDD. Our results suggest that the chew/spitting category should be eliminated, but the exercise bulimia nervosa category should remain.

Using the Q-EDD to Assess the Prevalence of Disordered Eating in Female Aesthetic Athletes

The prevalence of eating disorders in the general athlete population has not been clearly established in the literature. Researchers comparing the prevalence of eating disorders with athletes as a whole and the general population have had contradictory results. Some researchers have found an increased prevalence of eating disorders among the athlete group (Smolak, Murnen, & Ruble, 2000; Sundgot-Borgen, 1993), while others have found a decreased prevalence (Harris & Greco, 1990; Sherman & Thompson, 1990). Perhaps the most important factor for these varied findings is the athlete population studied. There are athletes in certain sports that have been shown to have a higher prevalence for eating disorders compared to other sports. Some researchers have found the highest prevalence of disordered eating in sports that have a major aesthetic component such as figure skating, gymnastics and dance (Haase & Prapavessis, 2001; Petrie, 1993; Sundgot-Borgen, 1994; Taylor & Ste-Marie, 2001), but other researchers have not found the same results (Ashley, Smith, Robinson, & Richardson, 1996; Clark, Findlay, Ste-Marie, & Simard, 2002; Hausenblaus & Mack, 1999). Given these contradictory findings, it is of importance to continue to study whether female aesthetic athletes have a higher prevalence of disordered eating and therefore are an “at-risk” population for eating disorders and eating disorder symptomatology.

The most commonly used measures to assess disordered eating in aesthetic athletes have been the Eating Attitudes Test (EAT-40; Garner & Garfinkel, 1979; EAT-26; Garner, Olmstead, Bohr, & Garfinkel, 1982), and the Eating Disorder Inventory (EDI; Garner, Olmstead, & Polivy, 1983) and EDI-2 (EDI-2; Garner, 1991). Both of

these questionnaires measure attitudes and behaviors about disordered eating and its correlates on a continuous scale. Researchers often use cut-off points on these scales to identify individuals that may have eating disorders. These scales, however, do not differentiate between those scoring above the cut-off, that is between anorexia nervosa and bulimia nervosa (Williamson, 1990; Williamson et al., 1995), and do not differentiate between individuals scoring in the non-eating disordered range of the scale, that is, between those with some disordered eating behaviors and those with no disordered eating behaviors at all. While these scales can give us valuable information about eating disorder symptomatology, a true eating disorder diagnosis can only be made by categorical assessment of specific behaviors. A relatively new questionnaire known as the Questionnaire for Eating Diagnosis (Q-EDD) was developed for this particular purpose.

Mintz et al. developed the Q-EDD in 1997. These researchers operationalized the current *DSM* criteria- the *DSM-IV* (1994), into a self-report questionnaire. This questionnaire is unique because it is diagnostic in nature and places individuals in categories, rather than on a continuous scale. At the most general level, the Q-EDD yields two diagnostic categorical labels: eating disordered and non-eating disordered, both of which contain more precise categories. The eating disordered category is composed of six specific diagnostic categories, two reflecting the *DSM-IV* diagnoses of anorexia nervosa and bulimia nervosa (which can be further broken down to reflect the subtypes) and four reflecting *DSM-IV* EDNOS categories. The non-eating disordered category includes the asymptomatic (no eating disorder symptoms), and the symptomatic categories (some eating disorder symptoms, but not at the diagnosable level). This further differentiation in the non-eating disordered category of asymptomatic and symptomatic is

proposed as a useful outcome. It has been suggested by researchers that if perhaps these individuals are identified and given the necessary intervention, the development of a diagnosable eating disorder, can be avoided (Hausenblaus & Carron, 1999; Mintz, O'Halloran, Mulholland, & Schneider, 1997; Petrie, 1996).

The Q-EDD has so far been used with a limited number of populations (Mulholland, 2001; Smart, 1999; Southerland, 2000), and has not yet been used with female athletes in aesthetic sports. Thus, the purpose of the present study was to use the Q-EDD with a sample of female aesthetic athletes to examine the frequencies of participants across the three broad categories of the Q-EDD - eating disordered (broken down to anorexia nervosa, bulimia nervosa, and EDNOS), symptomatic, and asymptomatic. We have no specific predictions concerning the distribution of athletes across the Q-EDD categories.

In the Q-EDD scoring manual, Mintz et al. (1997) had an additional comment about two subcategories (chew/spitting and exercise bulimia nervosa) of the Q-EDD. Chew/spitting is a type of EDNOS and this diagnosis is given when an individual chews food but spits it out to prevent weight gain, and has no other eating disorder symptoms (Mintz et al., 1997). An exercise bulimia nervosa diagnosis is given when an individual meets all the criteria for bulimia nervosa and more specifically, the inappropriate compensatory behavior is met by exercise alone. Mintz et al. (1997) suggested that because very few of their participants fit into either one of these categories, these categories should be either eliminated or re-classified. Due to this suggestion, a secondary purpose of the study was to collect frequency data on these two Q-EDD categories with a different population than was used by Mintz et al. (1997) to determine if

these categories should remain distinct. We hypothesize that the exercise bulimia nervosa category will remain distinct, however, we have no predictions regarding the chew/spitting category.

Method

Participants

One hundred and forty-four female aesthetic athletes who ranged in age from 16 to 24 years ($M = 19.0$ years, $SD = 2.08$) participated in this study. Participants were 93% Caucasian with a mean BMI in the normal range ($M = 21.48$, $SD = 2.20$). Two-thirds of the participants were University students and the remaining one-third was High School students. Participants were recruited from four aesthetic sports: synchronized swimming, figure skating, jazz dance, and gymnastics, with 36 participants obtained from each sport. All athletes were at the competitive level and were categorized as University or non-University level (comprised of provincial and national level competitors) athletes. There were nearly equal numbers of University and non-University athletes for each of the four sports, totaling 71 University and 73 non-University level athletes.

Materials

A demographic information sheet that included information on age, sex, race, height and weight (used to calculate BMI), sport, and competitive level (provincial, national, University) was used. Disordered eating was measured using the Questionnaire for Eating Disorder Diagnoses (Q-EDD; Mintz et al., 1997). This is a self-report questionnaire that contains 50 questions and requires approximately 5 to 10 minutes to complete. The Q-EDD collects attitude and frequency data for behaviors. Based on the respondent's answers, categorical labels are assigned that are guided by a scoring manual

consisting of flowchart decision rules. The participants are classified into one of two general categories— eating disordered (including anorexia nervosa, bulimia nervosa, and EDNOS) or non-eating disordered (symptomatic and asymptomatic). Participants need to meet all of the required *DSM-IV* criteria to be classified as eating disordered. To be classified as symptomatic, the participant must report engaging in one or more eating disordered behaviors, but not enough to be classified as having a diagnosable eating disorder. Asymptomatic individuals are those that report engaging in no disordered eating behaviors.

Validity for the Q-EDD was tested and established by Mintz et al. (1997). Experts in the field established content validity during the scale's development. Convergent validity was demonstrated by significant correspondence between Q-EDD diagnoses and scores on the Bulimia Test – Revised (BULIT-R) and the EAT. There was excellent accuracy between the Q-EDD and the clinical interviews, thus providing support for criterion-related validity. Finally, for incremental validity, when differentiating between those with and without bulimia nervosa, the BULIT-R and the Q-EDD performed quite similarly, except for positive predictive power (considered most important by Widiger, Hurt, Frances, Clarkin, & Gilmore, 1984) in which the Q-EDD performed superiorly. Test-retest reliabilities, although not high, were found to be within the expected range, given that eating disorder symptoms are not temporally stable phenomenon (Fairburn, Phil, & Beglin, 1990).

Procedure

Following ethics approval, the head coaches of major figure skating, dance, gymnastics clubs and Universities across Ontario were contacted by phone or email.

Once permission was gained from the head coach, a day and time was organized in which all of the athletes at the club were brought together, and the researcher personally distributed the questionnaires to the participants. As part of a larger study, three questionnaires were distributed to the participants however; only one of the questionnaires will be discussed for the purpose of this article. Prior to completing the questionnaires, the participants were given a brief description of the study, and told that the questionnaires would take approximately 15 to 20 minutes to complete. They were then requested to read the consent form before completing the questionnaires, and that if at any time they wished to stop, they were free to do so without any reprisal from the researcher. The participants were asked to complete the questionnaires as honestly and accurately as possible and not to confer with each other in the process. The researcher remained with the participants to answer any questions and to ensure that the participants were working independently. All participants were treated according to APA guidelines.

To further increase the likelihood of the participants responding honestly, the participants were told their results would be kept confidential and anonymous. Participants placed all completed questionnaires directly into an envelope provided, prior to returning them to the researcher. Because there is some concern that completing the questionnaires would raise awareness concerning eating disorders, all the participants were given an information sheet with the names, website addresses, and phone numbers of local organizations that could provide assistance to those with eating disorders, as well as a list of the dangers of disordered eating and guidelines for healthy eating.

Results

Initial analyses verified that the data had normal distribution and that there was homogeneity of variance. Analyses were then conducted to determine if the three groups of participants (eating disordered, symptomatic, and asymptomatic) differed significantly with respect to the factors of age, BMI, sport, and competitive level. Cross-tabulations were performed for sport and competitive level, and one-way ANOVAs were conducted for age and BMI. All of the analyses were shown to be not significant ($p > .05$), and therefore, it was concluded that the groups did not differ significantly with respect to these factors. A cross-tabulation and chi-square analysis were completed to view the frequencies of the athletes across the three broad categories of the Q-EDD: eating disordered, symptomatic, and asymptomatic ($\chi^2 (2, N = 144) = 53.29, p = .00$). Results revealed that based on the 144 participants, 86 participants (59.7%) were classified in the asymptomatic category, 43 (29.9%) in the symptomatic category, and 15 (10.4%) in the eating disordered category. Of the 15 eating disordered participants, one participant was diagnosed with anorexia nervosa, four were diagnosed with bulimia nervosa, and ten were diagnosed with EDNOS. In comparison to Mintz et al.'s (1997) Q-EDD data with 167 female University students (M age = 22.5 years, $SD = 5.41$), there were more eating disordered participants among the aesthetic athletes (10.4% vs. 6.6%), and a slightly higher percentage of participants categorized as symptomatic (29.9% vs. 27.5%). For the frequency data collected on the two Q-EDD subcategories, there were three participants classified in the exercise bulimia nervosa category, and zero participants classified in the chew/spitting category. A portion of the data was also used in Cooper & Ste-Marie's (2004) study.

Discussion

Our data show that a large representation of these female aesthetic athletes have either eating disorder symptomatology or eating disorders. The results from this study then lead to the question of why do female aesthetic athletes have more disordered eating tendencies, and therefore are more at risk for eating disorders? There are a number of possible factors. First, female aesthetic athletes not only deal with societal pressure to attain the ideal body, but they may also experience additional weight-loss pressure that is unique to the nature of aesthetic sport. Previous research has shown that the unique weight-loss pressure specific to aesthetic sport is most likely due to three key factors (Hausenblaus & Mack, 1999; Reel & Gill, 1996; Smolak et al., 2000). First of all, a small, thin body is required for performance reasons. Researchers have shown that leanness can contribute to a quicker rotation in the air (Niinimaa, 1982), and that a low body weight is positively correlated with obtaining greater vertical heights, in sports like figure skating (Black, 1991). Secondly, in aesthetic sports, there is the opportunity for the judge's opinion to be reflected in the athlete's marks. The judges may explicitly or implicitly emphasize the athlete's body size and appearance through their marking (Hausenblaus & Carron, 1999). Because of this, the athlete may feel that in order to be judged favourably, she must obtain and maintain the ideal body size. Finally, athletes in aesthetic sports must wear tight and revealing attire such as bathing or gym suits that may draw attention to the athlete's body flaws. As a result, the athlete may feel that others are evaluating their bodies negatively (Benson & Taub, 1993), and may feel pressure to attain a more desirable body size in order to avoid this negative scrutiny.

Thus, these three pressures, unique to aesthetic sport, may explain why our results show an elevated percentage of eating disorders and eating symptomatology found among the aesthetic athletes. These athletes may have experienced this heightened weight-loss pressure, which may have then led them to engage in disordered eating tendencies in an attempt to attain this sport-ideal body. Further research is necessary to clearly define these factors. This research, ideally, would be done through experimental or longitudinal studies. More importantly, interventions that target these factors must be developed. Future research should focus on determining the most effective methods to intervene, as well as who should be involved in the intervention process.

In line with the importance of interventions, a particular strength of the Q-EDD is its ability to identify those individuals that are symptomatic of an eating disorder, but that are not yet at the diagnosable level. Other measures typically place all individuals that do not have a diagnosable eating disorder into a single group, and thus it is not possible to differentiate among those individuals that have no symptoms and those that have some symptoms of an eating disorder. It has been suggested by researchers that it may be important to identify these symptomatic individuals, because an early intervention may help prevent the development of a more severe form of disordered eating that is then more difficult to treat (Hausenblaus & Carron, 1999; Mintz et al., 1997; Petrie, 1993). Indeed, almost 30% of the female athletes in this study were classified as symptomatic. This is certainly a significant percentage of female athletes and targeted interventions would be particularly important for this group. Future research should study the benefits of early implementation of such interventions with this population.

For the secondary purpose of the study, that is collecting frequency data on two of the more rare Q-EDD categories, it was found that there were no participants classified in the chew/spitting category and three participants classified in the exercise bulimia nervosa category. Because we had no participants that fit the chew/spitting diagnosis, we agree with the authors of the Q-EDD and recommend that participants that only answer yes to this item be either eliminated from the data set or be placed in the asymptomatic category, as suggested by Mintz et al. (1997).

Regarding the category of exercise bulimia nervosa, of the participants that were placed in the broader category of bulimia nervosa, 75% of them fit the more specific diagnosis of exercise bulimia nervosa. Although, Mintz et al. (1997) do not report the precise frequency of participants that fit in the category of exercise bulimia nervosa, they do state that only one participant was diagnosed with bulimia nervosa of the one hundred and sixty-seven University students, representing 0.6% of their sample. Our percentage of 1.4% exceeds this, thus supporting our prediction that we would find more participants with this diagnosis than was found by Mintz et al. (1997). This also suggests that exercise bulimia nervosa remain as a distinct category. This recommendation is made because the prevalence of bulimia nervosa in the general female population is estimated at between 1-3% (DSM-IV, 1994), and our result exceeds this minimum frequency.

Exercise is considered excessive when the participant not only exercises a lot, but also engages in exercise despite injury and/or medical complications, and that their primary reason for exercising is to counteract the effects of binges or to prevent weight gain (DSM-IV, 1994). Some researchers have suggested that a relationship between extensive or excessive exercise and disordered eating tendencies exists (Epling & Pierce,

1992; Katz, 1986; Lowe, 1993; Yates, 1991). For example, Davis, Kennedy, Ravelski, & Dionne (1994) found that of forty-five female patients admitted to an eating disordered treatment program, 78% of these patients had previously or were currently engaging in excessive exercise. They also stated that 75% of the patients reported that their level of exercise progressively increased during the period when their food intake and body weight decreased the most. These researchers concluded that excessive exercise may not only play a role in the predisposition to an eating disorder, but may also be a contributing factor in its progression.

Excessive exercise may be more difficult to assess in athletes than in the general population, because frequent exercise is more commonly found. In the sports context, it is important to look beyond the exercise behaviors, and to examine the athlete's thoughts and feelings about exercise. When their motives behind exercising are properly understood, it often becomes apparent whether or not the athlete is displaying eating disordered tendencies (Thompson & Sherman, 1993). The diagnosis of exercise bulimia nervosa is thought to be more common among female athletes than in the general female population. This is most likely due to the fact that exercise is a considerable part of an athlete's life, particularly an athlete with bulimia nervosa. In contrast, many non-athletes with bulimia nervosa do not exercise at all, let alone excessively (Thompson & Sherman, 1993). This may help explain why our sample of female athletes had more participants that fit the criteria for exercise bulimia nervosa, than Mintz et al's (1997) sample of female University students. Future research should examine the prevalence of exercise bulimia nervosa in other female athletes, and in particular female aesthetic athletes, to determine if this specific type of eating disorder is present.

As with any study that uses self-report questionnaires, there were certain limitations with this study. Firstly, there was no way of knowing if the participants' responses were completely accurate. Further, because the participants voluntarily completed the questionnaires, it is possible that those who were comfortable with their bodies and their eating habits were more likely to participate than those who had body image dissatisfaction or disordered eating tendencies, possibly resulting in the sample not being a true representation of the population.

Despite these limitations, our results show that many female athletes in aesthetic sports display a number of eating disorder symptoms. Future research should examine the prevalence of exercise bulimia nervosa in female athletes, and in particular female aesthetic athletes, to determine if this specific type of eating disorder is present. Researchers also need to continue to study the precise factors that are causing the increased prevalence of disordered eating in this population of athletes. This could then lead to the implementation of interventions designed to educate and eventually reduce the occurrence of eating disorders.

References

- Ashley, C.D., Smith, J.F., Robinson, J.B., & Richardson, M.T. (1996). Disordered eating in female collegiate athletes and collegiate females in an advanced program of study: A preliminary investigation. *International Journal of Sport Nutrition*, 6, 391-401.
- American Psychiatric Association. (1968). *Diagnostic and statistical manual of mental disorders* (2nd ed.). Washinton, DC: Author.
- American Psychiatric Association. (1980). *Diagnostic and statistical manual of mental disorders* (3rd ed.). Washinton, DC: Author.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washinton, DC: Author.
- Benson, J.D., Allemann, Y., Theintz, G.E., & Howald, H. (1990). Eating problems and caloric intake levels in Swiss adolescent athletes. *International Journal of Sports Medicine*, 11, 249-252.
- Benson, R.A., & Taub, D.E. (1993). Using the PRECEDE model for causal analysis of bulimic tendencies among elite women swimmers. *Journal of Health Education*, 24, 360-368.
- Black, D.R., (Ed.). (1991). *Eating disorders among athletes*. Reston, VA: American Alliance for Health, Physical Education, Recreation, and Dance.
- Clark, S.E., Findlay, L.C., Ste-Marie, D.M., & Simard, J. (2002). Eating attitudes and social physique anxiety among female athletes in aquatic sports. *Journal of Sport and Exercise Psychology*, 24, s47.

- Davis, C., & Cowles, M. (1989). A comparison of weight and diet concerns and personality factors among female athletes and non-athletes. *Journal of Psychosomatic Research*, 33, 527-536.
- Davis, C., Kennedy, S., Ravelski, E., & Dionne, M. (1994). The role of physical activity in the development and maintenance of eating disorders. *Psychological Medicine*, 24, 957-967.
- Epling, W.F., & Pierce, W.D. (1992). *Solving the anorexia puzzle*. Hogrefe & Huber Publishers: Toronto.
- Fairburn, C.G., Phil, M., & Beglin, S.J. (1990). Studies of the epidemiology of bulimia nervosa. *American Journal of Psychiatry*, 147, 401-408.
- Garner, D.M. (1991). *Eating disorder inventory-2: Professional manual*. Odessa, FL: Psychological Assessment Resources.
- Garner, D.M., & Garfinkel, P.E. (1979). The eating attitudes test: An index of the symptoms of anorexia nervosa. *Psychological Medicine*, 9, 273-279.
- Garner, D.M., Olmstead, M.P., Bohr, Y., & Garfinkel, P.E. (1982). The eating attitudes test: Psychometric features and clinical correlates. *Psychological Medicine*, 12, 871-878.
- Garner, D.M., Olmstead, M.P., & Polivy, J. (1983). Development and validation of a multidimensional eating disorder inventory for anorexia nervosa and bulimia. *International Journal of Eating Disorders*, 2, 15-34.
- Haase, A.M., & Prapavessis, H. (2001). Social physique anxiety and eating attitudes in female athletic and non-athletic groups. *Journal of Science and Medicine in Sport*, 4 (4), 396-405.

- Harris, M., & Greco, D. (1990). Weight control and weight concerns in competitive female gymnasts. *Journal of Sport & Exercise Psychology, 12*, 427-433.
- Hausenblaus, H.A., & Carron, A.V. (1999). Eating disorder indices and athletes: An integration. *Journal of Sport & Exercise Psychology, 21*, 230-258.
- Hausenblaus, H.A., & Mack, D.E. (1999). Social physique anxiety and eating disorder correlates among female athletic and nonathletic populations. *Journal of Sport Behavior, 22* (4), 502-513.
- Hesse-Biber, S. (1989). Eating patterns and disorders in a college population: Are college women's eating problems a new phenomenon? *Sex Roles, 20*, 71-90.
- Johnson-Sabine, E., Wood, K., & Patton, G. (1988). Abnormal eating attitudes in London schoolgirls- A prospective epidemiological study: Factors associated with abnormal response on screening questionnaires. *Psychological Medicine, 18*, 615-622.
- Katz, J.L. (1986). Long-distance running, anorexia nervosa, and bulimia: A report of two cases. *Comprehensive Psychiatry, 27*, 74-78.
- Kurtzman, F.D., Yager, J., Landsverk, J., Wiesmeier, E., & Bodurka, D.C. (1989). Eating disorders among selected female student populations at UCLA. *Journal of the American Dietetic Association, 89*, 45-53.
- Lowe, M.R. (1993). Anorexics aren't neurotic. *Contemporary Psychology, 38*, 42-43.
- Meadows, G.N., Palmer, R.C., Newball, E.U.M., & Kenrick, J.M.T. (1986). Eating attitudes and disorders in young women: A general practice based survey. *Psychological Medicine, 16*, 351-357.

- Mintz, L.B., O'Halloran, S.M. (2000). The eating attitudes test: Validation with DSM-IV eating disorder criteria. *Journal of Personality Assessment*, 74(3), 489-503.
- Mintz, L.B., O'Halloran, S.M., Mulholland, A.M., & Schneider, P.A. (1997). Questionnaire for eating disorder diagnoses: Reliability and validity of operationalizing DSM-IV criteria into a self-report format. *Journal of Counseling Psychology*, 44 (1), 63-79.
- Mulholland, A.M. (2001). Validation of an eating disorders assessment on African American college women. *Dissertation Abstracts International: Section B: the Sciences & Engineering*, 61 (9-B), 4996.
- Niinimaa, V. (1982). Figure skating: What do we know about it? *Physician and Sports Medicine*, 10 (4), 51-56.
- Petrie, T. (1996). Differences between male and female college lean sport athletes, non-lean sport athletes, and nonathletes on behavioral and psychological indices of eating disorders. *Journal of Applied Sport Psychology*, 8, 218-230.
- Petrie, T.A., (1993). Disordered eating in female collegiate gymnasts: Prevalence and Personality/Attitudinal Correlates. *Journal of Exercise Psychology*, 15, 424-436.
- Reel, J.J., & Gill, D.L. (1996). Psychosocial factors related to eating disorders among high school and college female cheerleaders. *Sport Psychologist*, 10, 195-206.
- Rosen, J.C., Silberg, N.T., & Gross, J. (1988). Eating attitudes test and eating disorders inventory: Norms for adolescent girls and boys. *Journal of Consulting and Clinical Psychology*, 56 (2), 305-308.

- Seiver, M.D. (1994). Sexual orientation and gender as factors in socioculturally acquired vulnerability to body dissatisfaction and eating disorders. *Journal of Consulting and Clinical Psychology, 62*, 252-260.
- Sherman, R.T., & Thompson, R.A. (1990). *Bulimia: A guide for family and friends*. Lexington, MA: Lexington Books.
- Smart, R.S. (1999). Role of ethnicity, body dissatisfaction, and stressful life events in disordered eating among Asian-American, Chicana/Latina, and European American college females. *Dissertation Abstracts International: Section B: the Sciences & Engineering, 60* (6-B), 2962.
- Smolak, L., Murnen, S., & Ruble, A. (2000). Female athletes and eating problems: A meta-analysis. *International Journal of Eating Disorders, 27* (4), 371-380.
- Southerland, D.L. (2000). The relationship between disordered eating behaviors and coping. *Dissertation Abstracts International: Section B: the Sciences & Engineering, 60* (12-B), 6384.
- Sundgot-Borgen, J. (1993). Prevalence of eating disorders in elite female athletes. *International Journal of Sport Nutrition, 3*, 29-40.
- Sundgot-Borgen, J. (1994). Risk and trigger factors for the development of eating disorders in female elite athletes. *Medicine & Science in Sport & Exercise, 26*, 414-419.
- Taub, D.E., & Blinde, E.M. (1994) Disordered eating and weight control among adolescent female athletes and performance squad members. *Journal of Adolescent Research, 9* (4), 483-497.

- Taylor, G.M., & Ste-Marie, D.M. (2001). Eating disorder symptoms in Canadian female pair and dance figure skaters. *International Journal of Sport Psychology*, 32, 21-28.
- Thompson, R.A., & Sherman, R.T. (1993). *Helping athletes with eating disorders*. Champaign, IL: Human Kinetics Publishers.
- Warren, B.J., Stanton, A.L., & Blessing, D.L. (1990). Disordered eating patterns in competitive female athletes. *International Journal of Eating Disorders*, 9 (5), 565-569.
- Widiger, T.A., Hurt, S.W., Frances, A., Clarkin, J.F., & Gilmore, M. (1984). Diagnostic efficiency in DSM-III. *Archives of General Psychiatry*, 41, 1005-1012.
- Williamson, D.A. (1990). *Assessment of eating disorders: Obesity, anorexia, and bulimia-nervosa*. New York: Pergamon Press.
- Williamson, D.A., Anderson, D., Jackman, L.P., & Jackson, S.R. (1995). Assessment of eating disordered thoughts, feelings and behaviors. In D. Allison (Ed.), *Handbook of assessment methods for eating behaviors and weight-related problems* (pp. 303-346). Thousand Oaks, CA: Sage.
- Yates, A. (1991). *Compulsive exercise and the eating disorders*. Brunner/Mazel: New York.

CHAPTER V

PRESENTATION OF ARTICLE 2

This chapter contains a manuscript entitled “Social Physique Anxiety and Q-EDD based Disordered Eating among Female Aesthetic Athletes”. The emphasis of this manuscript is the results of the relationship between SPA and Q-EDD based disordered eating. I plan to submit this manuscript to the *Journal of Applied Sport Psychology*.

Running Head: SOCIAL PHYSIQUE ANXIETY AND DISORDERED EATING

Social Physique Anxiety and Q-EDD based
Disordered Eating among Female Aesthetic Athletes

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Abstract

The purpose of this study was to examine the relationship between social physique anxiety (SPA) and disordered eating in female aesthetic athletes. While there has been research conducted on the topic, the use of outdated tools to measure disordered eating and a limited focus within aesthetic sport populations called for continued research in the area. The current study used the Questionnaire for Eating Disorder Diagnoses (Q-EDD), a new more accurate measure to assess disordered eating that has not previously been used with female aesthetic athletes, and included four different aesthetic sport populations. Specifically, participants included 144 competitive athletes from the aesthetic sports of synchronized swimming, figure skating, jazz dance, and gymnastics who completed the SPA scale (SPAS) and the Q-EDD. The results revealed that the eating disordered group had the highest SPA, followed by the symptomatic group, and then the asymptomatic group. The eating disordered group and the symptomatic group differed significantly from the asymptomatic group, with respect to SPA. These results indicate that in this subpopulation of athletes, SPA and disordered eating are associated. These findings suggest that interventions targeted at SPA may be beneficial for female aesthetic athletes.

Social Physique Anxiety and Q-EDD based

Disordered Eating among Female Aesthetic Athletes

Eating disorders are complex and arise from a variety of factors (Hausenblaus & Mack, 1999). One approach that may help to understand the etiology of eating disorders is the theory of self-presentation. Proponents of this theory state that individuals attempt to present themselves in a positive way, and may exclude any self-relevant information that could prevent this positive impression from being transmitted (Leary, 1992; Leary & Kowalski, 1990). When an individual doubts that he/she can convey a positive impression, social anxiety results. A subtype of social anxiety that deals specifically with an individual's physical self-perceptions, for example about his/her body fat, muscle tone, and body proportions (Fox, 1997; Hart, Leary, & Rejeski, 1989) is referred to as social physique anxiety (SPA). SPA is defined as the stress experienced when an individual perceives that his/her body is being negatively evaluated by others (Hart et al., 1989). Researchers have suggested that individuals high in SPA may resort to disordered eating tendencies in order to self-present in a favorable manner (Haase & Prapavessis, 1998; Hart et al., 1989). Researchers have found SPA to be correlated to eating disorder symptomatology in the general female population (Diehl, Johnson, Rogers, & Petrie, 1998; Haase & Prapavessis, 1998), and the general female athletic population (Haase & Prapavessis, 1998, 2001; Whitehead, Bratud, Eklund, 1998).

It has been suggested that female athletes in aesthetic sports may experience greater SPA compared to female athletes in other sports, due to the heightened emphasis on physical appearance (Borgen & Corbin, 1987; Haase & Prapavessis, 2001; Hausenblaus & Mack, 1999). Aesthetic athletes wear tight and revealing attire that may

lead them to feel like their bodies are constantly under scrutiny (Leary, 1992; Haase & Prapavessis, 2001). Also, in aesthetic sports there is a subjective component in the judging system that may implicitly or explicitly emphasize body appearance, and as a result may lead these athletes to have elevated SPA.

There have been six studies (only four of which are published articles) that have looked at the relationship between SPA and disordered eating in female aesthetic athletes. Reel and Gill (1996) examined SPA as a factor related to eating disorder symptoms, as measured by the Eating Disorder Inventory (EDI, Garner, Olmstead, & Polivy, 1983). The participants included 157 high school and college cheerleaders. It was found that the high school and college cheerleaders differed significantly with respect to SPA, with the high school cheerleaders having greater SPA. A stepwise multiple regression with body dissatisfaction, perfectionism, and the Social Physique Anxiety Scale (SPAS, Hart et al., 1989) entered in this order, and the drive for thinness subscale of the EDI entered as the dependent variable, was shown to be significant ($R^2 = .56, p < .001$). Overall, it was concluded that those with higher SPA report more unhealthy eating behaviors. This same conclusion was reached in Chad and Spink's (1996) study with figure skaters. These researchers conducted hierarchical regression analyses and found that age and social physique anxiety contributed significantly ($R^2 = .24, p < .05$) to the drive for thinness subscale of the EDI.

Haase and Prapavessis (2001) examined another population of aesthetic athletes, that of divers and aerobic competitors ($n = 27$ and 36 , respectively). The researchers also collected data on three other female groups: weight restricted athletes (rowers), non-physique-salient athletes (soccer players), and non-athletes. They compared SPA and

disturbed eating attitudes, as measured by the Eating Attitudes Test (EAT, Garner & Garfinkel, 1979) among the four groups of participants. It was found that the four groups did not differ significantly with respect to SPA. Correlations were performed for SPAS and EAT scores for the four groups of participants, and revealed medium to large correlations (r values ranging from .35 to .55, $p < .05$). Thus, a relationship between SPA and disordered eating was obtained.

Hausenblaus and Mack (1999) also studied a sample of divers ($n = 36$), as well as athletic (volleyball, soccer & lacrosse, $n = 39$) and nonathletic ($n = 39$) control groups for the relationship between SPA and eating disorder symptoms. The Eating Disorder Inventory-2 (EDI-2, Garner, 1991) was used as the measure for eating disorder symptoms. An ANOVA revealed that the SPAS scores differed significantly across the three groups, and the post-hoc analysis showed that the aesthetic sport group had significantly lower SPAS scores than the other two groups, contrary to their prediction. A stepwise multiple regression was also conducted, and it was found that SPA could be significantly predicted by the body dissatisfaction, drive for thinness, and the ineffectiveness subscales of the EDI-2.

Due to their unexpected SPA findings, Hausenblaus and Mack (1999) encouraged a replication of the study and thus a similar study was carried out by Clark, Findlay, Ste-Marie, & Simard (2002). These researchers included synchronized swimmers in addition to divers ($n = 54$, in total) for the aesthetic sport group. A non-aesthetic athletic control group ($n = 61$) was also included that was comprised of race swimmers, as well as a non-aesthetic athletic group ($n = 31$) comprised of athletes in other sports. In that study, Clark et al. (2002) found the aesthetic and non-aesthetic aquatic sport athletes to have lower

SPAS scores than the athlete control group, although these differences were not significant. A stepwise multiple regression was also conducted and it was determined that two of the three EAT subscales were significant predictors of SPAS scores.

Finally, Vadocz and Malina (in press) looked at the relationship between self-concept, SPA, and physical characteristics with eating disorder symptoms, as measured by the EDI, among a sample of 114 figure skaters. Correlations between each EDI subscale and the SPAS were found to be positive and moderate, with r values ranging from .17 to .60. Hierarchical stepwise regression analyses with age entered at step one, BMI at step two, and the SPAS at step three, revealed that the SPAS significantly predicted six of the eight subscales of the EDI.

The studies described above, however, have certain limitations, which have been addressed in the current study. First of all, the studies discussed used specific aesthetic populations, for example, divers (Clark et al., 2002; Haase & Prapavessis, 2001; Hausenblaus & Mack, 1999), cheerleaders (Reel & Gill, 1996), or figure skaters (Chad & Spink, 1996; Vadocz & Malina, in press); therefore, generalizability is limited to that specific population. However, by incorporating athletes from a variety of aesthetic sports a more generalized understanding of the relationship between SPA and disordered eating among aesthetic athletes is possible. Therefore, the current study recruited athletes from a wider base of aesthetic sports, namely, synchronized swimming, figure skating, jazz dance, and gymnastics.

Another limitation in the literature is that all previous studies used either the EAT or the EDI/EDI-2 to measure disordered eating. There are, however, certain restrictions with these measures. For example, the EAT was originally developed in 1979 to measure

symptoms of anorexia nervosa, however, the criteria for anorexia nervosa has evolved, and therefore the EAT does not reflect the current criteria for anorexia nervosa. The EAT has also been used to measure all types of eating disorders including, anorexia and bulimia nervosa and eating disorders not otherwise specified (EDNOS) (Hesse-Biber, 1989; Mintz & O'Halloran, 2000; Seiver, 1994) however, it has never been explicitly validated as a measure for the latter two.

Similar to the EAT, both versions of the EDI were developed based on outdated criteria, and therefore no longer reflect the current criteria for eating disorders. Specifically, the subscale utilized for a diagnosis of bulimia nervosa only contains questions about self-induced vomiting, while the current criteria of the American Psychiatric Association's Diagnostic and Statistical manual of mental disorders, fourth edition (1994), includes a variety behaviors, such as laxative abuse and fasting. There are also other restrictions that are similar for both the EAT and the EDI/EDI-2. These scales, for example, provide a cut-off point for diagnosing eating disorders, and are not able to differentiate between anorexia and bulimia nervosa for those scoring above that cut-off (Williamson, 1990; Williamson, Anderson, Jackman, & Jackson, 1995). Also these scales do not differentiate between those that score below the cut-off point. That is, those with some disordered eating behaviors are viewed no differently than those with no disordered eating behaviors at all. This may be an important differentiation to make because perhaps if these symptomatic individuals are identified early and given the necessary intervention, the development of a diagnosable eating disorder could be avoided (Hausenblaus & Carron, 1999; Mintz, O'Halloran, Mulholland, & Schneider, 1997; Petrie, 1996).

Mintz et al., (1997) developed the Questionnaire for Eating Disorder Diagnoses (Q-EDD) to overcome the restrictions of the EAT and the EDI/EDI-2. These researchers operationalized the current eating disorder criteria- the *DSM-IV*, into a self-report questionnaire. At the most general level are the diagnostic categories of non-eating disordered and eating disordered. The non-eating disordered category is composed of two more specific categories: asymptomatic (no eating disorder symptoms) and symptomatic (some eating disorder symptoms, but not at the diagnosable level). The eating disordered category is composed of six specific categories: anorexia and bulimia nervosa (which can be further broken down to reflect the subtypes) and four EDNOS categories.

Thus, the purpose of the present study was to examine the relationship between SPA and Q-EDD disordered eating in female aesthetic athletes. This study was unique because the Q-EDD has been used with only a limited number of populations (Mulholland, 2001; Smart, 1999; Southerland, 2000), and has not yet been used with female athletes in aesthetic sports. It was hypothesized that there would be significant differences between each of the three groups, with respect to SPA, and that the eating disordered group would have the highest SPA, and the asymptomatic group the lowest SPA.

Method

Participants

One hundred and forty-four female aesthetic athletes who ranged in age from 16 to 24 years ($M = 19.0$ years, $SD = 2.08$) participated in this study. Participants were 93% Caucasian, with a mean BMI in the normal range ($M = 21.48$, $SD = 2.20$). Two-thirds of the participants were University students and the remaining one-third was High School

students. Participants were recruited from four aesthetic sports: synchronized swimming, figure skating, jazz dance, and gymnastics, with 36 participants obtained from each sport. All athletes were at the competitive level and were categorized as University or non-University level (comprised of provincial and national level competitors) athletes. There were nearly equal numbers of University and non-University athletes for each of the four sports, totaling 71 University and 73 non-University level athletes.

Materials

Demographic Information. A demographic information sheet that included information on age, sex, race, height and weight (used to calculate BMI), sport, and competitive level was used.

Social Physique Anxiety Scale. The Social Physique Anxiety Scale is a 12-item self-report scale designed by Hart et al. (1989) to assess the degree to which people become anxious when others observe or evaluate their physiques. On items such as “In the presence of others, I feel apprehensive about my physique/figure”, individuals indicate the degree to which the statement is characteristic of themselves on a 5-point Likert-type scale with responses ranging from not at all (1) to extremely (5). Scores can range from 12-60, with higher values indicating greater social physique anxiety. In using the SPAS with undergraduate samples, Hart et al. (1989) demonstrated internal consistency (Cronbach’s alpha) and 8-week test-retest reliability/stability with values of .90 and .82, respectively. The researchers also established content validity, criterion-related validity, and construct validity by demonstrating that SPAS scores correlated with other measures involving evaluative concerns.

Questionnaire for Eating Disordered Diagnoses (Q-EDD). Disordered eating was measured using the Questionnaire for Eating Disorder Diagnoses (Q-EDD; Mintz et al., 1997). This is a self-report questionnaire that contains 50 questions and requires approximately 5 to 10 minutes to complete. The Q-EDD collects attitude and frequency data for behaviors. Based on the respondent's answers categorical labels are assigned that are guided by a scoring manual consisting of flowchart decision rules. The participants are classified into one of two general categories— eating disordered (including anorexia nervosa, bulimia nervosa, and EDNOS) or non-eating disordered (symptomatic and asymptomatic). Participants need to meet all of the required *DSM-IV* criteria to be classified as eating disordered. To be classified as symptomatic, the participant must report engaging in one or more eating disordered behaviors, but not enough to be classified as having a diagnosable eating disorder. Asymptomatic individuals are those that report engaging in no disordered eating behaviors.

Validity for the Q-EDD was tested and established by Mintz et al. (1997). Experts in the field established content validity during the scale's development. Convergent validity was demonstrated by significant correspondence between Q-EDD diagnoses and scores on the Bulimia Test – Revised (BULIT-R) and the EAT. There was excellent accuracy between the Q-EDD and the clinical interviews, thus providing support for criterion-related validity. Finally, for incremental validity, when differentiating between those with and without bulimia nervosa, the BULIT-R and the Q-EDD performed quite similarly, except for positive predictive power (considered most important by Widiger, Hurt, Frances, Clarkin, & Gilmore, 1984) in which the Q-EDD performed superiorly. Test-retest reliabilities were found to be within the expected range, given that eating

disorder symptoms are not a temporally stable phenomenon (Fairburn, Phil, & Beglin, 1990).

Procedure

Following ethics approval, the head coaches of major figure skating, dance, gymnastics clubs and Universities across Ontario were contacted by phone or email. Once permission was gained from the head coach, a day and time was organized in which all of the athletes at the club were brought together, and the researcher personally distributed the questionnaires to the participants. As part of a larger study, three questionnaires were distributed to the participants however; only two of the questionnaires will be discussed for the purpose of this article. Prior to completing the questionnaires, the participants were given a brief description of the study, and told that the questionnaires would take approximately 15 to 20 minutes to complete. They were then told to read the consent form before completing the questionnaires, and that if at any time they wished to stop, they were free to do so without any reprisal from the researcher. The participants were asked to complete the questionnaires as honestly and accurately as possible and to not confer with each other when completing them. The researcher remained with the participants to answer any questions and to ensure the participants were working independently. All participants were treated according to APA guidelines.

To further increase the likelihood of the participants responding honestly, the participants were told that their results would be kept confidential and anonymous. Participants placed all completed questionnaires directly into an envelope provided, prior to returning them to the researcher. Because there is some concern that completing the questionnaires would raise awareness concerning eating disorders, all the participants

were given an information sheet with the names, email addresses, and phone numbers of local organizations that provide assistance to those with eating disorders, as well as a list of the dangers of disordered eating and guidelines for healthy eating.

Results

Initial analyses verified that the data had normal distribution and that there was homogeneity of variance. Analyses were then conducted to determine if the three groups of participants (eating disordered, symptomatic, and asymptomatic) differed significantly with respect to the factors of age, BMI, sport, and competitive level. Cross-tabulations were performed for sport and competitive level, and one-way ANOVAs were conducted for age and BMI. All of the analyses were shown to be not significant ($p > .05$), and therefore, it was concluded that the groups did not differ significantly with respect to these factors.

A cross-tabulation and chi-square analysis were then completed to view the frequencies of the athletes across the three broad categories of the Q-EDD: eating disordered, symptomatic, and asymptomatic ($\chi^2 (2, N = 144) = 53.29, p = .00$). To determine if the SPAS scores differed across the three groups, a one-way analysis of variance was conducted with the SPAS scores serving as the dependent variable. The results of this analysis revealed the SPAS scores did indeed differ significantly across the three groups, $F(3, 143) = 8.54, p = .000$. A post-hoc Tukey's test revealed that the eating disordered group and the symptomatic group had significantly higher SPAS scores than the asymptomatic group with $p = .001$ and $p = .04$, respectively (see Table 1 for descriptive statistics). In terms of effect size, this was a large effect with $d = 1.08$ and a medium effect with $d = .47$, respectively.

A one-way ANOVA was also conducted to determine if SPAS differed significantly across the four sports. This result was significant, $F(3, 143) = 4.18, p = .007$, and a post-hoc Tukey's test revealed that the figure skating group had significantly higher SPA than the synchronized swimming group ($p = .004$) (see Table 2). A portion of the data was also used in Cooper & Ste-Marie's (2004) study.

Discussion

It was hypothesized that there would be significant differences between each of the three groups with respect to SPA, and that the eating disordered group would have the highest SPA and the asymptomatic group the lowest SPA. Indeed this trend was evident in the results. The results showed that the eating disordered group and the symptomatic group differed significantly from the asymptomatic group, with respect to SPA. Overall, these results are consistent with previous research on female aesthetic athletes that has shown SPA and disordered eating to be correlated (Chad & Spink, 1996; Haase & Prapavessis, 2001; Reel & Gill, 1996; Vadocz & Malina, in press).

While the results from this study reveal the trend that higher levels of disordered eating are associated with higher SPAS scores, the design of this study and the analysis performed does not test for causal relationships. Therefore, this study cannot determine the direction of the relationship between these two variables. This raises the question of whether SPA leads to disordered eating or disordered eating leads to SPA. The direction of this relationship has varied in past research with some researchers examining whether disordered eating predicts SPA (Clark et al., 2002; Hausenblaus & Mack, 1999), and others investigating whether SPA predicts disordered eating (Chad & Spink, 1996; Reel & Gill, 1996; Vadocz & Malina, in press). It might be that females engage in disordered

eating in an attempt to achieve the ideal physique but suffer SPA when unable to achieve this objective. Alternatively, as expressed by Haase, Prapavessis, & Owens (2002), it may be that those with high SPA turn to disordered eating tendencies in an attempt to cope with their inability to self-present in a positive way.

We align ourselves with this latter alternative as it coincides well with the literature that has shown eating disorders to be a common coping mechanism for females (Wiseman, Gray, Mosimann, & Ahrens, 1992). In addition, because SPA is related to the concept of body image (Hart et al., 1989), and body dissatisfaction has been shown to be a predictor of disordered eating (Stice, 2001; Stice & Shaw, 2002; Thompson, Heinberg, Altabe, Tantleff-Dunn, 1999), it would seem reasonable to presume that high SPA would also predict disordered eating. Future research should focus on the direction of the relationship between SPA and disordered eating, using new more accurate measures of disordered eating, such as the Q-EDD. Determining the direction is important because if it is shown that high SPA leads to disordered eating, then interventions could focus on reducing SPA in an attempt to reduce the level of disordered eating.

Furthermore, assessment for eating disorders may also be easier by using questionnaires such as the SPAS because they do not inform athletes of eating disorder behaviors. As mentioned in our method section, there is sometimes the concern that athletes actually learn techniques, and may eventually engage in such techniques, by mere completion of an eating disorder questionnaire. Thus, completion of a questionnaire that is empirically shown to provide important information concerning the likelihood of an emergent eating disorder, but does not provide “dangerous ideas” to the athletes, may be an important tool for individuals who intervene with female athletes at

risk for eating disorders. Our results imply that the SPAS is one such tool to place in the toolbox.

Before concluding, certain limitations with this study should be considered. First, both measures used were self-report questionnaires. There is no way of knowing if the participants were being entirely truthful with their answers. Second, because the participants were volunteers, those who were not comfortable about their bodies and their eating habits may not have been as likely to participate, and therefore, accurate sampling of the population may be a concern. Despite these limitations, our research has shown that higher levels of SPA are associated with more disordered eating tendencies. Returning to the notion of interventions, one that targets reducing SPA may be appropriate for female aesthetic athletes.

References

- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washinton, DC: Author.
- Borgen, J., & Corbin, C. (1987). Eating disorders among female athletes. *Physician and Sportsmedicine*, 15, 89-95.
- Chad, K., & Spink, K.S. (1996). Body image, social physique anxiety, and tendency to develop eating disorders in female figure skaters. *Journal of Applied Sport Psychology*, 8, s148.
- Clark, S.E., Findlay, L.C., Ste-Marie, D.M., & Simard, J. (2002). Eating attitudes and social physique anxiety among female athletes in aquatic sports. *Journal of Sport and Exercise Psychology*, 24, s47.
- Diehl, N.S., Johnson, C.E., Rogers, R.L., Petrie, T.A. (1998). Social physique anxiety and disordered eating: What's the connection? *Addictive Behaviors*, 23 (1), 1-6.
- Fairburn, C.G., Phil, M., & Beglin, S.J. (1990). Studies of the epidemiology of bulimia nervosa. *American Journal of Psychiatry*, 147, 401-408.
- Fox, K.R. (1997). The physical self and processes in self-esteem development. In K.R. Fox (Ed.), *The physical self: From motivation to well-being* (p.p., 111-140). Champaign, IL: Human Kinetics.
- Garner, D.M. (1991). *Eating disorder inventory-2: Professional manual*. Odessa, FL: Psychological Assessment Resources.
- Garner, D.M., & Garfinkel, P.E. (1979). The eating attitudes test: An index of the symptoms of anorexia nervosa. *Psychological Medicine*, 9, 273-279.

- Garner, D.M., Olmstead, M.P., & Polivy, J. (1983). Development and validation of a multidimensional eating disorder inventory for anorexia nervosa and bulimia. *International Journal of Eating Disorders*, 2, 15-34.
- Haase, A.M., & Prapavessis, H. (1998). Social physique anxiety and eating attitudes: Moderating effects of body mass and gender. *Psychology, Health & Medicine*, 3 (2), 1998.
- Haase, A.M., & Prapavessis, H. (2001). Social physique anxiety and eating attitudes in female athletic and non-athletic groups. *Journal of Science and Medicine in Sport*, 4 (4), 396-405.
- Haase, A.M., Prapavessis, H., & Owens, G.R. (2002). Perfectionism, social physique anxiety and disordered eating: A comparison of male and female elite athletes. *Psychology of Sport and Exercise*, 3, 209-222.
- Hart, E.H., Leary, M.R., & Rejeski, W.J. (1989). The measurement of social physique anxiety. *Journal of Sport and Exercise Psychology*, 11, 94-104.
- Hausenblaus, H.A., & Carron, A.V. (1999). Eating disorder indices and athletes: An integration. *Journal of Sport & Exercise Psychology*, 21, 230-258.
- Hausenblaus, H.A., & Mack, D.E. (1999). Social physique anxiety and eating disorder correlates among female athletic and nonathletic populations. *Journal of Sport Behavior*, 22 (4), 502-513.
- Hesse-Biber, S. (1989). Eating patterns and disorders in a college population: Are college women's eating problems a new phenomenon? *Sex Roles*, 20, 71-90.

- Leary, M.R. (1992). Self-presentation processes in exercise and sport. *Journal of Sport & Exercise Psychology, 14*, 339-351.
- Leary, M.R., & Kowalski, R.M. (1990). Impression management: A literature review and two component model. *Psychological Bulletin, 107*, 34-37.
- Mintz, L.B., O'Halloran, S.M. (2000). The eating attitudes test: Validation with DSM-IV eating disorder criteria. *Journal of Personality Assessment, 74*(3), 489-503.
- Mintz, L.B., O'Halloran, S.M., Mulholland, A.M., & Schneider, P.A. (1997). Questionnaire for eating disorder diagnoses: Reliability and validity of operationalizing DSM-IV criteria into a self-report format. *Journal of Counseling Psychology, 44* (1), 63-79.
- Mulholland, A.M. (2001). Validation of an eating disorders assessment on African American college women. *Dissertation Abstracts International: Section B: the Sciences & Engineering, 61* (9-B), 4996.
- Petrie, T.A. (1996). Differences between male and female college lean sport athletes, non-lean sport athletes, and nonathletes on behavioral and psychological indices on eating disorders. *Journal of Applied Sport Psychology, 8*, 218-230.
- Reel, J.J., & Gill, D.L. (1996). Psychosocial factors related to eating disorders among high school and college female cheerleaders. *The Sport Psychologist, 10*, 195-206.
- Seiver, M.D. (1994). Sexual orientation and gender as factors in socioculturally acquired vulnerability to body dissatisfaction and eating disorders. *Journal of Consulting and Clinical Psychology, 62*, 252-260.

- Smart, R.S. (1999). Role of ethnicity, body dissatisfaction, and stressful life events in disordered eating among Asian-American, Chicana/Latina, and European American college females. *Dissertation Abstracts International: Section B: the Sciences & Engineering*, 60 (6-B), 2962.
- Southerland, D.L. (2000). The relationship between disordered eating behaviors and coping. *Dissertation Abstracts International: Section B: the Sciences & Engineering*, 60 (12-B), 6384.
- Stice, E. (2001). A prospective test of the dual pathway model of bulimic pathology: Mediating effects of dieting and negative affect. *Journal of Abnormal Psychology*, 110, 124-135.
- Stice, E., & Shaw, H.E. (2002). Role of body dissatisfaction in the onset and maintenance of eating pathology: A synthesis of research findings. *Journal of Psychosomatic Research*, 53, 985-993.
- Thompson, J.K., Heinberg, L.J., Altabe, M., & Tantleff-Dunn, S. (1999). *Exacting beauty: Theory, assessment, and treatment of body image disturbance*. Washington, DC: American Psychological Association
- Vadocz, E.A., & Malina, R.A. (in press). Correlates of eating disorder risk among female figure skaters: A profile of adolescent competitors. *Psychology of Sport and Exercise*.
- Whitehead, J.R., Bratud, S.R., & Eklund, R.C. (1998). Social physique anxiety and physical self-perceptions as predictors of eating disorder risk. *Official Journal of the American College of Sports Medicine*, 5 (30), s121.

- Widiger, T.A., Hurt, S.W., Frances, A., Clarkin, J.F., & Gilmore, M. (1984). Diagnostic efficiency in DSM-III. *Archives of General Psychiatry, 41*, 1005-1012.
- Williamson, D.A. (1990). *Assessment of eating disorders: Obesity, anorexia, and bulimia-nervosa*. New York: Pergamon Press.
- Williamson, D.A., Anderson, D., Jackman, L.P., & Jackson, S.R. (1995). Assessment of eating disordered thoughts, feelings and behaviors. In D. Allison (Ed.), *Handbook of assessment methods for eating behaviors and weight-related problems* (pp. 303-346). Thousand Oaks, CA: Sage.
- Wiseman, C.V., Gray, J.J., Mosimann, J.E., & Ahrens, A.H. (1992). Cultural expectations of thinness in women: An update. *International Journal of Eating Disorders, 11*, 85-89.

Table 1

Means and Standard Deviations for SPA, and Frequency for each Q-EDD category in Female Aesthetic Athletes

Q-EDD Category	Mean	SD	Frequency
Asymptomatic	32.42	3.91	86
Symptomatic	34.26	4.20	43
Eating Disordered	36.67	4.01	15
Total	33.41	4.21	144

Table 2

Means and Standard Deviations for SPA for the Four Sports

Sport	Mean	SD
Figure Skating	35.25	4.82
Gymnastics	33.08	3.24
Jazz Dance	33.42	4.22
Synchronized Swimming	31.89	3.88

PART THREE: CONTRIBUTION OF COLLABORATORS

CONTRIBUTION OF COLLABORATORS

The topic of my Master's thesis was SPA and disordered eating in female aesthetic athletes. This was an area of research that was currently being conducted in our laboratory under the guidance of Dr. Diane Ste-Marie, my thesis supervisor. After meeting with Dr. Ste-Marie about the basic framework of my research project, I wrote a draft of my research proposal, which she then edited. After several drafts, a final version of the proposal was submitted for my proposal defense.

Following the proposal defense, based on suggestions from my committee members, Dr. Charlotte Beaudoin and Dr. George Tasca, a few changes were made to the methodology. Specifically, approximately equal numbers of participants were recruited from each of the sports. Also, I was required to be present to personally distribute and collect all of the questionnaires. Finally, in addition to the information sheet given to the athletes on the dangers of disordered eating, information about healthy eating was provided.

Data that had been collected for the larger project in our laboratory was used in my Master's study. In addition, I collected data from many more athletes. I was responsible for contacting all of the sport clubs in order to recruit participants. I personally distributed and collected all of the questionnaires. As well, I completed all of the questionnaire scoring and subsequent data entry. The statistical analyses were decided upon through discussion with Dr. Tasca, Dr. Beaudoin, Dr. Blanchard, and Dr. Ste-Marie. Once the data analyses were agreed upon and completed, I wrote drafts of the two thesis articles, the remaining sections of the thesis and made revisions to the existing

sections from the thesis proposal. These drafts were then edited by Dr. Ste-Marie, until we decided that it was ready to submit for my thesis defense.

PART FOUR: REFERENCES AND APPENDIXES

REFERENCES

- American Psychiatric Association. (1968). *Diagnostic and statistical manual of mental disorders* (2nd ed.). Washinton, DC: Author.
- American Psychiatric Association. (1980). *Diagnostic and statistical manual of mental disorders* (3rd ed.). Washinton, DC: Author.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washinton, DC: Author.
- Benson, J.D., Allemann, Y., Theintz, G.E., & Howald, H. (1990). Eating problems and caloric intake levels in Swiss adolescent athletes. *International Journal of Sports Medicine, 11*, 249-252.
- Benson, R.A., & Taub, D.E. (1993). Using the PRECEDE model for causal analysis of bulimic tendencies among elite women swimmers. *Journal of Health Education, 24*, 360-368.
- Berry, T.R., & Howe, B.L. (2000). Risk factors for disordered eating in female university athletes. *Journal of Sport Behavior, 23*, 207-218.
- Black, D.R., (Ed.). (1991). *Eating disorders among athletes*. Reston, VA: American Alliance for Health, Physical Education, Recreation, and Dance.
- Borgen, J., & Corbin, C. (1987). Eating disorders among female athletes. *Physician and Sportsmedicine, 15*, 89-95.
- Bottamini, G.L. (2000). *Weight loss pressures in ballet: Are teachers a possible source*. Unpublished master's thesis, University of Ottawa, Ottawa, Ontario, Canada.

- Bulik, C.M., Beidel, D.C., Duchmann, E., Weltzin, T.E., & Kaye, W.E. (1991). An analysis of social anxiety in anorexic, bulimic, social phobic, and control women. *Journal of Psychopathology and Behavioral Assessment, 13*, 199-211.
- Burkes-Miller, M., & Black, D. (1988). Male and female college athletes: Prevalence of anorexia nervosa and bulimia nervosa. *Athletic Training, 23*, 137-140.
- Burkes-Miller, M., & Black, D. (1991). College athletes and eating disorders: A theoretical context. In D. Black (Ed.), *Eating disorders among athletes: Theory, issues and research* (pp.11-26). Reston, VA: American Alliance for Health, Physical Education, Recreation & Dance.
- Cash, T., & Pruzinsky, T. (Eds.). (1990). *Body images: Development, deviance, and change*. New York: Guilford Press.
- Chad, K., & Spink, K.S. (1996). Body image, social physique anxiety, and tendency to develop eating disorders in female figure skaters. *Journal of Applied Sport Psychology, 8*, s148.
- Clark, N., Nelson, M., & Evans, W. (1988). Nutrition Education for elite female runners. *Physician and Sportsmedicine, 16*, 124-136.
- Clark, S.E., Findlay, L.C., Ste-Marie, D.M., & Simard, J. (2002). Eating attitudes and social physique anxiety among female athletes in aquatic sports. *Journal of Sport and Exercise Psychology, 24*, s47.
- Clarke, M.G., & Palmer, R.L. (1983). Eating attitudes and neurotic symptoms in university students. *British Journal of Psychiatry, 142*, 299-304.

- Davis, C., & Cowles, M. (1989). A comparison of weight and diet concerns and personality factors among female athletes and non-athletes. *Journal of Psychosomatic Research*, 33, 527-536.
- Diehl, N.S., Johnson, C.E., Rogers, R.L., Petrie, T.A. (1998). Social physique anxiety and disordered eating: What's the connection? *Addictive Behaviors*, 23 (1), 1-6.
- Fairburn, C.G., Phil, M., & Beglin, S.J. (1990). Studies of the epidemiology of bulimia nervosa. *American Journal of Psychiatry*, 147, 401-408.
- Fox, K.R. (1997). The physical self and processes in self-esteem development. In K.R. Fox (Ed.), *The physical self: From motivation to well-being* (p.p., 111-140). Champaign, IL: Human Kinetics.
- Gadpaille, W.J., Sanborn, C.F., & Wagner, W.W. (1987). Athletic amenorrhea, major affective disorders, and eating disorders. *American Journal of Psychiatry*, 144, 939-942.
- Garner, D.M. (1991). *Eating disorder inventory-2: Professional manual*. Odessa, FL: Psychological Assessment Resources.
- Garner, D.M., & Garfinkel, P.E. (1979). The eating attitudes test: An index of the symptoms of anorexia nervosa. *Psychological Medicine*, 9, 273-279.
- Garner, D.M., Garfinkel, P.E., Rockert, W., & Olmstead, M.P. (1987). A prospective study of eating disturbances in the ballet. *Psychotherapy and Psychosomatics*, 48, 170-175.
- Garner, D.M., Olmstead, M.P., & Polivy, J. (1983). Development and validation of a multidimensional eating disorder inventory for anorexia nervosa and bulimia. *International Journal of Eating Disorders*, 2, 15-34.

- Haase, A.M., & Prapavessis, H. (1998). Social physique anxiety and eating attitudes: Moderating effects of body mass and gender. *Psychology, Health & Medicine, 3* (2), 1998.
- Haase, A.M., & Prapavessis, H. (2001). Social physique anxiety and eating attitudes in female athletic and non-athletic groups. *Journal of Science and Medicine in Sport, 4* (4), 396-405.
- Haase, A.M., Prapavessis, H., & Owens, G.R. (2002). Perfectionism, social physique anxiety and disordered eating: A comparison of male and female elite athletes. *Psychology of Sport and Exercise, 3*, 209-222.
- Harris, M., & Greco, D. (1990). Weight control and weight concerns in competitive female gymnasts. *Journal of Sport & Exercise Psychology, 12*, 427-433.
- Hart, E.H., Leary, M.R., & Rejeski, W.J. (1989). The measurement of social physique anxiety. *Journal of Sport and Exercise Psychology, 11*, 94-104.
- Hausenblaus, H.A., & Carron, A.V. (1999). Eating disorder indices and athletes: An integration. *Journal of Sport & Exercise Psychology, 21*, 230-258.
- Hausenblaus, H.A., & Mack, D.E. (1999). Social physique anxiety and eating disorder correlates among female athletic and nonathletic populations. *Journal of Sport Behavior, 22* (4), 502-513.
- Hesse-Biber, S. (1989). Eating patterns and disorders in a college population: Are college women's eating problems a new phenomenon? *Sex Roles, 20*, 71-90.

- Johnsone-Sabine, E., Wood, K., & Patton, G. (1988). Abnormal eating attitudes in London schoolgirls- A prospective epidemiological study: Factors associated with abnormal response on screening questionnaires. *Psychological Medicine, 18*, 615-622.
- Kurtzman, F.D., Yager, J., Landsverk, J., Wiesmeier, E., & Bodurka, D.C. (1989). Eating disorders among selected female student populations at UCLA. *Journal of the American Dietetic Association, 89*, 45-53.
- Lachenmeyer, J.R., & Muni-Brander, P. (1988). Eating disorders in a nonclinical adolescent population: Implications for treatment. *Adolescence, 23*, 303-312.
- Lindeman, A.K. (1994). Self-esteem: Its application to eating disorders and athletes. *International Journal of Sport Nutrition, 4*, 237-252.
- Meadows, G.N., Palmer, R.C., Newball, E.U.M., & Kenrick, J.M.T. (1986). Eating attitudes and disorders in young women: A general practice based survey. *Psychological Medicine, 16*, 351-357.
- Mintz, L., & Betz, N. (1988). Prevalence of eating disorder behaviors among undergraduate women. *Journal of Counseling Psychology, 35*, 463-471.
- Mintz, L.B., O'Halloran, S.M. (2000). The eating attitudes test: Validation with DSM-IV eating disorder criteria. *Journal of Personality Assessment, 74*(3), 489-503.
- Mintz, L.B., O'Halloran, S.M., Mulholland, A.M., & Schneider, P.A. (1997). Questionnaire for eating disorder diagnoses: Reliability and validity of operationalizing DSM-IV criteria into a self-report format. *Journal of Counseling Psychology, 44* (1), 63-79.

- Moreno, A., & Thelen, M.H. (1993). Parental factors related to bulimia nervosa. *Addictive Behaviors, 18*, 681-689.
- Mulholland, A.M. (2001). Validation of an eating disorders assessment on African American college women. *Dissertation Abstracts International: Section B: the Sciences & Engineering, 61* (9-B), 4996.
- Neumark-Sztainer, D., Beutler, R., & Palti, H. (1996). Personal and socioenvironmental predictors of disordered eating among adolescent females. *Journal of Nutrition Education, 28*, 195-201.
- Niinimaa, V. (1982). Figure skating: What do we know about it? *Physician and Sports Medicine, 10* (4), 51-56.
- Petrie, T.A., (1993). Disordered eating in female collegiate gymnasts: Prevalence and personality/attitudinal correlates. *Journal of Exercise Psychology, 15*, 424-436.
- Petrie, T. (1996). Differences between male and female college lean sport athletes, non-lean sport athletes, and nonathletes on behavioral and psychological indices of eating disorders. *Journal of Applied Sport Psychology, 8*, 218-230.
- Reel, J.J., & Gill, D.L. (1996). Psychosocial factors related to eating disorders among high school and college female cheerleaders. *Sport Psychologist, 10*, 195-206.
- Rosen, J.C. (1990). *Body image disturbance in eating disorders*. In T.F. Cash & T. Pruzinsky (Eds.), *Body images: Development, deviance, and change* (pp. 190-214). New York: Guilford Press.
- Rosen, L.W., & Hough, D.O. (1988). Pathogenic weight-control behaviors of female college gymnasts. *Physician and Sportsmedicine, 16* (9), 140-144.

- Selby, R., Weinstein, H.M., & Bird, T.S. (1990). The health of university athletes: Attitudes, behaviors, and stressors. *Journal of American College Health, 39*, 11-18.
- Shaw, B.F., & Garkinkel, P.E. (1990). Research problems in the eating disorders. *International Journal of Eating Disorders, 9*, 545-555.
- Sherman, R.T., & Thompson, R.A. (1990). *Bulimia: A guide for family and friends*. Lexington, MA: Lexington Books.
- Seiver, M.D. (1994). Sexual orientation and gender as factors in socioculturally acquired vulnerability to body dissatisfaction and eating disorders. *Journal of Consulting and Clinical Psychology, 62*, 252-260.
- Smart, R.S. (1999). Role of ethnicity, body dissatisfaction, and stressful life events in disordered eating among Asian-American, Chicana/Latina, and European American college females. *Dissertation Abstracts International: Section B: the Sciences & Engineering, 60* (6-B), 2962.
- Smolak, L., Murnen, S., & Ruble, A. (2000). Female athletes and eating problems: A meta-analysis. *International Journal of Eating Disorders, 27* (4), 371-380.
- Southerland, D.L. (2000). The relationship between disordered eating behaviors and coping. *Dissertation Abstracts International: Section B: the Sciences & Engineering, 60* (12-B), 6384.
- Sundgot-Borgen, J. (1993). Prevalence of eating disorders in elite female athletes. *International Journal of Sport Nutrition, 3*, 29-40.

- Sundgot-Borgen, J. (1994). Risk and trigger factors for the development of eating disorders in female elite athletes. *Medicine & Science in Sport & Exercise*, 26, 414-419.
- Taylor, G.M. (1998). *Female pair/dance figure skater's attitudes, behaviors and perceptions related to weight*. Unpublished master's thesis, University of Ottawa, Ottawa, Ontario, Canada.
- Taylor, G.M., & Ste-Marie, D.M. (2001). Eating disorder symptoms in Canadian female pair and dance figure skaters. *International Journal of Sport Psychology*, 32, 21-28.
- Thompson, J.K. (1990). *Body image disturbance: Assessment and treatment*. Elmsford, NY: Pergamon Press.
- Thompson, R.A., & Sherman, R.T. (1993). *Helping athletes with eating disorders*. Champaign, IL: Human Kinetics Publishers.
- Vadocz, E.A., & Malina, R.A. (in press). Correlates of eating disorder risk among female figure skaters: A profile of adolescent competitors. *Psychology of Sport and Exercise*.
- Weight, L.M., & Noakes, T.D. (1987). Is running an analog of anorexia? A survey of the incidence of eating disorders in female distance runners. *Medicine and Science in Sports and Exercise*, 19, 213-217.
- Whitehead, J.R., Bratud, S.R., & Eklund, R.C. (1998). Social physique anxiety and physical self-perceptions as predictors of eating disorder risk. *Official Journal of the American College of Sports Medicine*, 5 (30), s121.

- Widiger, T.A., Hurt, S.W., Frances, A., Clarkin, J.F., & Gilmore, M. (1984). Diagnostic efficiency in DSM-III. *Archives of General Psychiatry, 41*, 1005-1012.
- Wilkins, J., Boland, F., & Albinson, J. (1991). A comparison of male and female university athletes and nonathletes on eating disorder indices: Are athletes protected? *Journal of Sport Behavior, 14*, 129-143.
- Williamson, D.A. (1990). *Assessment of eating disorders: Obesity, anorexia, and bulimia-nervosa*. New York: Pergamon Press.
- Williamson, D.A., Anderson, D., Jackman, L.P., & Jackson, S.R. (1995). Assessment of eating disordered thoughts, feelings and behaviors. In D. Allison (Ed.), *Handbook of assessment methods for eating behaviors and weight-related problems* (pp. 303-346). Thousand Oaks, CA: Sage.
- Williamson, D., Netemeyer, R., Jackman, L., Anderson, D., Funsch, C., & Rabalais, J. (1995). Structural equation modeling of risk factors for the development of eating disorder symptoms in female athletes. *International Journal of Eating Disorders, 17*, 387-393.

APPENDIXES

APPENDIX A

SOCIAL PHYSIQUE ANXIETY SCALE

We are interested in obtaining your honest input concerning the questions that follow. All answers will remain anonymous and confidential. If you have any questions, feel free to ask the representative involved. The completion of this questionnaire implies your informed consent. We thank you in advance for your participation.

Sport: _____ Level: _____ # of years: _____
 Age: _____ Gender: _____
 Current weight: _____ Desired weight: _____ Height: _____

Using the scale below, please indicate in the spaces provided the degree to which the following statements are characteristic or true of you.

1	2	3	4	5
Not at all	Slightly	Moderately	Very	Extremely

1. I am comfortable with the appearance of my physique/figure. _____
2. I would never worry about wearing clothes that might make me look too thin or overweight. _____
3. I wish I wasn't so uptight about my physique/figure. _____
4. There at times when I am bothered by thoughts that other people are evaluating my weight or muscular development negatively. _____
5. When I look in the mirror I feel good about my physique/figure. _____
6. Unattractive features of my physique/figure make me nervous in certain social settings. _____
7. In the presence of others, I feel apprehensive about my physique/figure. _____
8. I am comfortable with how fit my body appears to others. _____
9. It would make me uncomfortable to know others were evaluating my physique/figure. _____
10. When it comes to displaying my physique/figure to others, I am a shy person. _____
11. I usually feel relaxed when it is obvious that others are looking at my physique/figure. _____
12. When in a bathing suit, I often feel nervous about the shape of my body. _____

APPENDIX B

QUESTIONNAIRE FOR EATING DISORDER DIAGNOSES

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

Sex: (Please circle) Male Female

Age:

School/Occupational Status: (Please circle)
 Junior High or younger (specify grade : _____)
 Grade 9
 Grade 10
 Grade 11
 Grade 12
 OAC
 First year University
 Second year University
 Third year University
 Fourth year University
 Graduate Student
 Not in school/Employed (specify: _____)

Race/Ethnicity:
 (Please circle) Caucasian/White
 African/Canadian/Black
 Hispanic/Latino/Mexican-Canadian
 Asian-Canadian
 Aboriginal
 Other: (specify: _____)

Present height: _____

Present weight: _____

My body-frame is: small medium large
 (Please circle)

I would like to weigh: _____

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

YES NO

If YES: Continue to answer the following questions.

If NO: Skip to Question #4

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

YES NO

3. Circle the answers within the **two** sets of (**bold brackets**) below that best fit for you:

On the average, I have had (1,2,3,4,5,6, or more) binge eating episodes a WEEK for at least (1 month, 2 months, 3 months, 4 months, 5 months, 6-12 months, more than one year)

4. Please circle the appropriate responses below concerning things you may do **currently** to prevent weight gain. If you circle yes to any question, please indicate how often on the average you do this and how long you have been doing this.

- a) Do you make yourself vomit to prevent weight gain? YES NO
How often do you do this?
 Daily Twice/week Once/Week Once/Month
How long have you been doing this?
 1 month 2 months 3 months 4 months 5-11 months More than a year
- b) Do you take laxatives to prevent weight gain? YES NO
How often do you do this?
 Daily Twice/week Once/Week Once/Month
How long have you been doing this?
 1 month 2 months 3 months 4 months 5-11 months More than a year
- c) Do you take diuretics (water pills) to prevent weight gain? YES NO
How often do you do this?
 Daily Twice/week Once/Week Once/Month
How long have you been doing this?
 1 month 2 months 3 months 4 months 5-11 months More than a year
- d) Do you fast (skip food for 24 hours) to prevent weight gain? YES NO
How often do you do this?
 Daily Twice/week Once/Week Once/Month
How long have you been doing this?
 1 month 2 months 3 months 4 months 5-11 months More than a year
- e) Do you chew your food but spit it out to prevent weight gain? YES NO
How often do you do this?
 Daily Twice/week Once/Week Once/Month
How long have you been doing this?
 1 month 2 months 3 months 4 months 5-11 months More than a year
- f) Do you give yourself an enema to prevent weight gain? YES NO
How often do you do this?
 Daily Twice/week Once/Week Once/Month
How long have you been doing this?
 1 month 2 months 3 months 4 months 5-11 months More than a year
- g) Do you take appetite control pills to prevent weight gain? YES NO
How often do you do this?
 Daily Twice/week Once/Week Once/Month
How long have you been doing this?
 1 month 2 months 3 months 4 months 5-11 months More than a year
- h) Do you diet strictly to prevent weight gain? YES NO
How often do you do this?
 Daily Twice/week Once/Week Once/Month
How long have you been doing this?
 1 month 2 months 3 months 4 months 5-11 months More than a year

i) Do you exercise a lot? YES NO

How often do you do this?

Daily Twice/week Once/Week Once/Month

How long have you been doing this?

1 month 2 months 3 months 4 months 5-11 months More than a year

5. If you answered YES to "exercise a lot", please answer questions #5a, 5b, 5c, & 5d. If you answered NO to "exercise a lot" skip to question #6

5a. Fill in the blanks below:

I _____ (types of exercise, e.g., jog, swim) for an average of ____ hours at a time.

5b. My exercise sometimes significantly interferes with important activities. YES NO

5c. I exercise despite injury and/or medical complications. YES NO

5d. Is your primary reason for exercising to counteract the effects of binges or to prevent weight gain?
YES NO

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

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

1 2 3 4 5
Not at all A little A moderate amount Very much Extremely or completely

7. How afraid are you of becoming fat?

1 2 3 4 5
Not at all A little A moderate amount Very much Extremely or completely

8. How afraid are you gaining weight?

1 2 3 4 5
Not at all A little A moderate amount Very much Extremely or completely

9. Do you consider yourself to be:

1 2 3 4 5 6
Grossly Moderately Overweight Normal Low Severely
Obese Obese Weight Weight Underweight

10. Certain parts of my body (e.g., my abdomen, buttocks, thighs) are too fat. YES NO

11. I feel fat all over. YES NO

12. I believe how little I weigh is a serious problem. YES NO

13. I have missed at least 3 consecutive menstrual cycles (not including those missed during a pregnancy)
YES NO

APPENDIX C

ETHICS COMMITTEE APPROVAL



Université d'Ottawa • University of Ottawa

Cabinet du vice-recteur
à la recherche

Office of the Vice-Rector,
Research

January 24th, 2003

Mrs. Diane Ste-Marie
School of Human Kinetics
Montpetit Hall, Room 206
University of Ottawa
Ottawa (Ontario)

Object: A comparison of Athletes' social physique anxiety in three aquatic sports
(File H 12-00-06)

Dear Mrs. Ste-Marie,

You will find enclosed the Health Sciences and Science Research Ethics Board renewal certification for your research project above-mentioned.

Please note that it is the responsibility of researchers to:

- a) Send a copy of this approval to the Research Services, if necessary;
- b) Notify the ethics office of any changes in the research project;
- c) Fill out an annual status report to be sent to the Protocol officer for ethics in research. Such report can be found on the ethics web site at:
http://www.uottawa.ca/services/research/rge/rebs/download/rapport_annuel_projets_angl_ais.doc

Please do not hesitate to contact me at the following number 562-5387 if you have any questions.

Sincerely yours,

Andrée Bertrand
Protocol officer for ethics in research
550, Cumberland Street, Room 160

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HEALTH SCIENCES AND SCIENCE RESEARCH ETHICS BOARD

CERTIFICATION OF ETHICS APPROVAL

This is to certify that the University of Ottawa Health Sciences and Science Research Ethics Board (REB) examined the application for extension of ethics approval for the research project **A comparison of Athletes' social physique anxiety in three aquatic sports (File H 12-00-06)** submitted by Mrs. Diane Ste-Marie of the School of Human Kinetics. This project received initial ethics approval in January 2001 by the REB as meeting appropriate ethical standards set out in the Tri-Council Policy Statement and in the Procedures of the University of Ottawa Research Ethics Boards. The University of Ottawa REB members accordingly gave it an extension of ethics approval. This ethics renewal certification is valid for one year from the date indicated below.

Andrée Bertrand
Protocol officer for ethics in research
For Daniel Lagarec,
Chair, Health Sciences and Science REB

January 24th, 2003

Date

APPENDIX D

ATHLETE INFORMATION SHEET

Dear Athlete,

Thank you very much for considering participating in this study. Please read the information below carefully and if you have any questions do not hesitate to ask the researcher who is present or contact any of the names listed below.

Andrea Cooper, under the supervision of Dr. Diane Ste-Marie, is conducting a study that is interested in discovering information about athletes' social physique anxiety and eating behaviors in the aesthetic sport environment. We are asking that you completely fill out the attached questionnaires: the Social Physique Anxiety Scale, the Eating Attitudes Test, and the Questionnaire for Eating Disorder Diagnoses. This process will take approximately 15-20 minutes. If at any time you feel uncomfortable and wish to end your participation, feel free to do so, with no fear of reprisal. Should you have any concerns about the ethical conduct of this research please contact the protocol officer for Ethics in Research at (613) 562-5387 or ethics@uottawa.ca.

If, after reading the above information, you wish to participate in the study, please complete the attached questionnaires.

Thank you very much for your interest in this study.

Andrea Cooper
Graduate Student
School of Human Kinetics
University of Ottawa
(613) 562-5800 ext. 4248
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Diane Ste-Marie
Associate Professor
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APPENDIX E

EATING INFORMATION SHEET

The Dangers of Engaging in Unhealthy Eating Practices

If you are malnourished or purging (e.g., vomiting, diet pills), these are just a few of the side effects you could experience:

- **Fatigue:** You will feel sluggish and find it difficult to function throughout the day.
- **Memory loss:** It will become difficult to learn new skills and routines.
- **Injury:** You put yourself at risk for injury and prolong recovery.
- **Muscle weakness:** It will become difficult to perform demanding skills that require strength and endurance.
- **Decreased bone density:** Stress fractures can result.
- **Dehydration:** You will feel fatigued and can lead to reduced aerobic capacity and endurance, muscle cramps, constipation, abnormal heart rhythm, and dizziness.

Others: Premature osteoporosis, social isolation, difficulties concentrating, dental and gum problems, decreased motivation, moodiness, gastrointestinal problems, loss of coordination, menstrual irregularities, and hair loss (Mitchell, Pomeroy, & Adson, 1997; Thompson & Sherman, 1993).

If you would like further information, please contact any one of the organizations provided on the contact list.

Tips for Healthy Eating

Most women should eat 1800 to 2200 Cal per day, however, if you are an adolescent and/or engaging in strenuous exercise you may need more energy and nutrients.

For information on healthy eating, follow the Canada Food Guide:
http://www.hc-sc.gc.ca/hpfb-dgpsa/onpp-bppn/food_guide_rainbow_e.html

Recommended range of servings according to the Canada Food Guide:

Grain Products

5-12 servings per day

Meat and Alternatives

2-3 Servings per day

Vegetables and Fruit

5-10 Servings per day

Other Foods

No specific serving range

Milk Products

Youth 10-16 years: 3-4 servings/day

Adults: 2-4 servings/day

Athletes have more flexibility in the food choices they make. The extra energy needed often gives them the option to include foods that are higher in fat and energy.

APPENDIX F
CONTACT LIST

- Academy for Eating Disorders (703) 556-9222
www.aedweb.org
- Bellwood Health Services Inc. (800) 387-6198
www.bellwood.ca
- Eating Disorders Program at the (416) 340-4800
Toronto General Hospital
- Hopewell Eating Disorders Support Centre of Ottawa (613) 241-3428
www.hopewell.on.ca
- National Eating Disorder Information Centre (NEDIC) (416) 340-4156
www.nedic.on.ca
- New Realities Eating Disorders Recovery Centre (905) 763-0660
www.newrealitiescan.com
- Ottawa Eating Disorder Clinic (613) 729-0801
www.ottawaeatingdisorders.com
- Regional Centre for the Treatment of Eating (613) 737-8042
Disorders at the Ottawa Hospital
- Still Waters Clinic for Eating Disorders (416) 767-9575
www.stillwatersclinic.homestead.com