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**Female Pair/Dance Figure Skaters Self-Reported Attitudes, Behaviors and  
Perceptions Related to Weight Loss**

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Thesis submitted to the School of Graduate Studies, University of Ottawa

In partial fulfillment of the requirements of the degree of Master of Arts, Human Kinetics

Ottawa, Ontario, Canada, 1998



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0-612-38770-4

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### Acknowledgments

I would like to express heartfelt appreciation and thanks to Dr. Diane Ste-Marie, my advisor, for all the support she has given me throughout this process. Your encouragement, guidance and enthusiastic assistance have been invaluable. While this was a learning process for us both, you made this journey a much smoother and enjoyable one.

To my research team-Kavita, Jen, Clare, Sally, and Marie, a great big thank-you for all your input and help you have given me throughout the last two years. A special thank-you to Kavita, for both her moral support as well as her statistical support. All those long distance calls paid off.

Heartfelt thanks to my family-Mom, Dad, Sharon, Wendy, Keith, Brent, Meg, Matt, Taylor, and Jordan. Your constant support and motivation throughout this process have meant the world to me . The patience all of you have showed me in the past two years means more to me than you will ever know. This thesis has a little of all of you in it. And finally, a thank-you is in order for Shawn, my fiance whose encouragement to begin this process was invaluable. I could never have begun or completed this project without the love and support all of you have shown me during the past two years.

## Abstract

The purpose of this thesis was to examine the self-reported eating attitudes/behaviors behaviors, as well as weight loss pressures in female pair/dance figure skaters. Two separate studies were completed in order to examine these issues. Forty-one pair and dance female figure skaters (26 pairs, 15 dance) completed two questionnaires that tapped into whether the figure skaters exhibited disordered eating tendencies (EDI), and whether weight loss pressures were evident in this sporting population (SKATE Scale). Results from the EDI indicated that a significant number of the skaters had self-reported eating attitudes and behaviors analogous to individuals with disordered eating tendencies. Also, analyses of the SKATE Scale revealed that the figure skaters perceived themselves and their coach as the most significant sources of weight loss pressures, and that this pressure was mainly for performance benefits. Correlational analyses of the three most commonly used subscales of the EDI with the five pressure sources of the SKATE Scale revealed a strong positive relationship between these two. These results are discussed in terms of the possible relationship between disordered eating tendencies and weight loss pressures, as well as practical implications and future research.

## Chapter I

## INTRODUCTION

## Eating Disorders

General Information

In Joan Ryan's (1995) popular book entitled Little Girls in Pretty Boxes: The Making and Breaking of Elite Gymnasts and Figure Skaters, it was unveiled that which was only known in the ice rinks and gymnastic clubs: the intense pressures and win at all cost attitude that parents, coaches, and athletes alike are willing to endure in the sports of gymnastics and figure skating. The work in this book has been called "ground breaking" and a must read for all sport scientists and sports enthusiasts alike (Pierson, 1996). One major issue that surfaced from her book was the disordered eating patterns and tendencies of the athletes involved in the sports of gymnastics and figure skating. Eating disorders are an area in psychology, including sport psychology, that has recently seen a growing body of research.

The purpose of this thesis was to further this knowledge base, looking more specifically at the self-reported eating attitudes and behaviors of pair/dance figure skaters, and the possible pressures towards weight loss that may exist in this sporting environment. In the subsequent sections of this thesis, the first article, entitled *Disordered Eating Tendencies of Female Pair and Dance Figure Skaters* will address the first purpose of this thesis, and the second article, entitled *Weight loss pressures of Female Pair and Dance Figure Skaters* will address the second purpose of this thesis. Following the two articles, a general discussion of both articles will be presented in order to integrate the results of

both articles. The questionnaires used, methodology, contribution of the collaborators, and the letters confirming the ethical approval of this thesis will be presented in the appendices.

## Chapter II

### REVIEW OF LITERATURE

During the past two to three decades, researchers have argued that society has placed increasing pressure on women to lose weight in order to conform to the unrealistically “thin” set of standards for physical attractiveness (Davis & Cowles, 1989; Garner, Garfinkel, Schwartz, & Thompson, 1980; Nasser, 1988). A slim body is viewed by society as beautiful, whereas being overweight is not only considered unhealthy, but also unattractive (Ritenbaugh, 1982; Schwartz, Thompson, & Johnson, 1982). In a recent article, Garner (1997) found that in a sample of 3452 women, 89% said that they wanted to lose weight or thought that they needed to lose weight in order to fit society’s norm of beauty. In order to comply with such unrealistic societal standards of “beauty”, many women have resorted to the use of pathogenic weight control behaviors. Such behaviors include laxative abuse, self-induced vomiting, fasting, use of diuretics, and use of diet pills ( Sundgot-Borgen, 1994a). Through the repeated use of such methods, an eating disorder can subsequently appear (Taub & Blinde, 1992).

Eating disorders can be broadly described as either anorexia nervosa or bulimia nervosa. A third disorder, termed eating disorder not otherwise specified (NOS), is also included in eating disorder research, but will not be discussed in this paper. The reason for its omission is due to the fact that the questionnaire to be used in this research does not include information concerning NOS. Specifically, the Eating Disorder Inventory , a scale developed by Garner, Olmstead, and Polivy (1983) was designed to assess the self-reported attitudes and behaviors about body image, eating and dieting in relation to the

disorders of anorexia nervosa and bulimia nervosa. Therefore, only the disorders of anorexia nervosa and bulimia nervosa will be addressed next.

Generally speaking, anorexia nervosa is termed the “self-starvation” syndrome (Thompson & Sherman, 1993), and is characterized clinically by the following factors: an intense fear of fatness or weight gain while being underweight and amenorrheic (the absence of at least three consecutive menstrual cycles in a postmenarcheal female), a significant weight loss, a refusal to maintain minimal body weight considered normal for age and height (i.e., weight loss leading to bodyweight 15% below that expected), and a disturbance of body image (DSM-III-R, 1987). General signs and symptoms of anorexia nervosa are obsessiveness about food and weight, depression, irritability, hyperactivity, excessive exercise, insomnia, compulsive ritualistic behaviors, and unusual eating behaviors (Thompson, 1987). Medical signs and symptoms of anorexia nervosa include bradycardia, dental problems, dehydration, electrolyte abnormalities, hypotension, and hyperthermia (Mitchell, 1986a).

The complex and multidimensional characteristics of anorexia have been outlined by Garfinkel and Garner (1982). They stated that this disorder generally starts from a combination of unhealthy family dynamics, societal pressures, and the personality characteristics or deficits of the individual. Anorexics typically attempt to lose weight by what they perceive as a normal “diet”, while simultaneously engaging in exercise. When weight is lost, significant others initially respond positively to this weight loss. This reaction thus reinforces that the dieting is working and continued weight loss becomes a goal. At this point in the disorder, the individual begins to take a sense of pride in his or

her weight loss and self-control over the amount of food intake. Concurrent with this, the individual begins to fear the return of their lost weight, and in order to absolve this fear, the anorexic tends to eat less and exercise more.

As time goes on, the initial feelings of self-control are replaced with an intense fear and anxiety of weight gain. These feelings continue until the anorexic is eating very little, if anything at all. The ability to think clearly or rationally about food and eating is gone. Any form of eating is seen as analogous to fat and/or weight gain, which creates the characteristic of chronic fear often found in anorexics. Self-perception becomes distorted and the anorexics are unable to see themselves as others see them. If, in fact, the anorexic could see himself or herself, he or she would see the emaciated and starved person he or she has become, and in turn may begin to eat again. But instead, the disorder has become so powerful that the anorexic sees himself or herself as fat and persists in the belief of the need to lose more weight (Garfinkel & Garner, 1982).

The other eating disorder identified is bulimia nervosa. It is generally defined as the “binge-purge” syndrome (Thompson & Sherman, 1993). Clinically speaking, it involves recurrent episodes of binge eating where rapid consumption of a large amount of food occurs in a discrete period time, with a feeling of lack of control over the eating behavior during the binge. As well, the binge usually involves the consumption of calorie-dense food, usually eaten inconspicuously or secretly (DSM-III-R, 1987). The individual will employ the practices of either self-induced vomiting, use of laxatives or diuretics, strict dieting and fasting, or vigorous exercise to undo the effects of the binge episode (DSM-III-R, 1987). Also, persistent overconcern with body shape and weight, and two

binge episodes a week for at least three months are characteristics of bulimia nervosa (DSM-III-R, 1987).

Bulimia nervosa is considered more difficult to detect because, although the individual may be near their normal weight or recommended weight, they tend to exhibit greater fluctuations in weight (Garner, 1991; Thompson, 1987). Medical signs of bulimia nervosa are less severe and extensive than those of anorexia nervosa, but do include dehydration, dental problems, electrolyte imbalances, menstrual irregularities, and swollen salivary glands (Mitchell, 1986b). Other more general signs and symptoms of bulimia nervosa include depression, stealing (often food and laxatives), substance abuse, inconsistent eating patterns, and eating alone when they are bingeing (Thompson, 1987).

Although not as well understood as anorexia, Johnson and Haddi (1986, as cited in Thompson, 1987) suggested that bulimia, like anorexia, appear to be related to familial, psychological, and sociocultural factors. More specifically, they stated that bulimics may either have a biological vulnerability to affective instability or depression, a conflicted and disorganized family, and a confusing sociocultural environment. All of these factors are said to contribute to a low self-esteem. Weight loss is then seen as a means to increase the bulimic's self-esteem by enabling him or her to meet society's standard of beauty. The intense dieting that follows, eventually leads to binge eating which in turn heightens the bulimic's depression and feelings of low self-esteem. While the binge eating serves to control immediate negative emotions, guilt regarding potential weight gain sets in soon after. Purging behaviors such as self-induced vomiting or laxative use most often occur. Johnson and Haddi also explain that most bulimics do not intend to continue this binge-

purge cycle on a frequent basis, and the bulimic believes that he or she is in total control of the situation. Nonetheless, after each binge-purge episode, the bulimic slowly loses control over his or her behaviors to a point where possibly such episodes may become a daily event. Unfortunately though, any relief the bulimic feels after a binge-purge episode is usually temporary and the feelings of guilt and self-dissatisfaction only serve to set up the next binge-purge episode.

Research on various aspects of eating disorders has dramatically increased in the last 15 years (Schlundt & Johnson, 1990). The research has been largely fueled by such findings: the prevalence of anorexia nervosa and bulimia nervosa has significantly increased over the past 15 to 20 years (Levenkron, 1982); the disorders of anorexia nervosa and bulimia nervosa have been identified as both major psychological and health problems (Taub & Blinde, 1992); the term “epidemic” has been used in regards to anorexia nervosa and bulimia (Gordon, 1990); and, the assertion that society has accepted anorexia nervosa or bulimia nervosa as normal and a common means to reach the cultural norms that promote thinness and weight control (Huon, Brown, & Morris, 1988).

Demographically speaking, research has shown that in the general population of women, anorexia nervosa is estimated at 0.7%, while bulimia nervosa is estimated as high as 10.3% (Pope, Hudson, & Yurgelun-Todd, 1984). More specifically, eating disorders have been shown to occur most often among young, white, affluent women in modern industrialized countries (Anderson & Hay, 1985; Hsu, 1989). Estimates are that 90%-95% of those with eating disorders are female, with only 5% of the eating disorder population being male (Garfinkel & Garner, 1982; Thompson & Sherman, 1993). As

well, it is between the ages of 15 and 24 that the greatest incidences are seen (Hsu, 1990). Based on these findings, researchers soon began to look at specific subgroups within society, and their findings are explored in the next sections.

### Sporting Populations vs. Non-Sporting Populations

Certain subgroups within society have been deemed “at risk” for eating disorders. Included in these subgroups are models, dancers, and female athletes (e.g., Taub & Blinde, 1992). Of particular interest is the athletic population, and thus only research reported in such populations will be the focus for the remainder of the introduction. Findings from studies investigating whether female athletes are at a higher risk of developing an eating disorder than non-female athlete counterparts have been equivocal in nature. The majority of studies have found that female athletes are more at risk than female non-athletes for displaying the signs and symptoms of eating disorders (Black & Burckes-Miller, 1988; Brooks-Gunn, Warren, & Hamilton, 1987; Burkes-Miller & Black, 1991, 1988; Clark, Nelson, & Evans, 1988; Harris & Greco, 1990; Pasman & Thompson, 1988; Rosen & Hough, 1988; Rosen, Mckeag, Hough, & Curley, 1986; Smith, 1980; Striegel-Moore, Silberstein, & Rodin, 1986; Sundgot-Borgen, 1993, 1994b; Sundgot-Borgen & Corbin, 1987; Wessinger, Housh, Johnson, & Evans, 1991; Woods, Wilson, & Masland, 1987). Reasons proposed for such findings include the assertion that female athletics represents a subculture that amplifies existing sociocultural pressures to be thin and is therefore associated to a greater risk of developing an eating disorder (Striegel-Moore et al., 1986). Another alternative that has been presented is that female athletes have unique weight loss pressures associated with the sport that occur above and beyond the existing sociocultural

factors and it is these pressures that may lead the athlete to engage in unhealthy eating and pathogenic weight management (Black & Burkes-Miller, 1988; Burkes-Miller & Black, 1988, 1991).

Other studies, however, have found no increased incidence of disordered eating tendencies in female athletes, when compared to females in non-athletic populations (Davis & Cowles, 1989; Sundgot-Borgen & Corbin, 1987; Taub & Blinde, 1994; Warren, Stanton, & Blessing, 1989; Wilkins, Boland, & Albinson, 1991). Such different findings highlight that more research is needed in order to determine whether female athletes truly are an “at risk” population for the development of eating disorders. These conflicting findings may have occurred for two reasons, which are outlined next.

#### Methodological Limitations of Related Studies

The first reason for the differing findings may be due to the methodological limitation that most studies use self-reported attitudes questionnaires. By using self-reports, it is possible that participants not answer truthfully, and thus estimates may be lower than the true incidence of these disorders (Griffin & Harris, 1996; Sundgot-Borgen, 1993). In fact, it has been noted that diagnosed anorexics and bulimics in the general public represent only a small portion of those who actually have eating disorders (Button & Whitehouse, 1981; Fries, 1977). Similarly, athletes have also been targeted as a population with large numbers of undiagnosed reports (Smith, 1980; Yates, Leehey, & Shisslak, 1983). For the athletic population, athletes may underreport their true behaviors out of fear that their coach or other people important to their athletic career will find out and possibly take negative actions, such as not allowing the athlete to compete with their

team (Griffin & Harris, 1996; Sundgot-Borgen, 1994a; Wilmore, 1991). Support for the argument that athletes will underreport their true behaviors is found by Wilmore's (1991) research. Wilmore found that none of the 87 elite athletes he questioned fell within the eating disordered range based on his questionnaire, yet in the two years following the study, 18% of that population entered treatment centres for eating disorders. With the females in the non-athletic population, however, there may not be these same fear factors, and thus they may complete the questionnaires more truthfully. In so doing, the non-athletic population may appear similar to the athletic population.

Another methodological limitation found in many studies relates to the population used by researchers. Most female athlete/non-athlete samples were relatively small and from a limited geographical region (Petrie, 1993). Thus, due to the fact that researchers have used as few as 10 subjects in their studies, the results may not be generalizable. To expand, if a study only used 10 athlete participants and 10 non-athlete participants, their findings would not be very convincing due to the small sample size. Further, comparisons to other studies or other populations would be difficult. This stresses the point that more research is needed before any powerful conclusions could be made regarding eating disorders and their participant populations. Research that is done should also attempt to include as many participants of the target population as possible—a factor that will be incorporated here. Furthermore, in regards to the populations tested, when female athletic populations were compared to female non-athletic populations, the athletic population was most often made up of several sports (Petrie, 1993). Many researchers have noted that in order to get a more in-depth understanding of eating disorders and female athletes, only

one sporting population should be studied at one time (e.g., Griffin & Harris, 1996). This recommendation is embraced in the present research and will be later elaborated upon.

At this point it is important to bring attention to one further methodological limitation of many of the studies. Although it is not directly related to the conflicting findings mentioned earlier, it is of relevance to this research. The instrument of measure in most eating disorder studies are questionnaires that determine whether or not an athlete has an eating disorder *tendency*, not a clinically diagnosed eating disorder (e.g., Thompson & Sherman, 1993). Yet, most researchers use the term “eating disorder” in their studies when discussing their findings when in actual fact they have only determined whether self-reported disordered eating behaviors and tendencies existed within their population of interest. It should be noted, however, that although a subclinical diagnosis of an eating disorder is not as strong as an actual clinical diagnosis, it nonetheless has merit. For example, Sundgot-Borgen (1993) found that 89% of the athletes who were diagnosed as having disordered eating tendencies also met the clinical criteria for anorexia nervosa and/or bulimia nervosa as stated in the DSM-III-R (1987). Thus, although not ideal, results from self-reported attitude questionnaires that indicate disordered eating tendencies or self-reported behaviors of anorexia nervosa and bulimia nervosa can be used to better understand eating disorders in certain populations (Sundgot-Borgen, 1994a). Therefore, based on this observation, future explanations of research on this issue will focus on disordered eating tendencies of female athletes, not clinically diagnosed eating disorders.

## Disordered Eating Tendencies

### Female Aesthetic Sporting Populations

As previously mentioned, the majority of research done to date regarding female athletes and disordered eating tendencies has used combined sporting populations in order to determine whether the self-reported eating attitudes and behaviors fall within the range of disordered and maladaptive (Burkes-Miller & Black, 1988; Davis, 1992; Davis & Cowles, 1989; Mallick, Whipple, Heurta, 1987; Rosen, et al., 1986; Sundgot-Borgen, 1993, 1994a, 1994b; Sundgot-Borgen & Corbin, 1987; Stoutjesdyk & Jevne, 1992; Taub & Blinde, 1992, 1994). For example, Davis (1992) used participants from the sports of diving, basketball, field hockey, figure skating, gymnastics (rhythmic and artistic), downhill skiing, synchronized swimming, sprinting, and volleyball. In such research, certain sports have been found to exhibit greater disordered eating tendencies than others. In determining this, researchers grouped certain sports into specific subgroups and then compared them to other subgroups (Davis & Cowles, 1989; Stoutjesdyk & Jevne, 1992; Sundgot-Borgen, 1993, 1994b; Sundgot-Borgen & Corbin, 1987). As an example, athletes involved in sports such as biathlon, cross country skiing, cycling, middle-long distance running, race walking, rowing, speed skating, and swimming could be grouped into a category labeled “endurance sports”. Another grouping could include sports labeled “aesthetic”, which would have the characteristics of sports requiring a small lean body for success, with a focus on body form in their scoring. Sports within this category can include figure skating, gymnastics, diving and cheerleading.

Results from such studies have concluded that athletes from aesthetic sporting populations exhibit more frequent disordered self-reported eating behaviors than do other groupings of various sports. For example, Sundgot-Borgen (1993) found that athletes he categorized as competing in aesthetic sports (gymnastics, figure skating, diving, rhythmic gymnastics, and sports dance) had significantly higher disordered self-reported eating behaviors than athletes in the subgroups labeled technical, endurance, weight dependent, ball games, and power sports. He therefore concluded that disordered eating patterns occur in sports where athletes are encouraged to be thin for either performance or appearance-- that is, aesthetic sports. Similarly, Rosen et al. (1986) found that gymnasts exhibited greater self-reported pathogenic weight control behaviors compared to athletes in the sports of basketball, field hockey, golf, softball, swimming, tennis, track and field, track (long distances), and volleyball. More specifically, they found that 74% of the gymnasts exhibited at least one self-reported pathogenic weight control behavior (i.e., self-induced vomiting, use of laxatives, use of diet pills, use of diuretics, bingeing more than twice weekly, and excessive weight loss). This result was significantly higher than the percentage of pathogenic weight control behavior for the other sports under study.

Given these consistent findings of athletes in aesthetic sports showing a higher prevalence of disordered eating tendencies, researchers began to examine specific individual aesthetic sporting populations. Although many sports can be classified as "aesthetic" in nature, only those most pertinent to the present study will be presented. With this in mind, studies focusing on the sports of gymnastics, cheerleading, diving, and figure skating will be expanded in the following sections. These specific sports were

chosen because they all have one thing in common-- they are all "subjectively" judged sports where the focus is on the athlete's overall presentation.

### Gymnastics

The largest knowledge base to date concerning self-reported eating patterns in sports is within the sport of gymnastics (Thompson & Sherman, 1993). In gymnastics, the athlete must be able to demonstrate strength, flexibility, coordination and grace. Being thin, small and lean is thought to be aesthetically pleasing and to help the gymnast when it comes to being marked (Sherman, Thompson, & Rose, 1996). In fact, anthropometric measures have shown a change in the typical female gymnast across the decades.

Classens, Veer, Stijnen, Lefevre, Maes, Steens, and Beunen (1991) and Sinning (1978) concluded that gymnasts were becoming smaller and having delayed physical maturation.

For example, Classens, et al., (1991) measured the age, height, weight, and shape of gymnasts from 1964-1984. They found a decrease in age, from a mean age of female gymnasts from 22.7 to 16.5 years of age. Also, they found that the height of gymnasts did not vary greatly, however, the weight of the gymnasts decreased. In 1964 the mean weight for an elite gymnast was 52 kg, and in 1984 this value had dropped to 45 kg.

Although anthropometric studies cannot be related to disordered eating tendencies directly, the empirical data shows a trend toward a thinner, smaller gymnast. Thompson and Sherman (1993) presented two reasons as to why this low body weight trend exists in gymnastics. The first is that in order to be able to do the difficult elements on the various apparatus, a gymnast needs a small, thin and pre-pubescent body shape. That is, the complex movement patterns are more easily performed by a small light body than a larger,

heavier body. The second line of thought regarding this issue lies in the fact that many believe that a slim, almost shapeless body will receive higher marks from the judges because of the gymnasts straight line appearance. In fact, Falls and Humphrey (1978) and Sherman et al., (1996) demonstrated that gymnasts who have lower body mass index and lower percentage of body fat were given higher from the judges than heavier gymnasts.

Given this information, it becomes obvious why many gymnasts focus on their weight and are tempted to rely on unhealthy eating behaviors to attain and maintain a low weight. Several studies have reported that gymnasts are concerned about weight loss and have taken unhealthy measures to lose weight, often resorting to maladaptive eating patterns. For example, Rosen and Hough (1988) found that 62 % of the female gymnasts in their sample reported using at least one form of pathogenic weight control measure. Such measures included fasting, vomiting, use of laxatives, diuretics, and diet pills. Also, in a study done by Harris and Greco (1990), 75% of the gymnasts reported using a mild diet as a weight control measure, 71% reported using increased levels of exercise as a weight control method, 43% reported using a strict diet as a weight control measure, 18% reported using starvation for a day as a weight control measure, and 7% reported using laxatives as a weight control measure. One respondent in this study reported taking as many as 22 Ex-Lax in one day in order to control a low body weight. Such findings strongly suggest that disordered eating tendencies are a real and serious problem in the sport of gymnastics.

### Cheerleading

Sports such as cheerleading, diving and figure skating have similar weight requirements and expectations as gymnastics, but surprisingly little research exists on these specific sporting populations (Thompson & Sherman, 1993). Some of these sports have been included in research that grouped aesthetic sports together, making it difficult to draw strong conclusions about each specific population. Nonetheless, with respect to cheerleading, Taub and Blinde (1992) found that 42.1 % of the cheerleaders in their sample reported using pathogenic weight control behaviors. Of the few studies done exclusively with a cheerleading population, Lundholm and Littrell (1986) found that high school cheerleaders who scored high on the desire for thinness had significantly higher scores on seven of eight eating-disorder scales on the EDI (Garner, Olmstead & Poilivy, 1983). Also, and more recently, Reel and Gill (1996) found that the high school cheerleaders in their study had greater disordered eating tendencies when compared to college cheerleaders.

### Diving

Divers, like cheerleaders, have been studied within the general grouping of aesthetic sports, but none have exclusively dealt with that particular athletic population. Of the four studies found that included diving, all included it in a group of aesthetic sports (Davis, 1992; Davis & Cowles, 1989; Stoutjesdyk & Jevne, 1993; Sundgot-Borgen, 1993). One could assume that divers must face many of the same weight issues as the other athletes in “at risk” aesthetic sports. First, they must train and compete in revealing bathing suits, which in essence puts their bodies on display. Second, part of their score is

based on how they look executing the dive. Again this puts extra emphasis on their body, leading to possible unhealthy eating in order to meet the weight criteria related to their sport. Both of these points can be illustrated by the work presented by Eisenman (1990, as cited in Thomas & Sherman, 1993). He argued that the ideal body fat range for an elite female diver was 8% to 14%. This is obviously lower than the normal 20% to 22% of body fat for average young females. Furthermore, he stated that extra weight detracted from performance and appearance. Thus, based on these comments and on the demands of their sport, it is possible that athletes involved in diving, like cheerleading and gymnastics could be considered “at risk” for the development of disordered eating tendencies. One final aesthetic sport that has received relatively little attention in regard to eating patterns is figure skating.

### Figure Skating

Individuals in figure skating, like cheerleading, have been labeled as an “at-risk” sporting population for disordered eating tendencies (Brooks-Gunn et al., 1987; Davis, 1992; Davis & Cowles, 1989; Garner & Rosen, 1991; Sundgot-Borgen, 1994a, 1994b). Although limited in number, researchers have investigated this specific population. For example, Brooks-Gunn et al. (1987) compared figure skaters to ballet dancers, swimmers, and a control group. It was found that the figure skaters were most like the ballet dancers and tended to be leaner and lighter than the swimmers and control group. Differences existed in the method of choice for weight loss between the dancers and figure skaters. The figure skaters reported employing more oral control behaviors such as vomiting or laxative abuse, whereas the ballet dancers reported using strict dieting as their weight loss

method. Brooks-Gunn et al. (1987) argued that the demands of ballet and figure skating required that athletes maintain a low weight.

In the one study that has looked exclusively at figure skating, it was found that female figure skaters had caloric intakes well below the Recommended Daily Allowance (RDA) for moderately active individuals (Rucinski, 1989). Further, Rucinski found that female figure skaters exhibited greater weight and body concern than male figure skaters and had a markedly higher scores on The Eating Attitudes Tests (Garner & Garfinkel, 1979). Despite figure skaters being included in samples of aesthetic sports, little attention has been given to them alone (Thompson & Sherman, 1993), thus illustrating a need for research with this population. Moreover, others have recommended that only one population at a time be studied. Based on these factors, this study will investigate issues related to disordered eating tendencies in the female pair and dance figure skating population.

#### Future Research

In brief, researchers have concluded that female athletes, particularly those in aesthetic and lean body sports, reported high incidences of pathogenic and disordered eating tendencies. They have also noted, however, that the literature related to disordered eating and sports is just now moving from the anecdotal and descriptive stage (e.g., Stoutjesdyk & Jevne, 1993). Few have examined this issue with the focus of determining *why* there is a high incidence of disordered eating tendencies in aesthetic sports. This fact has been pointed out by researchers such as Killen, Taylor, Hayward, Wilson, Haydel, Hammer, Simmonds, Robinson, Litt, Varady, and Kraemer (1994). Fairburn and Beglin

(1990) have similarly stated "... it is our view that it is time for a shift in emphasis away from prevalence per se toward studies of the nature, course, and etiology of the full spectrum of disturbance that exists in the community. Research of this type should broaden and deepen our currently limited understanding of eating disorders" (p. 407). Taking this idea into hand, one possible reason why self-reported disordered eating behaviors exist for individuals in aesthetic sporting populations, could be the potential multiple weight loss pressures athletes feel from significant others and from themselves, regarding their weight and body appearance. Such pressures have been postulated as an underlying reason for which female participants turn to pathogenic or disordered eating tendencies in order to control their weight (Rosen & Hough, 1988; Thompson & Sherman, 1993).

#### Sources of Weight Loss Pressure in Aesthetic Sports

Only recently, and in a limited quantity has research with the orientation of weight loss pressures been conducted. For example, Reel and Gill (1996) studied weight loss pressures in the aesthetic sport of cheerleading and their findings indicated that there existed significant weight loss pressures in this sport. For example, in the response to the question, "Do you think there are pressures associated with cheerleading to lose weight or maintain a below average weight ?", 84 % of the participants responded "yes". As specific examples, pressures of wearing a revealing uniform and weight loss pressures from the coach were ranked high by the cheerleaders in the study. However, this is the only study that looked exclusively at weight loss pressures in an aesthetic sport.

Based on the findings from Reel and Gill (1996), it is apparent that weight loss pressures from significant others exist in aesthetic sports such as cheerleading. Given this direction, one purpose of this study will be to examine potential weight loss pressures in the athletic realm of female pair/dance figure skaters. Potential weight loss pressures in aesthetic sports such as gymnastics and figure skating have been documented extensively by Ryan (1995). Specifically, for figure skating, she mentioned that weight loss pressures may exist from sources such as coaches, judges, teammates or the athlete's parents, as well as from wearing a revealing uniform that many athletes must don, and the required lifting of the female partners in figure skating. Using these comments as a starting point, the following five categories of potential pressures were chosen; coach, partner, judge, parent, skater. Justification for their selection is outlined in the next sections.

#### The Male Skating Partner

Although very little research exists to verify that the male skating partner may pressure his partner to lose and maintain a low weight, research does provide some insight on this issue. The rationale for including this pressure is based on results like those of Black (1991) who found that low body weight was positively correlated with improved vertical movement and ease in being lifted or carried. Such lifts and carries are a requirement in pair/dance figure skating. In agreement with Black (1991), Overdorf (1987) suggested that a high percentage of body fat was assumed to slow movement, hinder performance, and cause fatigue both in quickness, and endurance activities. These combined findings strongly suggest that a lighter partner is easier to lift, and can result in improved overall performance. Other researchers have acknowledged this potential

pressure, but have only dealt with it sparingly in their discussion sections (e.g., Rucinski, 1991). Thus, the underlying assumption, is that the male figure skating partner may be one source of weight loss pressure that a female dance or pair figure skater is subjected to. The research to be done here will attempt to determine whether this assumption is sound.

### The Coach

In contrast to the very limited literature on the potential pressure from the partner, a number of studies have made reference to weight loss pressures from the coach. To begin, Harris and Greco's (1990) study with gymnasts revealed that coaches had a negative impact on their weight. Specifically, 56% of the gymnasts reported being told by their coach to lose weight. Further, Rosen and Hough (1988) stated that of the gymnastic coaches used in their study, two-thirds had told their athletes that they were too heavy, and 75% of those athletes resorted to pathogenic weight control behaviors. Many studies have also documented weigh-ins and/or weight requirements enforced by coaches. Moreover, these weigh-ins/weight requirements can be used as scare tactics, for example, the athlete being told that if she does not meet the weight requirement, then she may be cut from the team (Thompson, 1987). The point stressed here is that the coach holds a great deal of control over the athlete and, in essence, the coach holds an athlete's future in their hands and can thus mold the athlete the way the feel is necessary (Rosen, McKeag, Hough, & Curley, 1986).

Although the coaches potentially possesses this control over the athlete's appearance, it has been found that they have less than optimal knowledge regarding weight control behaviors and nutritional knowledge (Bedgood & Tuck, 1983; Griffin &

Harris, 1996; Jacobson & Gemmell, 1991; Parr, Porter, & Hodgson, 1984; Sundgot-Borgen, 1993; Wolf, Wirth, & Lohman, 1979). For example, Griffin and Harris (1996) found that coaches in their study tended to make decisions about the need for weight control on the basis of appearance rather than objective indicators. Further, they demonstrated a low level of knowledge regarding weight control behaviors. With respect to nutritional aspects, Par et al. (1984) found that 61% of coaches in their study had no formal nutritional background, while Wolf et al. (1979) found that 78% of their coaches believed they needed to acquire more knowledge about diet and nutrition. What is clear from these studies is that although the coach has a very strong influence in terms of their desires for athletes to maintain a low weight, they know very little about diet and nutrition.

A qualitative study by Krane, Greenleaf, and Snow (1997) will further demonstrate this weight loss pressure that coaches may put on their athletes in relation to weight maintenance. Krane et al. (1997) completed an in-depth qualitative interview based study with a former gymnast. A reoccurring theme that emerged was that the coach was often perceived as having pressured the gymnast to lose weight. Specifically, the gymnast identified that her coach demanded perfection in every sense and often scrutinized her food intake and diet in order to achieve this “perfection”. As well, in the gym at which this specific gymnast trained, the coaches created an environment where only a certain body type was expected and accepted, that of the thin and petite gymnasts. The following quote will demonstrate a pressure tactic this coach put on the gymnast in relation to her weight: “We had to tell [coach] everything we ate every single day. We had a diary and if

we ate something that he did not approve of, he would tell our parents, he would make us feel so ashamed in front of everybody, he used public humiliation. 'Oh [gymnast] ate a candy bar today, I can't believe she did that, and she won't do that again, right?'" (p. 60). This quote stresses the important and potentially damaging impact a coach may have on an athlete. The coach undoubtedly possess the ability to place a great deal of pressure regarding weight control for their athletes and there is little evidence that ensured that this weight loss was attained by healthy means.

A final point to be addressed relates to the unintentional messages that the coaches may be sending to their athletes. Athletes may misinterpret the message the coach is giving them in regard to their weight. For example, Noden (1994) found that often what the coach said was misconstrued by the athlete. In that article, a former athlete is quoted as saying that her coach stressed maintenance of low weight a great deal, but when the coach was asked, he is quoted as never mentioning nor stressing a particular weight for his gymnasts. Similarly, Chernes (1994) reported that a member of the national gymnastic team stated that although the coaches did not explicitly tell the athletes to lose weight, the coaches only had to look at the athletes in a certain way, and the athletes know that they were focusing on their weight. Therefore, the coach may not be directly telling the athlete to lose weight in a unhealthy manner, or even at all, but the athlete may perceive it as weight loss pressure. Although this aspect of coaching behavior will not be examined in the present study, it is important to recognize that athletes' perceptions of a coaches behavior or comment may be wrong. Therefore, it is important that issues of weight loss, and the like, be an open topic and discussed by both the coach and the athlete alike.

### The Judges

Another external weight loss pressure that will be examined is that coming from the judges. Weight loss pressure may come from judges because a figure skater's performance is subjectively evaluated by the judges. Research has taken the path of looking at different biases with respect to judging in aesthetic sports. Biases in gymnastics judging have been related to memory influences (Ste-Marie & Lee, 1991), within team order placings (Ansorge & Scheer, 1988), and international biases (Ansorge, Scheer, Laub, & Howard, 1978; Seltzer & Glass, 1991; Whissel, Lyons, Wilkinson, & Whissel, 1993). In two studies that have looked specifically at the sport of figure skating, Seltzer and Glass (1991), and Whissel, Lyons, Wilkinson, and Whissel (1993) concluded that the sport of figure skating is also prone to international biases. Seltzer and Glass (1991) found that in an analysis of all figure and dance skating events in the Winter Olympics between the years of 1968-1988, judges gave skaters from their own countries significantly higher scores than to those skaters from other countries. Likewise, Whissel, Lyons, Wilkinson, and Whissel, (1993) found judges scores from the 1984 and 1988 Winter Olympic figure skating competitions favored their own countries. The judges tended to give skaters from their own country the maximum score (from among the judges) and their overall rank for those skaters tended to be higher than the skater's final standing.

A more specific bias related to the premise here has been documented by Falls and Humphrey (1978), whose research revealed that certain body types were related with higher scores from the judges. Further, they proposed that the small, thin gymnast may be

visually more appealing to the judges and thus may be awarded higher marks. Moreover, Valiquette (1996) looked specifically at whether judges had a preferred body shape for gymnasts, and she found that they preferred smaller body shaped gymnasts. These studies demonstrate that there does indeed exist a potential bias on the part of the judges in regard to the body shape of the athlete, however, more research is needed in order to be able to draw any strong conclusions. Further, many researchers, in their discussion sections, mention pressure from judges regarding weight (e.g., Sundgot-Borgen, 1993), but this tends to be mentioned only as a possible topic of future research.

Along more anecdotal lines, many of the athletes Ryan (1995) interviewed mentioned that there existed this source of weight loss pressure to be thin from the judges. For instance, a skater interviewed stated " In skating no aesthetic detail goes unnoticed, on or off the ice. The judges would see you in the hotel lobby and you had to look perfect" (p. 97). Looking perfect in this quotation also included being excessively thin. Ryan outlined a dramatic example of how judges can affect an athlete is that of Christy Henrich, an elite gymnast. Ryan explained that when Christy was 15, a judge told her that she would never make the 1992 Summer Olympic Team unless she lost weight. Before this incident with the judge, Christy was never concerned about her weight. At the time the judge told her this, Christy was 4 feet 11 inches and weighted 90 pounds. Christy's response to the comment was to stop eating. In early 1991, 18 months before the trials for the 1992 Summer Olympics, Christy weighed less than 80 pounds and retired from gymnastics. Despite being out of the gymnastic environment, Christy continued to lose weight. Tragically, in June of 1994, Christy died of complications related to anorexia.

Although a very severe example, it stresses that judges are very influential and powerful and have the potential to put weight loss pressure on females involved in aesthetic sports.

### The Parents

A fourth source of potential weight loss pressure that these figure skaters may receive is from their parents. This source of potential weight loss pressure had been proposed by many researchers (Griffin & Harris, 1996; Krane, Greenleaf, & Snow, 1997; Rosen & Hough, 1988; Scanlan, Stein, & Ravizza, 1991; Smith, 1996; Stoutjesdyk & Jevne, 1993; Taub & Blinde, 1992, 1994). Yet, again, the majority of this documentation is brief and only mentioned in the discussion sections with little “empirical” support. For example, Rosen and Hough (1988) mentioned that comments on an athlete’s weight, made by “significant others” (included here was parents) could easily initiate or maintain an eating disorder. Also, in the qualitative study done by Krane et al. (1997) with an elite gymnast, parental weight loss pressure was mentioned briefly. Interestingly, in that single-case study, the setting in which the gymnast was in encouraged unhealthy and potentially dangerous eating behaviors. Nonetheless, all the significant others in that gymnast’s life saw these eating practices as a necessity in order for her to achieve success. What Krane et al. made clear by the gymnast was that disordered eating behaviors were seen as acceptable and were even enforced by her parents.

Ryan (1995) also looked at this potential source of weight loss pressure, and in fact devoted an entire chapter entitled “We All Became Junkies” to this very issue. She explained, “almost every successful child athlete rides to the top on the shoulders of a parent undaunted by sacrifice and extremes-whether this means sending a child far away to

train, mortgaging a home to foot the bills, taking a child out of school so she can train longer hours, abusing her physically or verbally for not performing, or even giving up custody” (p. 146). She goes on further to explain that many athletes feel weight loss pressure from their parents to be perfect and successful in order to make up for the astronomical sacrifices they have had to make.

Ryan (1995) explains through the example of Chelle Stack, a member of the 1988 U.S. Olympic gymnastics team, the extreme measures Chelle took to deal with such parental pressures. Throughout Chelle’s gymnastic career, her mother, in particular, placed excessive pressure on Chelle to win and be perfect. Several examples will help illustrate this: her mother threatened to spank Chelle if she did not go to practice; her mother made Chelle compete when she had a temperature of 104 degrees; her mother would tell Chelle that she was humiliated to be her mother if she felt that Chelle did not train hard enough, often leaving Chelle in tears.

Before the 1988 Olympics, Chelle told her mother that she wanted to quit gymnastics, but her mother would hear nothing of it. Chelle’s mother stated: “I put this much time and effort into this and, by God, if you think I’m going to let you quit now, you’re crazy. If I have to literally go out there and get up on the beam with you, you’re going to do it. If I have to beat you every day, you’re going to do it” (p. 153). After Chelle did not do well at the Olympics, her mother was both furious and devastated. Following the Olympics, Chelle again voiced her desire to quit gymnastics, but again her mother would not allow it. At age 18, Chelle broke her knee and was unable to compete in gymnastics anymore. When Chelle finally did get a chance to retire from gymnastics, a

number of complications were left over from her gymnastics career. For example, she has numerous digestive problems that were related to her history of drinking whole bottles of laxatives to keep her weight down during puberty. Again, this example is extreme but it does highlight the potential weight loss pressure from parents. Further, a specific form of pressure from parents can be the pressure to be thin. In order to deal with the parent's desire for success, the athlete may have to make unhealthy eating decisions. Chelle, for example, chose to deal with her "normal" weight gain due to puberty, by drinking whole bottles of laxatives, in the hopes to keep her weight down, so that she would be perfect for significant others in her life, including her mother. Thus, for these athletes to deal with extensive weight loss pressures from their parents, they may turn to disordered eating tendencies.

### The Skater Herself

The final source of pressure related to weight loss, is that from the figure skater herself. Although this is considered a pressure in and of itself, often it is based on an accumulation of the weight loss pressures previously stated (Thompson & Sherman, 1993). These weight loss pressures can include the everyday societal pressures to be thin, media pressures that convey the message that thin is beautiful, and the four sports-related pressures discussed in the previous sections. This "internal" pressure, however, can be substantiated by data that is obtained from the athletes themselves in regards to what they actually think and feel regarding control of their weight. Many athletes assume that lowering their body weight will result in an improved performance and competitive edge over other athletes (Ashley, Smith, Robinson, & Richardson, 1996). Further, Harris and

Greco (1990) reported that although weight, body mass index, and percentage of body fat were lower than the average population for their sample of gymnasts, the *gymnasts* considered themselves too fat and were very dissatisfied with their bodies. The gymnasts also reported that even a small weight gain would result in a negative effect on their performance. Similarly, Rosen, Mckeag, Hough, and Curley (1986) found that 75% of their sample of female athletes admitted that their continued weight loss was done out of fear of losing control of their eating habits. Similar perceptions were revealed in a study by Scanlan, Stein, and Ravizza (1991), who found that 23% of the figure skaters they interviewed, indicated a personal struggle with weight. For example, the most relevant comments from one skater were: "If I was light, I was right. And if I was overweight, hey forget it... One of the biggest negative things was always having to be on a diet... And the more pressure, the more you would eat... the anxiety and nervousness over the fact that you might be too fat" (p. 115). Such comments confirm that athletes in aesthetic sports such as figure skating do indeed feel internal pressures related to weight.

Interestingly enough, even though these athletes feel they must lose weight, they know little regarding weight and nutritional practices (Calabrese, 1985; Loosli, Benson, Gillien, & Bourdet, 1986). For instance, Loosli et al. (1986) found that the nutritional knowledge of their sample of female gymnasts was low and that this may have accounted for the finding that 40% of the gymnasts consumed less than two thirds of the recommended dietary allowance for calcium, folate, vitamin B, iron, and zinc. Thus, it is apparent that while the gymnast may know little about losing weight in a healthy manner, she still feels this inward pressure to be thin. However, as stated above, it is an

accumulation of external pressures to be thin that has lead her to feel this self-pressure.

Some examples of these internal weight loss pressures are further discussed below.

Ryan (1995) discussed this internal weight loss pressure, and the quote "though weight and appearance have always counted in figure skating, the sport rewards (marks from the judges) the lighter skaters more richly than ever because scores now depend so much on the acrobatic triple jumps " (p. 102) helps explain that in the mind of the athlete, in order to get the high marks from the judges, the female athlete must be able to perform the more difficult moves and jumps which means they must be thin. Further, Ryan pointed out that " in truth, the perfect skater is a combination of Twiggy and Barbie, thin enough to perform the difficult jumps and desirable enough to fit the skating's cover-girl image" (p. 97). These are the messages that are being sent to female figure skaters—it is the athlete's responsibility to be thin if she hopes to do well in the sport. The pressure associated with this responsibility may then lead the figure skater to take drastic measures in order to live up to the expectations the female athlete has placed on themselves with regard to figure skating appearance, with one measure being self-starvation or bingeing and purging. This type of pressure is also evident in studies such as those by Blinde (1989), Fairbanks (1987), and Thornton (1990) who demonstrated that the coaches made it clear that it was the athlete's responsibility to achieve and maintain a pre-set weight. Coaches in this instance would have regular weigh-ins, in order to observe the athlete's weight. If the athlete did not meet the coaches' expectations, negative measures were taken, such as not being able to attend a competition. Eventually, in the athlete's mind, they think and feel that being a low weight is a necessity in order to continue practicing

and competing. This example stresses the point that while the weight loss pressure stems from external sources (i.e., the coach), it can eventually become internal to the athlete themselves.

### Justification and Purpose of Thesis

In summary, female sporting populations have been targeted as one in which the potential of developing an eating disorder is high (e.g., Sundgot-Borgen, 1993).

Furthermore, a great deal of descriptive research has demonstrated that female sports that emphasize leanness such as gymnastics, cheerleading and figure skating have a greater risk of acquiring these disordered eating tendencies (e.g., Brooks-Gunn et al., 1987).

However, few researchers has specifically studied within the sport of figure skating (i.e., single, pairs, dance), as well as possible reasons as to why these populations adopt disordered eating tendencies (Thompson & Sherman, 1993). Thus, the four question that this research will seek to address are:

- 1) Do female figure skaters exhibit disordered eating tendencies?
- 2) Do female pair/dance figure skaters have a higher incidence of disordered eating tendencies than the non athletic population?
- 3) Do pressures exist in figure skating to lose weight, and if so, which are the most prevalent?
- 4) What do female pair/dance figure skaters report in terms of issues related to general weight loss issues?

It is hypothesized that a portion of the female figure skaters in this study will indeed demonstrate disordered eating tendencies, and that the female figure skaters will

show a higher incidence of disordered eating tendencies than females in the non-athletic population. Further, based on research to date, it is hypothesized that all five sources of potential weight loss pressure will be accounted for, but possibly in varying degrees. For example, the coach may be the highest source of weight loss pressure.

The compelling need for this study is demonstrated by at least two gaps in the literature. One is the limited research regarding disordered eating tendencies specific to the population of figure skaters, and second is the lack of study on the possible reasons for this problem. This study seeks to address both of these gaps in the literature. First, a more in-depth understanding of whether pair/dance figure skaters may turn to disordered eating tendencies to control their weight will be addressed. Second, pressures to be thin from various sources, both internal and external will be used as possible reasons for disordered eating tendencies in dance/pair figure skating. Although other studies have documented that there do exist pressures to be thin in sport (e.g., Reel & Gill, 1996), none have tried to find a relationship between these pressures and disordered eating tendencies.

This study will strengthen and further the knowledge base regarding eating disorders. It is a step ahead of the descriptive research done to date, and will provide increased information related to disordered eating tendencies. Further, this study will hopefully increase the awareness of significant others in an athlete's life, that their weight concerns hold great power and influence over the athlete. If such people are aware of this impact hopefully, they will become more careful and encourage only healthy eating habits. Finally, other sports with similar characteristics and demands to that of pairs/dance figure skating, such as cheerleading may benefit from this knowledge base.

### Chapter III

#### JOURNAL ARTICLES

In the next section of the thesis document, two articles are presented according to APA format. At this time, Article 1 has been submitted to the Journal of Sport and Exercise Psychology, and Article 2 will be submitted to an additional journal which has not been chosen at this time.

Running head: WEIGHT LOSS ISSUES IN FIGURE SKATING

Disordered Eating Tendencies of Female

Pair and Dance Figure Skaters

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### Abstract

The aim of this study was twofold. First, we wanted to examine the self-reported eating attitudes and behaviors of females participating in the aesthetic sport of pair/dance figure skating. Second, researchers have suggested that female athletes who participate in aesthetic sports may be more at risk for developing disordered eating tendencies than non-athletes (e.g., Sungot-Borgen, 1993). We were interested in determining whether this would be supported by comparing the results from our study to that of the norms published by Rosen, Silberg and Gross (1988) on female non-athletes. A sample of 41 pair/dance figure skaters (26 pair and 15 dance) ranging in age from 16 to 24 ( $M=18.1$ ) completed the Eating Disorder Inventory (EDI)—a valid and reliable scale used to measure to predict disordered eating tendencies of individuals. Results revealed that 36.6% of participants had a raw score at or above the known score for disordered eating patients on at least 5 of the 8 EDI subscales; 40.7% of participants had raw scores at or above the known score for disordered eating patients on 3 of the most commonly discussed EDI subscales in sport psychology research (drive for thinness, bulimia, and body dissatisfaction); and participants had significantly higher scores than non-athletes on 5 of the 8 original subscales of the EDI. Taken together, the results indicate that female pair/dance figure skaters have an exceptional preoccupation with weight, disordered eating tendencies, and are more at risk for this than non-athletes.

## Disordered Eating Tendencies of Female

### Pair and Dance Figure Skaters

Research on various aspects of eating disorders has increased dramatically in the last 15 years (Schlundt & Johnson, 1990). This increase has been largely fueled by such findings: the prevalence of anorexia nervosa and bulimia nervosa significantly increasing over the past 15 to 20 years (Levenkron, 1982); the disorders of anorexia nervosa and bulimia nervosa being identified as major psychological and health problems (Taub & Blinde, 1992); the term “epidemic” being used in regards to anorexia nervosa and bulimia (Gordon, 1990); and the assertion that society has accepted anorexia nervosa or bulimia nervosa as normal and a common means in order to reach cultural norms that promote thinness and weight control (Huon, Brown, & Morris, 1988).

Different subgroups within society have been deemed “at risk” for eating disorders, such as models, dancers, and female athletes (e.g., Taub & Blinde, 1992). Of interest here is the population consisting of female athletes. Findings from studies investigating whether female athletes are at a higher risk of developing disordered eating patterns than non-female athlete counterparts have been equivocal in nature. The majority of studies have found that female athletes are more at risk than female non-athletes for displaying the signs and symptoms of disordered eating tendencies (e.g., Burkes-Miller & Black, 1991; Harris & Greco, 1990; Rosen & Hough, 1988; Sundgot-Borgen, 1993, 1994a, 1994b; Sundgot-Borgen & Corbin, 1987).

Reasons proposed for such findings include the assertion that female athletes are in a subculture that amplifies the existing sociocultural pressures to be thin (Striegel-Moore, Silberstein, & Rodin, 1986), or that female athletes have unique pressures associated with being in a particular sport (Reel & Gill, 1996). Whichever the reason, both of these factors are argued to result in the female athlete engaging in unhealthy eating and/or pathogenic weight management above and beyond that of the non-athletic population (Black & Burkes-Miller, 1988; Burkes-Miller & Black, 1988, 1991). Other studies, however, have not found an increased incidence of disordered eating tendencies in female athletes, when compared to non-athletic populations (Davis & Cowles, 1989; Sundgot-Borgen & Corbin, 1987; Taub & Blinde, 1994; Warren, Stanton, & Blessing, 1990; Wilkins, Boland, & Albinson, 1991).

Two explanations have been forwarded to account for these findings. The first is related to the methodological limitation of most studies using self-reported attitudes questionnaires. Relying on self-reported attitudes leaves open the possibility that participants will not answer truthfully. Estimates, then, may be lower than the true incidence of the disorders (Griffin & Harris, 1996; Sundgot-Borgen, 1993). Moreover, it is thought that this factor has more impact on athletes than non-athletes. That is, athletes may underreport their true behaviors more so than non-athletes because their coach, or other people important to their athletic career, may discover this and take negative action, such as preventing the athlete to compete with the team (Griffin & Harris, 1996; Sundgot-Borgen, 1994; Wilmore, 1991). With individuals in the non-athletic population, however, such consequences may not exist, and questionnaires may be completed more

truthfully. The end result is that athletes in the athletic population appears similar to individuals in the non-athletic population, when in fact that might not be so. Support for this argument is found by Wilmore (1991). In this research, none of the 87 elite athletes were within the disordered eating range as indicated by initial questionnaire data at the onset of study. Yet, interestingly enough, in the two years following the study, 18% of that population entered treatment centres for eating disorders.

Another reason argued to contribute to the discordant findings relates to the composition of the participants involved in such comparative studies. When female athletic populations were compared to female non-athletic populations, the athletic population has often been made up of several sports (e.g., Davis, 1992; Petrie, 1993; Sundgot-Borgen, 1993, 1994; Taub & Blinde, 1992, 1994). However, combining a number of athletes from different sports and considering them as one population may be problematic. Consider, for example, the results of Sundgot-Borgen's (1993) study, where athletes tested were categorized as being in aesthetic sports (e.g., gymnastics and figure skating), technical sports (e.g., bowling and golf), endurance sports (e.g., cross country-skiing and rowing), weight dependent sports (e.g., wrestling and judo), ball games (e.g., basketball and soccer), and power games (e.g., discus and shot put). Analysis of the results revealed that athletes in the aesthetic group reported significantly higher self-reported eating attitudes and behaviors than athletes in the other sport subgroups. If all the groups had been combined, however, such a feature may not have been identified. A conclusion drawn by Sundgot-Borgen was that disordered eating patterns were more likely to occur in sports where a focus on body form is used in their scoring and where

athletes are encouraged to be thin for either performance or appearance-- that is, in aesthetic sports.

Thus, differences between female athletes and non-athletes may not have been evident in previous research due to "pooling" of sporting populations. For this reason, it is important for research pertaining to female athletes to be sport specific. Indeed, researchers have espoused the notion that in order to get a more in-depth understanding of disordered eating tendencies in female athletes, only one sporting population should be studied at one time (e.g., Griffin & Harris, 1996). This recommendation is embraced here and the focus population was female pair/dance figure skaters. As well, selecting this population will allow us to address in more detail the issue of whether athletes in aesthetic sports are more likely to be at risk for disordered eating tendencies than non-athletes.

The largest knowledge base to date concerning eating patterns in aesthetic sports is within the sport of gymnastics (Thompson & Sherman, 1993). In this sport, being small, thin and lean is thought to be visually pleasing and help the gymnast when it comes to being evaluated (Sherman, Thompson, & Rose, 1996). Evidence in support of this comes from studies that have demonstrated that gymnasts who had a lower body mass index (BMI) and lower percent body fat were awarded higher marks from the judges than gymnasts with a higher BMI and percent body fat (Falls & Humphrey, 1978; Sherman, Thompson, & Rose, 1996). Does this fact transfer to the gymnast wanting to be thinner? An interesting line of reasoning is to consider the findings from studies that have included anthropometric measures. Such studies have shown a change in the typical female gymnast across the decades (Classens, Veer, Stijnen, Lefevre, Maes, Steens, & Beunen,

1991; Sinning, 1978). For example, Classens, et al. (1991) measured the age, height, weight, and shape of gymnasts from 1964 to 1984. They found that although the height of the gymnasts had not decreased, the weight of the gymnasts has decreased from 52 kg in 1964 to 45 kg in 1984. While anthropometric studies cannot be directly related to disordered eating tendencies, they are important because they show the trend toward a thinner gymnast.

Given this information, it becomes more obvious why gymnasts may be tempted to rely on unhealthy eating behaviors in order to attain or maintain a low weight. Indeed, several studies have reported that gymnasts are concerned about weight loss and take unhealthy measures to lose weight. For example, Rosen and Hough (1988) found that 62% of the female gymnasts in their sample reported using at least one form of pathogenic weight control measures and similar results were reported by Harris and Greco (1990). Such measures included fasting, vomiting, use of laxatives, diuretics, and diet pills. Extreme cases were also reported, such as someone taking as many as 22 Ex-Lax in one day in order to control a low body weight (Harris & Greco, 1990).

Sports such as cheerleading, diving and figure skating have similar weight requirements and expectations as gymnastics, but surprisingly little research has been done with these populations in disordered eating research (Thompson & Sherman, 1993). Taub and Blinde (1992) did include a group of cheerleaders in their study and found that 42.1 % of them reported using pathogenic weight control behaviors. The limited numbers, however, make it difficult to draw strong conclusions. Similarly, despite researchers identifying figure skaters as a population at risk for disordered eating tendencies (e.g.,

Davis, 1992; Sundgot-Borgen, 1994a, 1994b), very little research has investigated this specific population. For this reason, female pair/dance figure skaters are of interest here.

That which has been done, however, does indicate that it is an appropriate population for study. For example, Brooks-Gunn, Warren, and Hamilton (1987) compared figure skaters to ballet dancers, swimmers, and a control group. It was found that the figure skaters were most like the ballet dancers and tended to be leaner and lighter than the swimmers and control group. Moreover, the figure skaters reported using more oral control behaviors, such as vomiting or laxative abuse to lose weight, whereas the ballet dancers reported employing strict dieting as their weight loss choice. In addition, in the one study that has looked exclusively at figure skating, it was found that female figure skaters had caloric intakes well below the Recommended Daily Allowance (RDA) for moderately active individuals (Rucinski, 1989). Further, the female figure skaters exhibited a great concern about their weight and body appearance with 48% of them reported having eating patterns similar to those of anorexics.

In sum, researchers have concluded that female athletes, particularly those in aesthetic and lean body sports, reported high incidences of pathogenic and disordered eating tendencies. Although figure skaters have been included in some aesthetic sport samples, little attention have been solely directed to them, illustrating a need for further research with this population. Thus, the purpose of the present study was to determine if female pair/dance figure skaters exhibited disordered eating tendencies, and whether they had a higher incidence of disordered eating tendencies than the non-athletic female population. It was hypothesized that the female pair/dance figure skaters would exhibit

self-reported attitudes and behaviors lending themselves to disordered eating classification and that the female pair/dance figure skaters will report a higher incidence of disordered eating tendencies than the non-athletic female population.

## Method

### Participants

Forty-one female pair and dance figure skaters (26 pairs and 15 dance) who ranged in age from 16 to 22 years ( $M=18.1$  years) participated in this study. The figure skaters were categorized into three competitive levels (7 novice competitive, 16 junior competitive, and 18 senior competitive). The total years of figure skating experience ranged from 3.5 to 18 years ( $M=11.2$ ), the total years of competing in figure skating was from 2.5 to 16 years ( $M=9.2$ ), and the total years of competing in either pairs or dance figure skating was from 1 to 11 years ( $M=6.4$ ). Participants were recruited from summer skating schools and summer skating competitions within the Ontario region.

### Materials

A general demographic form that included information about the participants' age, their skating discipline (pairs or dance), their competitive level (novice, junior, senior), their total years of skating, their total years of competition, and their total years of competition as a pairs or dance figure skater was used in the study. In addition, participants completed the Eating Disorder Inventory (EDI) questionnaire. The EDI was developed by Garner, Olmstead, and Polivy (1983) and included 64 self-reported attitudes questions, comprised of three subscales designed to assess the self-reported attitudes and behaviors concerning eating, weight and shape (Drive for Thinness, Bulimia, Body

Dissatisfaction), and five subscales which tap into the more general constructs or psychological traits clinically linked to eating disorders (Ineffectiveness, Perfection, Interpersonal Distrust, Interoceptive Awareness, Maturity Fears). The questions are presented in a 6-point format requiring participants to answer whether each item applies “always”, “usually”, “often”, “sometimes”, “rarely”, or “never”.

The EDI questionnaire has been supported with reliability coefficients (alphas) ranging from .83 to .93 for the subscales for an eating disorder sample (Garner & Olmstead, 1984), and internal consistency with alphas over .80 being found (Norrington, 1989; Norring & Sohlberg, 1988; Welch, 1988). Three subsequent studies have demonstrated a high test-retest reliability, indicating that the EDI is a reliable questionnaire to use (Crowther, Lilly, Crawford, & Sheperd, 1992; Wear & Pratz, 1987; Welch, 1988).

Validity for the EDI has been tested and established using three measures of validity: content validity, criterion related validity, and construct validity. All three measures have proven that the EDI is a valid questionnaire (Garner, et al., 1983; Garner & Olmstead, 1984). This point is further stressed by Crowther, Lilly, Crawford, and Sheperd (1992) who stated that the EDI has been reported to be one of the most widely used set of standardized measures that assess the self-reported eating attitudes and behaviors characteristic of individuals with eating disorders.

### Procedure

After signing an informed consent form, participants were given the general information form to complete. Following completion, participants were given the EDI and

told that in order to ensure their anonymity, they were not to fill out any of the information on the front page of the EDI answer sheet. Each participant was asked to complete the entire questionnaire as honestly and accurately as she could, and was informed that if at any time she wished to stop, she was free to do so without any reprisal from the researcher. If more than one participant completed the questionnaire at one time, they were asked not to confer with each other when completing the EDI. The researcher remained with the participants to address any questions that might arise, and to ensure the independence of work, when necessary. All completed questionnaires were placed in a sealed envelope and participants were thanked for their participation.

## Results

### Descriptive Statistics

The percentages of participants who scored above the mean values for known anorexics, as per the criteria set forth by the EDI profile form (Garner, 1991), are presented in Table 1. A number of important points are worth noting here. First, a very high percentage of the figure skaters were in the disordered range for the subscales of Maturity Fears (75.9%), Perfectionism (65.9%), and Drive for Thinness (46.3%). As well, when including all of the eight subscales, 29% in the disordered eating range was the lowest percentage obtained for this population. Thus, a fairly high percentage of the figure skaters were in the disordered range for all subscales. The data have also been tabulated according to the cumulative percentages of participants with elevated scores on each of the EDI subscales (refer to Table 2). Of particular interest is the fact that 87.8% of participants scored above the score known for anorexics on at least one of the subscales

and that over half of the sample (56.7%) had elevated EDI scores on at least four of the eight subscales.

#### Comparison of Figure Skater's EDI Scores With Normative Data

Single sample t-tests were completed in order to compare the figure skaters' EDI scores with female adolescent norms set forth by Rosen, Silberg, and Gross (1988). Results (see Table 3) revealed that the figure skaters scored significantly higher on 5 of the 8 subscales of the EDI when compared to the normative sample, namely: Drive for Thinness  $t(40)=5.28$ ,  $p=.000$ , Bulimia  $t(40)=4.66$ ,  $p=.000$ , Body Dissatisfaction  $t(40)=3.52$ ,  $p=.001$ , Perfectionism  $t(40)=7.29$ ,  $p=.000$ , and Maturity Fears  $t(40)=3.86$ ,  $p=.000$ .

#### Discussion

In the past few years, there has been a growing number of studies in the area of disordered eating tendencies and athletics. However, there still exists some controversy as to whether female athletes are more at risk for disordered eating tendencies than non-athletic populations. Some researchers have proposed that female athletes participating in aesthetic sports are at a particular risk since they are subjectively evaluated during their performances (e.g., Thompson & Sherman, 1993). The majority of the research testing this proposition, however, has been mainly limited to the sport of gymnastics (i.e., Rosen & Hough, 1988). The study described here broadens this research base by examining another aesthetic sport, namely that of pair/dance figure skating.

The present findings are supportive of the proposition that females participating in aesthetic sports are more at risk for developing disordered eating patterns and behaviors

than are females in the normal population. Single sample t-tests revealed that the figure skaters had significantly higher scores on 5 of the 8 subscales than a normative female non-athletic population (i.e., Rosen et al., 1988). These findings support those of previous studies that have shown female athletes to be more at risk than non-athletes (e.g., Davis, 1992; Sundgot-Borgen & Corbin, 1987). The question arises then as to why this population of female figure skaters are more at risk? As mentioned previously, there appears to be two explanations offered. One in terms of how participation in sport amplifies aspects that also exist in the normal population (i.e., Taub & Blinde, 1992), and another that states that there are unique aspects that originate within the subculture of sport itself (i.e., Heil, 1993). Although the data presented does not allow us to evaluate which of the two is more valid, we align ourselves more with the latter explanation. Before elaborating upon this, the more general results related to the prevalence of disordered eating tendencies in the female pair/dance figure skating population will be discussed.

This study is consistent with other findings demonstrating that female athletes from aesthetic sports display disordered eating tendencies (e.g., Davis, 1992; Sundgot-Borgen & Corbin, 1987; Sundgot-Borgen, 1994; Taub & Blinde, 1992). In reviewing such studies, it can be noted that different criteria have been used for classifying whether participants were an “at risk” population. If we use these various criteria, the figure skaters in this study can indeed be classified as a population at risk for the development of disordered eating tendencies. More specifically, 22% of the figure skaters met the criterion score of 15 or above on the Drive for Thinness subscale of the EDI, indicating a

preoccupation with weight (cf. Davis, 1992; Garner & Olmstead, 1983; Garner, Olmstead & Polivy, 1984; Sundgot-Borgen, 1994; Sundgot-Borgen & Corbin, 1987); 40.7% of the figure skaters met the criteria scores at or above those for known anorexics on the Drive for Thinness, Body Dissatisfaction, and Bulimia subscales of the EDI, indicating an exceptional preoccupation with weight (cf. Sundgot-Borgen & Corbin, 1987); and finally, 36.6% of the figure skaters were at or above those for known anorexics on at least 5 of the 8 subscales of the EDI, indicating a tendency toward eating disorders (cf. Sundgot-Borgen & Corbin, 1987; Taub & Blinde, 1992).

Other statistics that are relevant include the finding that three quarters of this population revealed elevated “maturity fears”. In looking at the prepubescent forms of the top female skaters like the reigning World and Olympic Champion Tara Lipinski, however, the notion that figure skaters do not want to lose their “immature” qualities is not that surprising. Perhaps the most alarming statistic that appears in this study is that 10% of the participants had elevated scores on 7 of the 8 subscales of the EDI (see Table 2). Although this is not a specific criterion that has been used by other researchers, it certainly points to the fact that many female pair/dance figure skaters have self-reported disordered eating attitudes and behaviors.

This returns us to the question of “why them?”. As we stated earlier, we agree with researchers who maintain that participation in sport involves being in a particular subculture with its own specific environment and rules (e.g., Burkes-Miller & Black, 1991; Heil, 1993). In fact, Ryan’s (1995) anecdotal accounts of this sport subculture hypothesis is her main argument of why disordered eating tendencies are appearing in the

sports of gymnastics and figure skating. In the next section, we identify possible factors specific to the context of the figure skating environment that embody the notion that a low weight is a quality necessary for ideal performance in the sport. Such factors are obviously thought to contribute to the risk of disordered eating tendencies.

Researchers (e.g., Harris & Greco, 1990; Thompson & Sherman, 1993) have suggested that many of the significant others in an athlete's life may contribute to a weight dependent environment, and this opinion has been empirically supported. For example, Reel and Gill (1996) found that nearly 46% of cheerleaders in their study agreed that body weight and appearance were important to their coach. Also, and more convincingly, Rosen and Hough (1988) found that two thirds of the gymnasts in their study reported being told directly by their coach to lose weight. The figure skating judge can also be considered as a significant other in an athlete's life because success in this sport is based on her perceptions of a figure skater's performance. Ryan (1995) highlighted this notion in her book when she documented how one gymnast developed an eating disorder after a judge told her to lose weight. Certainly, research in gymnastics has shown that judges prefer thinner gymnasts (Valiquette, 1996), and that better marks are accorded to gymnasts that conform to such preferences (Falls & Humphrey, 1978; Sundgot-Borgen, 1994). All this can easily be applied to the sport of figure skating, with its similar aesthetic requirements, and may help explain the high percentages of disordered eating tendencies found in this study.

In pairs/dance figure skating, another important component not addressed yet is the requirement of the female partner being carried, lifted and/or thrown by the male

partner. The female pair/dance member may thus feel pressure to be thin and light and lean because it is she who is lifted and thrown. This is highlighted by the comment that “many pairs teams today are formed with the idea of having a wide gap between the size of the man and the size of the woman to reduce the stress on the men’s frames” (Harvey, 1998, p. C5). The male partner, then is a significant other given the direct connection with the female figure skater and the nature of their roles in the performance.

This also introduces a factor that is not related to the impact of significant others, but rather to the idea of performance benefits as a result of weighing less. For example, Davis (1992) concluded that greater speed, endurance, agility, and decreased fatigue are all benefits of a lower body weight in any sport. Specifically related to figure skating, Rucinski (1989) stresses this point with the comment that “a woman must attain a low body weight since she must be light enough to be lifted”(p. 99). Regardless of whether actual performance benefits exist, literature on gymnasts’ (Harris & Greco, 1990) and cheerleaders’ (Reel & Gill, 1996) self-reported perceptions suggest that they believe they will perform better if they are lighter. It is likely that figure skaters also have these same perceptions and that having such beliefs will contribute to engaging in unhealthy self-reported eating attitudes and behaviors that have been demonstrated here.

Finally, an additional pressure unique to aesthetic sports, such as cheerleading (Reel & Gill, 1996), and gymnastics (Ryan, 1995), is the tight and form fitting outfits that these females must wear. This certainly is the case in figure skating and given the subjective nature of the judging, how a skater looks in her outfit may have a potentially significant impact on her marks from the judges. The high percentage of figure skaters

with elevated scores on the Perfectionism subscale of the EDI (65.9%) lends support to this idea that the skater thinks that everything must be perfect. That is, a skater knows that she must look perfect in her tight fitting outfit, and any imperfections in this aspect may be detrimental to her success.

In essence, actual performance benefits or perceptions thereof, the uniform the figure skater wears, and the impact of significant others such as the coach, male partner, or judge, can be described as weight loss pressures unique to the sport of figure skating. That is, it is doubtful that a non-athlete is faced with these same weight loss pressures because they are not part of this sporting environment. This is not to exclude the alternative hypothesis that weight loss pressures that exist in the non-athletic population may also exist here, however, based on the findings here, we also want to highlight the possibility that other weight loss pressures exist above and beyond those in everyday society. Unfortunately, the present study was not designed to address this issue, and at present we can only indicate that it is one of our future research goals. Nonetheless, we present such weight loss pressures, and the specific sport culture in which they develop, as a possible explanation for why such high percentages of the figure skaters were observed to have disordered eating tendencies. That is, the stated weight loss pressures may have led the female figure skater to want to be thin, lean and aesthetically pleasing as a means to be successful in this sporting environment. This in turn, resulted in the high incidence of disordered eating tendencies in this population.

This study has shown that female pair/dance figure skaters are “at risk” for the development of disordered eating tendencies above and beyond that of a population of

females that were not involved in the sport (cf. Rosen et al., 1988). A strength of this research is that we focused only on one group of athletes, as suggested by researchers (i.e., Sundgot-Borgen, 1993), and looked specifically at one aesthetic sporting population that has received little research attention. In this light, we were successful in gaining a fair representation of this population within our province, based on estimates of the actual population base identified by the Canadian Figure Skating Association. However, we realize the limitations in terms of the relatively small numbers (as compared to other disordered eating research), and the distinct geographic location of our sample. As such, additional research related to figure skating, possibly with larger sample sizes and a greater geographical assembly should be continued to shed more light into this needed area of research. As well, ascertaining whether such high incidences of disordered eating tendencies in this figure skating population is related to the unique sport related demands and pressures evident in the sport of figure skating is an important research question. Future research such as that proposed here is an important step toward the potential treatment of these dangerous and deadly measures that figure skaters take in order to attain or maintain low weight for the purposes of achieving success in the sport.

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Table 1

Frequency and Percentage for the Eight Subscales of the Eating DisorderInventory

Subscale	Frequency		Percentage	
	Disordered	Non-disordered	Disordered	Non-disordered
DT	19	22	46.3	53.7
BD	16	25	39.0	61.0
B	15	26	36.6	63.4
IA	13	28	31.7	68.3
ID	18	23	43.9	56.1
I	12	29	29.3	70.7
MF	31	10	75.6	24.4
P	27	14	65.9	34.1

Note.

DT-Drive for thinness

I-Ineffectiveness

BD-Body Dissatisfaction

ID-Interpersonal distrust

B-Bulimia

MF-Maturity fears

IA-Interoceptive awareness

P-Perfectionism

Table 2

Cumulative Percentage of Participants With Elevated EDI Subscale Scores

# Subscale(s)	Frequency of Disordered Subscales	Percentage of Disordered Subscales
1	36	87.8%
2	31	75.6%
3	26	63.4%
4	22	56.7%
5	15	36.6%
6	9	22.0%
7	4	9.8%
8	0	0.0%

Table 3

Comparison of Figure Skater's EDI Scores With Norms a

	Current subjects		Adolescent girls a		
	M	SD	M	SD	t(40)
EDI-					
Drive for Thinness	10.1	5.4	5.6	5.9	5.28*
Body Dissatisfaction	12.0	7.9	11.3	5.9	3.52*
Bulimia	6.2	5.6	2.1	3.3	4.66*
Ineffectiveness	5.8	5.1	4.2	5.1	0.82
Perfectionism	9.3	4.4	5.2	4.3	7.29*
Interpersonal Distrust	3.7	3.4	3.6	3.8	-0.22
Interoceptive Awareness	5.8	6.2	4.5	5.3	0.47
Maturity Fears	6.3	4.5	4.2	3.6	3.86*

Note.

a Norms came from Rosen, Silberg, and Gross, 1988.

\* $p < .05$ .

Running head: WEIGHT LOSS ISSUES IN FIGURE SKATING

**Weight Loss Pressures of Female Pair and Dance Figure Skaters**

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### Abstract

The purpose of this study was to examine whether female pair/dance figure skaters perceived weight loss pressures to exist. Specifically, we were interested in looking at potential weight loss pressures originating from the figure skaters' coach, partner, parents, judges, as well as from themselves. Participants included 41 pair/dance figure skaters (26 pair and 15 dance), aged 16-24 years ( $M=18.1$ ), who completed a self-reported attitudes questionnaire designed by the researchers to examine weight loss pressures specific to the sport of figure skating (the SKATE Scale). Results revealed that 92.7% of participants perceived weight loss pressures in their sport. Further, ANOVA analyses revealed that the figure skaters perceived their coaches and themselves as the most significant contributors to weight loss pressures. Questions related to perceived performance advantages as a function of low weight were found to impact the most. More general questions at the end of the SKATE Scale indicated that 78% of the skaters engaged in weight loss methods such as fasting/use of diet and excessive exercise. As well, 70.8% of participants identified their skating uniform as a source of weight loss pressure. Taken together, results highlight the perceived existence of weight loss pressures in female pair/dance figure skating.

### Weight Loss Pressures of Female Pair/Dance Figure Skaters

In the past, researchers have reported that female athletes have shown high incidences of pathogenic and disordered eating tendencies (i.e., Davis, 1992; Sundgot-Borgen, 1993). More germane to aesthetic sports, athletes involved in such lean body sports, where an emphasis is on body form in the scoring, such as gymnastics (e.g., Rosen & Hough, 1988), and cheerleading (e.g., Taub & Blinde, 1994), have been particularly highlighted as sports with “at risk” populations for disordered eating tendencies. Specific to figure skating, we have just completed a study that confirmed that figure skaters can also be placed in the “at risk” category (Taylor & Ste-Marie, 1998).

Such findings of high incidences of disordered eating tendencies, however, are still in the descriptive stage and we need to move forward to address other pertinent issues. As Fairburn and Beglin (1990) state “... it is our view that it is time for a shift in emphasis away from prevalence per se toward studies of the nature, course, and etiology of the full spectrum of disturbance that exists in the community. Research of this type should broaden and deepen our currently limited understanding of eating disorders” (p. 407). Taking this idea into hand, the goal of this study was to investigate one possible contributor to disordered eating tendencies in pair/dance figure skating. We propose that one possible reason why self-reported disordered eating behaviors exist in aesthetic sporting populations is that athletes perceive multiple weight loss pressures from significant others and from themselves regarding their weight and body appearance (Thompson & Sherman, 1993). Although others have postulated that such weight loss pressures may be an underlying reason for which female participants turn to pathogenic or

disordered eating patterns in order to control their weight (i.e., Rosen & Hough, 1988), few have systematically tapped into the various potential sources of weight loss pressure.

Certainly, evidence is available to demonstrate that weight loss is seen as a concern in this sport. For example, Scanlan, Stein, and Ravizza (1991) studied diverse sources of stress identified by former elite figure skaters. One source of stress reported was personal struggles, and within this orientation, comments made related to maintaining a low body weight were reported on the part of the skater, such as: "...the anxiety and nervousness over the fact that you might be too fat..." (p. 115). Recently, researchers have looked at similar issues reported by Scanlan et al. (1991), that being perceived sources of stress related to weight, but have changed the focus from the individuals' identifying the sources of stress to that of determining what were the contributing factors. For example, Reel and Gill's (1996) study on weight loss pressures in the sport of cheerleading found that significant pressures associated with body weight existed. In the response to the question, "Do you think there are pressures associated with cheerleading to lose weight or maintain a below average weight?", 84 % of the participants responded "yes". The pressure sources that ranked the highest in the study included wearing a revealing uniform and influences from the coach. At present, however, this appears to be the only study that looked exclusively at the terminology of weight loss pressures perceived by athletes in an aesthetic sport. For this reason, we feel it is important to broaden the research base by including another aesthetic sport population. Moreover, Reel and Gill's study did not concentrate on any particular source of pressure and took a more general approach to the issue. These potential sources of weight loss pressures have also been anecdotally

documented extensively by Ryan (1995) in her popular book entitled Little Girls in Pretty Boxes: The Making and Breaking of Elite Gymnasts and Figure Skaters. Specifically, for the sport of figure skating, she mentioned that weight loss pressures exist from areas such as coaches, judges, parents, wearing revealing outfits, and the required lifting of the female partner. For these reasons, the following five sources of potential weight loss pressure were chosen for study: the coach, the partner, the parent, the judge, and the skater. While Ryan's book offers no empirical support for such weight loss pressures, in the subsequent sections it will become obvious that researchers have made similar allegations. Also, Ryan's work deserves attention with accolades such as Ryan's work in this book being called "ground breaking" and a must read for all sport scientists and sports enthusiasts alike (Pierson, 1996).

### The Partner

Although little research exists to verify that the male skating partner may pressure his partner to lose and maintain a low weight, research does provide some insight on this issue. Black (1991) found in his research that low body weight was positively correlated with improved vertical movement and ease in being lifted or carried-- a requirement for pair/dance figure skating. Further, Overdorf (1987) suggested that a high percentage of body fat slowed movement, hindered performance, and caused fatigue both in quickness, and endurance activities. Thus, given that lifting is a requirement for pair/dance figure skating and it is also an activity requiring quickness and endurance, it may be that a lighter female partner is potentially beneficial for the male counterpart. That is, it would take less effort and be easier for him to execute the difficult throws and lifts, components in the pair

or dance routine. This could result in improved overall performance and consequently, higher scores from the judges. Indeed, Rucinski (1989) made a similar statement when he wrote “a woman [female figure skater] must attain a low body weight since she must be light enough to be lifted” (p. 99). In this context, the male skating partner may then encourage their partner to have a low body weight. In fact, Rucinski introduced this point, but only in his discussion section. At this point, however, there is no research that has investigated this possibility and the research reported here attempts to determine whether this is a valid assumption.

### The Coach

In contrast to the very limited literature on the potential weight loss pressure from the partner, a number of studies have made reference to the weight loss pressure from the coach. Harris and Greco's (1990) study with female gymnasts, 56% of the gymnasts reported being told by their coach to lose weight. Further, Rosen and Hough (1988) reported that two thirds of the gymnastic coaches used in their study told their athletes that they were too heavy, and 75% of those athletes resorted to pathogenic weight control behaviors. In addition, of the one-third of gymnasts told that they were not too heavy, 36% reported pathogenic weight control behaviors. Also, Sundgot-Borgen (1994a) found that 67% of the athletes in their study started to diet after their coaches had advised them to reduce their weight. Taken together, it appears that coaches have a significant impact on the eating attitudes of these athletes. On more anecdotal lines, Ryan (1995) argued that many of the figure skaters and gymnasts in her book started to starve themselves in

response to the belittling comments such as “pigs” and “cows” that their coaches made concerning their weight.

A qualitative single-case study of a former gymnast also illustrates the pressure that coaches may put on their athletes in relation to weight (Krane, Greenleaf, & Snow, 1997). In that study, the gymnast explained that her coach demanded perfection in every sense and often scrutinized her food intake and diet in order to achieve this “perfection”. As well, in the gym this specific gymnast trained at, the coaches created an environment where only a certain body type was expected and accepted, that of the thin and petite gymnasts. An example of a weight loss pressure tactic on the part of the coach is seen in this excerpt from the paper that is given by the gymnast “We had to tell [coach] everything we ate every single day. We had a diary and if we ate something that he did not approve of, he would tell our parents, he would make us feel so ashamed in front of everybody, he used public humiliation. “Oh [gymnast] ate a candy bar today, I can’t believe she did that, and she won’t do that again, right?” (p. 60). This quote stresses the potentially damaging impact a coach may have on a athlete.

This excerpt also brings to light the fact that coaches can require that certain practices be followed by gymnasts on their team (re. daily diet journal). Certainly, there are other practices coaches often request of gymnasts, and the similarity of figure skating to gymnastics leads us to believe that the same procedures are involved here. Having athletes weigh-in at different times throughout the season as well as specific weight requirements are two such practices documented (e.g., Rosen, McKeag, Hough, & Curley, 1986). Moreover, these weigh-ins/weight requirements can be used as scare

tactics with the athlete, for example; being told that if she did not meet this weight requirement, she will not be able to practice with the team (Thompson, 1987). Ryan (1995) alluded to this very idea when she described an incident in her book where an athlete drank an entire bottle of Ex-Lax for fear of her coach weighing her in the next morning. It may not always be that these practices are used for such scare tactics, nor is the message to lose weight conveyed by the coach directly. Nonetheless, behaviors on the part of the coach can be interpreted by the athletes as messages to lose weight (e.g., Chernes, 1994; Noden, 1994) and for this reason they need to be considered.

In sum, data-based research has revealed that coaches do give the message to athletes to lose weight. As well, certain practices in the sport environment that have been documented (i.e., daily diet journal, weigh-ins) may lead athletes to believe that the coach finds a low weight desirable and that it is a requirement for continued participation on that team. Empirical reports (e.g., Harris & Greco, 1990) and anecdotal reports (e.g., Ryan, 1995) provide evidence that the athletes are receiving this message and responding by adopting pathogenic weight control behaviors. The assertion derived from this analysis leads us to hypothesize that coaches are a likely source and contribute to female pair/dance figure skaters feeling pressure to attain or maintain a low body weight.

### The Judges

In any subjectively judged sport, biases will exist. Biases that have been identified in aesthetic sports, like gymnastics and figure skating, include memory-influences (Ste-Marie & Lee, 1991), within team order placings (Ansorge & Scheer, 1988), and international biases ( Ansorge, Scheer, Laub, & Howard, 1978; Seltzer & Glass, 1991;

Whissel, Lyons, Wilkinson, & Whissel, 1993). A more specific bias related to the premise here has been documented by Falls and Humphrey (1978). That research showed that the small, thin gymnasts were awarded higher marks than ones that were heavier. They also presented the idea that this may have occurred because the judges found those gymnasts to be more visually appealing. Valiquette's (1996) research lends credence to this notion, as gymnastics judges were shown to have a significantly greater preference for a smaller body shaped gymnasts as compared to larger ones when asked to rate them on their aesthetic appeal. These studies demonstrate that there does indeed exist a potential bias on the part of the judges in regard to the body shape of the athlete. No research, however, has questioned whether these biases may lead the athlete to believe that she should lose weight in order to conform to the "preferred" image of the judge. This is despite the fact that many researchers, such Sundgot-Borgen (1993) have identified judges as a source of weight loss pressure and encourage further research on the issue.

Before leaving this particular line, it is again useful to provide an example documented both by Ryan (1995) and Noden (1995), from the sporting environment of gymnastics. Christy Henrich, an elite gymnast, who was 4 feet 11 inches and weighed 90 pounds at 15 years of age, was told by a judge that she would never make the 1992 Summer Olympic team unless she lost weight. Before this incident, Christy was never concerned about her weight and reported that this comment led her to stop eating. Difficulties surmounted and she retired from gymnastics much before the Olympics, weighing less than 80 pounds. Despite her removal from gymnastics, Christy continued to lose weight and, tragically, in June of 1994, Christy died of complications related to

anorexia. Although a very severe example, it serves to illustrate the point that judges are very influential and have the potential to put pressure on females involved in aesthetic sports.

### The Parents

A fourth source of potential weight loss pressures these figure skaters may have to confront is that of their parents. Researchers have documented parents as a source of pressure (e.g., Leff & Hoyle, 1995); and others who have reported that parents may be a source of pressure for athletes in relation to their weight (Griffin & Harris, 1996; Rosen & Hough, 1988; Smith, 1996; Stoutjesdyk & Jevne, 1993; Taub & Blinde, 1992, 1994). In keeping with the preceding section, although these researchers have written of this possible weight loss pressure, the majority of this documentation is brief and only mentioned as a discussion point with no “empirical” support. For example, Rosen and Hough (1988) mention that comments regarding an athlete's weight, made by “significant others”, included here was parents, could easily initiate or solidify an eating disorder. Krane, Greenleaf, and Snow (1997), also briefly alluded to weight loss pressures from parents in their single-case study of a gymnast. They found that the gymnasts' sporting environment was one that encouraged unhealthy and potentially dangerous eating behaviors. Moreover, these behaviors were said to be enforced by her parents as they saw it as a necessary requirement for their daughter's success in the sport.

Ryan (1995) lends anecdotal support to this potential weight loss pressure and in fact, devotes an entire chapter entitled “We All Became Junkies” to this very issue. She explains “almost every successful child athlete rides to the top on the shoulders of a parent

undaunted by sacrifice and extremes, whether this means sending a child far away to train, mortgaging a home to foot the bills, taking a child out of school so she can train longer hours, abusing her physically or verbally for not performing, or even giving up custody” (p. 146). She goes on further to explain much of this parental pressure is related to weight. An example Ryan focused on was Chelle Stack, who reported that her mother took extreme measures to ensure that she stay in the sport of gymnastics and demanded nothing but perfection from her. To meet such demands, Chelle, chose to deal with her “normal” weight gain due to puberty by drinking whole bottles of laxatives. Despite these statements, little is found that contains information specific to weight loss pressures from the parent. This lack of research shows a need to address this issue.

#### The Figure Skater

The final source of pressure related to weight loss, is that from the figure skater herself. Although this is considered as a separate weight loss pressure in and of itself, it is most likely based on an accumulation of the pressures previously stated (Thompson & Sherman, 1993). These external sources of weight loss pressure can stem from everyday societal pressures to be thin, the media, or the four sport-related weight loss pressures mentioned above. Indeed, it becomes difficult to disentangle the external sources of weight loss pressure from the internal sources of weight loss pressure. However, we have chosen to define that the athlete sees herself as a source of weight loss pressure is by asking her to respond to all of the questions from the perspective of “I”. For example, in question 1 of the SKATE Scale, it would be read by the figure skaters as “I think my skating performance would improve if I lost 5 pounds”. This is a somewhat arbitrary

definition, but one that we think is useful, because in the end, one must consider whether all of the weight loss pressures are combining to affect the athletes overall perception of weight pressure. That is, whether it is a part of her belief structure that less weight is better.

Support for the impact of these perceptions is seen in research assessing what the athlete's believe to be the outcome of weight loss or weight gain. For many athletes, the assumption is that lowering their body weight will result in an improved performance and competitive edge over their fellow athletes (Ashley, Smith, Robinson, & Richardson, 1996). Correspondingly, gymnasts reported that even a small weight gain was perceived as having a deteriorious effect on their performance (Harris & Greco, 1990). The fact that she will then act upon these beliefs has already been attested to here in the research documenting disordered and pathogenic weight control measures of female athletes (e.g., Black & Burkes-Miller, 1988; Brooks-Gun, Warren, & Hamilton, 1987; Burkes-Miller & Black, 1991; Davis, 1992; Harris & Greco, 1990; Sundgot-Borgen, 1993, 1994a, 1994b)

Likewise, in spite of the evidence that an athlete is in fact not overweight, some continue to perceive themselves as such. For example, Harris and Greco (1990) reported that the weight, body mass index, and percentage of body fat were lower than the average population for their sample of gymnasts tested, but the gymnasts still considered themselves too fat and were very dissatisfied with their bodies. Similarly, Rosen, Mckeag, Hough, and Curley (1986) found that 75% of their sample of female athletes admitted that their continued weight loss was done out of fear of losing control of their eating habits. These same concerns exist in the sport of figure skating as indicated by Scanlan, Stein, and

Ravizza's (1991) study wherein they found that 23% of the figure skaters they interviewed, indicated a personal struggle with weight. For example, comments such as "If I was light, I was right. And if I was overweight, hey forget it" (p. 115) helps to verify that athletes in aesthetic sports such as figure skating do indeed feel internal pressures related to weight. In combination, these findings substantiate why the perspective of the skater is an important one to consider in the research, and thus is included as a separate source of pressure.

### Summary

In summary, the female sporting population has been targeted as one in which the potential of developing a disordered eating tendency is high (e.g., Sundgot-Borgen, 1993). Furthermore, a great deal of descriptive research has demonstrated that females participating in sports that emphasize leanness such as gymnastics, cheerleading and figure skating are at a greater risk of acquiring these disordered eating tendencies (e.g., Brooks-Gunn et al., 1987). However, the specific sport of figure skating has been investigated minimally, but researchers have targeted it as a sport worthy of investigation (i.e., Davis, 1992; Sundgot-Borgen, 1994a). More importantly, the possible reasons as to why athletes in these sporting populations adopt disordered eating tendencies is in need of research (Thompson & Sherman 1993). With this in mind, the purpose of this study is to examine whether weight loss pressures from coaches, parents, partners, judges, and from the skater herself exist in the sport of pair/dance figure skating. It was hypothesized that of the five weight loss pressures, those coming from the coach and the skater herself would be most significant. Other general issues were also investigated, such as the weight

loss methods used by the skaters, the figure skating uniforms, and other issues related to weight loss pressures in figure skating.

## Method

### Participants

Forty-one female pair and dance figure skaters (26 pairs and 15 dance) who ranged in age from 16 to 22 years ( $M=18.1$  years) participated in this study. The figure skaters were categorized into three competitive levels (7 novice competitive, 16 junior competitive, and 18 senior competitive). The total years of skating experience ranged from 3.5 to 18 years ( $M=11.2$ ), the total years of competing in figure skating was from 2.5 to 16 years ( $M=9.2$ ), and the total years of competition in either pairs or dance figure skating was from 1 to 11 years ( $M=6.5$ ). One participant did not fully complete the questionnaires and was thus excluded from the data analyses. Participants were recruited from summer skating schools and summer skating competitions within the Ontario region.

### Materials

A questionnaire entitled the SKATE Scale was designed to investigate weight loss pressures hypothesized as being associated with pair/dance figure skating. The Skate Scale is an 18-item self-report questionnaire, that contains questions related to the skater's perceived weight loss pressures from her coach, partner, judges, parents, and herself, as well as other more general information. More specifically, 10 questions tap into the possibility of weight loss pressure from the five sources mentioned above and are structured with possible responses that range along a 1-7 continuum with 1 being strongly disagree and 7 being strongly agree. The key words of agree, disagree, and neutral also

appear along the continuum, with a score of 3.5 being neutral. The SKATE Scale also contains descriptive questions regarding issues such as use of various pathogenic weight control methods. The questionnaire finishes with an open-ended section whereby the participant could provide any other comments that she wanted to contribute. General demographic information related to the figure skater is completed at the beginning section of the SKATE Scale.

The initial notion and basic parameters of the SKATE Scale were designed from the Cheer Scale, a questionnaire designed to look at weight loss pressures in the sport of cheerleading (see Reel & Gill, 1996, for a summary of the Cheer Scale). In order to generate the SKATE Scale, the following steps were used. First, a pool of questions was generated by the first author. These questions were then examined by expert raters that were believed to have expert knowledge relevant to the areas in question. These raters included six former dance/pair figure skaters, two eating disorder therapists, four psychologists, and two medical doctors, including one of the medical doctors from the Canadian Figure Skating Association. They were asked to look at the accuracy and applicability of the questions. Based on the experts comments and recommendations regarding the SKATE Scale, the final version of the SKATE Scale was completed.

### Procedure

After signing an informed consent form, participants were given the SKATE Scale and told that in order to ensure their anonymity, they were not to place their name anywhere on the questionnaire. Each participant was asked to complete the entire questionnaire as honestly and accurately as she could, and she was informed that if at any

time she wished to stop, she was free to do so without any reprisal from the researcher. Participants were asked not to confer with each other when completing the Skate Scale and if any questions arose, the skater was to ask the researcher who remained in the room with the participants. All completed questionnaires were placed in a sealed envelope and participants were thanked for their participation. It should be noted that these participants also completed the EDI Questionnaire used in Taylor and Ste-Marie's (1998) study just prior to completing the SKATE Scale. The responses from the EDI will not be addressed here and the reader is directed to that study for its specific results.

### Results

Analysis of Variance (ANOVA) tests were conducted to look at the various sources of pressure tested. We used the significance level of  $p < .05$  to test our results. Also, Tukey Post-hoc tests were conducted to determine differences among means when needed. Descriptive statistics were used on the other items of the SKATE Scale.

#### Weight Loss Pressures

A two-way [ 5 Pressures (coach, parent, partner, judge, skater) X 10 Questions (1-10)] ANOVA with repeated measures on both factors was used to analyze the data. A significant main effect was found for the factor of pressure,  $F(4, 156) = 26.06$ ,  $Mse = 7.33$ . Recall that there were ten questions in the scale the range of responses was from 1-7, with 1 being strongly disagree and 7 being strongly agree. Thus, a score of 70 would indicate intense weight loss pressure from this source. Post-hoc testing showed that the figure skater perceived herself ( $M = 58.9$ ) and the coach ( $M = 54.3$ ) as sources of pressure. These

two sources were not significantly different from each other, but both were significantly higher than the other three sources.

A main effect for question,  $F(9,351) = 6.17$ ,  $MSe = 5.56$ , was also found (see Table 1). Here the means were calculated by summing all possible scores from 1-7 for the five sources of pressure associated with that particular question. Thus, a mean score of 35 would indicate that the skater felt a particularly high association with that question. Tukey post hoc testing revealed that the figure skaters responded significantly higher for questions 10, 9, 8, 6, 5, and 2, than for questions 1, 3, 4, and 7.

A significant interaction between the factors of question and pressure,  $F(36,1404) = 1.46$ ,  $MSe = 2.55$  was obtained. In general, the trends to emerge were that the figure skaters saw themselves as the highest source of pressure, closely followed by the coach, then significantly lower for the parents, partner, and finally the judges across most of the questions. However, figure skaters scored parents ( $M = 46.9$ ) and judges ( $M = 41.2$ ) higher for Question 10 than the other three sources, and similarly, judges ranked highest ( $M = 41.2$ ) for Question 9.

### Descriptive Information

The more descriptive questions at the end of the SKATE Scale revealed the following information. In response to the question, "Do you think there are pressures associated with figure skating to lose weight or maintain a below average weight", 92.7% of the figure skaters responded "yes". As well, 70.8% of the figure skaters agreed or strongly agreed that their skating uniform made them conscious of their bodily appearance. One of the questions in the SKATE Scale dealt with various pathogenic

weight control measures, and 100% of the figure skater indicated that they had used at least one of the weight loss methods mentioned during their athletic careers. Further, related to the specific weight loss methods, 78% of the figure skaters reported using fasting/dieting and/or excessive exercise as their most commonly used weight control measures. Further, 39% of the figure skaters reported using vomiting and/or diet pills to control their weight. Finally, nearly 25% of the figure skates reported using all of the weight control measures mentioned in the SKATE Scale.

### Discussion

Over the past few years, a significant knowledge base has been constructed concerning the dangerous levels of disordered eating tendencies in female sports, and particularly those in aesthetic sports (i.e., Sundgot-Borgen, 1993, 1994a, 1994b; Taylor & Ste-Marie, 1998; Thompson & Sherman, 1993). In this article, we were interested in taking the disordered eating research one step further and into the area of ascertaining what leads to such disordered eating tendencies. Our hypothesis here was that participating in the sport of pair/dance figure skating provided an environment wherein specific weight loss pressures related to that sport would be experienced. The extension of this is that such pressures may contribute to the incidence of disordered eating tendencies seen in these aesthetic sporting populations (i.e., Taylor & Ste-Marie, 1998). This hypothesis aligns itself with the proposition that in such aesthetic sports, a unique subculture exists because of certain sport-specific demands and expectations (e.g., Harris & Greco, 1990; Heil, 1993; Reel & Gill, 1996; Ryan, 1995; Taylor & Ste-Marie, 1998; Thompson & Sherman, 1993). It should be mentioned that others have proposed that

participation in sport amplifies pressures that are already found in every day life to be thin (i.e., Taub & Blinde, 1992), or that figure skating attracts a female whom is prone to disordered eating tendencies (i.e., Thompson & Sherman, 1993). While we do not negate either of these particular views, we were more interested here in determining whether there were specific weight loss pressures that emanated from sources that were directly relevant to the context of pair/dance figure skating.

Our results supported the notion that there exists specific weight loss pressures related to weight in the sport of pair/dance figure skating. Specifically, 92.7% of the figure skaters indicated that they perceived weight loss pressures in the sport of pair/dance figure skating. Of the five sources of pressure the SKATE Scale tapped into, the pressures perceived to come from the coach and from the skater herself were most significant. For this reason, the emphasis of this discussion will be on these two sources, with the more descriptive information related to the SKATE Scale being addressed later.

The figure skaters perceived their coaches as a significant source of pressure related to weight. Recall that a score of 70 would have occurred if the skater had indicated a strong agreement with all ten questions on the SKATE Scale, and a score of 10 if the skater had indicated strong disagreement. In this study, the grand mean for the pressure source of coach was 54.3, leading us to conclude that the coach was in fact a perceived source of significant weight loss pressure for the skater. This finding is consistent with other researchers who concluded that coaches are perceived to play a vital and powerful role in an athlete's life (e.g. Harris & Greco, 1990; Reel & Gill, 1996; Rosen & Hough, 1988).

The manner in which these weight loss pressures were perceived were reflected in the questions that showed the greatest weighting from the figure skater's perceptions of her coaches' beliefs. For example, the mean response for the pressure source of coach was especially high for Question 9 ( $\underline{M}=5.8$ ), which dealt with physical appearance, Question 8 ( $\underline{M}=5.7$ ) which dealt with body weight, and Questions 6 ( $\underline{M}=5.5$ ) and Question 10 ( $\underline{M}=5.5$ ) which dealt with the notion that being smaller resulted in a technical and performance advantage. These examples help to show that the skater thinks that her coach feels that being aesthetically pleasing and having an ideal body weight are important to her performance and ultimately her success in the sport.

Another means by which to support the argument that the coach was often perceived as being concerned with the skater's weight, is by way of the comments provided by the skaters in the open-ended questions at the end of the SKATE Scale. Two that are particularly relevant here are: "I wish that our coaches would encourage us instead of criticizing us for gaining weight", and "coaches put too much pressure to be thin--I wish they were more supportive".

As previously mentioned, several researchers have documented that coaches implement certain practices, such as daily diet journals in order to keep track of their athletes' weight and eating patterns (e.g. Rosen, et al., 1986). Another method mentioned is regular weigh-ins and many of the skaters in the present study indicated in the general comment section of the questionnaire that such measures were taking place at their respective figure skating clubs. In addition, although many clubs may not have a formal procedure being implemented, messages to weigh less still came across by other methods.

Again, responses in the form of open-ended comments in the SKATE Scale highlight this. For instance one skater wrote: "When I first came to this club, my coach picked me up and told me I was heavy". After hearing such a comment from a coach, it is not hard to believe that the skater will then attempt to lose weight. An interesting point to mention is that although coaches feel free to send the message to an athlete that she should lose weight, it has been found that they generally have less than optimal knowledge regarding healthy weight control behaviors and nutritional knowledge (Bedgood & Tuck, 1983; Griffin & Harris, 1996; Jacobson & Gemmell, 1991; Parr, Porter, & Hodgson, 1984; Sundgot-Borgen, 1993; Wolf, Wirth, & Lohman, 1979).

For example, Griffin and Harris (1996) found that coaches in their study tended to make decisions about the need for weight control on the basis of appearance rather than objective indicators, and demonstrated a low level of knowledge regarding weight control behaviors. With respect to nutritional aspects, Par et al. (1984) found that 61% of coaches in their study had no formal nutritional background, while Wolf et al. (1979) found that 78% of their coach sample believed they needed to acquire more knowledge about diet and nutrition. What is clear from these studies is that although the coach may be a very strong influence and source of weight loss pressure for the athlete, they in fact may know very little about diet and nutrition.

The source that yielded the highest mean for source of weight loss pressure was that of the figure skater herself. As mentioned in the introduction, by stating that the figure skater herself can be seen as a source of weight loss pressure, we mean that she may have internalized those beliefs and suggestions that are constantly being communicated to

her from external sources. In considering this line of thought, it implicitly assumes that a figure skater that has received greater amounts of external pressure related to weight will have a greater chance of having internalized these beliefs than one that has received less.

To test this assumption, the mean scores of the external sources of weight loss pressure were summed together into one value. This value was then entered into a Pearson Product Correlational Analysis with the figure skater's self-perception score. The analysis revealed a significant positive relationship ( $r=.69$ ,  $p<.05$ ). Thus, the higher the external weight loss pressure perceived by the skater from the external sources of the coach, the partner, the parent, and the judges, the more the skater had internalized these weight loss pressures, as reflected by her responding to the questions from the "T" perspective.

It is acknowledged, however, that the 4 sources of external weight loss pressure presented in the SKATE Scale are not the only sources of external weight loss pressure a figure skater may be faced with, otherwise a raw score of 1.0 would have been obtained. Other examples then could include the societal pressure on females to be thin to fit the "norm" of beauty accepted by society. Also, within society, a female figure skater may face weight loss pressures from various sources such as the media, friends and teammates. While there exists excessive sources of potential external weight loss pressures, the fact that a relationship was found between the internal source of "T" with the combined sources of coach, parent, partner, and judge, lends support to the hypothesis of internal pressures resulting due to an accumulation of external sources of weight loss pressure.

What then are the beliefs or perceptions that are eventually internalized by the skaters? Not surprisingly, the skaters showed the same general pattern as the coaches. That is, the figure skaters scored questions related to improved performance and body appearance significantly higher than other questions. The requirements of pair/dance figure skating are relevant to introduce at this point, because it is useful to consider just what it is that is being performed and thus required of these athletes. For the female, often she is being lifted and carried by her male partner, and here we see the possible pressure to be thin, and small in order for her partner to be able to throw and lift her during their routines. As mentioned by Ryan (1995) "... the sport rewards (marks from the judges) the lighter skaters more richly than ever because scores now depend so much on the acrobatic triple jumps " (p. 102). A corollary to this is the point that in the mind of the athlete, in order to get the high marks from the judges, they must be able to perform the more difficult moves and jumps-- which she translates in the fact that she must be thin.

Rucinski (1989) also indicated that the female figure skaters in his study felt it necessary to be small and light because of the sport-specific requirements of being lifted, providing further support for this idea. Perhaps the strongest support comes from the written comments made by the skaters. For example, one skater wrote: "My partner isn't that strong so I feel that I should keep my weight down to help him out on lifts etc.... I would feel really bad if he hurt himself because of me". Another figure skater indicated that a goal in pair figure skating was "to be thin and the lightest so that your partner can lift you". A point that should be made here relates to the fact that while a figure skater must be thin and small to be able to do the more difficult elements, she must also be

muscular enough to perform them. In this light, in fact the figure skater must be lean--light yet muscular.

One feature of this sporting context that has not surfaced yet at this point is the in-equal representation of males and females in the sports of pair/dance figure skating. Estimates from the Canadian Figure Skating Association are that for every male pair/dance figure skater, there are 3 to 4 females of the same domain. This can easily create an atmosphere of competition amongst the females such that the males have the opportunity to "select" their partner. It appears that consideration of weight comes into the picture here, as was made apparent to us by the following comment: "...if you send in a resume for a partner, you would lower your actual weight on the form...".

In summary, the female figure skaters in this study placed pressure on themselves to be small and thin because performance advantages were seen as a consequence of this. As well, other nuances that surfaced were fear of hurting their male skating partner if they were not light and the idea that a low body weight may be one criterion male partners use to select their female counterpart. These factors are said to be related to the sport specific demands of being lifted and/or carried, and thrown while performing a pair/dance figure skating routine.

In addition to these features that are related to direct performance advantages, another feature that is sport specific is that success is determined by how one has been rated in a competition by a panel of judges. Moreover, the evaluation is not only based on objective measures, such as landing of a jump, but rather has a largely subjective component that emphasizes aesthetic qualities. This "aesthetic" component also emerged

as a source of pressure. For example, in response to Question 9 that dealt with physical appearance being important, this question was ranked the highest by the participants, indicating the importance of this component to pair/dance figure skating. This is seen by the comment: "My appearance and weight controls the way my mood is. I feel fat, I feel like shit and if I feel slim from not eating anything, I feel great". Also, it should be noted that participants rated the judges as a high source of pressure for this question which again stresses the importance of the aesthetic element of pair/dance figure skating. Ryan (1995) alluded to this essential aesthetic quality in her book and pointed out that "in truth, the perfect skater is a combination of Twiggy and Barbie, thin enough to perform the difficult jumps and desirable enough to fit the skating's cover-girl image" (p. 97) and again later with the comment " In skating no aesthetic detail goes unnoticed, on or off the ice. The judges would see you in the hotel lobby and you had to look perfect" (p. 97). This is also seen by the comment made by one skater in this study who said, "The girl must have no hips of chest of fat on her body to be considered an ideal dance or pairs skater" and then went on to say, "We [figure skaters] don't have to be thin, we also have to be have long, lean legs, graceful arms, small hips and be beautiful".

In addition, another interesting result that was found was the high percentage, precisely 70.8% of the figure skaters who felt that they feel self-conscious in their skating uniforms. One needs only to look on the television at any given figure skating competition to see just how scant and form fitting these outfits are. It is not surprising then that such a high percentage of the females questioned felt this a pressure because in figure skating, no aesthetic detail goes unnoticed on the ice—including how one looks in their uniform.

Indeed, as discussed earlier the skaters themselves believe that body weight and physical appearance are very important in order to be successful in the sport of figure skating.

Another aspect related to this aesthetic requirement is the strive for perfection. In Taylor and Ste-Marie's (1998) study, it was found that 65.9% of the participants were in the disordered eating range for the subscale of Perfectionism on the EDI. This brings to light the pressure the skaters feel to look perfect and aesthetically pleasing. This is seen with the comment, "It is so stressful trying to be perfect. Perfect size (petite), perfect body, perfect skater". What are the consequences of this notion of striving for perfection and sport related weight requirements? By this questionnaire alone, we can attest to the fact that all of the figure skaters reported using one of the weight loss methods mentioned which included fasting/dieting, vomiting, diet pills and excessive exercise. This notion of sport specific demands ultimately leading to disordered eating tendencies has been postulated by many, and these results support this hypothesis. An example of this dangerous aspect of figure skating was mentioned by one of the participants: "I am so angry that this sport has caused me to develop an eating disorder. I wish I was normal".

This paper has advanced the knowledge base regarding weight issues and the sporting environment of athletes involved in an aesthetic sporting population. It has also provided some vital information for the sport of figure skating related to weight issues and weight loss pressures. It is important for individuals such as coaches to see that they may have a huge effect on their skaters and that any weight related comments they may make, however insignificant the coach may feel, may actually have a significant impact on the

perceptions of the skaters. Also, this research has brought to light many issues around the sport-specific requirement hypothesis. More specifically, many of the figure skaters in the present study felt that in order to be successful in this sport, they had to be thin, light, lean and physically appealing to all those involved in the sport.

This study raised important points to consider, but at the same time, we do acknowledge that there were limitations. First, this sample was fairly small and from a specific geographical location, thus it would be interesting to see if these results would be found in a larger and more geographically representative sample. Second, the method of measure, the SKATE Scale, was made solely for this study and has not gone through rigid validity and reliability testing. As well, related to the aspects into which the SKATE Scale tapped, it would be interesting to look at the possibility of weight loss pressure coming from the figure skater's teammates, as some of the skaters mentioned this idea. A final limitation of this study was that while our analysis was quantitative, our discussion has been largely supported by quotes obtained from the skaters in the open-ended question section of the SKATE Scale. While these quotes provided richness to our statements, future research should probe further into this issue by using qualitative analysis. Although this study was exploratory in nature, it nonetheless made it clear that for many female pair/dance figure skaters, weight loss pressures are evident and a concern to the athletes.

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Table 1

Mean Scores for Questions 1-10 From Skate Scale

Question	Mean
4. __encourage(s) participation weight control techniques	22.8
3. __encourage(s) maintenance of below weight	23.0
1. __think(s) my skating performance would improved if I lost 5 pounds	23.1
7. __scrutinize(s) my body and make(s) me/myself concerned about my weight	23.2
2. __notice(s) if I gain weight	25.4
6. __feel(s) that the lightest female skaters are at a distinct performance advantage	25.5
5. __encourage(s) participation in a weight-training program during the season	26.0
10. __feel(s) that the lightest female skaters are at a technical advantage for performing difficult elements, such as lifts	26.4
8. Body weight is important to __	27.1
9. Physical appearance is important to __	27.2

Note: A score of 35 indicates strong agreement with the question.

## Chapter IV

### GENERAL DISCUSSION

The general purpose of this thesis was twofold; first, to examine the self-reported eating tendencies of female pair/dance figure skaters, and second, to examine the potential weight loss pressures in the sport of pair/dance figure skating. In order to examine both aspects of this thesis, 41 figure skaters completed the EDI (a questionnaire that measured their self-reported attitudes behaviors regarding weight and various weight loss methods), as well as the SKATE Scale(a questionnaire that measured the figure skater's perceptions related to the various weight loss pressures that could be found in this sport).

#### General Findings of Article 1

After examining the self-reported eating attitudes and behaviors of the participants, the predicted outcomes were confirmed. The results of Article 1 showed a significant number of the figure skaters scoring equal or above the score known for anorexics. In addition, using criteria that other researchers used to identify disordered eating patterns (i.e., Davis, 1992) also helped to show a high percentage of participants with self-reported disordered eating attitudes and behaviors. Thus, the conclusion was that disordered eating tendencies exist for this specific population. These findings are consistent with others who have studied and found disordered eating patterns among female athletes competing in aesthetic sports (i.e., Davis, 1992; Rosen & Hough, 1988; Sundgot-Borgen, 1993, 1994a, 1994b). Further, single sample t-tests of the data revealed that the participants scored significantly higher and yielded more disordered eating patterns when compared to a female non-athletic population (Rosen, Silberg, & Gross, 1988). Taken together, these

results confirmed the hypothesis that the figure skaters in this study were “at risk” for the development of disordered eating patterns.

### General Findings of Article 2

Participants were scored according to their perceived weight loss pressures from five sources of potential pressure (coach, partner, parent, judge, and self). Results revealed that participants felt that weight loss pressures in pair/dance figure skating existed. Further, analyses of variance demonstrated that the skaters perceived themselves and their coaches as being the most significant sources of weight loss pressure. Moreover, additional analyses revealed a significant positive correlation between the cumulative mean score for the sources of potential weight loss pressure from the coach, the partner, the parent, and the judges when compared to the mean source of pressure of the figure skater herself ( $r=.69, p<.05$ ). Generally speaking, this means that when these external sources of weight loss pressure were summed up together, they have a significant relationship with the internal weight loss pressure from the skater. The higher the perceived weight loss pressure from the external sources of pressure, the higher the self-pressure. This supports our hypothesis that the weight loss pressure the skater is feeling is based on an accumulation of external pressure that she encounters. It must be noted then, that the externally derived weight loss pressures can lead to the figure skater to thinking and feeling these pressures internally. It should be acknowledged that there exists additional sources of potential weight loss pressure not mentioned in the SKATE Scale, such as that coming from the media and teammates. These sources of weight loss pressure, however, were not examined in the present study, and thus will not be elaborated upon.

Explanation of the issue of internal/external weight loss pressure can best be explained in the social psychology literature and the notions of compliance and acceptance. Compliance is defined as “publicly acting in accord with social pressure while privately disagreeing” (Myers, 1990, p. 203), while acceptance is defined as “both acting and believing in accord with social pressure” (Myers, 1990, p. 203). The social psychology literature stressed that compliance and acceptance are related in that compliance most often leads to acceptance. Related to our area of interest, this idea of compliance and acceptance can best be explained as follows. First, a female figure skater will feel weight loss pressure from external sources with respect to her weight. Although she complies to these and attempts to lose weight, she may not agree that weight loss is needed. After continued compliance and weight related pressure, the skater will then start to adopt the same beliefs and accepts that she must lose weight. This would thus lead her to internally believe that she must lose weight, based on an accumulation of the external sources of weight loss pressure.

Also, although the figure skaters acknowledged that there exists weight loss pressure, they felt the greatest amount of pressure related to physical appearance and performance outcomes. That is, the figure skaters felt they must be thin, lean and light, and be aesthetically appealing in order to attain a successful performance. In combination, weight loss pressures in pair/dance figure skating were evident.

#### Integration of Article 1 and Article 2

Over the past few years, several conclusions related to female aesthetic sport populations have been generated. One such inference made is that female athletes

involved in aesthetic sports such as gymnastics and figure skating are deemed “at risk” for the development of disordered eating patterns (Thompson & Sherman, 1993). Several studies have given strength to this assertion with the findings of disordered eating patterns in their sample of female athletes in aesthetic sports (e.g., Davis, 1992; Sundgot-Borgen, 1994a, 1994b), but the population of figure skaters has not been specifically investigated to the extent where strong conclusions can be made. This lack of knowledge justified the contributions made by Article 1. Based on these results, it was apparent that many of the figure skaters demonstrated self-reported attitudes and behaviors related to disordered eating patterns.

The next logical step was to ask *why* this was happening. Recently, researchers have begun to look at the sporting environment of these females as a possible explanation for the high incidences of disordered eating patterns that have been reported (e.g., Reel & Gill, 1996). It has been hypothesized that it is this sporting environment and the people involved in it that may cause these females to turn to pathogenic weight control techniques (Harris & Greco, 1988; Ryan, 1995; Thompson & Sherman, 1993). This assumption was the basis for Article 2. Based on the findings from Article 2, it became evident that the figure skaters perceived the pair/dance figure skating environment to be one filled with weight loss pressures, most specifically perceived to come from themselves and their coaches. These two articles, thus, become very much linked by how the pressures identified in the second article can be used to partly account for high incidence of disordered eating tendencies found in the first article.

To this end, the argument that aesthetic sports are a specific subculture, with its own expectations and requirements (e.g., Hiel, 1993; Reel & Gill, 1996; Ryan, 1995) was the one supported in the second article. The primary basis of this argument is that in aesthetic sports, the female athletes learn that in order to be successful, they must meet certain expectations. Of particular interest here was the perceived weight requirements associated with this subculture, and their subsequent effect on the eating patterns of the figure skaters. Information from the questions on the SKATE Scale revealed that the figure skaters believe that in order to be successful in this subjectively viewed sport they must be light and lean. Two factors were introduced to explain this. One concentrated on the physical performance requirements and the other on the aesthetic qualities of the sport.

Firstly, the female pair and/or dance figure skater may feel more of this weight loss pressure because it is she who is thrown and lifted by the male partner. Second, the skater knows that all aspects of her performance, including how she aesthetically looks are important to her success, since this sport is subjectively marked by a panel of judges. This fact therefore puts pressure on the female not only to be thin, in order to meet the rigors of the sport, but also to be beautiful and aesthetically pleasing. These subsequent pressures may then eventually lead the skater to employ dangerous and disordered eating patterns. The fact that the figure skaters indicated a tendency toward disordered eating patterns in Article 1, and revealed significant weight loss pressures in Article 2, supports this hypothesis of specific sport subcultures. However, before any definitive conclusions can be made regarding this relationship, future research in this area is needed.

In sum, evidence was presented related to high incidences of disordered eating tendencies and weight loss pressures in the sport of pair/dance figure skating. The next logical extension of this line of research, is the hypothesis that these weight loss pressures may contribute to the high incidence of disordered eating tendencies. To study that logic, correlational analyses were performed. The 3 subscales of the EDI most commonly discussed by researchers (Body Dissatisfaction, Bulimia, and Drive for Thinness) were separately entered and analyzed with the mean scores for each of the 5 sources of pressure from the SKATE Scale (coach, partner, parent, judge, skater). The rationale here is that a positive correlation between the weight loss pressures and a high EDI subscale score is strongly suggestive of a strong connection between the two factors. Indeed, a strong positive correlation was found for the subscales of Body Dissatisfaction and Drive for Thinness for all 5 sources of pressure, and the Bulimia Subscale was positively correlated with the pressure sources of coach, partner, parent, and themselves (see Table 1 for results). Together, these results indicate a strong relationship between sources of weight loss pressure and the self-reported attitudes and behaviors regarding weight for the participants. This finding stresses the importance for future research to look at this relationship as being a precursor to the explanation of disordered eating tendencies in female athletes.

#### Global Summary and Practical Implications of the Research

Based on the findings of Article 1, and Article 2, it becomes apparent that the sport of pair/dance figure skating has some serious issues that need to be addressed related to weight. First, the females figure skaters felt excessive pressure to be lean and light,

while at the same time be aesthetically pleasing in order to be successful in this sport.

Also, many of the figure skaters showed high incidences of self-reported disordered eating attitudes and behaviors, and these were made stronger by the responses the figure skaters gave related to the various weight control methods they reported using to lose weight.

The practical implications of this thesis are that all the individuals involved in this sport must step back and look at their behaviors and evaluate whether or not they are placing demands on their athletes that may contribute to disordered eating tendencies. While change will not happen overnight, it is research like this that will open up this issue to the sporting environments, and those involved within such environments. Education, in the form of seminars, written literature, and alike, are needed to educate those in this population on warning signs of eating disorders, how to deal with these and prevention knowledge, so that this does not become an issue. This research has basically shown that the often glamorous sport of figure skating is not without controversy and that disordered eating patterns are a potentially dangerous thorn in its side. Overall, findings from this thesis may be of best value to all those involved in the sport of figure skating, in that they have shed some light into how the female figure skaters feel and the actions they may employ to deal with these feelings. Research like this is an important first step towards increased awareness and knowledge of what is happening behind all the glittery costumes and smiles.

The limitations of this study only highlight the need for additional research on this area. First, while the sample was small and came from a limited geographical region, it nonetheless was representative of the population of pair/dance figure skaters for this

region. It would be interesting to see if such findings would be evident in other skating disciplines as well as from other geographical regions of Canada. Second, the SKATE Scale was designed primarily for this study and therefore did not go through the rigors of validity and reliability testing. However, since this area of study has not been extensively looked at, it would be interesting if future research used similar testing devices, would find similar results to those found in Article 2. Finally, it should be noted that while this paper has alluded to a possible relationship between weight loss pressures and disordered eating tendencies, this is only a hypothesis. Future research studying this very relationship would be interesting, in that, this may be the much needed answer why such high incidences of disordered eating tendencies have been found for females in aesthetic sporting populations.

### Conclusion

In conclusion, the general purpose of this thesis was to study the self-reported attitudes and behaviors, and perceptions of female pair/dance figure skaters towards weight and their sport. Results from this thesis have increased the understanding and knowledge of how female figure skaters feel about weight loss pressures in their sport, and their subsequent actions to deal with these pressures. More specifically, findings from Article 1 demonstrated that many of the figure skaters had self-reported attitudes and behaviors related to those with eating disorders and that the figure skaters had significantly higher self-reported disordered eating patterns when compared to a non-athletic female population (Rosen, Silberg, & Gross, 1988). Further, findings from Article 2 highlighted the weight loss pressures participants perceived as being evident in this

sporting population. The figure skaters indicated that they felt the most pressure to be lean and light in relation its potential performance advantages, and that they felt the most weight loss pressure from themselves and from their coach. Taken together, these results suggest a possible relationship between weight loss pressures and the ensuing pathogenic weight loss methods.

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**Table 1****Significant Correlational Analyses for the EDI and the SKATE Scale**

Pressure	EDI Subscale					
	DT		BD		B	
	r-value	p-value	r-value	p-value	r-value	p-value
Coach	.5590	.000	.4760	.002	.5575	.000
Partner	.5321	.000	.4933	.001	.5073	.001
Parent	.5121	.000	.4301	.005	.5429	.000
Judge	.5905	.000	.5777	.000		
Skater	.5857	.000	.4400	.004	.5553	.000

DT-Drive for Thinness

BD-Body Dissatisfaction

B-Bulimia

## Appendix A

### Contribution of Collaborators

### Contribution of Collaborators

Submission of both Article 1 and Article 2 to the subsequent journals and within this thesis have two authors indicated on the title page; Gail M. Taylor and Dr. Diane Ste-Marie. Inclusion of these authors are based on the fact that both have been involved in the various stages of this study and this thesis.

In terms of the actual research project, after I read the relevant studies related to my idea, I approached Dr. Ste-Marie with the general concept and basic framework for this project. After several designs of the proposed research study were drafted based on Dr. Ste-Marie's expertise in the research process and my knowledge and interest of the area, a final version of the project was completed. The next step was acquisition of the EDI and the development of the SKATE Scale. I was primarily responsible for both of these, with assistance by Dr. Ste-Marie. Specifically related to the SKATE Scale, Dr. Ste-Marie and several of my research colleagues assisted with revisions and guidance on this endeavor. It was also my responsibility to contact the various figure skating rinks in order to recruit participants for the study. I was thankfully assisted by two undergraduate student research colleagues in the collection, administering, and data entry of the questionnaires. All analyses were primarily completed by myself. After each analyses was completed, I met with Dr. Ste-Marie for the clarification and validation of my findings. Throughout this entire research process, I met regularly with Dr. Ste-Marie to discuss the progression of the project.

Moreover, it was my responsibility to create initial drafts of all written material. This material was passed in to Dr. Ste-Marie who carefully read through each draft and

**gave me important suggestions on improving these documents. Dr. Ste-Marie's guidance and help throughout this entire process has been truly beneficial and a tremendous asset to my thesis.**

## **Appendix B**

### **Revised Method**

### Revised Methodology

The following information is the original methodology section of the thesis proposal. It should be noted that although no major changes to the method were suggested by my committee, two subsequent changes were made after the thesis proposal. First, only 41 participants were recruited for the two studies. It was hoped to get 50 subjects, but based on estimates from the Canadian Figure Skating Association, the sample size was a good indicator of the population. Second, while it was proposed to include all eleven subscales of the EDI-2, only the original eight subscales were analyzed. This was primarily done for two reasons; first, only the original eight subscales have gone through rigorous validity and reliability tests; and second, the non-sporting population norms from Rosen, Silberg, & Gross (1988), only looked at the original eight subscales of the EDI. Thus, with these two factors in mind, it was decided only to look at these original subscales. If the reader wishes to view these revisions, they can be found in Article 1 and Article 2.

## Method

### Participants

Fifty pair and dance figure skaters from Ontario and Quebec will be recruited to participate in this study. Recruitment will occur through contact with the skating clubs by the researcher, followed by contact with the skaters themselves.

### Materials

Participants will complete the following questionnaires: The Eating Disorder Inventory-2 (EDI-2)- a 91-item, self-reported attitudes questionnaire designed by Garner (1991) which serves as a means to measure the psychological and behavioral traits commonly found in eating disorders for individuals over the age of 12 (see Appendix D). The EDI-2 is an updated version of the original EDI developed by Garner, Olmstead, & Polivy (1983). The original EDI contained 64 questions comprising three subscales to assess the self-reported attitudes and self-reported attitudes behaviors concerning eating, weight and shape, (Drive for Thinness, Bulimia, Body Dissatisfaction) and five subscales which tap into the more general constructs or psychological traits clinically linked to eating disorders (Ineffectiveness, Perfection, Interpersonal Distrust, Interoceptive Awareness, Maturity Fears). The new enhanced EDI-2 retains the original 64 items from the EDI, and includes 27 additional questions, which are entitled the EDI provisional subscales (i.e., Asceticism, Impulse Regulation, and Social Insecurity). These additional questions were added based on research that has indicated that eating disorders are multidetermined and multidimensional (Garner, 1991). More specifically, subscales measure: (1) Drive for Thinness-dieting concerns; (2) Bulimia-uncontrolled eating; (3)

Body Dissatisfaction-self-reported attitudes to shape; (4) Ineffectiveness-feelings of inadequacy; (5) Perfectionism-excessive expectations for superior achievement; (6) Interpersonal Distrust-alienation and reluctance to form close relationships; (7) Interoceptive Awareness-lack of confidence in identifying emotions and sensations of hunger and sensations of hunger and satiety; and (8) Maturity Fears-desire to retreat to a pre-adolescent state; (9) Asceticism-tendency to seek virtue through the pursuit of spiritual ideals such as self-discipline, self-denial, self-restraint, self-sacrifice, and control of bodily urges; (10) Impulse Regulation-tendency toward impulsivity, substance abuse, recklessness, hostility, destructiveness in interpersonal relationships, and self-destructiveness; and (11) Social Insecurity-belief that social relationships are tense, insecure, disappointing, unrewarding, and generally of poor quality. The questions are presented in a 6-point format requiring participants to answer whether each item applies "always", "usually", "often", "sometimes", "rarely", or "never".

Reliability for this questionnaire has been supported with reliability coefficients (alphas) for the 64-item EDI, ranging from .83 to .93 for the subscales for a eating disorder sample (Garner & Olmstead, 1984). Similarly, other studies have demonstrated alphas over .80, indicating internal consistency (Norrington, 1989; Norring & Sohlberg, Welch, 1988). Also, there have been three studies that used test-retest methods in order to determine the reliability of the EDI. All three studies demonstrated a high test-retest reliability, indicating that the EDI is indeed a reliable questionnaire to use (Crowther, Lilly, Crawford, & Sheperd, 1992; Wear & Pratz, 1987; Welch, 1988)

Validity for the EDI has been tested using three measures of validity. In order to determine content validity Garner, et al,(1983) state that 146 items were generated by a pool of clinicians who were both familiar with the research literature on eating disorders and who were involved in patient care. These 146 items were then broken down into 11 subscales. These items went through a correlation, and items were only retained if they were highly correlated with their intended subscale than with all of the other subscales. This correlation yielded the original eight subscales of the EDI. A Second measure of validity, criterion-related validity was again tested by Garner, et al, (1983). This validity is based on the ability of items to discriminate between the eating disordered population and the nonpatient samples. Again, Garner, et al, (1983) stated that all items on the original EDI met this standard. As well, Garner, et al, (1983) also documented that criterion-related validity was met for the eight subscales of the EDI. The final method to test validity of the EDI involved testing construct validity. This construct validity involves testing convergent validity. In order to do this, a strong relationship with other measures of the same construct are tested. Garner, et al, (1983) and Garner & Olmstead (1984) found that several of the EDI subscales overlapped conceptually with other self-reported attitudes measures that were administered as a part of the initial validation of the EDI. Subsequent correlations with these measures provided support for convergent validity of the EDI. These correlations were made with the Eating Attitude Test (Garner, Olmstead, Bohr, & Garfinkel, 1982), a questionnaire that looks at dieting and eating self-reported attitudes, and the Restraint Scale (Herman & Polivy, 1975), which measures dieting self-reported attitudes behaviors. See Garner (1991) for a summary of all subsequent

studies that have duplicated the findings of Garner, et al, (1983)—the EDI is a valid and reliable questionnaire. This point is further stressed by Crowther, Lilly, Crawford, & Sheperd (1992) who state that the EDI has been reported to be one of the most widely used standardized measures that assesses the eating self-reported attitudes and self-reported attitudes behaviors characteristic of eating disorders.

The second questionnaire participants will complete is the SKATE Scale- a 18-item self-reported attitudes questionnaire designed by this researcher to investigate pressures hypothesized as being associated with possible disordered eating tendencies in pair/dance figure skating, (see Appendix C). These include pressures from one's coach, one's partner, the judges, one's parents, and oneself. Ten questions were structured with possible responses of strongly agree, agree, neutral, disagree, and strongly disagree. The SKATE scale also includes descriptive questions regarding caloric intake, knowledge regarding weight loss techniques from teammates, exercise frequency, past use of pathogenic weight control self-reported attitudes behaviors, weight requirements specific to the skating club, and an open question regarding what the participant feels the pressures are that are associated with dance/pair figure skating that are not addressed in the questionnaire. Finally, demographic information relating to the figure skater is presented at the beginning of the SKATE Scale.

The primary purpose of the SKATE Scale is to determine what type of weight loss pressures exists in figure skating. To generate the SKATE Scale, the following steps were used. First, a pool of questions was generated based on literature relevant to the topic. These questions were then examined by expert raters including former six dance/pair

figure skaters, two eating disorder therapists, four psychologists, two doctors, including one of the medical doctors from the Canadian Figure Skating Association, to look at the accuracy and applicability of the questions. Based on the experts comments and recommendations regarding the SKATE Scale, the final version of the SKATE Scale was completed.

### Procedures

Questionnaires will be distributed by the researcher to participants at the selected skating clubs. Instructions from the experimenter regarding the questionnaires such as ensuring a parent sign the consent form, ensuring that the participant will complete the questionnaires without the help of any other significant other, and ensuring that the questionnaires will be returned if permission for participation is given will be supplied at the beginning of the figure skaters' practice. A test packet with the consent form, the EDI-2 and the SKATE Scale will be given to willing participants at that stage. If granted permission to participate, skaters will return the completed questionnaires and consent forms directly to the researchers in the two stamped, addressed envelopes provided in the package. Approximately thirty minutes will be needed to complete the questionnaires.

## Appendix C

### SKATE Scale

# SKATE Scale

Please answer the following questions by circling the number 1-7, with 1 being strongly disagree (SD), 3.5 being neutral (N) and 7 being strongly agree (SA). Please ensure that you are answering these questions independently, only seeking assistance when a question is not clear. If at any time you wish to not complete this questionnaire, please feel free to do so, with no fear of reprisal from the researcher.

Age: \_\_\_\_\_

Skating Discipline (Pair/ Dance): \_\_\_\_\_

Number of Years Skating: \_\_\_\_\_

Number of Years Competing: \_\_\_\_\_

Number of Years Skating Pair/Dance: \_\_\_\_\_

Competitive Level: \_\_\_\_\_

1. \_\_\_\_\_ think(s) my skating performance would improve if I lost 5 pounds.

My Coach	1 SD	2	3	3.5 N	4	5	6	7 SA
My Partner	1 SD	2	3	3.5 N	4	5	6	7 SA
My Parent(s)	1 SD	2	3	3.5 N	4	5	6	7 SA
The Judges	1 SD	2	3	3.5 N	4	5	6	7 SA
I	1 SD	2	3	3.5 N	4	5	6	7 SA

2. \_\_\_\_\_ notice(s) if I gain weight.

My Coach	1 SD	2	3	3.5 N	4	5	6	7 SA
My Partner	1 SD	2	3	3.5 N	4	5	6	7 SA
My Parent(s)	1 SD	2	3	3.5 N	4	5	6	7 SA
The Judges	1 SD	2	3	3.5 N	4	5	6	7 SA
I	1 SD	2	3	3.5 N	4	5	6	7 SA

3. \_\_\_\_\_ encourage(s) maintenance of below average weight.

My Coach	1 SD	2	3	3.5 N	4	5	6	7 SA
My Partner	1 SD	2	3	3.5 N	4	5	6	7 SA
My Parent(s)	1 SD	2	3	3.5 N	4	5	6	7 SA
The Judges	1 SD	2	3	3.5 N	4	5	6	7 SA
I	1 SD	2	3	3.5 N	4	5	6	7 SA

4. \_\_\_\_\_ encourage(s) participation of weight control techniques.

My Coach	1 SD	2	3	3.5 N	4	5	6	7 SA
My Partner	1 SD	2	3	3.5 N	4	5	6	7 SA
My Parent(s)	1 SD	2	3	3.5 N	4	5	6	7 SA
The Judges	1 SD	2	3	3.5 N	4	5	6	7 SA
I	1 SD	2	3	3.5 N	4	5	6	7 SA

5. \_\_\_\_\_ encourage(s) participation in a weight-training program during the season.

My Coach	1 SD	2	3	3.5 N	4	5	6	7 SA
My Partner	1 SD	2	3	3.5 N	4	5	6	7 SA
My Parent(s)	1 SD	2	3	3.5 N	4	5	6	7 SA
The Judges	1 SD	2	3	3.5 N	4	5	6	7 SA
I	1 SD	2	3	3.5 N	4	5	6	7 SA

6. \_\_\_\_\_ feel(s) that the lightest female skaters are at a distinct performance advantage.

My Coach	1 SD	2	3	3.5 N	4	5	6	7 SA
My Partner	1 SD	2	3	3.5 N	4	5	6	7 SA
My Parent(s)	1 SD	2	3	3.5 N	4	5	6	7 SA
The Judges	1 SD	2	3	3.5 N	4	5	6	7 SA
I	1 SD	2	3	3.5 N	4	5	6	7 SA

7. \_\_\_\_\_ scrutinize(s) my body and make(s) me/myself concerned about my weight.

My Coach	1 SD	2	3	3.5 N	4	5	6	7 SA
My Partner	1 SD	2	3	3.5 N	4	5	6	7 SA
My Parent(s)	1 SD	2	3	3.5 N	4	5	6	7 SA
The Judges	1 SD	2	3	3.5 N	4	5	6	7 SA
I	1 SD	2	3	3.5 N	4	5	6	7 SA

8. Body weight is important to \_\_\_\_\_

My Coach	1 SD	2	3	3.5 N	4	5	6	7 SA
My Partner	1 SD	2	3	3.5 N	4	5	6	7 SA
My Parent(s)	1 SD	2	3	3.5 N	4	5	6	7 SA
The Judges	1 SD	2	3	3.5 N	4	5	6	7 SA
Me	1 SD	2	3	3.5 N	4	5	6	7 SA

9. Physical appearance is important to \_\_\_\_\_

My Coach	1 SD	2	3	3.5 N	4	5	6	7 SA
My Partner	1 SD	2	3	3.5 N	4	5	6	7 SA
My Parent(s)	1 SD	2	3	3.5 N	4	5	6	7 SA
The Judges	1 SD	2	3	3.5 N	4	5	6	7 SA
Me	1 SD	2	3	3.5 N	4	5	6	7 SA

10. \_\_\_\_\_ feel(s) that the lightest female skaters are at a technical advantage for performing difficult elements, such as lifts.

My Coach	1 SD	2	3	3.5 N	4	5	6	7 SA
My Partner	1 SD	2	3	3.5 N	4	5	6	7 SA
My Parent(s)	1 SD	2	3	3.5 N	4	5	6	7 SA
The Judges	1 SD	2	3	3.5 N	4	5	6	7 SA
I	1 SD	2	3	3.5 N	4	5	6	7 SA



18. What, if any are your skating club's weight policies ? (e.g., specific weight limits for trying out/competition, weight goals, and weigh-ins at practice and competition).

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List any pressures in pairs/dance figure skating not addressed here that you can think of.

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Comments:

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Thank-you for your participation

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**APPENDIX D  
126-130**

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**UMI**

## Appendix E

### Ethics Approval



# Université d'Ottawa · University of Ottawa

Faculté des sciences de la santé  
Cabinet de la doyenne

Faculty of Health Sciences  
Office of the Dean

May 7, 1997

Student Gail Taylor  
Professor Diane Ste-Marie  
School of Human Kinetics  
Faculty of Health Sciences  
University of Ottawa  
Montpetit Hall  
INTRA

**Subject:** *Your project entitled "Weight loss pressures in figure skating: Is there a relationship to disordered eating?"*

---

Dear Student and Dear Professor:

It is my pleasure to inform you that the Faculty of Health Sciences, Human Research Ethics Committee, after study of the documentation provided, concluded that your project met the appropriate standards of ethical acceptability and falls within **CATEGORY 1A**.

I hereby attach a copy of the certificate of clearance granted by the University Human Research Ethics Committee.

This certificate is valid for a period of one year from the time of issuance. I would also like to remind you that, in accordance with the policies of the UHREC, it is your responsibility to notify the Committee of any major changes in this project.

On behalf of the Committee, I wish you success in your project.

Sincerely,

J. Roger Proulx, Ph.D.  
Chair, Human Research Ethics Committee

Encl.



# Université d'Ottawa - University of Ottawa

Faculté des sciences de la santé  
Cabinet de la doyenne

Faculty of Health Sciences  
Office of the Dean

## CERTIFICATION OF INSTITUTIONAL HUMAN RESEARCH ETHICS COMMITTEE FACULTY OF HEALTH SCIENCES

This is to certify that the Institutional Human Research Ethics Review Committee of the Faculty of Health Sciences has examined the research proposal by **Student Gail Taylor and Professor Diane Ste-Marie** from the School of Human Kinetics, for the project "*Weight loss pressures in figure skating: Is there a relationship to disordered eating?*" and concludes that, in all respects, the proposed research protocol meets the appropriate standards of ethical acceptability, at a **Category 1A** level.

### MEMBERS OF THE COMMITTEE

<u>Name (Optional)</u>	<u>Position held</u>	<u>Department of discipline</u>
Victor Boucher	Professor	Audiology and Speech-Pathology Program
François Tremblay	Professor	Physiotherapy Program
Claire-Jehanne Dubouloz	Professor	Occupational Therapy Program
Jocelyne Tourigny	Professor	School of Nursing
Julian Roberts	Professor	Department of Criminology
Roch Paquin	Member-at-Large	
Mark Grenier	Student	School of Human Kinetics
J. Roger Proulx	Chair	Human Research Ethics Committee School of Human Kinetics

### SIGNATURE

07/05/97

Date

Committee Chairperson - J. Roger Proulx, Ph.D.