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PREDICTORS OF EATING PATHOLOGY IN ADOLESCENTS: A COMPARISON
OF BALLET DANCERS AND NON-DANCERS

by

Alison Ann Spadafora

A Dissertation
Submitted to the Faculty of Graduate Studies
Through the Department of Psychology
In Partial Fulfillment of the Requirements for the
Degree of Doctor of Philosophy at the
University of Windsor

Windsor, Ontario, Canada

2010

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AUTHOR'S DECLARATION OF ORIGINALITY

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ABSTRACT

Adolescence is a developmental stage in which there is a heightened risk for the development of eating pathology in girls. Adolescents who participate in aesthetic sports, such as dance or gymnastics, which are known to emphasize thinness, are believed to be at even higher level of risk for eating pathology than girls in the general population. Ballet is an example of an aesthetic sport where thinness is thought to be greatly emphasized and valued. There is a strong body of literature indicating that ballet dancers have more eating pathology than non-dancers, but explanatory models have not been extensively researched and dancers' perceptions about the pressures that they experience have rarely been assessed. The current study tested a predictive model of eating pathology in adolescent girls who were hypothesized to experience different levels of risk for eating pathology. Girls who were studying classical ballet at well-established dance schools ($N = 45$) were compared with high school girls who were not currently studying ballet ($N = 111$) on individual, interpersonal, and socicultural variables that were selected for their strong empirical support. Although dancers in the current sample had significantly lower BMIs than non-dancers, they did not have higher levels of pathological eating. However, SEM analyses indicated that the processes leading to pathological eating among dancers and non-dancers differ. Analyses of dancers' experiences suggested that dancers did not perceive pressures to be thin from instructors or peers. Instead, dancers who participated in the current study perceived ballet to be a positive experience in their life with a health-promoting effect.

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Chapter I

INTRODUCTION

*Overview**Context of the Problem*

Eating disorders are characterized by body image concerns, maladaptive eating behaviours and harmful methods of weight loss (American Psychiatric Association [APA], 2000). The age of onset is typically during adolescence, a time when females encounter various developmental stressors and physical changes (Attie & Brooks-Gunn, 1992). Since eating disorders are associated with high rates of comorbid psychopathology and harmful physical side effects in all major organ systems of the body (APA, 2000), affected youth experience considerable impairment in many areas of their lives.

Although eating disorders are a low base rate phenomenon (APA, 2000; Striegel-Moore & Cachelin, 2001), subclinical eating pathology is widespread among adolescents. Specifically, approximately half of all adolescent girls attempt to lose weight through dieting, exercise, or the use of vomiting, laxatives, or diuretics (e.g., Shisslak et al., 1998, Crow, Eisenberg, Story, & Neumark-Sztainer, 2006). Certain subgroups of adolescents, such as those who take ballet lessons, are at an elevated risk for eating pathology (e.g., Garner, Rosen & Barry, 1998; Smolak, Murnen, & Ruble, 2000). Dancers experience more eating pathology and body image concerns, and they also weigh less than adolescents who do not take ballet lessons (e.g., Garner & Garfinkel, 1980; Davison, Earnest & Birch, 2002; Ravalidi et al., 2003).

Traditionally, eating pathology in ballet dancers has been understood as a common and even acceptable reaction to the discipline's requirements of extremely low

body weights (Hamilton & Robson, 2006). This view is problematic given that the majority of adolescent dancers do not go on to dance professionally. Eating pathology in dancers cannot be considered an adaptive weight control strategy since dancers with eating pathology report similar levels of symptoms on standardized measures of eating pathology as do non-dancers with eating pathology (Ringham et al., 2006). Dancers are thus equally as likely to suffer from the same harmful side effects as non-dancers. For example, Davis and Strachan (2001) reported that 30% of women hospitalized for Anorexia Nervosa at the Toronto General Hospital participated in elite athletics or professional dance prior to their hospitalization (Davis & Strachan, 2001).

Although predictors of eating pathology have been identified for adolescents in the general population, there is virtually no research examining predictors of eating pathology in adolescent dancers. The lack of research is problematic given that dancers appear to be at elevated risk for developing eating pathology. The present research will examine predictors of eating pathology in adolescent dancers and non-dancers. This comparative study will be informed by developmental psychopathological theory. Specifically, predictor variables will include individual variables (i.e., internalization of the thin ideal, body image concerns, perfectionism, internalizing and externalizing psychopathology), interpersonal and sociocultural pressures to be thin (i.e., direct comments from parents and peers about eating, shape and weight; weight-related teasing; and the presence of parents and peers who are themselves trying to lose weight). The overarching goal of this research is to provide a better understanding of predictors of eating pathology in adolescent girls who have different levels of risk for eating pathology.

Organization of Literature Review

The review begins with definitional issues, a description of developmental psychopathological theory, and the application of developmental psychopathological theory to eating pathology. This will be followed by a review of variables that have been closely associated with eating pathology for adolescent girls, followed by a review of the interrelationships among these variables. Finally, there will be a review of eating pathology in adolescent dancers.

Eating Disorders from the Perspective of Developmental Psychopathology

Developmental psychopathology is a unique approach to understanding the processes underlying the emergence of psychopathology throughout the lifespan (Cummings, Davies, & Campbell, 2000). Considered a macroparadigm, developmental psychopathology grew out of research on children at-risk for psychopathology (Sameroff, 2000; Cicchetti & Rogosch, 2002). In early studies, not all children of parents with psychopathology became maladjusted, and some children with no family history of psychopathology became maladjusted due to the deleterious effects of family conflict and poverty (Rutter & Sroufe, 2000). Researchers then began to conceptualize adjustment and maladjustment as dynamic states that are influenced by a variety of risk and protective factors at individual, interpersonal, and sociocultural levels.

Developmental psychopathology emerged as a result of the failure of traditional theories to explain psychopathology (Sameroff, 2000). Traditional theories of psychopathology provided only a limited understanding of diverse outcomes. Theories did not reflect the findings that intricate processes lead to the gradual emergence of psychopathology over time, and that risk and protective factors interact. There is also an

implicit assumption in traditional theories of psychopathology that one theory can account for the emergence of psychopathology (Rutter & Sroufe, 2000). However, simple causal models were unsatisfactory, and more intricate models incorporating variables from multiple domains were needed (Sameroff, 2000).

Additionally, our awareness of how psychopathology presents throughout the lifespan has improved for disorders that were previously thought to be absent in young children. There have also been advances in understanding the continuity between childhood behavior problems and adult outcomes. For example, conduct problems with a childhood onset appear to be more persistent and severe than late-onset conduct problems (Campbell, Shaw, & Gilliom, 2000). These improvements in understanding came as a result of research on parenting styles, attachment and contextual factors such as poverty.

The application of developmental psychopathological theory would greatly improve the understanding of predictors of eating pathology in adolescents. Eating disorders are considered to have multifactorial etiologies (Striegel-Moore & Cachelin, 2001), and developmental psychopathological theory provides a useful framework for linking predictors of eating pathology at individual, interpersonal and sociocultural levels. Since studying eating pathology from this perspective incorporates variables that are relevant for adolescent girls, such as the influence of peers, there are direct implications for interventions with this population. For example, finding that weight-related teasing is an important predictor of eating pathology in adolescent girls (Lieberman, Gauvin, Bukoski, & White, 2001) supports anti-bullying intervention strategies within the school system.

The diagnostic category of eating disorders includes several specific diagnoses (Anorexia Nervosa, Bulimia Nervosa and Eating Disorder Not Otherwise Specified) that share the core characteristics of body image concerns and maladaptive eating behaviors (APA, 2000). Anorexia Nervosa is characterized by drastic caloric restriction or purging in an attempt to lose weight, whereas Bulimia Nervosa involves engaging in compensatory behaviors, such as purging or exercising after eating large quantities of food. Eating Disorder Not Otherwise Specified (EDNOS) is a diagnostic category for those who do not meet full criteria for Anorexia or Bulimia, yet who still demonstrate disordered eating.

Adjustment and Maladjustment in the Context of Eating Disorders

The examination of predictors of eating pathology from a developmental psychopathological perspective first requires an understanding of how adjustment and maladjustment are conceptualized. Developmental psychopathology espouses a dimensional view of psychopathology, reflecting a continuum of functioning that is theoretically possible for any given person at any point in time. Maladjustment, and in this case, eating pathology, is seen to evolve gradually over time as a result of complex relationships between risk and protective factors at individual, interpersonal and sociocultural levels; there is no precise demarcation between normal eating and pathological eating (e.g., Cummings et al., 2000).

Developmental psychopathology stands in contrast to the categorical approach to understanding psychopathology that is reflected in the current diagnostic system. *The Diagnostic and Statistical Manual for Mental Disorders* (DSM-IV-TR; APA 2000) was greatly influenced by the biomedical model, which assumes that a single causal model

can explain psychopathology in all people (Widiger, 1997). There is an assumption that symptoms have the same meaning and expression across different developmental stages, and that childhood disorders are essentially the same as adult disorders, or that they will lead directly to an adult disorder (Sameroff, 2000).

Researchers have asserted that eating pathology in children and adolescents is not accurately captured by DSM-IV-TR diagnostic criteria, and several guidelines for recognizing pathological eating in this age group have been proposed to address these limitations (Robin, Gilroy & Dennis, 1998). Kreipe and colleagues (1995) concluded that eating disorders should be investigated in adolescents who fail to meet expected weight gain for their age, think about food obsessively, and practice risky weight loss strategies. Similarly, Robin and colleagues (1998, p. 41) recommend that eating disorders should be suspected *“in any child or adolescent who engages in potentially unhealthy weight control practices and/or demonstrates obsessive thinking about food, weight, shape, or exercise.”*

From a developmental psychopathological perspective, pathological eating involves binge eating and/or trying to lose weight through dieting or other compensatory methods of weight control (e.g., vomiting, diet pills). This more dimensional perspective allows for the investigation of a broader range of symptoms of eating pathology, ranging from mild to severe, than can be captured by strict reliance on DSM-IV-TR (APA, 2000) diagnostic criteria for eating disorders. That is, investigating adolescents with a DSM-IV-TR eating disorder diagnosis would reflect only one end of the continuum of functioning that is possible, and provide quite limited information about pathological eating in this age group (e.g., Cicchetti, 1993). Thus, the term *“eating pathology”* will be used to

describe a broad spectrum of pathological eating in adolescents, and the term “*eating disorders*” will be used when discussing pathological eating as defined by the DSM-IV-TR (APA, 2000).

It is important to investigate subclinical eating pathology during adolescence, as subclinical eating pathology can lead to clinically significant eating disorders (Attie & Brooks-Gunn, 1989; Patton, Selzer, Coffey & Wolfe, 1999). Eating disorders can be fatal, with mortality rates ranging from 1 to 13% (Agras et al., 2004). Death can be caused from electrolyte imbalances, the physical effects of eating disorder symptoms, or suicide (APA, 2000). Eating disorders can cause damage to all major organ systems of the body as a result of starvation, or from the side effects of bingeing or purging (APA, 2000; Rome et al., 2003). For affected individuals, prognosis is more favorable when the eating disorder is identified and treated during adolescence compared to when the eating disorder begins in, or persists into adulthood (Robin et al., 1998).

Eating pathology typically emerges during adolescence, a time when females experience rapid physical changes that can result in increased storage of adipose tissue and subsequent weight gain (Attie & Brooks-Gunn, 1992). Body image concerns often develop in adolescent girls when their body shape diverges from society’s image of an ideal woman (Steiner et al., 2003). Girls also encounter several developmental changes, such as increased independence from parents, greater importance of peer relationships, and the onset of dating and high school. As a result of these physical and social changes, adolescence is a developmental period in which there is a heightened risk for the development of eating pathology.

Eating pathology is common during adolescence; approximately half of all girls attempt to lose weight through diet, exercise, or through other compensatory weight loss methods (e.g., Shisslak et al., 1998; Croll, Neumark-Sztainer, Story, & Ireland, 2002; Neumark-Sztainer, Wall, Story, & Perry, 2003; Crow et al., 2006). When asked what types of behaviors they are engaging in to lose weight, the most common methods that girls report are diet and exercise (Shisslak et al., 1998; Neumark-Sztainer, Story, Falkner, Beuhring, & Resnick, 1999). Less common methods of weight loss that adolescents report include fasting, smoking to suppress appetite, vomiting and using diet pills and laxatives (Croll et al., 2002).

Risk and Resiliency in the Context of Eating Disorders

According to developmental psychopathological theory, the processes leading to maladjustment are intricate and complex, involving multiple individual, interpersonal and sociocultural variables (Cummings et al., 2000). Correlates are variables that are significantly associated with the outcome of interest and risk factors are variables that have been found to occur prior to the outcome of interest (Jacobi, Hayward, de Zwaan, Kraemer, & Agras, 2004). It is rare that a single risk factor operating in isolation leads to maladjustment (Cummings et al., 2000). Many individual risk factors are surrogates for multiple risk factors that may simply not have been measured in the research. In other words, risk factors do not directly lead to maladjustment; they increase the probability for maladjustment as a result of increased exposure to additional risk factors or limited exposure to protective factors (Cicchetti & Sroufe, 2000). Risk and protective factors are additive; the presence of more risk factors increases the probability for maladjustment in

later life, while the presence of more protective factors increases the probability for adjustment (Sroufe, Carlson, Levy, & Egeland, 1999).

Children who are exposed to multiple risk factors are referred to as being “at-risk” for becoming maladjusted. Although children who are at-risk have a higher probability for maladjustment, some children function well despite having experienced many risk factors. This is referred to as resiliency (Cumming et al., 2000). Resiliency is dynamic; children who are well adjusted and resilient at one point in development will not necessarily be well adjusted at a later point in time. Investigating resilient children allows researchers to examine factors that protect against maladjustment. Subsequent prevention efforts can then be directed towards decreasing the risk factors and increasing protective factors (Cummings et al., 2000).

A thorough investigation of predictors of eating pathology from a developmental psychopathological perspective would include a broad sample of girls who experience different levels of risk for eating pathology. This can be accomplished by comparing girls in the general population with girls who are at an even higher level of risk for eating pathology. Comparing predictors of eating pathology in two samples of girls would provide more in-depth information than could be gained from studying one sample alone and important information about what variables can be targeted through interventions.

One subgroup that is at-risk for developing eating pathology is adolescents who participate in aesthetic sports such as dance, gymnastics, or figure skating (Garner et al., 1998). In a recent meta-analysis, athletes who participated in aesthetic sports were significantly more likely to have eating pathology than athletes who participated in athletics that did not emphasize leanness (Smolak et al., 2000). Athletes who participated

in sports that did not emphasize leanness reported significantly less eating pathology than non-athletes, suggesting that participation in such activities may protect against eating pathology. Thus, participation in athletics per se does not increase adolescents' risk for developing eating pathology. Rather, participation in athletics in which thinness is emphasized appears to increase the risk for eating pathology.

Ballet is an aesthetic sport in which leanness is greatly emphasized and valued. Girls who take ballet lessons have been found to experience significantly more eating pathology and body image concerns, and to weigh significantly less than adolescents who do not take ballet lessons (e.g., Garner & Garfinkel, 1980; Davison et al., 2002; Ravaldi et al., 2003). In addition, researchers have found that college women who reported taking ballet during childhood obtained significantly higher scores than women who did not take ballet on the bulimia, drive for thinness and impulse regulation subscales of the Eating Disorder Inventory-2 (EDI-2) (Ackard, Henderson & Wonderlich, 2004). This finding lends further support to the premise that dancers are more at-risk for eating pathology.

Thus, a thorough investigation of predictors of eating pathology can be accomplished by comparing adolescents who take ballet lessons with adolescents who do not take ballet lessons. According to Cicchetti and Rogosch (2002, p. 14), "*risk and protective processes and the manner in which they transact may vary depending on the priorities of the culture.*" Relative to adolescents who are not involved in ballet, it appears that dancers likely encounter increased sociocultural pressures to be thin as a result of their involvement in a subculture in which thinness is greatly valued, emphasized and encouraged. Furthermore, comparing these two groups of adolescents will improve the understanding of whether or not the same variables predict eating

pathology for dancers, and whether the greater prevalence of eating pathology in dancers can be explained by increased exposure to these variables, or whether there are different variables that predict eating pathology for dancers and non-dancers.

Predictors of Eating Pathology in Adolescents

A number of variables have been identified as important predictors of eating pathology in adolescent girls. Several variables (i.e., body mass index, body image concerns, direct comments from parents and peers, weight-related teasing, internalizing psychopathology, and perfectionism) were selected for the current study because they were identified as strong predictor variables in a meta-analytic study (Stice, 2002) and because previous studies have investigated these variables in adolescents dancers.

Although meta-analytic research (e.g., Stice, 2002) has not found strong support for the presence of peers who are trying to lose weight as a predictor variable for eating pathology, in other studies this variable has been identified as an important predictor of body image concerns and dieting for pre-adolescent and adolescent girls (e.g., Smolak, Levine & Schermer, 1999). Internalization of the thin ideal and externalizing psychopathology were also included in the current research because although there has been relatively little research in these area, more recent research suggests that these variables are strongly associated with eating pathology in adolescent girls (Stice, 2002; Mamorstein, von Ranson, Iacono & Succop, 2007).

Body mass index. The literature indicates that body image concerns and the body mass index (BMI) are the strongest predictors of eating pathology for adolescent girls (Attie & Brooks-Gunn, 1989; Wertheim, Koerner, & Paxton, 2001; Hill, 2007). The BMI

is considered to be an indicator of body fat and a screening tool to identify people who may be at-risk for health problems (Center for Disease Control and Prevention, 2007a).

Body image concerns. According to sociocultural theories, thinness is highly emphasized and valued in North America. Body image concerns arise when there is a discrepancy between desired body shape and actual body shape. Such body image concerns can lead to eating pathology (Levine, Smolak, & Hayden, 1994).

Body image concerns are common in both pre-adolescent and adolescent girls (Adams, Katz, Beauchamp, Cohen, & Zavis, 1993; Kelly, Wall, Eisenberg, Story, & Neumark-Sztainer, 2005; Sim & Zeman, 2006). McVey, Tweed, and Blackmore (2004) found that 40% of pre-adolescent girls had body image concerns. In another study, approximately half of the girls between ages 6 and 8 reported that they wanted to be thinner (Dohnt & Tiggeman, 2006). Neumark-Sztainer, Paxton, Hannan, Haines and Story (2006) found that body image concerns were reported by 34% of the girls in their sample, and 18% of the girls in their sample reported having high body satisfaction. Other researchers have found that approximately 26% of girls were unhappy with their bodies most of the time, and 35% were sometimes unhappy with their bodies (Sinton & Birch, 2006).

For girls, body image concerns tend to become more severe with age and this finding can be explained by the increase in BMI that occurs throughout puberty (Steiner et al., 2003). Body image concerns are most severe in adolescent girls with elevated BMIs (Hill, 2007); there is a positive correlation between BMI and levels of eating pathology and a desire to be thinner (e.g., Kostanski & Gullone, 1998; Shisslak et al., 1998; McVey et al., 2004; Bearman, Presnell, Martinez, & Stice, 2006; Dohnt &

Tiggeman, 2006). Thus, body image concerns are more likely to be found in girls with elevated BMIs (Stice & Whitenton, 2002) and body satisfaction is more likely to be found in girls with BMIs in the normative range (Kelly et al., 2005).

Further supporting the premise that elevated BMI is an important predictor of eating pathology are findings that girls who have clinical eating disorders are likely to have elevated BMIs. In Neumark-Sztainer and colleagues' (1999) study, approximately 7% of girls would have met diagnostic criteria for an eating disorder and girls with a Body Mass Index (BMI) greater than the 95th percentile had the highest risk of eating disorders. Similarly, in a younger sample of pre-adolescents, approximately 10% of girls scored in the clinical range on the Children's Eating Attitudes Test (ChEAT; Smolak & Levine, 1994; McVey et al., 2004). The ChEAT is a measure of eating pathology in children that suggests the possible presence of an eating disorder. In McVey and colleagues' (2004) study, girls who scored in the clinical range on the ChEAT were more likely to have elevated BMIs.

Thus, there is good support in the literature that body image concerns and elevated BMI are the strongest predictors of eating pathology for adolescent girls (Attie & Brooks-Gunn, 1989; Wertheim et al., 2001; Hill, 2007). According to Stice (2002), elevated BMI does not directly lead to eating pathology. Instead, elevated BMI increases the severity of other predictor variables, such as body image concerns, or sociocultural pressures to be thin, which then lead to eating pathology.

As an illustrative example, Neumark-Sztainer and colleagues (2003) tested a predictive model of eating pathology in adolescent girls using structural equation modeling. They hypothesized that eating pathology would be predicted by body image

concerns, psychological symptoms, attitudes towards eating and BMI. In addition, weight and shape norms for parents and peers (e.g., weight-related teasing, the presence of parents and peers who are trying to lose weight) were expected to lead to body image concerns and psychological symptoms, and low family connectedness was expected to lead to body image concerns. Neumark-Sztainer et al. (2003) found that elevated BMI led directly to body image concerns, and that body image concerns led directly to eating pathology. Also, weight and shape norms for parents and peers led directly to body image concerns. A weak but significant relationship was also found between low family connectedness and body image concerns. There were no significant relationships between eating pathology and attitudes towards eating and psychological symptoms.

Other researchers have found that body image concerns, along with preoccupation with thinness and negative life events, are risk factors for eating pathology (McKnight Investigators, 2003). In the McKnight Investigators Study (2003), psychological symptoms were identified as risk factors, but they were highly correlated with body image concerns and preoccupation with thinness. After controlling for initial levels, psychological symptoms were not significant predictors of eating pathology. Wertheim and colleagues (2001) also found that body image concerns were a risk factor for eating pathology. These researchers identified dieting, elevated BMI, and having experienced weight-related teasing as risk factors for bingeing and purging specifically. In this study, psychological symptoms were not found to be significant risk factors for eating pathology.

Alternatively, there is evidence that eating pathology is a risk factor for body image concerns. Ohring, Graber, and Brooks-Gunn (2002) found that eating pathology,

depression, and elevated BMI predicted the development of body image concerns in adolescent girls. In another study, eating pathology was a risk factor for body image concerns when BMI was held constant (Neumark-Sztainer et al., 2006). Eating pathology, depression, and a lack of social support also predicted the development of body image concerns in a study by Bearman and colleagues (2006).

Based on accumulated research, Striegel-Moore and Cachelin (2001) concluded that there is a bi-directional relationship between eating pathology and body image concerns. There is good support in the literature that elevated BMI predicts body image concerns and body image concerns predict eating pathology (Neumark-Sztainer et al., 2003). Yet, there is also evidence that eating pathology predicts body image concerns (Ohring et al., 2002). One potential reason for this finding is that girls who engage in pathological eating typically do not lose weight. Instead, girls who engage in pathological eating habits typically gain weight, which further increases body image concerns (Stice, Cameron, Killen, Hayward, & Taylor, 1999).

Internalization of the thin ideal. More recent research suggests that internalization of the thin ideal moderates the relationship between BMI and body image concerns (Thompson & Stice, 2001). Internalization of the thin ideal refers to “*the extent to which an individual cognitively ‘buys into’ socially defined ideal of attractiveness and engages in behaviours designed to produce an approximation of these ideals*” (Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999). Internalization of the thin ideal has been identified as a risk factor for body image concerns and eating pathology (Stice, 2002).

As an illustrative example, sociocultural theories explain that although women’s body sizes have increased consistently since the 1950s, images of women in the media

have become progressively thinner. Thinness is equated with success, femininity and attractiveness in the media, which contributes to body image concerns in women who are exposed to these images. Furthermore, the diet industry promotes the idea that anyone can be thin through diets, supplements or exercise (Garner & Wooley, 1991). The idealization of thinness, combined with the idea that body size and shape can be altered, can lead to the development of body image concerns and eating pathology. Thus, elevated BMIs are not expected to lead directly to body image concerns. Rather, girls who have elevated BMIs who internalize the thin ideal are expected to experience body image concerns.

Exposure to Western culture is often described as an etiological factor in the development of eating disorders (Soh, Touyz, & Surgenor, 2006). It is thought that other cultures do not value thinness to the same extent that thinness is valued in North America. Furthermore, characteristics of non-Western cultures are thought to protect against the development of eating disorders in that heavier body weights are believed to be ideal.

However, research comparing women from different ethnic backgrounds within North America has yielded conflicting findings (Rieger, Touyz, Swain, & Beumont, 2001; Soh et al., 2006). This may be partly due to methodological limitations of cross-cultural research including referral biases when using clinical samples, the use of non-valid assessment instruments, and difficulty measuring Western culture (Rieger et al., 2001). In addition, cross-cultural researchers have often neglected to actually examine ideas about body weight and shape in a given culture. As noted by Walcott, Pratt and Patel (2003), early research in eating disorders has tended to exclude people from diverse

cultures, leading to the erroneous conclusion that people from diverse cultures experience less eating pathology than Caucasians. Researchers have also tended to use samples of convenience, recruited from universities or clinics in urban areas, which are usually not representative of women in the general population.

Within North America, there appear to be ethnic differences in the prevalence of eating pathology. In their review of the literature, Crago, Shisslak and Estes (1996) concluded that African American women have lower incidences of eating pathology, likely because they report less body dissatisfaction and engage in fewer harmful methods of weight control than Caucasian women. The prevalence of eating disorders appears to be similar among Latina and Caucasian women. Due to a lack of previous research, conclusions about Native American and Asian American women are provisional; however, it appears that Native American women experience higher prevalence of eating pathology whereas Asian American women experience lower prevalence. Furthermore, it appears that being overweight is a risk factor for developing eating pathology among women from diverse cultures. However, Crago et al. (1996) conclude that Caucasian women who perceive themselves to be overweight, regardless of whether or not they actually are overweight, are more at risk for eating pathology.

According to Abrams and Stormer (2002), ethnicity may be a proxy risk factor for eating pathology through its association with more salient risk factors, such as acculturation or socioeconomic status. In a sample of high school students from diverse cultures, Caucasian girls reported significantly more awareness of sociocultural pressures to be thin, and greater internalization of the thin ideal than African American girls. However, African American girls who were friends with girls from other cultural groups

reported more awareness of sociocultural pressures to be thin and more internalization of the thin ideal than African American girls who were friends mostly with African American girls.

In contrast, Shaw, Ramirez, Trost, Randall and Stice (2004), maintain there is no convincing recent research evidence for between group differences in eating pathology among people from diverse cultures. Earlier studies from the 1980s typically found that eating pathology is lower among people from diverse cultures. In their sample of ethnically diverse high school and college students, Shaw et al. (2004) found that when age and parental education were held constant, there were no between group differences in eating pathology, nor were there differences among the various risk factors for eating pathology that were measured in the research, such as sociocultural pressures to be thin, modeling parent or peer weight concerns, body image concerns, or dieting. However, they did find that Caucasian and Asian girls reported significantly higher internalization of the thin ideal than African American and Latina girls did.

In a recent cross-sectional study that was completed as part of the Youth Risk Behavior Surveillance System, Chao et al. (2008) investigated differences in weight control practices by adolescents from diverse cultures. They found that Caucasian girls were most likely to diet (58%), followed by Hispanic girls (52%) and then African American girls (38%). African American girls were significantly less likely than Caucasian and Hispanic girls to diet, use diet products, purge, or exercise for weight loss. On average, Caucasian girls had significantly lower BMIs ($M = 22.2$) than Hispanic ($M = 23.3$) and African American girls ($M = 24.2$). Chao et al. (2008) concluded that there may be different sociocultural standards for beauty in the African American culture that

protect girls from developing eating pathology but that may put them at increased risk for obesity.

Sociocultural pressures. According to sociocultural theories, parents and peers can reinforce the thin ideal by exerting pressure on girls to lose weight through direct comments about eating, shape and weight or weight-related teasing (Levine, Smolak & Hayden, 1994; Hill, 2007). Stice (2002) observed that girls with elevated BMIs encounter more pressures from parents and peers to lose weight. These pressures are believed to lead to body image concerns and eating pathology.

Smolak and colleagues (1999) found that children in 4th and 5th grade had higher levels of body image concerns and dieted more when both parents made direct comments about their weight, compared to children whose parents did not comment about their weight. In another study, in comparison with non-dieters, adolescent dieters were more likely to report having a friend or family member tell them directly that they should go on a diet (Huon, Lim & Gunewardene, 2000). Huon and Walton (1999) also found that adolescent dieters were significantly more likely than non-dieters to have a friend or family member tell them directly that they should go on a diet and to report that friends and family members approved of them going on a diet.

Although there has been limited research on the influence of teasing by parents and peers, available evidence suggests that weight-related teasing is an important predictor of eating pathology and body image concerns in adolescent girls (Lieberman et al., 2001). Girls who experience weight related teasing are also more likely to have elevated BMIs (van den Berg, Wertheim, Thompson & Paxton, 2002). According to Donovan, Spence and Sheffield (2006), body image concerns often develop or intensify

for girls who experience weight-related teasing and these experiences can lead to depression and eating pathology. Furthermore, the effects of weight-related teasing may be long-lasting, as retrospective studies have found a relationship between weight-related teasing during childhood and body image concerns during adulthood (e.g., Stormer & Thompson, 1996).

Alternatively, adolescents can model weight loss behaviors by virtue of having parents and peers who are themselves trying to lose weight. In Smolak and colleagues' (1999) study of 4th and 5th graders, dieting by mothers and weight concerns of fathers were positively correlated with the daughter's body image concerns. Other researchers have found that adolescent dieters are more likely to have a mother or close friend who was dieting (Huon et al., 2000). In a longitudinal investigation of adolescent dieting by Huon, Lim, Walton, Hayne, and Gunewardene (2000), the strongest risk factor for dieting was having peers who were trying to lose weight.

Girls with body image concerns appear to experience more pressures to be thin from parents and peers, and they report more depression and less social support than girls who do not have body image concerns (Stice & Whitenton, 2002). Stice and Whitenton (2002) also found that girls with body image concerns are more likely to be overweight and to have experienced weight-related teasing. These researchers reported that after holding initial levels of body image concerns constant, body image concerns were best predicted by BMI, pressures to be thin from parents and peers, and a lack of social support. The most important predictor of body image concerns was pressure to be thin; girls who reported pressure to be thin from parents and peers were four times more likely to have body image concerns. In contrast to Stice and Whitenton's (2002) predictions,

they did not find weight-related teasing or depression to be significant predictors of body image concerns after the initial levels of body image concerns were controlled.

Direct comments from peers about eating, shape and weight, experiencing weight-related teasing, and high BMI have been identified as risk factors for eating pathology in younger adolescents (Shisslak et al., 1998). Shisslak et al. (1998) also found that for older girls, risk factors for eating pathology included body image concerns, direct comments from peers about eating, body shape and weight, experiencing weight-related teasing, substance use, and having parents who were not married.

Sinton and Birch (2006) found that girls who greatly valued physical appearance had more body image concerns than girls who did not place a great value on physical appearance. The value that girls placed on physical appearance was not related to BMI; however, it was highly correlated with parental and peer concerns about weight and shape and body image concerns. After BMI was held constant, girls who greatly valued physical appearance had more body image concerns and depression than girls who did not greatly value physical appearance.

In summary, researchers have found that girls with eating pathology often report experiencing social pressures to be thin from their parents and peers (e.g., Smolak et al., 1999; Huon et al., 2000). Body image concerns are correlated with experiences of pressure to be thin from peers who greatly value physical appearance, experiences of weight-related teasing, and/or parent concerns about a daughter's weight (Taylor et al., 1998).

Neumark-Sztainer and colleagues' (2003) study, which examined predictors of eating pathology in adolescent girls using structural equation modeling, also found

evidence that weight and shape norms for parents and peers (e.g., weight-related teasing, the presence of parents and peers who are trying to lose weight) lead directly to body image concerns, and that body image concerns lead directly to eating pathology. These results indicate that direct comments from parents and peers about eating, shape and weight, weight-related teasing, and having parents and peers who are themselves trying to lose weight predict eating pathology through their relationship with body image concerns (e.g., Shisslak, Crago, McKnight, Estes, Gray & Parnaby, 1998; Stice & Whitenton, 2002). That is, sociocultural pressures to lose weight can initiate or exacerbate body image concerns and lead to eating pathology.

However, the influence of parents and peers is not always negative. Parents and peers can also have a protective role in buffering adolescents from developing eating pathology. For example, Kelly and colleagues (2005) found that adolescents who were satisfied with their bodies tended to have parents and peers who encouraged healthy lifestyles through balanced eating and appropriate physical exercise. Girls with high body satisfaction also cared about being healthy and physically active, did not care about their weight, and did not weigh themselves frequently or use unhealthy methods of weight control such as dieting.

Comorbid psychopathology. Researchers have also considered the influence of comorbid psychopathology as a predictor of eating pathology. In their community sample of adolescent girls, Lewinsohn, Striegel-Moore, and Seeley (2000) found that the comorbidity rate for eating disorders was approximately 90%, with internalizing disorders such as major depressive disorder and anxiety disorders being most common. However, comorbidity was also high for girls with subclinical eating pathology. Girls

with subclinical eating pathology had levels of comorbid psychopathology that were similar to levels assessed in girls with full syndrome eating disorders, and appeared even more impaired on measures of depression and borderline personality disorder.

Depression during early adolescence has been found to predict eating pathology in mid- to late-adolescence (Johnson, Cohen, Kotler, Kasen, & Brook, 2002). Johnson et al. (2002) found the risk of eating pathology was intensified when adolescents had a comorbid anxiety, substance, or disruptive disorder. Specifically, adolescents with a comorbid disorder were five times more likely to report pathological eating over time. Depression was found to be the most powerful risk factor, and the risk for eating pathology increased even more when adolescents had depression plus another disorder.

Similarly, Measelle, Hogansen, and Stice (2006) found that depression is a risk factor for both eating pathology and substance abuse. A high level of eating pathology at the onset of the study was a risk factor for substance abuse and a high initial level of externalizing problems was a risk factor for substance abuse and depression. These results suggest that depression can lead to eating pathology and that girls with eating pathology can develop other problems, such as substance use, over time.

Sinton and Birch (2005) identified elevated BMI, along with depression, and low self-esteem, as risk factors for eating pathology. The risk for eating pathology increased for girls with elevated BMIs and high levels of depression, and for girls with elevated BMI and low levels of self-esteem. Gardner, Stark, Friedman, and Jackson (2000) found depression to be the most powerful predictor of eating pathology in their sample of girls.

Alternatively, Sim and Zeman (2006) suggest that depression in adolescent girls predicts the development of body image concerns. In their study, girls with the highest

levels of eating pathology had significantly more depression, difficulty understanding emotions, and poorer coping resources than girls with the lowest levels of eating pathology. Sim and Zeman (2006; p. 226) concluded that *“In a culture that values a thin female body, body dissatisfaction and the experience of frequent negative affect are inextricably linked.”*

Eating disorders have traditionally been associated with internalizing forms of psychopathology. However, evidence now suggests that they are also associated with externalizing forms of psychopathology (Marmorstein, von Ranson, Iacono & Succop, 2007). In a large scale study of high-risk behaviors, Ho, Kingree, and Thompson (2006) found that adolescent girls who reported engaging in delinquent acts were more likely to report dieting, fasting, and using diet pills to lose weight than girls who did not report engaging in delinquent acts. In another study, approximately 25% of girls reported pathological eating, and these girls were also more likely to engage in substance use and sexual risk-taking compared to girls who did not report pathological eating (Lock, Riesel, & Steiner, 2001). In Project EAT, dieters used more alcohol, cigarettes and marijuana than non-dieters did (Crow et al., 2006).

Girls who engage in pathological eating appear to experience considerable distress in many other areas of their lives. Girls who diet severely are more likely to use alcohol, tobacco or marijuana, and to attempt suicide than adolescents who do not diet (Rafiroiu, Sargent, Parra-Medina, Drane, & Valois, 2003). Likewise, in an epidemiological study by Steinhausen, Gavez, and Metzke (2005), girls who were trying to lose weight had significantly lower self-esteem and more family conflict and maladaptive behaviours than girls who were not trying to lose weight. Girls with

pathological eating also experienced more negative life events and had fewer coping resources than girls with normal eating.

These findings are supported by results of a large-scale study of 81,247 adolescents by Croll and colleagues (2002). Research findings indicated that girls who reported pathological eating were more concerned about their physical appearance and had poorer academic achievement, self-esteem, mood, and family and school relationships than girls who did not report pathological eating. Frequent use of cigarettes and alcohol, as well as concerns about physical appearance, were also identified as risk factors for eating pathology, whereas high-self-esteem, positive affect, academic achievement and positive family and school relationships protected against eating pathology.

In a recent longitudinal study, Aime, Craig, Pepler, Jiang and Connolly (2008) investigated the relationship between subclinical eating pathology and peer victimization, substance use, and internalizing and externalizing psychopathology in adolescents. They found that girls with subclinical eating pathology were more likely to have comorbid internalizing or externalizing psychopathology. There was no relationship between eating pathology and peer victimization or substance use. Aime et al. (2008) concluded that girls with subclinical eating pathology experience significant impairment and require clinical interventions to address comorbid psychopathology.

In summary, both internalizing and externalizing psychopathology have been found to predict eating pathology (e.g., Sinton and Birch, 2005; Mamorstein et al., 2007). Girls with pathological eating are not merely attempting to improve their physical appearance by dieting; they are often experiencing great difficulty functioning in home

and school environments and lack coping resources to deal with these challenges. One task of researchers in this area is to distinguish whether the comorbid disorder occurs before the emergence of eating pathology, or whether the comorbid disorder emerges after the onset of eating pathology. There is good support in the literature that internalizing forms of psychopathology occur prior to the onset of eating pathology. That is, depression has been identified as a risk factor for eating pathology. In contrast, externalizing forms of psychopathology may appear both prior to and after the onset of eating pathology in adolescent girls.

Perfectionism. One of the most commonly used measures of perfectionism in investigations of eating pathology is the perfectionism scale of the Eating Disorder Inventory (Bardone-Cone et al., 2007). In factor analytic research, Sherry, Hewitt, Besser, McGee and Flett (2004) found that the perfectionism scale of the EDI-2 measures both self-oriented perfectionism, which refers to placing high standards on oneself, and socially prescribed perfectionism, which refers to perceiving that other people are placing high standards on themselves.

Women with eating pathology typically report higher levels of perfectionism on the EDI-2 compared to women with normal eating. Forbush, Heatherton, and Keel (2007) also found that women who engaged in fasting and purging reported higher levels of perfectionism than women who engaged in binge eating, suggesting that perfectionism may be linked to specific behaviors rather than to eating disorders in general. This finding is supported by Bardone-Cone's (2007) review of the literature, which suggested that perfectionism is more strongly associated with Anorexia than Bulimia.

McVey, Pepler, Davis, Flett, and Abdoell (2002) found that eating pathology was predicted by high self-oriented perfectionism, along with low self-esteem about one's physical appearance and low support from fathers in 7th and 8th grade girls. Social support from mothers did not predict eating pathology, nor did socially prescribed perfectionism. In a subsequent study, Kirsh, McVey, Tweed, and Katzman (2007) found that girls with eating disorders reported significantly higher self-oriented perfectionism than a control group of age-matched girls from the community. Within the control group, girls with high levels of eating pathology had significantly higher self-oriented perfectionism than girls with low levels of eating pathology. However, there were no between group differences in socially prescribed perfectionism.

Predictors of Eating Pathology in Adolescent Dancers

Few studies have focused on eating pathology in adolescent dancers. The research evidence that is available indicates that girls who take ballet lessons experience significantly more eating pathology and body image concerns, and weigh significantly less than adolescents who do not take ballet lessons (e.g., Garner & Garfinkel, 1980; Braisted, Mellin, Gong & Irwin, 1985; Abraham, 1996a; Neumarker, Bettle, Bettle, Dudeck, & Neumarker, 1998; Bettle, Bettle, Neumarker & Neumarker, 1998; Neumarker, Bettle, Neumarker, & Bettle, 2000; Davison et al., 2002; Ravaldi et al., 2003; Anshel, 2004). Braisted et al. (1985) report that binge eating and amenorrhea are also more common in dancers compared to girls in the general population who do not take ballet lessons. They found that dancers reported more physical symptoms, such as stomach aches, constipation, and diarrhea. Given that dancers reported more binge eating and amenorrhea than non-dancers, it is possible that the physical symptoms that dancers

reported were indeed side effects of pathological eating behaviors. There were no differences between dancers and non-dancers in the presence of vomiting or the use of laxatives and dieting pills.

Brooks-Gunn, Warren, and Hamilton (1987) found that one third of their sample of female ballet dancers aged 19 to 35 reported having a clinical eating disorder, 19% reported amenorrhea, and 40% reported irregular menstrual cycles. Dotti, Fioravanti, Balotta, Tozzi, Cannella, and Lazzari (2002) found that 40% of female ballet dancers aged 11 to 14, and 60% of dancers aged 15 to 29, were dieting to such an extent that they were not meeting their daily caloric needs.

Abraham (1996b) reported that approximately 45% of ballet dancers and 28% of adolescents who did not take ballet lessons believed that they had an eating disorder, and more than half of the entire sample reported engaging in at least one method of weight loss. There was no difference in the frequency of vomiting between dancers and non-dancers. However, dancers were significantly more likely to use laxatives as a method of weight control.

Neumarker and colleagues (1998) found that ballet dancers reported wanting to lose more body weight compared with adolescents who did not take dance lessons. Younger dancers between ages 11 and 13 reported a desire to lose significantly more body weight than dancers who were between ages 15 and 17 (Bettle et al., 1998). For both dancers and non-dancers, eating pathology peaked at ages 13 and 16. Of the entire sample, 22% of dancers scored above the cut-off point on the EAT-40, indicating that they may have a clinically significant eating disorder.

Body image concerns in dancers. There is evidence that body image concerns emerge early for girls who participate in aesthetic sports. Davison et al. (2002) found that girls who participated in aesthetic sports, such as dance or gymnastics, reported significantly more body image concerns at ages 5 and 7 than girls who participated in athletic activities that did not emphasize leanness (e.g., soccer, basketball), and girls who did not participate in any sports. Moreover, girls reported more body image concerns at 7 years old than 5 years, suggesting a tendency for body image concerns to become progressively more severe with age.

In their sample of ballet dancers, gymnasts and a control group of girls who did not participate in those activities, Ravaldi et al. (2003) found that dancers had significantly more eating pathology, body image concerns and lower BMIs than all other groups of girls in the study. In another sample of ballet dancers between ages 11 and 29, body image concerns were significantly more severe in older dancers than in younger dancers (Dotti et al., 2002). Dotti et al. (2002) reported that eating pathology was also more severe in dancers between ages between ages 15 to 29 compared to dancers between ages 11 and 14, reinforcing the observation that eating problems and body image concerns became progressively more severe with age.

In summary, ballet dancers have more body image concerns compared to adolescents who do not take ballet lessons (e.g., Davison et al., 2002; Ravaldi, et al., 2003). Additionally, for both dancers and adolescents who do not take dance lessons, body image concerns and eating pathology become progressively more severe with age.

Sociocultural pressures for dancers. No known studies have examined direct comments about eating, shape and weight, the presence of parents and peers who are

themselves trying to lose weight, and experiences of weight related teasing as predictors of eating pathology in a sample of adolescent dancers. However, researchers have examined competition in dance and competition can be considered a proxy variable for sociocultural pressures to be thin. Garner and Garfinkel (1980) found that ballet dancers at competitive schools weighed significantly less and had significantly more eating pathology than ballet dancers at non-competitive schools (Garner & Garfinkel, 1980). Compared to age-matched music students, ballet dancers also weighed significantly less and had significantly more eating pathology. According to these researchers, it is the combination of a highly competitive environment and participation in athletics emphasizing leanness that predicts eating pathology.

In their sample of elite, competitive and non-competitive ballet dancers, Thomas, Keel, and Heatherton (2005) found that elite dancers were significantly less satisfied with their weights and dieted more than dancers in other groups. However, there were no between-group differences in BMI. Elite and non-competitive dancers also obtained significantly higher scores than competitive dancers on the drive for thinness and perfectionism scales of the Eating Disorder Inventory-2 (EDI-2). That is, dancers at non-competitive schools demonstrated the same level of eating pathology as dancers at elite schools, where performance expectations were very rigorous and demanding.

Overall, there is conflicting evidence about the relationship between competition and eating pathology in ballet dancers. Some researchers have found that competitive ballet dancers have more eating pathology than non-competitive ballet dancers (e.g., Garner & Garfinkel, 1980) whereas others have found that non-competitive ballet dancers have about the same level of eating pathology as competitive ballet dancers (e.g., Thomas

et al., 2005). On the other hand, findings that competitive dancers weigh less than non-competitive ballet dancers supports the hypothesis that higher levels of competitiveness, and presumably, more subcultural social pressures to be thin, are associated with an increased risk of eating pathology in ballet dancers (Garner & Garfinkel, 1980; Bettle et al., 1998).

Comorbid psychopathology in dancers. Several lines of research have investigated whether eating pathology in ballet dancers is associated with the same level of comorbid psychopathology as observed in non-dancers (Davis & Strachan, 2001). Some researchers have concluded that dancers with eating pathology do not experience the same level of comorbid psychopathology as adolescents with eating problems who do not take dance lessons (e.g., Holderness, Brooks-Gunn, & Warren, 1994; Anshel, 2004). Eating pathology in ballet dancers is often viewed as a normative and even acceptable reaction to putative social pressures to be thin that exist within the ballet subculture. However, there is a lack of previous research examining exactly what these pressures are, from whom they are originating, and what impact they have on young dancers.

In an early study by Garner and Garfinkel (1980), ballet dancers and fashion models reported significantly more eating pathology on the EAT-26 than a control group who were not involved in those activities. For dancers, eating pathology was associated with elevated somatization, depression, obsessive compulsive tendencies, interpersonal sensitivity and anxiety, whereas for the control group, eating disorder symptoms were only associated with elevated depression. These results suggest that for dancers, eating pathology is associated with a higher level of comorbid psychological distress than is the case for non-dancers.

In contrast, Holderness et al. (1994) found no significant relationship between eating pathology and psychological symptoms for ballet dancers who ranged in age from 13 to 31. However, a significant relationship between eating pathology and psychological symptoms was found for non-dancers, suggesting that non-dancers who demonstrated eating pathology were experiencing significantly more psychological distress than were dancers. The authors concluded that eating pathology in dancers was not associated with the same level of comorbid psychopathology exhibited by non-dancers with eating pathology.

Ravaldi and colleagues (2003) found that ballet dancers and gymnasts reported significantly more eating pathology and depression than controls did. Interestingly, there was no significant relationship between eating pathology and depression, nor was there a significant relationship between BMI and eating pathology for dancers or gymnasts. A significant positive relationship was found between eating pathology and depression and between eating pathology and BMI for controls. Body image concerns were positively correlated with eating pathology for all groups. These results suggest that comorbid psychopathology is a more powerful predictor of eating pathology for non-dancers than for adolescents participating in aesthetic sports like gymnastics and dance.

Perfectionism in dancers. There are relatively few studies of perfectionism in dancers specifically (Anshel, 2004). In an investigation of eating problems in adolescent athletes and non-athletes, Fulkerson, Keel, Leon, and Dorr (1999) found no between-group differences in BMIs or EDI-2 scores. When athletes with the highest and lowest scores on the Perfectionism scale were compared, females in the high perfectionism group demonstrated higher scores on the drive for thinness and interoceptive awareness

subscales than females in the low perfectionism group. The researchers concluded that perfectionism may place adolescent athletes at increased risk for eating disorders.

Schwartz, Gairrett, Arugette, and Gold (2005) found that college athletes had higher scores on the EDI-2 perfectionism scale compared to non-athletes and that higher levels of perfectionism were correlated with higher levels of eating pathology. Although there were no between group differences in levels of eating pathology or BMIs, non-athletes had more body image concerns. Within the group of athletes, women who participated in judged sports, such as diving, dieted more than women who participated in refereed sports, such as basketball.

Based on Schwartz and colleagues' (2005) findings, one might predict that ballet dancers would have higher levels of perfectionism than non-dancers, and that there would be a stronger relationship between perfectionism and eating pathology for dancers compared to non-dancers. Anshel (2004) found that adolescents who took ballet lessons had higher scores on the drive for thinness, body dissatisfaction and perfectionism scales of the EDI-2 than adolescents who did not take ballet lessons. Also, for dancers only, there was a significant positive correlation between drive for thinness and perfectionism, indicating that high perfectionism was associated with greater desire to be thin. These findings support the premise that dancers do have higher levels of perfectionism than non-dancers and that perfectionism is an important predictor of eating pathology for dancers (e.g., Schwartz et al., 2005).

In summary, there is good evidence in the literature that individual variables, such as elevated BMI, internalization of the thin ideal, internalizing psychopathology, and perfectionism increases the risk for pathological eating for adolescents in the general

population. Furthermore, sociocultural pressures to lose weight are also believed to increase risk for pathological eating by increasing the salience of risk factors at the individual level. However, relatively less is known about how these variables interact to increase risk for pathological eating. There is also little know about the role of externalizing psychopathology. Finally there is a lack of understanding about variables that increase risk for eating pathology in ballet dancers who are believed to have a higher level of risk for eating pathology than adolescents in the general population.

Methodological Issues and Limitations in Past Research

There is a relatively good understanding of predictors of eating pathology in adolescents in the general population. However, relatively little is known about predictors of eating pathology in adolescent ballet dancers (Anshel, 2004). Eating pathology in dancers has been understood as a common and even acceptable reaction to the discipline's requirements of extremely low body weights. Yet, the majority of adolescent dancers do not go on to dance professionally (Hamilton & Robson, 2006). That is, unlike a professional ballet dancer, thinness is not a necessary qualification for girls who elect to take dance lessons during adolescence since most will not make a career out of dancing.

There is good evidence that adolescent ballet dancers have more eating pathology than adolescents who do not take dance lessons. However, due to a lack of comparative research, very little is known about why dancers are more at-risk than adolescents in the general population (Anshel, 2004). It is not clear whether the same variables that predict eating pathology in non-dancers also apply to dancers, whether the higher prevalence of eating pathology in dancers can be explained by increased exposure to these variables, or whether there are different variables that predict eating pathology for dancers and non-

dancers. Clarifying these issues could provide important information about how to target interventions for adolescent dancers.

Many variables that would potentially be important predictors of eating pathology in dancers have not been examined. Researchers often explain that dancers are at an increased risk for eating pathology due to increased subcultural social pressures to be thin. Currently, there is little research evidence about what these pressures are and from whom the pressures are originating. The investigation of social pressures to be thin (e.g., in the form of direct comments about eating shape and weight, experiences of weight-related teasing, and contact with peers who are trying to lose weight) would improve the understanding of variables that predict eating pathology for adolescent dancers. Also, understanding the extent to which internalization of the thin ideal, perfectionism and comorbid psychological symptoms predict eating pathology in adolescent dancers would add significant knowledge in this area.

The dance subculture is believed to be characterized by norms, values, and beliefs that encourage the development of eating pathology in young dancers (Montanari & Zietkiewicz, 2000), yet very little is known about what aspects of the dancing subculture predict eating pathology in young dancers. Successful participation in ballet requires commitment, dedication and conformity to rules and expectations. There may be an expectation within the dance subculture that dancers are to be thin and that thinness leads to success. Furthermore, the day to day experiences of adolescent dancers may heighten the risk for eating pathology beyond the normative risks for eating pathology that are experienced by girls in the general population. For example, dancers are taught to critique their own performance by looking in mirrors and they often receive corrections from their

instructors about appropriate form, posture and technique. The expectation of thinness, combined with the day-to-day experiences of an adolescent dancer, may explain why dancers are at elevated risk for developing eating pathology.

Purpose of the Current Research

Justification and Rationale

The purpose of the research was to test a predictive model of pathological eating. The model was tested within two distinct samples: an at-risk sample of adolescent ballet dancers and a sample of high school students. The selection of these two samples provided a natural experiment that varied key predictors of eating pathology. In accordance with developmental psychopathological theory, predictor variables at the individual level (i.e., internalization of the thin ideal, body image concerns, comorbid psychopathology, perfectionism), and the interpersonal and sociocultural levels (i.e., direct comments from parents and peers, the presence of parents and peers who are trying to lose weight, weight-related teasing) were investigated.

Current theory defines eating pathology along a continuum that captures a range of symptoms. This conceptualization is in contrast to current DSM-IV-TR criteria, which define eating disorders as discrete diagnostic categories. Because adolescents rarely seek help themselves for eating pathology and the majority of adolescents with eating pathology go undetected by parents and professionals (Rome et al., 2003), the current study relied on self-reports of symptoms instead of clinical diagnosis to define pathological eating.

For the present study, “dancer” refers to a girl who is currently studying or has studied classical ballet within the past five years. The term “recreational dancer” refers to

a ballet dancer who takes lessons at a community dance school that is accessible to the public. “Competitive dancer” refers to a girl who is involved in a competitive dance team outside of their regular ballet classes. Competitive dance teams typically involve auditioning for admittance, traveling to different regions and performing in competitions for various prizes. “Elite dancer” refers to a ballet dancer who was selected, based on an audition or other screening process, to train at a school that prepares dancers for a career in professional dance. Finally, the term “non-dancer” refers to female high school students who have not studied classical ballet within the past five years.

The study included adolescents in the general population and an at-risk group of girls who took ballet lessons. In accordance with the developmental psychopathological perspective, this sampling method would theoretically capture girls in the general population who did and did not have eating pathology and girls in the at-risk group who did and did not have eating pathology. In other words, the sampling method allowed for the examination of variables that predicted eating pathology, as well as variables that protected against eating pathology in the general population and in an at-risk sample.

One unique aspect of the current study was the investigation of dancers' subjective experiences. Dancers completed a survey designed for the current study that assessed, for example, the age at which they began their lessons, their level of commitment to dance, and their future goals. The information obtained from this questionnaire provided a more personal account of dancers' subjective experiences of the pressures to be thin that exists within the dance subculture.

The current study addressed several shortcomings of previous studies. First, the research tested a predictive model of eating pathology which incorporated variables from

multiple domains. This model incorporated several variables that have been under-investigated, including the impact of peers and externalizing psychopathology. Second, this was the first known study to test a predictive model of eating pathology in adolescent ballet dancers. Therefore, this study went beyond previous research by explaining how eating pathology develops within this specific subculture. Third, rather than making assumptions about the sociocultural pressures that exist within the ballet subculture, this study added a unique contribution to the literature through the investigation of dancers' subjective experiences.

Although variables from multiple domains (i.e., individual and sociocultural) were incorporated into the model, only those variables that have been strongly tied to eating pathology were included (Licht, 1995). A more complex model would lack explanatory power and increase the experiment-wise error rate. That is, adding less important predictors would increase the likelihood that significant findings would not generalize to other samples and would apply only to the sample utilized in the current study. Thus, a more parsimonious model with greater statistical power was favored.

Hypotheses

Hypothesis 1. Eating Pathology in Non-dancers and Dancers

It was predicted that ballet dancers would have more eating pathology and body image concerns, and lower BMIs than non-dancers. Specifically, ballet dancers were expected to obtain significantly higher scores on the drive for thinness, bulimia and body dissatisfaction subscales of the EDI-3, and significantly lower BMIs than adolescents who did not take dance lessons.

Hypothesis II. Predictors of Eating Pathology in Non-dancers and Dancers

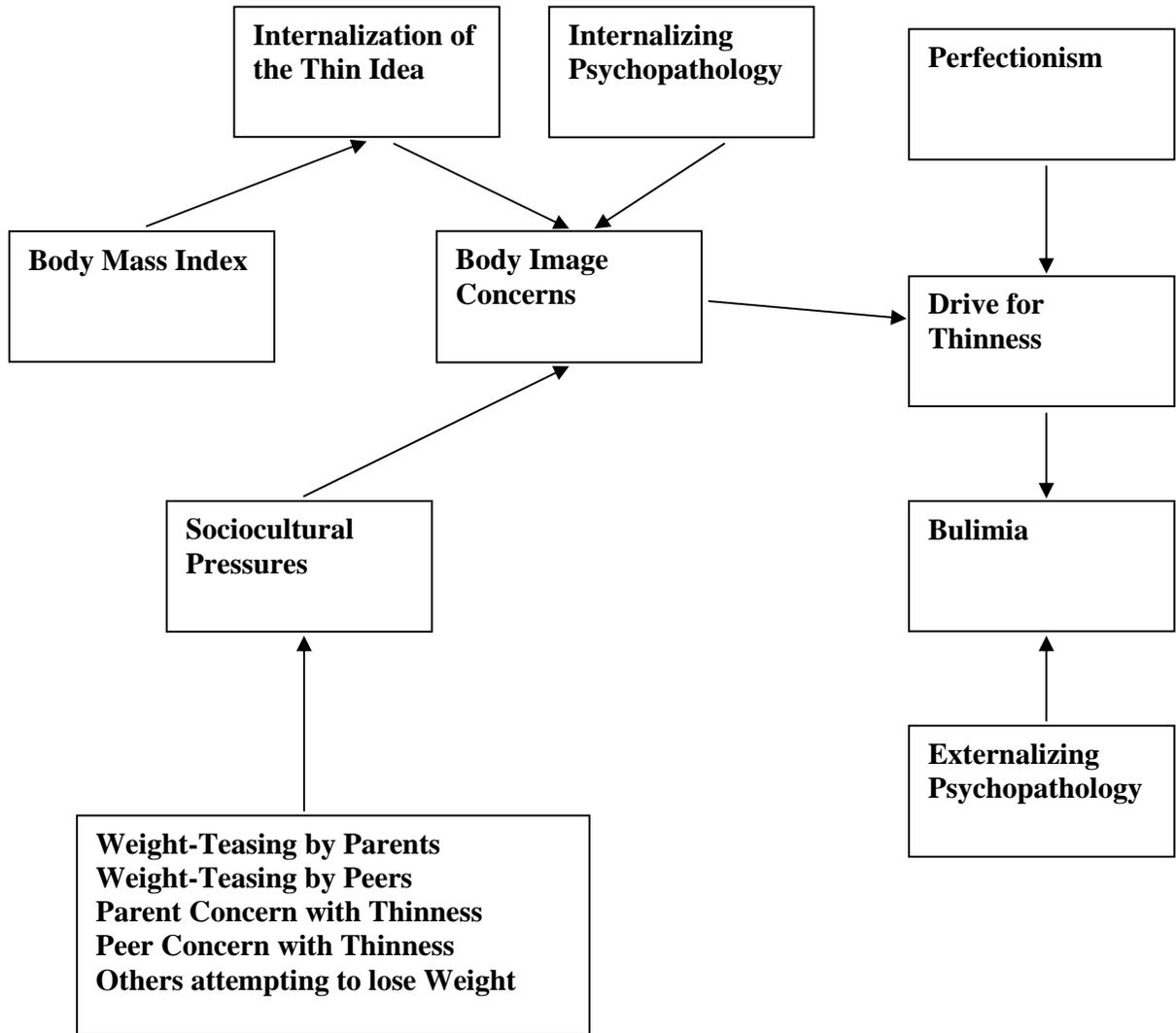
Based on the review of the literature, a predictive model emerged, in which body mass index, body image concerns, internalization of the thin ideal, sociocultural pressures, comorbid psychopathology and perfectionism predicted eating pathology (Figure 1). It was expected that internalization of the thin ideal would moderate the relationship between BMI and body image concerns (Attie & Brooks-Gunn, 1989; Wertheim et al., 2001; Hill, 2007). Sociocultural pressures to be thin (i.e., direct comments about eating, shape and weight from parents and peers, weight-related teasing and the presence of parents and peers who are trying to lose weight) were thought to lead to body image concerns (Shisslak et al., 1998). Internalizing psychopathology was expected to lead to body image concerns and externalizing psychopathology was expected to lead directly to binge eating (Johnson et al., 2002; Marmorstein et al., 2007). Perfectionism was expected to lead directly to drive for thinness (Kirsh et al., 2007), which was in turn would lead to bulimia. It was expected that the hypothesized model of eating pathology would not fit the data as well for dancers.

Hypothesis III. Dance Variables Related to Eating Pathology

It was predicted that greater exposure to the ballet subculture would be associated with higher eating pathology. Specifically, it was hypothesized that there would be a positive association between eating pathology (i.e., drive for thinness, bulimia, and body dissatisfaction) and age at which girls began ballet, total number of years taking ballet lessons, and total number of hours taking ballet lessons each week, practicing ballet at home, and rehearsing with a dance team. Directional hypotheses about BMI were not formulated since eating pathology is associated with high and low BMIs.

Figure 1.

Conceptual Model of Eating Pathology in Adolescents



Hypothesis IV. Dancers' Career Aspirations and Eating Pathology

It was predicted that girls who were more involved and committed to ballet would have a higher level of eating pathology (i.e., drive for thinness, bulimia, body dissatisfaction) than girls who danced for recreational purposes. Dancers' level of commitment was based on their responses to a question on the Dancers' Experiences Survey about their career aspirations. Directional hypotheses were not formulated for BMI because eating pathology is associated with both high and low BMIs.

Hypothesis V. Protective Factors for Non-dancers and Dancers

It was predicted that eating pathology would be negatively associated with girls' participation in activities to make them feel good about themselves, such as organized sports or extracurricular activities (Smolak et al., 2000), academic performance (Croll et al., 2002) and social support. It was also predicted that there would be a positive association between eating pathology and experiencing negative life events (McKnight Investigators, 2003).

Chapter II

METHOD

Group Assignment and Participant Characteristics

Dancers. Participants in this group were adolescent girls who were recruited through three well-established dance schools in Windsor, Ontario, or who were identified during participant recruitment in local high schools (see below for details about recruitment). In order to be included in the dancer group, participants had to (a) be female high school students between the ages of 14 and 18 years and (b) have taken ballet lessons within the previous 5 years.

Within the dance schools, a total of 52 dancers were recruited and provided written consent (if age 16 and older) or obtained parental consent and assented to participate (if under age 16). However, 12 of these had to be excluded because they were still in elementary school; another 7 were excluded because they had already graduated from high school.

Forty-five girls met the inclusion criteria and were assigned to the dancer group. Of these, 33 were recruited through the dance schools; the remaining 12 were identified during participant recruitment in local high schools. The average age of the girls in the dance group was 15.7 years ($SD = 1.1$, $range = 14$ to 18 years). The majority ($n = 40$, 91%) were currently taking ballet lessons; the remaining five ($n = 5$, 9%) were not taking ballet at the time of the study but had taken ballet within the previous 5 years (See Table 1). All of the participants who were not currently taking ballet lessons were recruited from high schools. On average, dancers had taken ballet lessons for 9.6 years ($SD = 3.9$; $range = 1$ to 15 years). Many dancers who were currently taking ballet also reported

Table 1.

Number of Dancers Who Studied Each Form of Dance

	Currently	Previously	Years of		Minimum	Maximum
	Studying	Studied	Involvement		Years	Years
			<i>M</i>	(<i>SD</i>)		
Ballet (<i>n</i> = 45)	40	5	9.6	(3.9)	1	15.0
Tap (<i>n</i> = 29)	23	6	9.7	(3.8)	2	15.8
Jazz (<i>n</i> = 36)	27	9	8.3	(3.8)	1	14.8
Modern (<i>n</i> = 7)	7	0	4.8	(3.2)	1	9.7
Hip Hop (<i>n</i> = 29)	22	7	5.2	(2.8)	1	9.7
Ethnic (<i>n</i> = 1)	0	1	2.0	-	-	2.0

having lessons in one or more other forms of dance within the previous year (See Table 2). In addition, five dancers (11%) had trained for figure skating competitions during the previous year and two (4%) had trained for gymnastics competitions within the previous year.

Within the sample of dancers, there were 14 grade 9 students (31%), 8 grade 10 students (18%), 14 grade 11 students (31%) and 8 grade 12 students (18%) in the group. The majority of dancers were Caucasian ($n = 38$, 84%); the others reported their ethnic background as Asian/Pacific Islander ($n = 3$, 7%) Middle Eastern ($n = 1$, 2%), Native Canadian ($n = 1$, 2%) and mixed ($n = 2$, 4%). The majority were born in Canada ($n = 40$; 89%); others in this group were born in the U.S.A, Russia and China ($n = 4$, 9%). Dancers who were not born in Canada reported that they had lived in Canada for an average of 10.1 years ($SD = 4.2$; $range = 5$ to 14 years).

Eighty per cent of the dancers reported that their parents were married ($n = 36$); the remaining dancers reported that their parents were divorced ($n = 6$, 13%), separated ($n = 2$, 4%), and remarried ($n = 1$, 2%). Participants were asked to report parent occupation as a means of estimating family SES. Among the dancers, the majority of parents had occupations in the major business and professional category ($n = 19$, 42%) or the medium business, minor professional, and technical category ($n = 18$, 40%); the remainder were employed as skilled craftsmen, clerical and sales workers ($n = 4$, 9%), or machine operators and semi-skilled workers ($n = 1$, 2%).

Non-Dancers. Participants in this group were adolescent girls recruited from three Catholic high schools in Windsor, Ontario (see below for details about recruitment and group assignment). In order to be included in the group of non-dancers, participants

Table 2.

Frequency of Participation in Dance Classes, Dancers

	Number of Dancers	Percentage
Currently Taking Ballet		
Only Ballet	10	25%
Ballet + One Other Form of Dance	6	15%
Ballet + Two Others Form of Dance	4	10%
Ballet + Three Others Form of Dance	16	40%
Ballet + Four Others Form of Dance	4	10%
Total	40	100%
Previously Took Ballet (< 5 Years Ago)		
Ballet + Two Others Forms of Dance	3	60%
Ballet + Three Others Forms of Dance	1	20%
Currently Taking Another Form of Dance	1	20%
Total	5	100%

had to be between the ages of 14 and 18 years, attending high school, and not involved in ballet lessons within the previous 5 years. One hundred and eleven female high school students who had provided written consent, or who had obtained parental consent and assented to participate, were included in the study. Their average age was 16.1 years ($SD = 1.2$, $range = 14$ to 19 years). The overwhelming majority ($n = 100$; 90%) reported that they were not currently taking any dance lessons; 9 (8%) reported that they were currently taking dance lessons other than ballet (See Table 3 and 4). Another 8 (7%) reported that they had trained for participation in a gymnastics competition and 4 (4%) indicated that they had trained for participation in a figure skating competition within the previous year.

There were 70 grade 11 students (63%) among participants in this group; the remainder were in grade 9 ($n = 28$, 25%), grade 12 ($n = 11$, 10%), and grade 10 ($n = 2$, 2%). Most were Caucasian ($n = 88$, 79%); others reported their ethnic background as Middle Eastern ($n = 9$, 8%), African/Caribbean Canadian ($n = 5$, 5%), mixed ethnicities ($n = 5$, 5%), Native Canadian ($n = 2$, 2%), Asian/Pacific Islander ($n = 1$, 1%), and Indian ($n = 1$, 1%). The majority were born in Canada ($n = 92$, 83%); 17% ($n = 19$) were born in other countries including the U.S.A, Greece, Ghana, Lebanon, Iraq, South Africa, Jordan, Bosnia, Sudan, Bulgaria, Jamaica, Albania, and Romania. Participants who were not born in Canada reported that they lived in Canada for an average of 7.9 years ($SD = 4.5$; $range = 0.5$ to 16.5 years).

Most participants in this group reported that their parents were married ($n = 75$, 68%); the remainder reported that their parents were divorced ($n = 14$, 13%), separated ($n = 10$, 9%), remarried ($n = 4$, 4%), widowed ($n = 3$, 3%), single ($n = 3$, 3%) and living

Table 3.

Number of Participants Who Studied Each Form of Dance, Non-Dancers

	Currently	Previously	Years of		Minimum	Maximum
	Studying	Studied	Involvement	(<i>SD</i>)	Years	Years
Ballet (<i>n</i> = 18)	0	18	2.0	(1.7)	0.2	8.0
Tap (<i>n</i> = 15)	1	14	2.8	(2.2)	1.0	9.0
Jazz (<i>n</i> = 19)	3	16	3.6	(3.3)	0.2	10.0
Hip Hop (<i>n</i> = 37)	5	32	3.0	(2.4)	0.3	11.0
Ethnic (<i>n</i> = 6)	2	4	4.8	(4.3)	1.0	11.0
Modern (<i>n</i> = 2)	2	0	2.9	(3.0)	0.8	5.0
Ballroom (<i>n</i> = 2)	0	2	0.8	(0.4)	0.5	1.0

Table 4.

Frequency of Participation in Dance Classes, Non-Dancers

	Number of Girls	Percentage
Currently Taking Dance, Other Than Ballet		
One Form of Dance	5	56%
Two Forms of Dance	3	33%
Three Forms of Dance	1	11%
Total	9	100%
Previously Took Ballet (> 5 years ago)		
Only Ballet	15	83%
Ballet + One Other Form of Dance	2	11%
Ballet + Three Others Form of Dance	1	6%
Total	18	100%
Previously Took Dance, Other Than Ballet		
One Form of Dance	28	80%
Two Forms of Dance	3	9%
Three Forms of Dance	3	9%
Four Forms of Dance	1	3%
Total	35	100%

common-law ($n = 1$, 1%). One participant (1%) did not know her parents' marital status. Forty-three percent reported that their parents had occupations in the medium business, minor professional, and technical category ($n = 48$; 43%); others reported that their parents were employed as skilled craftsmen, clerical and sales workers ($n = 24$, 22%), in major business and professions ($n = 17$, 15%), or as machine operators and semi-skilled workers ($n = 2$, 2%). Descriptive statistics for demographic variables are reported by group in Table 5.

Participant Recruitment and Response Rates

Recruitment from dance schools. Local dance schools were contacted by the researcher via telephone to request permission to recruit dancers through their studios. Of eight well-established dance schools in Windsor, Ontario, three schools agreed to distribute information and questionnaire packages to willing dancers at their studios (See Table 6). Table 7 provides detailed information about dance schools within the community that were approached by the researcher. Two other dance schools refused permission, and the researcher was unable to establish contact with owners or directors at the remaining three schools despite leaving telephone messages and sending information letters about the research to the schools (See Appendix A).

Dance School A is a family-owned school that has been in operation for almost 30 years. Dance School B is also a large, family-owned school with 5 locations throughout the city of Windsor that has been in operation for 55 years. Dance School C is an independently owned school in operation for over 30 years. Dance schools that were involved in the research focus exclusively on teaching dance and instructors have appropriate qualifications and expertise in teaching ballet. Dancers at these schools

Table 5.

Descriptive Statistics for Demographic Variables, by Group

Variable	Dancers (N = 45)		Non-Dancers (N = 111)	
	n	(%)	n	(%)
Grade				
9	14	(31%)	28	(25%)
10	8	(18%)	2	(2%)
11	14	(31%)	70	(63%)
12	8	(18%)	11	(9%)
Place of Birth ^a				
Canada	40	(89%)	92	(83%)
Other	4	(9%)	19	(17%)
Ethnicity				
White/Caucasian	38	(84%)	88	(79%)
African/Caribbean Canadian	0	(0%)	5	(5%)
Middle Eastern	1	(2%)	9	(8%)
Asian/Pacific Islander	3	(7%)	1	(1%)
First Nations/Native Canadian	1	(2%)	2	(2%)
Mixed	2	(4%)	5	(5%)
Parents' Marital Status				
Married	36	(80%)	75	(68%)
Divorced	6	(13%)	14	(13%)
Separated	2	(4%)	10	(9%)
Remarried	1	(2%)	4	(4%)

Table 5. (continued)

Variable	Dancers (<i>N</i> = 45)		Non-Dancers (<i>N</i> = 111)	
	<i>n</i>	(%)	<i>n</i>	(%)
Single	0	(0%)	3	(3%)
Widowed	0	(0%)	3	(3%)
Common-law	0	(0%)	1	(1%)
Unknown	0	(0%)	1	(1%)
SES ^b				
Machine operators, Semi-skilled workers	1	(2%)	2	(2%)
Skilled craftsman, Clerical/sales workers	4	(9%)	24	(22%)
Medium business, Minor Professional, Technical	18	(40%)	48	(43%)
Major business, Professional	19	(42%)	17	(15%)
	<i>M</i>	(<i>SD</i>)	<i>M</i>	(<i>SD</i>)
Age ^c	15.7	(1.1)	16.1	(1.2)
Years in Canada	10.1	(4.2)	7.9	(4.5)

^a Place of birth was missing for one dancer.

^b SES was missing for three dancers and 20 participants in the non-dancer group.

^c Age was missing for one participant in the non-dancer group.

Table 6.

Participant Recruitment from Dance Schools

Schools Contacted	Region of Windsor	Response
School A	East	Agreed
School B	South	Agreed
School C	Central	Agreed
School D	Central	Declined
School E	East	Declined
School F	Tecumseh	No Response
School G	West	No Response
School H	Sandwich Town	No Response

Table 7.

Characteristics of Dance Schools within the Community

School	Years of Operation	Size	Number of Instructors	Instructor Certification	Classes	Competitive Team
A ^a	25+	Large	10+	Cecchetti	Ballet, 5 Others	Yes, 40 dancers
B ^a	55	Large	25	Cecchetti	Ballet, 5 Others	Yes, 25 dancers
C ^a	30+	Medium	1	RAD BATD ^d	Ballet	No
D ^b	5	Large	15+	Other ^e	Ballet, 5 Others	Yes, Size Unknown
E ^b	10+	Small	3	Cecchetti	Ballet, 3 Others	No
F ^c	25+	Medium	1	Other ^f	Ballet, 4 Others	No
G ^c	5+	Small	1	None ^g	Ballet, 6 Others	No
H ^c	20+	Small	1	Cecchetti	Ballet, 3 Others	No

^a Dance school participated in the research .

^b Dance school declined to participate in the research.

^c Unable to establish contact with dance school.

Table 7. (continued)

^d Instructor danced professionally at a national elite ballet school and is certified with the Royal Academy of Dance, British Association of Teachers of Dance.

^e One dance instructor has performed at an elite ballet school overseas and taught ballet at a national elite ballet school. Other instructors do not appear to have certification for teaching dance, yet they have an extensive history of professional performance in dance.

^f Instructor danced professionally at a national ballet school.

^g Instructor has a history of professional performance in dance.

typically learn a syllabus and participate in yearly examinations through the Royal Academy of Dance or the Cecchetti Society of Canada.

The three dance schools that did permit access were provided with packages containing information letters, consent forms and questionnaires for dancers to take home to complete. The information letter described the study as an investigation of eating habits in adolescent girls. Information letters and consent forms for students under age 16 and for those aged 16 years and above are included in Appendices B and C, respectively. Dance instructors at the schools informed dance students about the research project. Dancers who indicated an interest in participating were provided with questionnaire packages containing the information letter, consent form, and research questionnaires to take home, complete, and return to the dance school by a specified date. As an incentive to return questionnaire packages, dancers and their parents were made aware that participants could choose to enter their names in a draw for a \$25 gift certificate from the local mall. Although the consent form for ballet dancers indicated that the researcher would directly measure their heights and weights, this procedure did not occur because dance teachers did not agree to allow data collection to take place at dance schools. Instead, dancers had the option of self-reporting their height and weight on one of the research questionnaires.

Response rates from dance schools. A total of 120 questionnaire packages were distributed to dance schools. See Table 8 for the distribution of completed questionnaire packages returned by students from each dance school. Across the three dance schools, a total of 70 girls obtained questionnaire packages from their dance schools to complete at home; 52 of these were returned for an overall response rate of 74%. Despite reminders

Table 8.

Response Rates by Dance School

Dance School	Distributed to School	Accepted by Dancers	Returned by Dancers	Response Rate (%)
School A	30	20	10	50%
School B	50	31	23	74%
School C	30	19	19	100%
Total	110	70	52	74%

from the researcher and dance teachers, 18 girls did not return the completed questionnaire packages to their dance schools.

Recruitment from high schools. After approval was obtained from the University of Windsor's Research Ethics Board (REB), a letter (see Appendix D) was sent to the Superintendent of the Windsor-Essex Catholic District School Board, along with an application for ethical clearance and permission to conduct the research in Catholic high schools. The researcher was granted permission to directly contact principals at the high schools. Subsequently, letters of introduction requesting access to schools for the purpose of recruiting participants were sent by the researcher to principals at six local Catholic high schools (See Appendix E). Access was granted by the principals of three of the six schools that were approached (See Table 9). The schools that agreed to participate were located in different regions of the city, ensuring a sample that was representative with respect to ethnicity and socioeconomic status. The researcher was given the opportunity to recruit female students in specific classes at each high school. At School 1, the participating classes were the grades 9 and 11 physical education classes. At School 2, participating classes were grades 9 and 11 physical education classes and one grade 11 dance class. At School 3, female students were recruited from all physical education and leadership classes in grades 9 through 12.

Information about the number of female students enrolled in participating classes was provided to the researcher by school principals. The researcher then provided school principals with the appropriate number of information letters and consent forms. Information letters and consent forms for students under age 16 and students older than age 16 are included in Appendices F and G, respectively. The information letter

Table 9.

Participant Recruitment from High Schools

Schools Contacted	Region of Windsor	Response
School 1	East	Agreed
School 2	County	Agreed
School 3	Tecumseh	Agreed
School 4	West	Declined
School 5	Central	Declined
School 6	South	Declined

described the purpose of the study as an investigation of eating habits in adolescent girls. In order to participate in the study, students under age 16 years had to return completed parental consent forms prior to the study testing date for their school. Students who were age 16 years or older could choose to participate without returning parental consent forms. Although the consent form for indicated that the researcher would directly measure participants' heights and weights, school principals did not agree to this procedure due to a lack of available classroom space to measure height and weight in a private. Participants were instead asked to self-report their height and weight on one of the research questionnaires.

Principals provided the teachers in participating classes with the information letters and consent forms, and teachers distributed the forms to all students in their class, regardless of their expressed interest in participating in the research. Students, in turn, were to take the information letter and consent form home to their parents, have them sign the consent form, and return the completed consent form to the school. As an incentive to participate, parents and students were made aware that research participants had the option of entering their name in a draw for a \$25 gift certificate from the local mall.

Since it was possible that dancers would be identified during recruitment in the high schools (e.g., dancers taking classes at dance schools other than the ones who had permitted access for this study), the information letter also asked parents of girls who took ballet lessons to contact the researcher directly if they consented to having their daughters participate in the study. One parent contacted the researcher directly stating that her daughter took ballet lessons. Accordingly, this student was provided with the

questionnaire package for dancers when she completed the study at her high school, and was assigned to the dancer group. The researcher also inquired during data collection whether girls had taken ballet within the previous 5 years. There were 11 girls who indicated that they had taken ballet lessons. They were also provided with the questionnaire package for dancers and placed within the dancer group. Therefore, there were a total of 12 dancers recruited from local high schools.

Response rate from high schools. As with students recruited through dance schools, the response rate for participants recruited through the high schools was based on the total number of information and consent forms distributed to students by their teachers. However, in contrast to the practice at the dance schools, where students received information letters and consent forms only if they indicated an interest in participating, female students in participating classes at the high schools all received information letters and consent forms regardless of their interest or intention to participate in the study. Therefore, response rates cannot be meaningfully compared across dance schools and high schools.

Altogether, 345 information letters and consent forms were distributed to students in participating classes at the three high schools (See Table 10). Completed questionnaires were obtained from 123 high school students, for an overall response rate of 36%. Girls who were 16 years of age or older were able to sign consent forms on their own behalf and could therefore participate in the research without obtaining prior parental consent. In total, 36 (29%) students in grades 9 and 10 returned completed parental consent forms, and assented to participation. The other 87 (71%) students were girls in grades 11 and 12 who were old enough to consent to participate on their own.

Table 10.

Response Rates by High School

School Name	Number of Information Letters Distributed to Students	Number of Participants	Response Rate (%)
School 1	75	16	21%
School 2	75	47	63%
School 3	195	60	31%
Total	345	123	36%

Measures

Measures used in the current study were the About You Background Survey, Eating Disorder Inventory-3 (EDI-3; Garner, 2005), Sociocultural Attitudes Towards Appearance Questionnaire-3 (SATAQ-3; Thompson, van den Berg, Roehrig, Guarda & Heinberg, 2004), McKnight Risk Factor Survey-IV (MRFS-IV), Youth Self-Report (YSR; Achenbach, 2001), and Dancers' Experiences Survey (Spadafora, Kuhn, & Samardzic, 2007). Both the About You Background Survey and the Dancers' Experiences Survey were developed specifically for use in the current study. Dancers completed all of these questionnaires whereas non-dancers completed all the questionnaires except the Dancers' Experiences Survey. Regardless of group assignment, the About You Background Survey was the first measure in the questionnaire package, and the remaining measures were presented in randomized order to control for order effects.

About You Background Survey

This survey was designed for the purpose of the study (Appendix H). It consists of 20 items asking about basic demographic characteristics including age, date of birth, and parents' marital status, level of education and occupation. Participant responses to questions about parental education and occupation were used to calculate SES based on the Hollingshead Four Factor Index (1975). The About You Background Survey also asked participants to indicate if they were currently taking dance lessons, or had taken dance lessons in the past. Additional items on the survey inquired about whether parents, siblings and friends were trying to lose weight.

Eating Disorder Inventory-3

The EDI-3 is a self-report instrument that assesses eating pathology in adolescents and adults (Garner, 2005). The EDI-3 is a recent revision of the EDI-2, the most widely used instrument for measuring eating pathology in both research and clinical practice. Although the EDI-3 contains the same 91 items as the EDI-2, there were revisions to the component scales to better reflect modern theories of eating disorders (Garner, 2005). There are a total of 18 scales, some of which assess variables directly related to eating pathology (drive for thinness, bulimia, body dissatisfaction, and eating disorder risk composite). Others assess psychosocial variables associated with eating pathology (low self-esteem, personal alienation, interoceptive deficits, emotional dysregulation, perfectionism, asceticism, maturity fears, ineffectiveness, interpersonal problems, overcontrol, and general psychological maladjustment). There are also three validity scales: inconsistency, infrequency, and negative impression.

The EDI-3 is appropriate for use with adolescents and adults who range in age from 13 to 53 (Garner, 2005). The EDI-3 was standardized on 1,980 females with Anorexia, Bulimia, and Eating Disorder Not Otherwise Specified who resided both in the United States and in other countries, and on 3,802 females without Eating Disorders. Normative data are available for adult and adolescent females with eating disorders (i.e., Anorexia Nervosa, Bulimia Nervosa and Eating Disorder Not Otherwise Specified).

The EDI-3 has demonstrated good psychometric properties. For the majority of subscales, internal consistency reliabilities range above .80, and test-retest reliabilities range from .93 to .98 (Cumella, 2006). The construct validity of the various subscales has

also been supported through factor analytic research, and the EDI-3 has demonstrated good convergent validity with other measures of eating pathology (Cumella, 2006).

Sociocultural Attitudes Towards Appearance Questionnaire-3 (SATAQ-3)

The SATAQ-3 (Thompson et al., 2004) is a 30-item questionnaire designed to measure internalization of the thin ideal, pressure by the media and awareness of media depictions of body size and appearance (Appendix I). This measure has been widely used in studies with both adolescent girls (e.g., Abrams & Stormer, 2002) and women (e.g., Thompson et al., 2004). Items are rated on a 5-point Likert scale (1 = definitely disagree, 2 = mostly disagree, 3 = neither agree nor disagree, 4 = mostly agree, 5 = definitely agree). The four scales of the SATAQ-3 were identified through factor analyses. Sample items on the various scales are as follows: information (9 items, e.g., “*TV programs are an important source of information about fashion and “being attractive”*”), pressures (7 items, e.g., “*I’ve felt pressure from TV or magazines to lose weight*”), internalization-athlete (5 items, e.g., “*I do not wish to look as athletic as the people in magazines*”), internalization-general (9 items, e.g., “*I do not care if my body looks like the body of people who are on TV*”).

The construct validity of SATAQ-3 scales has been supported in studies of undergraduate women (Thompson et al., 2004), and in a large sample of women hospitalized for eating disorders (Calogero, Davis, & Thompson, 2004). The SATAQ-3 has demonstrated good psychometric properties within a normative sample of female undergraduate students (Thompson et al., 2004). The measure was found to have good convergent validity with the EDI-2 drive for thinness and body dissatisfaction scores. Additional analyses were conducted comparing factor scores for fifteen women

hospitalized for eating disorders, women in the normative sample with eating pathology, and a control group. Women with eating disorders and eating pathology were found to have significantly higher scores on the pressures, internalization-general, internalization-athlete subscales than controls. However, women with eating pathology had significantly higher scores than women with eating disorders and women in the control group on the Information scale.

McKnight Risk Factor Survey-IV

The McKnight Risk Factor Survey-IV (MRFS-IV) is a 103-item self-report measure that was developed by a team of researchers (e.g., Shisslak et al., 1998) to identify risk factors for eating disorders in adolescents. Data collection, which began in 1994, has included adolescents from multiple sites across Arizona and California. The measure is appropriate for use with youth in grades 6 through 12. Most items are rated on a 5-point Likert scale (1 = Never, 5 = Always). The MRFS-IV yields 36 different scores, including for example, weight-related teasing from peers or adults, experiencing pressures to be thin from participation in athletics, and over-concern with shape and weight.

Although there are limited data on the psychometric properties of the most recent revision, the MRFS-IV, it was used in the current study because this version has been used by prominent researchers in studies of eating pathology in adolescents (e.g., Stice & Whitenton, 2002) and the earlier version has demonstrated good psychometric properties. The McKnight Survey I and II were piloted on adolescent girls and revised a third time to address the limitations found in these early investigations (Shisslak et al., 1999). The MRFS-III has demonstrated good test-retest reliability for girls in high school and

adequate test-retest reliability for girls in elementary school. Convergent validity was established with other measures of self-confidence, self-esteem and depression.

Youth Self-Report

The YSR is a self-report questionnaire that assesses a variety of emotional and behavioural problems that may have been present during the preceding six months (Achenbach, 2001). It is one measure in the Achenbach System of Empirically Based Assessments. These measures have been utilized in over 6,000 published studies (Achenbach, 2007). The YSR has demonstrated good reliability, with internal consistency reliabilities ranged from .71 to .95 for each of the subscales. Criterion-related validity has also been established, as the measure was able to distinguish between clinically referred and non-referred adolescents after controlling for demographic variables such as SES (Achenbach, 2001).

The YSR consists of 112 items that adolescents rate on a 3-point scale (0 = Not true to 2 = Very true or often true) based on how well the item applies to them. A Grade 5 reading level is required for completion and it is appropriate for use with adolescents between ages 11 and 18 years. The YSR is comprised of eight syndrome scales (e.g., withdrawn, somatic complaints, anxious/depressed, attention problems, thought problems, social problems, aggressive behaviours, and delinquent behaviours), two broadband syndrome scales (internalizing and externalizing) and a total problem score.

Dancers' Experiences Survey

This survey (Appendix J) was designed specifically for the purpose of the current study. The development of this measure is described in Appendix K. The Dancers' Experiences Survey was developed by former dancers (Spadafora, Kuhn, & Samardzic,

2007) to summarize and describe the experiences of adolescent dancers. It contains 35 items that ask girls to describe why they began taking dance lessons, at what age they started, how often they take lessons, and their career aspirations. Additionally, girls are asked to rate how comfortable they are practicing in front of mirrors and wearing their typical dance attire. The survey also inquires about their perceptions of pressures to be thin from instructors and peers.

Procedure

At the dance schools. Dance instructors informed their students about the research project. Dancers who expressed interest in participating were provided with packages containing the information letter, consent form, and research questionnaires to take home, complete, and return to the dance school by a specified date. The questionnaire package, and all of the questionnaires within it, were number coded. For tracking purposes, a record was kept of the name of the participant who received each package. Dancers who did not return the package by the specified date were provided with reminder letters by their dance instructor.

After completed questionnaires were returned from research participants, critical items from the Youth Self Report about intent to harm oneself or others were reviewed by the researcher. Dancers did not endorse any critical items. Subsequently, research summary letters (Appendix L) were made available to participants through the dance schools; these described the purpose of the study and included a list of community resources to access in the event of behavioural or emotional difficulties. The draw for a gift certificate took place when data collection had been completed at all three dance schools. There was one gift certificate available for participating dancers who indicated

that they wanted to be entered in the draw and who had supplied their names and addresses to the researcher for that purpose. One name was drawn randomly from an envelope containing the names of all participating dancers and the gift certificate for \$25 was sent to the winning participant through the mail.

At the high schools. On the designated testing day for their class, participants completed the questionnaires during class time in the researcher's presence. The testing took place in individual classrooms at School 2, in the cafeteria at School 3, and in gymnasium at School 1.

Participants younger than age 16 whose parents had given consent for them to participate in the study were provided with an assent form (Appendix M) to sign and return to the researcher. Participants who were age 16 or older provided written consent on their own behalf. Participants signed their name on an attendance sheet and were provided with a questionnaire package. The package and the individual measures within it were coded with an identification number. This number was recorded on the attendance sheet next to the name of the participant. Participants were instructed not to put their names anywhere on the questionnaire package.

It took the majority of participants less than one hour to complete the questionnaires; however, some participants were unable to complete the questionnaires before they had to attend another class. As such, data were incomplete for 5 girls who participated in the study.

After returning the questionnaire package to the researcher, participants were given a copy of the research summary letter that described the purpose of the study and included a list of community resources to address behavioural or emotional difficulties.

Participants who elected to enter the draw for a gift certificate for \$25 were provided with a small piece of paper to record their name, address and telephone numbers. They put this piece of paper in a blank envelope and returned it to the researcher, who in turn placed it in a larger envelope containing all of the entries.

After all participants had left the room in which the testing had occurred, critical items from the Youth Self Report that asked about intent to harm oneself or others were reviewed by the researcher. The names of participants who endorsed critical items were identified by matching the identification number on the questionnaire package to the number and associated name on the attendance sheet. In total, there were 4 students at School 1, 3 students at School 2, and 10 students at School 3 who were at-risk. The researcher notified the principal, who in turn met with the student to assess whether she required immediate intervention.

Draws for gift certificates took place when data collection had been completed at the high schools. There was one gift certificate available to be won. Students who had indicated that they wanted to be entered in the draw and who had supplied their names and addresses to the researcher for that purpose were entered in the draw. One name was drawn randomly from an envelope containing the names of participants and a gift certificate for \$25 was sent to the winning participant through the mail.

The researcher returned to two high schools (School 2 and School 3) one to two weeks following data collection to conduct a series of interactive workshops for research participants on healthy body image. The researcher did not present at School 1 at the request of staff because it was nearing the end of their semester and class time was therefore limited. The topics covered included sociocultural factors that contribute to

body image concerns, maintaining a healthy lifestyle through moderate exercise and balanced eating, and methods to foster healthy body image. The presentations were well-received; students were attentive and interested in the various topics.

Chapter III

RESULTS

Overview

The results of the research are included in several sections, and information included in each section will be explained for clarity. First, the power analysis, data screening and statistical analyses will be explained. Next, there will be a description of the research variables, followed by descriptive statistics. Results of the analyses investigating the five main research hypotheses are then discussed. Finally, exploratory analyses are presented on information obtained from the Dancers' Experiences Survey.

Power Analysis

A power analysis was conducted with G*Power computer software (Buchner, Erdfelder, & Faul, 2001). With the various predictor variables and a small effect size, at least 90 participants were recommended for structural equation modeling. Generally, a large number of participants are recommended for such analyses, with 200 cases for small and relatively simple models considered an adequate sample size (Tabachnick & Fidell, 2001). The sample of dancers was smaller than the recommended size. Structural equation modeling was therefore conducted with a smaller, simplified model and evaluated with fit indices appropriate for small samples.

Data Screening

Prior to analyses, variables were examined for accuracy, missing values, outliers, skewness and kurtosis through SPSS Explore. In order to check for accuracy of data entry, a random sample of 10% of participants was selected using SPSS random sample generator. Raw data was checked with data entered and no data entry errors were

identified. Next, missing values were examined. Missing data were in an acceptable range and found to be random throughout data set.

Within the sample of dancers, outliers were identified in the following variables: body mass index (BMI) ($n = 1$; value = 30.0), bulimia ($n = 1$; value = 13.0), internalizing psychopathology ($n = 2$; $M = 39.5$, $SD = 6.4$), externalizing psychopathology ($n = 1$; value = 29.0), parent concern with thinness ($n = 5$; $M = 37.2$; $SD = 1.3$), peer concern with thinness ($n = 2$; $M = 4.9$; $SD = 0.9$), weight teasing from peers ($n = 3$; $M = 22.0$; $SD = 2.3$), and weight teasing from parents ($n = 1$; value = 5.7).

For non-dancers, outliers were identified in the following variables: BMI ($n = 9$; $M = 32.4$, $SD = 2.9$), drive for thinness ($n = 1$; value = 26.0), internalizing psychopathology ($n = 3$; $M = 38.0$, $SD = 1.0$), externalizing psychopathology ($n = 2$; $M = 39.5$, $SD = 0.7$), bulimia ($n = 9$; $M = 16.8$, $SD = 4.2$), perfectionism ($n = 1$; value = 21.0), activities to feel good ($n = 6$; $M = 6.8$, $SD = 1.2$), parent concern with thinness ($n = 10$; $M = 4.9$, $SD = 0.9$), peer concern with thinness ($n = 2$; $M = 11.0$, $SD = 0.9$), academic performance ($n = 1$; value = 0), support person ($n = 1$; value = 12.0), support sharing ($n = 2$; $M = 2.5$, $SD = 0.2$), weight teasing from parents ($n = 2$; $M = 6.7$, $SD = 0.5$), weight teasing from peers ($n = 7$; $M = 26.4$, $SD = 3.9$), and other trying to lose weight ($n = 4$; $M = 13.3$, $SD = 1.0$).

For dancers, the variables BMI, bulimia, parent concern with thinness, weight teasing from peers, and weight teasing from parents were not normally distributed. Logarithmic transformations were applied, and skewness was reduced significantly for BMI (1.0 to 0.6) and bulimia (1.3 to 0.1). Weight teasing from parents and weight teasing from peers remained significantly skewed despite attempts at transformation.

For non-dancers, the variables BMI, bulimia, parent concern with thinness, support sharing, weight teasing from peers, and weight teasing from parents were not normally distributed. Logarithmic transformations improved skewness for BMI (1.4 to 0.8) and bulimia (2.2 to 0.3). Parent concern with thinness, support sharing, weight teasing from peers and weight teasing from parents were not improved after transformations, nor were they improved after outliers were omitted.

Data were re-screened and preliminary analyses were conducted with both transformed and untransformed variables. Results were not altered. Therefore, analyses were conducted with untransformed variables to enhance interpretability. Outliers were retained because they were thought to be reflective of the distribution of clinical variables in the population.

Statistical Analyses

Descriptive statistics, independent samples *t*-tests and correlational analyses were conducted with SPSS version 13.0 (SPSS, 2009). MPLUS statistical software was utilized for SEM analyses (Muthen & Muthen, 1998). This software uses full information maximum likelihood estimation to estimate missing data, which is considered to be one of the best practices for handling missing data. Thus, for SEM analyses, missing values were estimated, whereas for correlational and descriptive analyses with SPSS, cases with missing values were excluded from analyses. For all analyses, the statistical significance level was set at .05. Internal consistency reliabilities (Cronbach's alpha) for measures used in the research are provided in Appendix N.

Description of Variables

Body mass index. Table 11 provides a list of variables and how they were measured. Means and standard deviations are provided in Table 12 for raw scores. Self-reported heights and weights were used to calculate Body Mass Index (BMI). Weight in pounds was divided by height inches squared and then divided by 703 (Center for Disease Control and Prevention, 2007).

Eating pathology and perfectionism. Eating pathology was measured by participants' raw scores on the drive for thinness, bulimia, and body dissatisfaction scales of the Eating Disorder Inventory-3 (EDI-3). Perfectionism was measured by scores on the perfectionism scale of the EDI-3. Raw scores were preferred over standard scores because the normative group for the EDI-3 only included adolescents with clinically defined eating disorders. Since the majority of participants in the current study would not meet diagnostic criteria for an eating disorder, this was considered to be an inappropriate reference group. Nevertheless, standard score equivalents are provided in Table 13 according to the Eating Disorder Not Otherwise Specified normative group.

Internalization of the thin ideal. Internalization of the thin ideal was measured by the internalization-general scale on the Sociocultural Attitudes Towards Appearance Questionnaire-3 (SATAQ-3). Although there are three other scales on the SATAQ-3 (information, pressures, internalization-athlete), only internalization-general was used in statistical analyses because it has the most empirical support for being associated with the overall construct (Thompson et al., 2004).

Others trying to lose weight. Information about parents, peers and siblings trying to lose weight was also obtained from the About You Background Survey. In order to

Table 11.

List of Research Variables and How They Were Measured

Variable	How Measured
Body Mass Index (BMI)	About You Background Survey
Eating Pathology	
Drive for Thinness	Eating Disorder Inventory-3 Drive for Thinness Scale (Raw Scores)
Bulimia	Eating Disorder Inventory-3 Bulimia Scale (Raw Scores)
Body Dissatisfaction	Eating Disorder Inventory-3 Body Dissatisfaction Scale (Raw Scores)
Internalization of the Thin Ideal	
Internalization-General	Sociocultural Attitudes Towards Appearance Questionnaire-3 Internalization-General Scale
Sociocultural Pressures	
Direct Comments about Weight	McKnight Risk Factor Survey-IV Parent Concern with Thinness Scale McKnight Risk Factor Survey -IV Peer Concern with Thinness Scale
Teasing	McKnight Risk Factor Survey -IV Weight Teasing from Parents McKnight Risk Factor Survey -IV Weight Teasing from Peers
Others Trying to Lose Weight	About You Background Survey
Comorbid Psychopathology	
Internalizing Psychopathology	Youth Self-Report Internalizing Scale (Raw Score)
Externalizing Psychopathology	Youth Self-Report Externalizing Scale (Raw Score)

Table 11. (continued)

Variable	How Measured
Perfectionism	Eating Disorder Inventory-3 Perfectionism Scale (Raw Score)
Protective Factors	
Pleasurable Activities	McKnight Risk Factor Survey-IV Activities to Feel Good Scale
Academic Performance	McKnight Risk Factor Survey -IV School Performance Scale
Social Support	McKnight Risk Factor Survey -IV Support Person & Sharing Scale
Negative Life Events	McKnight Risk Factor Survey -IV Negative Life Events Scale
Dance Variables	
Level of Involvement in Ballet	Dancers' Experiences Survey
Career Aspirations	Dancers' Experiences Survey

Table 12.

Descriptive Statistics for Research Variables

Variable	Dancer (<i>N</i> = 45)		Non-Dancer (<i>N</i> = 111)		Test Statistic <i>t</i> (155)
	<i>M</i>	(<i>SD</i>)	<i>M</i>	(<i>SD</i>)	
Body Mass Index (BMI)	20.6	(2.8)	22.4	(4.1)	-2.5*
	Range 15.6 - 30.0		Range 15.0 – 37.1		
Eating Pathology					
Drive for Thinness	7.7	(6.9)	6.8	(6.5)	0.7
Bulimia	3.9	(4.3)	3.6	(5.0)	0.4
Body Dissatisfaction	11.6	(8.4)	14.0	(10.0)	-1.5
Internalization of the Thin Ideal					
Internalization-General	25.2	(9.8)	24.0	(9.3)	0.8
Sociocultural Pressures					
Direct Comments - Peers	5.5	(1.9)	5.0	(1.6)	1.8
Direct Comments - Parents	2.4	(1.3)	2.1	(1.1)	1.5
Teasing - Parents	3.1	(1.1)	3.0	(1.0)	0.4
Teasing- Peers	8.5	(4.6)	9.8	(5.8)	-1.4
Others Trying to Lose Weight	5.5	(3.0)	5.4	(2.9)	0.1
Comorbid Psychopathology					
Internalizing Psychopathology	14.8	(8.8)	13.9	(9.2)	0.7
Externalizing Psychopathology	9.6	(5.5)	13.3	(8.1)	-2.6*
Perfectionism	10.6	(5.2)	7.4	(6.6)	3.1**
Protective Factors					
Activities to Feel Good	3.7	(1.9)	2.6	(1.7)	3.4**
Negative Life Events	2.6	(1.6)	3.0	(1.9)	-1.1
School Performance	2.7	(0.5)	2.3	(0.6)	3.2**
Support Sharing	9.2	(2.6)	9.5	(2.1)	-0.8
Support Person	4.4	(2.1)	4.7	(2.3)	-0.8

**p* = .01, ** *p* < .01

Table 13.

T-score Equivalents of Mean Raw Scores for Research Variables

Variable	Dancer (N = 45)			Non-Dancer (N= 111)		
	<i>M</i>	(<i>SD</i>)	Range	<i>M</i>	(<i>SD</i>)	Range
Drive For Thinness	31.0	(10.1)	20-61	29.6	(9.4)	20-58
Bulimia	42.7	(5.3)	38-57	42.4	(6.2)	38-71
Body Dissatisfaction	32.8	(8.1)	22-52	35.4	(9.7)	22-57
Internalizing Psychopathology	53.8	(9.6)	36-82	52.9	(10.4)	32-78
Externalizing Psychopathology	49.6	(8.1)	34-70	54.9	(9.5)	37-79
Perfectionism	46.9	(10.5)	33-67	41.7	(8.5)	30-64

quantify this information, data were re-coded such that higher scores were associated with more harmful methods of weight control. For each of the questions “*In the past year, has your mother, father, brother or sister, or friends tried to lose weight?*,” Yes was coded as a 1, and No was coded as a 0. The methods of trying to lose weight were coded as follows: Ate healthfully (Yes = 0, No = 1), Dieted severely (Yes = 1, No = 0), Exercised a little (Yes = 0, No = 1), Exercised a lot (Yes = 1, No = 0), Other (Harmful = 1, Non-harmful = 0). Harmful methods of weight control included having gastric by-pass surgery and using diet pills. Non-harmful methods of weight control included participating in the Weight Watchers Program and using a Personal Trainer. The variable Others Trying to Lose Weight was derived from adding the total score for mothers, fathers, siblings and friends trying to lose weight.

Teasing. Teasing was assessed by participants' score on two scales from the McKnight Risk Factor Survey-IV. The weight teasing from peers and weight teasing from parents scales of the MRFS-IV inquire about whether girls experienced teasing about their body weight or shape from others.

Direct comments. Direct comments about eating, shape and weight were assessed by participants' scores on the parent concern with thinness and peer concern with thinness scales of the MRFS-IV.

Comorbid psychopathology. Raw scores on the internalizing and externalizing scales of the Youth Self Report were included as measures of comorbid psychopathology and eating pathology. Raw scores were preferred over standard scores because they were thought to be a clearer representation of the variables in question. T-score equivalents of raw scores are described above in Table 13.

Protective factors. The protective factors that were examined in the research were all assessed by the MRFS-IV. They included engaging in pleasurable activities (activities to make you feel good scale), academic performance (school performance scale), social support (support person scale and support sharing scale), and negative life events (negative life events scale). The scales measuring social support differ in that the supporting person scale assesses the number of people in one's external environment that girls feel they can rely on for social support, whereas support sharing assesses the extent to which girls feel they can share intimate information with those people.

Dance variables. One dance-related variable of interest in the research hypotheses included dancers' career aspirations. This was measured by a question on the Dancers' Experiences Survey that inquired about what dancers hoped to accomplish from taking ballet lessons. Exposure to the dance subculture was also measured by the Dancers' Experiences Survey. Specific questions inquired about the age at which girls began ballet, total number of years taking ballet lessons, and total number of hours taking ballet lessons each week, practicing ballet at home, and rehearsing with a dance team.

Research Hypotheses

Hypothesis I. Eating Pathology in Non-dancers and Dancers

The first aim of this study was to replicate previous findings that dancers have more eating pathology and lower BMIs than non-dancers. Independent samples *t*-tests were conducted to investigate whether dancers had higher scores on drives for thinness, bulimia and body dissatisfaction and lower BMIs compared to non-dancers. In contrast to this hypothesis, there were no statistically significant differences between groups on drive for thinness, $t(146) = 0.7, p = .5$, bulimia, $t(145) = 0.3, p = .78$ and body dissatisfaction,

$t(141) = -1.5, p = .14$. As predicted, dancers were found to have significantly lower BMIs than non-dancers, $t(147) = -2.4, p = .006$. Thus, there was partial support for the first hypothesis. Although dancers did not evidence higher scores on the drive for thinness, bulimia and body dissatisfaction scales, dancers did have significantly lower BMIs than non-dancers.

Hypothesis II. Predictors of Eating Pathology in Non-Dancers and Dancers

The second aim of this study was to test a predictive model of eating pathology in a sample of non-dancers and then examine model fit within the sample of dancers. To test the model, path analysis was conducted using SEM methodology. The hypothesized model was presented earlier in Figure 1. Due to the large number of parameters to be estimated, a more parsimonious model was favoured to increase power. The core model incorporated variables that have the strongest empirical support as predictors of eating pathology. Sociocultural pressures to lose weight, and comorbid psychopathology were omitted from the core model since they have less empirical support as predictors of eating pathology. A model building, rather than a model trimming procedure was favoured, as the addition of these variables would create unnecessary complexity within the model and decrease statistical power.

Model testing proceeded in the following manner. The core model was tested within the sample of non-dancers. Theoretically defensible modifications were added if they significantly improved model fit. In accordance with the confirmatory nature of these analyses, there were no further modifications once the model adequately fit the data. The model was re-tested with additional components (i.e., sociocultural pressures to be thin and comorbid psychopathology) and fit statistics were re-evaluated.

Chi-square statistics were used to assess the overall fit of the model. Non-significant chi-square statistics (e.g., $p > .05$) indicate that the hypothesized model fits data (Tabachnick & Fidell, 2001). Since chi-square statistics are highly sensitive to sample size, fit indices were also used to supplement the evaluation of model fit. In the current study, the comparative fit index (CFI; Bentler, 1988), the standard root mean square residual (SRMR), and root mean square error of approximation (RMSEA; Browne & Cudeck, 1993) were used. The CFI is an appropriate fit index with small samples. Values range from 0 to 1, with values greater than .95 indicating that the hypothesized model fits the data appropriately (Tabachnick & Fidell, 2001). Smaller SRMR values are indicative of good model fit, with values less than .08 considered appropriate. The RMSEA is also a widely utilized fit statistic. Values less than .06 indicate that the hypothesized model fits the data appropriately.

Non-Dancers

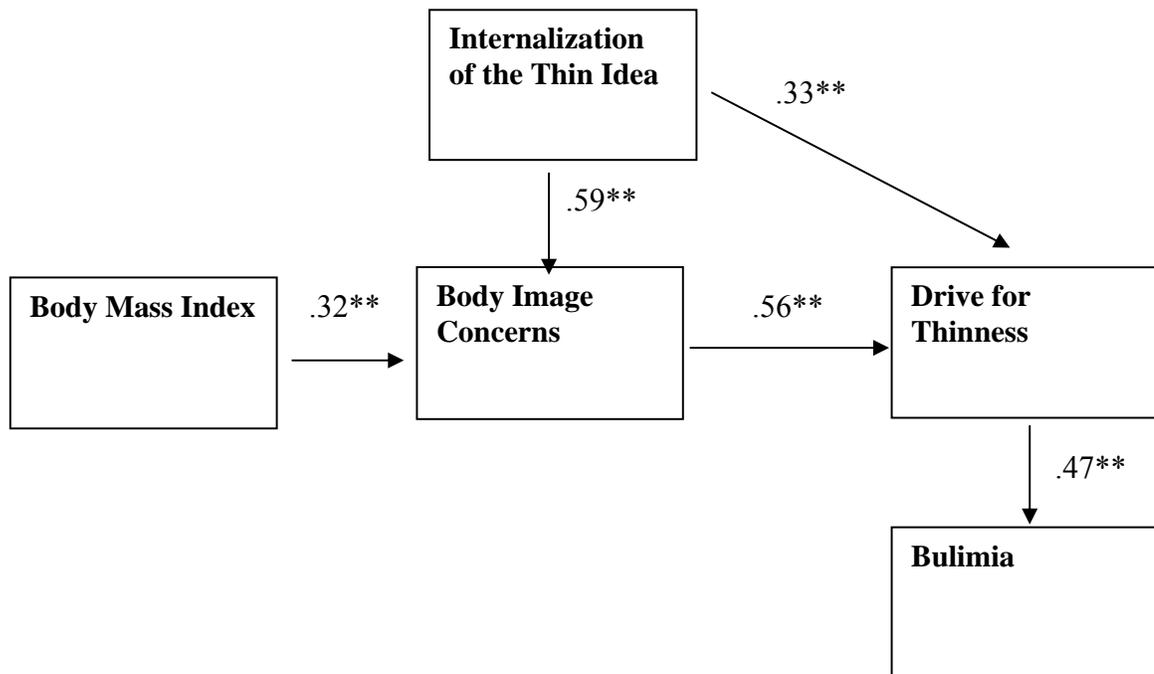
In the first step, bulimia was regressed on drive for thinness. Drive for thinness was regressed on body dissatisfaction and perfectionism. Body dissatisfaction was regressed on internalization-general, BMI, and a mediator variable for internalization-general and BMI. The model fit the data reasonably well after some modifications, $\chi^2(9) = 9.1, p = .4$; SRMR = .07; CFI = .99; RMSEA = .01. First, internalization-general as a mediator between BMI and body dissatisfaction was omitted. Second, a path leading directly from internalization-general to drive for thinness was added. After the addition of sociocultural pressures to be thin (i.e., weight-related teasing from parents, weight-related teasing from peers, parent concern with thinness, peer concern with thinness, and others trying to lose weight) the model did not adequately fit the data, $\chi^2(34) = 132.6, p < .01$;

SRMR = .20; CFI = .68; RMSEA = .16. Similarly, after the addition of Internalizing and Externalizing psychopathology, the model also did not adequately fit the data $\chi^2(13) = 30.6, p < .01$; SRMR = .07; CFI = .93; RMSEA = .11.

Direct effects. There were significant direct effects from BMI and internalization-general to body dissatisfaction. There were significant direct effects from body dissatisfaction to drive for thinness, and from drive for thinness to bulimia. The direct effect of perfection on drive for thinness was not significant. Eliminating perfectionism did not result in a significant improvement in model fit based on the chi square difference test, $\Delta\chi^2(4) = 4.8, p > .5$. However, fit indices indicated that model fit was improved by the elimination of this pathway, $\chi^2(5) = 4.3, p = .5$; SRMR = .06, CFI = 1.00; RMSEA = 0. The final model incorporating all significant paths is depicted in Figure 2. Observed variables are represented by rectangles and connecting arrows implies the direction of the relationship. The lack of an arrow between two observed variables implies no relationship.

Indirect effects. Indirect effects were evaluated by using the Sobel test (Sobel, 1982; Baron & Kenny, 1986). All indirect paths were significant. The indirect path leading from body dissatisfaction to bulimia through drive for thinness, $z = 4.3, p < .01$, indicated that body image concerns were associated with more drive for thinness, leading to more symptoms of bulimia. The path leading from internalization-general to bulimia through drive for thinness, $z = 3.4, p < .01$, demonstrated that highly valuing the thin ideal leads to more drive for thinness, and therefore to more symptoms of bulimia. In addition, the indirect path from BMI to drive for thinness through body dissatisfaction, z

Figure 2.

Predictive Model of Eating Pathology in Non-Dancers

** $p < .01$

= 3.2, $p < .01$, indicated that higher BMIs lead to more body dissatisfaction, and then to more drive for thinness. Finally, there was an indirect path from internalization-general to drive for thinness through body dissatisfaction, $z = 4.3$, $p < .01$. That is, highly valuing the thin ideal leads to more body dissatisfaction, and therefore, to a higher drive for thinness.

Dancers

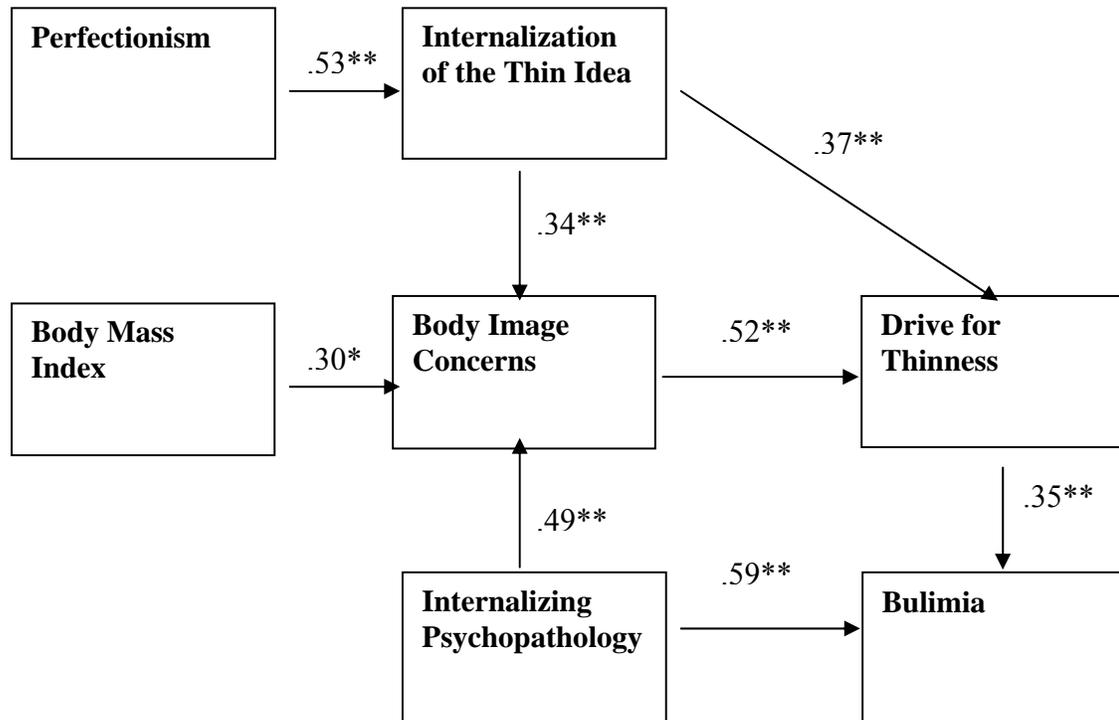
The final model that fit the data for non-dancers was then tested in the sample of dancers. Specifically, bulimia was regressed on drive for thinness. Drive for thinness was regressed on body dissatisfaction, perfectionism, and internalization-general. Body dissatisfaction was regressed on internalization-general and BMI. As predicted, the model for non-dancers did not fit the data well for dancers, $\chi^2(9) = 20.9$, $p = .01$; SRMR = .15; CFI = .82; RMSEA = .17. The addition of sociocultural pressures to be thin (i.e., weight-related teasing from parents, weight-related teasing from peers, parent concern with thinness, peer concern with thinness, and others trying to lose weight) had an adverse effect on model fit, $\chi^2(34) = 113.5$, $p < .01$; SRMR = .23; CFI = .43; RMSEA = .23.

However, after the addition of internalizing and externalizing psychopathology, the model fit was improved, $\chi^2(12) = 19.3$, $p = .08$; SRMR = .08; CFI = .93; RMSEA = .12. After a review of modification indices, several adjustments were made to the model. First, the path from perfectionism to drive for thinness was omitted and replaced with a direct path to internalization-general. Second, a direct path from internalizing psychopathology to bulimia was added. This resulted in a model that fit the data reasonably well, $\chi^2(15) = 14.4$, $p = .5$; SRMR = .09; CFI = 1.00; RMSEA = 0.

Direct effects. There was a significant direct effect from perfectionism to internalization-general. There was a significant direct effect from internalization-general to body dissatisfaction, and to drive for thinness, as well as a significant direct effect from BMI to body dissatisfaction. There was a significant direct effect from internalizing psychopathology to body dissatisfaction, and to bulimia. There were significant direct effects from body dissatisfaction to drive for thinness, and from drive for thinness to bulimia. The path from externalizing psychopathology to bulimia was not significant. The deletion of the path did not improve model fit according to the chi square difference test, $\Delta\chi^2(4) = 4.7, p > .5$. However, fit indices indicated that model fit was improved by the elimination of this pathway, $\chi^2(11) = 9.6, p = .6$; SRMR = .07, CFI = 1.00; RMSEA = 0. The final model incorporating all significant paths is depicted in Figure 3.

Indirect effects. All indirect effects within the final model were evaluated with the Sobel test (Sobel, 1982; Baron & Kenny, 1986) and found to be significant. The path leading from BMI to drive for thinness through body dissatisfaction, $z = 2.3, p < .05$, implied that higher BMI was associated with higher more body image concerns and therefore, more dieting. The path from internalization-general to drive for thinness through body dissatisfaction, $z = 2.5, p < .01$ indicated that highly valuing the thin ideal leads to more body image concerns, and in turn to more dieting. In addition, the path from internalizing psychopathology to drive for thinness through body dissatisfaction was also significant, $z = 3.1, p < .01$. This finding indicated that higher levels of internalizing problems, like anxiety and depression leads to more body image concerns, and then to more dieting behaviors.

Figure 3.

Predictive Model of Eating Pathology in Dancers

* $p < .05$, ** $p < .01$

The indirect path leading from internalization-general to bulimia through drive for thinness, $z = 2.3, p < .01$, indicated that highly valuing the thin ideal was associated with more dieting, and then to more symptoms of bulimia. Similarly, the path from body dissatisfaction to bulimia through drive for thinness, $z = 2.6, p < .01$, suggested that more body image concerns leads to more dieting, which in turn leads to more bulimia. Finally, perfectionism leads to body dissatisfaction through internalization-general, $z = 2.4, p < .01$. This implies that higher perfectionism leads to placing a great importance on the thin ideal, which in turn leads to more body image concerns.

Hypothesis III. Dance Variables related to Eating Pathology

The third aim of this study was to increase our understanding of why dancers specifically have a higher risk for eating pathology. The dance subculture is often depicted as a toxic environment, where thinness is highly emphasized and valued. It was therefore predicted that greater exposure to this subculture would be associated with increased risk for eating pathology. To test this hypothesis, Pearson product-moment correlations were conducted between measures of eating pathology (i.e., drive for thinness, bulimia, body dissatisfaction and BMI) and age at which girls began ballet, total number of years taking ballet lessons, and total number of hours taking ballet lessons each week, practicing ballet at home, and rehearsing with a dance team.

Age at which girls began ballet lessons. It was predicted that higher levels of eating pathology would be negatively associated with the age at which girls began ballet lessons. In direct contrast to this prediction, there were significant positive correlations between the age at which girls began ballet lessons and drive for thinness, $r(39) = .44, p < .01$, bulimia, $r(42) = .41, p < .01$, and body dissatisfaction, $r(40) = .41, p < .01$. That is,

beginning ballet at later ages was associated higher levels of eating pathology. The correlation between the age at which girls began ballet lessons and BMI was not significant, $r(40) = .21, p = .19$.

Total number of years in ballet. It was predicted that higher levels of eating pathology would be positively associated with the total number of years taking ballet lessons. Also in direct contrast to this prediction, there were significant negative correlations between the total number of years girls took ballet lessons and drive for thinness, $r(39) = -.44, p > .01$, bulimia, $r(42) = -.36, p = .02$, and body dissatisfaction $r(40) = -.37, p = .02$. Thus, higher eating pathology was actually associated with less exposure to the dance subculture, as measured by the total number of years taking ballet lessons. The correlation between the total number of years girls took ballet lessons and BMI was not significant, $r(40) = -.15, p = .35$.

Total number of hours in ballet class. It was predicted that higher levels of eating pathology would be positively associated with the number of hours girls spend in ballet class each week. Correlations between the number of hours girls spent each week at their ballet lesson and drive for thinness, $r(38) = .12, p = .47$, bulimia, $r(40) = .05, p = .75$, body dissatisfaction, $r(39) = .11, p = .49$ and BMI, $r(39) = .07, p = .69$ were not significant.

Total number of hours practicing at home. It was predicted that higher levels of eating pathology would be positively associated with the number of hours girls spend practicing ballet at home each week. In contrast to this prediction, there was a significant negative correlation between the number of hours girls practiced ballet at home each week and body dissatisfaction, $r(38) = -.39, p = .01$. That is, the more girls practiced

ballet at home, the lower their level of body dissatisfaction. Correlations between the number of hours girls practiced ballet at home each week and drive for thinness, $r(37) = -.15, p = .36$, bulimia, $r(39) = -.24, p = .13$, and BMI, $r(38) = -.11, p = .49$ were not significant.

Total number of hours rehearsing with a dance team. It was predicted that higher levels of eating pathology would be positively associated with the number of hours girls spend rehearsing with their dance team each week. There were 13 girls who indicated that they are involved in a dance team outside of their regular ballet classes. Within this subset of dancers, there was a significant negative correlation between the number of hours girls practiced with their dance team and body dissatisfaction, $r(11) = .70, p < .01$. Correlations between the number of hours each week girls practiced with their dance team and drive for thinness, $r(11) = .31, p = .34$, bulimia, $r(11) = .40, p = .18$, and BMI, $r(11) = -.45, p = .14$ were not significant.

In summary, beginning ballet lessons at later ages, and fewer years of involvement in ballet, were associated with higher levels of eating pathology. Thus, it does not appear that more exposure to the dance subculture was associated with more risk for eating pathology. Instead, less exposure to the dance subculture was actually associated with more eating pathology.

Hypothesis IV. Dancers' Career Aspirations and Eating Pathology

Eating pathology in ballet dancers has been understood as a common and even acceptable reaction to the discipline's requirements of extremely low body weights. If this view is accurate, one would expect that girls who intend to make a career out of ballet would have higher levels of eating pathology than girls who dance for recreational

purposes. First, girls ($n = 18$) who reported on the Dancers' Experiences Survey that they wanted to become a professional ballerina, hoped to dance in a non-professional company and perform, and wanted to become a dance teacher were coded as “serious.” Girls ($n = 21$) who hoped their ballet training would improve their skills in other areas and listed other reasons for taking ballet lessons were coded “non-serious.” Mean differences in drive for thinness, bulimia, body dissatisfaction and BMI were tested with independent samples t -tests.

It was predicted that serious dancers would have higher scores on drive for thinness, bulimia and body dissatisfaction, and lower BMIs than non-serious dancers. In direct contrast to this prediction, non-serious dancers had significant higher scores on drive for thinness than serious dancers, $t(39) = -2.3, p = .03$. There were no significant differences between groups on bulimia, $t(41) = -1.3, p = .22$, body dissatisfaction, $t(40) = -1.0, p = .31$ and BMI, $t(40) = 1.0, p = .32$. Analyses were re-computed including only serious and non-serious dancers with BMIs in the normative range, between 18.5 and 24.9 (Center for Disease Control and Prevention, 2009). There were no significant differences on drive for thinness, $t(27) = 1.3, p = .22$, bulimia, $t(27) = -1.4, p = .17$, body dissatisfaction, $t(26) = -0.9, p = .39$ or BMI $t(28) = 1.7, p = .11$. Descriptive statistics are provided in Tables 14 and 15.

Hypothesis V. Protective Factors for Non-dancers and Dancers

Another goal of this study was to replicate previous findings that certain variables protect girls from developing eating pathology. Specifically, engaging in pleasurable activities, such as organized sports and extracurricular activities, good academic performance, experiencing few negative life events, and having social support are all

Table 14.

Descriptive Statistics for Serious and Non-Serious Dancers

	Serious ($n = 18$)			Non-Serious ($n = 21$)			t	(df)
	M	(SD)	Range	M	(SD)	Range		
Drive For Thinness	5.3	(4.7)	0-15	10.0	(7.8)	0-28	-2.3*	(39)
Bulimia	3.2	(3.6)	0-14	4.8	(4.8)	0-15	-1.3	(41)
Body Dissatisfaction	10.3	(6.7)	0-27	13.0	(9.9)	0-32	-1.0	(40)
Body Mass Index	21.2	(2.6)	15.6-25.8	20.3	(2.9)	17.0-30.0	1.0	(40)

* $p < .05$

Table 15.

Descriptive Statistics for Normal Weight Serious and Non-Serious Dancers

	Serious ($n = 15$)			Non-Serious ($n = 15$)			t	(df)
	M	(SD)	Range	M	(SD)	Range		
Drive For Thinness	6.5	4.6	0-18	9.0	6.1	0-21	1.3	(27)
Bulimia	2.5	2.6	0-15	4.7	5.2	0-19	-1.4	(27)
Body Dissatisfaction	11.7	6.7	0-32	14.5	10.4	0-37	-0.9	(26)
Body Mass Index	21.3	1.5	18.8-23.8	20.4	1.4	18.7-24.6	1.7	(28)

variables that have been found to protect girls from developing pathological eating. To test this hypothesis, Pearson product-moment correlations were conducted separately for dancers and non-dancers on the relationship between eating pathology (i.e., drive for thinness, bulimia, body dissatisfaction, BMI) and the following scales of the MRFS-IV: activities to feel good, negative life events, support person and support sharing.

Spearman's rho correlations, which are appropriate for correlations with categorical data, were conducted on the relationship between eating pathology and academic performance. Although BMI was included in the analyses, no explicit hypotheses were formulated for BMI because both low and high BMIs can be associated with eating pathology. Also, it was expected that the relationships between eating pathology and the independent variables would be similar for both dancers and non-dancers.

Pleasurable activities. It was predicted that eating pathology would be negatively associated with engaging in pleasurable activities. For dancers, there were no significant correlations between engaging in pleasurable activities and measures of eating pathology or BMI (See Table 16). In contrast to the hypothesis, there was a significant positive association between engaging in pleasurable activities and bulimia, $r(96) = .22, p = .03$ for non-dancers. That is, for non-dancers, engaging in more activities that were perceived as pleasurable was associated with more symptoms of bulimia.

Academic performance. It was predicted that eating pathology would be negatively associated with academic performance. There were no significant associations for dancers. However for non-dancers, this hypothesis was supported by a significant

Table 16.

Correlation Coefficients between Eating Pathology and Protective Factors

	Drive For Thinness	Bulimia	Body Dissatisfaction	BMI
Dancers (<i>N</i> = 45)				
Pleasurable Activities	.09	-.12	-.05	-.09
Academic Performance	.09	-.08	.01	.02
Negative Life Events	.19	.33*	.02	-.19
Support Person	-.25	-.46**	-.34*	-.12
Support Sharing	-.14	-.30*	-.32*	.20
Non-Dancers (<i>N</i> = 111)				
Pleasurable Activities	.01	.22*	-.06	.16
Academic Performance	-.06	-.26**	-.07	-.01
Negative Life Events	.36***	.45***	.36***	.02
Support Person	.04	-.16	.07	.06
Support Sharing	-.28	-.33***	-.09	-.14

* $p < .05$, ** $p < .01$, *** $p < .001$

negative association between academic performance and bulimia, Spearman's rho (96) = $-.26, p = .01$.

Social support. Social support was measured by the supporting person scale and support sharing scale. It was predicted that there would be a negative association between eating pathology and social support. For dancers, this hypothesis was supported by significant negative associations between support person and bulimia, $r(40) = -.46, p < .01$, and body dissatisfaction, $r(39) = -.34, p = .03$. In addition, there were also significant negative associations between support sharing and bulimia, $r(41) = -.30, p = .05$, and body dissatisfaction, $r(40) = -.32, p = .04$. For non-dancers, this hypothesis was supported by significant negative associations between support sharing and drive for thinness, $r(102) = -.28, p < .01$, and bulimia, $r(99) = -.33, p = .001$.

Negative life events. It was predicted that there would be positive associations between negative life events and pathological eating. For dancers, this hypothesis was supported by a significant positive association with negative life events and bulimia, $r(40) = .33, p = .04$. For non-dancers, this hypothesis was fully supported. There were significant positive associations between negative life events and drive for thinness, $r(96) = .36, p < .001$, bulimia, $r(94) = .45, p < .001$, and body dissatisfaction, $r(90) = .36, p = .001$. Thus for non-dancers, experiencing more negative life events was associated with more pathological eating.

In summary, there was partial support for the hypotheses on variables that protect against eating pathology. For both dancers and non-dancers, there were no significant associations between protective factors and BMI. Also, for dancers, there were no significant associations between any of the protective factors and drive for thinness.

Social support appears to play an especially important role in protecting dancers from developing symptoms of bulimia and body image concerns. Within the sample of non-dancers, negative life events appear to have a strong role in increasing the risk for eating pathology. In contrast to findings with dancers, there were no significant associations with having supportive people in one's life and eating pathology for non-dancers.

Exploratory Analyses

Exploratory analyses were conducted to investigate whether there were differences in eating pathology and BMI between girls who participated in dance, other athletic activities, or no physical activities. Group assignment was based on the following criteria. Girls who had participated in classical ballet within the past 5 years ($n = 45$) were included in the “dancer” group and girls who were currently participating in other forms of dance ($n = 9$) were included in the “other dancer” group. The “aesthetic” sports group consisted of girls ($n = 19$) who indicated on the McKnight Risk Factor Survey-IV that they either participated or competed in gymnastics, figure skating, or swimming during the previous year. The “non-aesthetic” sports group consisted of girls ($n = 41$) who participated in organized sports or track and field. Finally, the “no participation” group consisted of girls ($n = 36$) who did not currently participate in any dance lessons or athletic activities.

To test for group differences in scores on drive for thinness, bulimia, body dissatisfaction and BMI, a 4 x 5 analysis of variance was conducted with group status (dancer, other dancer, aesthetic, non-aesthetic and no participation) as the factors. The overall model was significant, $F(16, 496) = 2.6, p = .001$, Pillai's Trace = .3, $\eta^2 = .08$. There were significant group differences on drive for thinness, $F(4, 124) = 3.2, p = .015$,

$\eta^2 = .09$, body dissatisfaction, $F(4, 124) = 5.3, p = .001, \eta^2 = .15$, and BMI, $F(4, 124) = 4.7, p = .001, \eta^2 = .13$. There were no significant differences between groups on bulimia, $F(4, 124) = 0.8, p > .05, \eta^2 = .03$.

Post-hoc analyses using Tukey's HSD indicated that other dancers had significantly higher scores on drive for thinness than girls who participated in aesthetic and non-aesthetic sports (See Table 17). Other dancers also had significantly higher scores on body dissatisfaction than ballet dancers and girls who participated in both aesthetic and non-aesthetic sports. Girls who did not participate in any activities had higher scores on body dissatisfaction compared with girls who participated in aesthetic sports. In addition, girls who did not participate in any activities had significantly higher BMIs than ballet dancers and girls who participated in aesthetic sports.

Given these findings, additional analyses were conducted to further investigate mean differences in predictor variables using one-way or multivariate analyses of variance and Tukey post-hoc analyses. Descriptive statistics are provided in Table 18. There was a significant difference between groups on age, $F(4, 144) = 5.5, p < .001$. Tukey post-hoc analyses indicated that other dancers were significantly younger than girls who participated in non-aesthetic sports, as well as girls who did not participate in any activities. There were also group differences in internalization of the thin ideal, $F(4, 135) = 3.6, p < .01$. Other dancers had significantly higher scores on internalization of the thin ideal than girls who participated in both aesthetic and non-aesthetic sports. Group differences were also found on perfectionism, $F(4, 139) = 2.7, p < .05$, with ballet dancers obtaining significantly higher scores on perfectionism than girls who participated in non-aesthetic sports.

Table 17.

Descriptive Statistics for Eating Pathology by Dance or Athletics Participation

Variable	<i>M</i>	(<i>SD</i>)	<i>n</i>
Drive for Thinness*			
Dancer	7.8	(6.9)	40
Other Dancer ^a	12.0	(8.0)	9
Aesthetic	4.7	(5.6)	15
Non-Aesthetic	5.2	(5.5)	35
No Participation	8.3	(5.7)	30
Bulimia			
Dancer	3.7	(4.1)	40
Other Dancer	5.4	(6.6)	9
Aesthetic	2.7	(3.1)	15
Non-Aesthetic	2.9	(3.7)	35
No Participation	3.5	(4.3)	30
Body Dissatisfaction**			
Dancer	11.9	(8.6)	40
Other Dancer ^b	22.7	(8.5)	9
Aesthetic ^c	8.7	(8.3)	15
Non-Aesthetic	11.7	(8.6)	35
No Participation	16.4	(8.8)	30
Body Mass Index**			
Dancer	20.7	(2.7)	40
Other Dancer	21.2	(5.2)	9
Aesthetic	20.6	(1.7)	15
Non-Aesthetic	22.0	(2.6)	35
No Participation ^d	23.9	(4.5)	30

* $p < .05$, ** $p = .001$

Table 17. (continued)

^a Significant difference between other dancers and girls who participate in non-aesthetic sports ($p = .03$) and girls who participate in aesthetic sports ($p = .046$).

^b Significant difference between other dancers and dancers ($p = .008$), girls who participate in aesthetic sports ($p = .002$) and girls who participate in non-aesthetic sports ($p = .007$).

^c Significant difference between girls who participate in aesthetic sports and girls who do not participate in any activities ($p = .044$).

^d Significant difference between girls who do not participate in any activities and dancers ($p = .001$) and girls who participate in aesthetic sports ($p = .018$).

Table 18.

Descriptive Statistics for Research Variables by Dance or Athletics Participation

Variable	<i>M</i>	<i>(SD)</i>	<i>n</i>	<i>F (df)</i>
Age***				5.5 (4, 144)
Dancer	15.7	(1.0)	45	
Other Dancer ^a	14.8	(1.0)	9	
Aesthetic	15.7	(1.1)	18	
Non-Aesthetic	16.3	(1.0)	41	
No Participation	16.3	(1.2)	36	
Internalization of the Thin Ideal**				3.6 (4, 135)
Dancer	25.2	(9.8)	42	
Other Dancer ^b	33.2	(6.9)	9	
Aesthetic	23.3	(7.1)	19	
Non-Aesthetic	21.3	(8.5)	38	
No Participation	25.3	(9.2)	32	
Perfectionism*				2.7 (4, 139)
Dancer ^c	10.6	(6.6)	44	
Other Dancer	6.7	(3.5)	9	
Aesthetic	7.8	(5.1)	18	
Non-Aesthetic	6.8	(5.8)	39	
No Participation	8.4	(5.3)	34	
Internalizing Psychopathology*				2.4 (4, 139)
Dancer	14.4	(8.8)	42	
Other Dancer ^d	21.0	(9.6)	9	
Aesthetic ^c	11.7	(7.2)	19	
Non-Aesthetic	11.9	(9.8)	39	
No Participation	14.9	(7.7)	35	

Table 18. (continued)

Variable	<i>M</i>	(<i>SD</i>)	<i>n</i>	<i>F</i> (<i>df</i>)
Externalizing Psychopathology***				5.2 (4, 139)
Dancer ^d	9.1	(5.5)	42	
Other Dancer	16.7	(9.4)	9	
Aesthetic	10.4	(6.9)	19	
Non-Aesthetic	11.7	(7.0)	39	
No Participation	15.8	(8.8)	35	
Direct Comments - Parents				0.9 (4, 137)
Dancer	2.4	(1.3)	39	
Other Dancer	2.4	(1.3)	9	
Aesthetic	2.2	(1.3)	18	
Non-Aesthetic	1.9	(1.2)	39	
No Participation	2.0	(0.9)	33	
Direct Comments - Peers				1.0 (4, 137)
Dancer	5.6	(1.9)	39	
Other Dancer	5.1	(1.7)	9	
Aesthetic	5.2	(1.8)	18	
Non-Aesthetic	4.8	(1.6)	39	
No Participation	5.0	(1.5)	33	
Teasing - Parents				0.7 (4, 137)
Dancer	3.1	(1.1)	39	
Other Dancer	3.4	(1.3)	9	
Aesthetic	2.9	(1.3)	18	
Non-Aesthetic	2.9	(1.0)	39	
No Participation	3.1	(0.9)	33	

Table 18. (continued)

Variable	<i>M</i>	(<i>SD</i>)	<i>n</i>	<i>F</i> (<i>df</i>)
Teasing - Peers				2.1 (4, 137)
Dancer	8.4	(4.6)	39	
Other Dancer	13.0	(6.7)	9	
Aesthetic	9.1	(5.9)	18	
Non-Aesthetic	8.0	(3.7)	39	
No Participation	10.3	(7.3)	33	
Others Trying to Lose Weight				0.2 (4, 137)
Dancer	5.5	(3.1)	39	
Other Dancer	5.6	(2.5)	9	
Aesthetic	5.7	(3.2)	18	
Non-Aesthetic	5.2	(3.0)	39	
No Participation	5.2	(2.8)	33	
Activities to Feel Good***				6.5 (4, 134)
Dancer ^f	3.6	(1.8)	39	
Other Dancer	3.4	(2.6)	9	
Aesthetic ^g	3.6	(1.6)	16	
Non-Aesthetic	2.4	(1.4)	41	
No Participation	1.9	(1.5)	34	
Negative Life Events				1.4 (4, 134)
Dancer	2.7	(1.6)	39	
Other Dancer	4.0	(2.0)	9	
Aesthetic	2.6	(1.4)	16	
Non-Aesthetic	2.7	(2.1)	41	
No Participation	3.1	(1.7)	34	

Table 18. (continued)

Variable	<i>M</i>	(<i>SD</i>)	<i>n</i>	<i>F</i> (<i>df</i>)
Academic Performance*				2.7 (4, 134)
Dancer ^h	2.6	(0.5)	39	
Other Dancer	2.6	(0.5)	9	
Aesthetic	2.4	(0.5)	16	
Non-Aesthetic	2.3	(0.6)	41	
No Participation	2.2	(0.7)	34	
Support Person				0.5 (4, 134)
Dancer	4.3	(2.1)	39	
Other Dancer	3.9	(1.7)	9	
Aesthetic	4.9	(2.6)	16	
Non-Aesthetic	4.7	(2.4)	41	
No Participation	4.8	(2.3)	34	
Support Sharing				0.6 (4, 134)
Dancer	9.3	(2.3)	39	
Other Dancer	9.6	(2.4)	9	
Aesthetic	10.2	(1.3)	16	
Non-Aesthetic	9.4	(2.2)	41	
No Participation	9.7	(2.2)	34	

* $p < .05$, ** $p < .01$, *** $p < .001$

^a Other dancers were significantly younger than girls who participated in non-aesthetic sports ($p = .002$) and girls who did not participate in any activities ($p = .002$).

^b Other dancer had significantly higher scores on internalization of the thin ideal than girls who participated in both aesthetic ($p = .049$) and non-aesthetic sports ($p = .004$).

^c Ballet dancers had significantly higher scores on perfectionism than girls who participated in non-aesthetic sports ($p = .021$).

^d Other dancers reported significantly more internalizing psychopathology than girls who participated in non-aesthetic sports ($p = .043$).

^e Ballet dancers reported significantly less externalizing psychopathology than other dancers ($p = .043$) and girls who did not participate in any activities ($p = .001$).

^f Ballet dancers reported significantly more activities to feel good than girls who participated in non-aesthetic sports ($p = .024$) and girls who did not participate in any activities ($p < .001$).

^g Girls who participated in aesthetic sports reported significantly more activities to feel good than girls who did not participate in any activities ($p = .006$).

^h Ballet dancers reported significantly higher academic performance than girls who did not participate in any activities ($p = .03$).

A 2 x 5 analysis of variance was conducted to investigate group differences in comorbid psychopathology with group status as the factors. The overall model was significant, $F(8, 278) = 4.0, p < .001$, Pillai's Trace = .2, $\eta^2 = .10$. There were significant differences between groups on both internalizing psychopathology, $F(4, 139) = 2.4, p = .05, \eta^2 = .07$, and externalizing psychopathology, $F(4, 139) = 5.2, p = .001, \eta^2 = .13$. Tukey HSD tests indicated that other dancers reported significantly more internalizing psychopathology than girls who participated in non-aesthetic sports. Furthermore, ballet dancers reported significantly less externalizing psychopathology than other dancers and girls who did not participate in any activities.

In addition, a 5 x 5 analysis of variance was conducted to examine differences in sociocultural pressures to be thin (i.e., weight teasing from parents, weight teasing from peers, direct comments from parents, direct comments from peers, and other trying to lose weight). The overall model was not significant, $F(20, 544) = 0.9, p = .6$, Pillai's Trace = 0.1, $\eta^2 = .03$. There were no group differences in direct comments from parents $F(4, 137) = 0.9, p = .47, \eta^2 = .03$, direct comments from peers, $F(4, 137) = 1.0, p = .40, \eta^2 = .03$. weight-teasing parents, $F(4, 137) = 0.7, p = .59, \eta^2 = .02$, weight-teasing peers, $F(4, 137) = 2.1, p = .09, \eta^2 = .06$, and others trying to lose weight $F(4, 137) = 0.2, p = .96, \eta^2 = .01$.

Finally, a 5 x 5 analysis of variance was conducted to investigate group differences in protective factors. The overall model was significant, $F(20, 532) = 2.3, p = .001$, Pillai's Trace = .3. There were significant between group differences on activities to feel good, $F(4, 134) = 6.5, p < .001, \eta^2 = .16$, and academic performance, $F(4, 134) = 2.7, p = .03, \eta^2 = .07$. Tukey HSD post-hoc analyses revealed that ballet dancers reported

significantly more activities to feel good than girls who participated in non-aesthetic sports and girls who did not participate in any activities. In addition, girls who participated in aesthetic sports reported significantly more activities to feel good than girls who did not participate in any activities. Also, ballet dancers reported significantly higher academic performance than girls who did not participate in any activities. However, there were no significant differences on negative life events, $F(4, 134) = 1.4, p = .25, \eta^2 = .05$, support person, $F(4, 134) = 0.5, p = .71, \eta^2 = .02$, and support sharing, $F(4, 134) = 0.6, p = .68, \eta^2 = .02$.

Dancers' Experiences

One unique aspect of this study was the elicitation of dancers' experiences through the Dancers' Experiences Survey. While not intended as a measure of underlying constructs, the survey was created to summarize dancers' subjective experiences of sociocultural pressures to be thin that exist within the ballet subculture. The survey inquired about level of involvement in dance, beliefs about success in dance, comfort with different aspects of the ballet subculture, supportiveness of the environment, and perceived pressure from others.

In the current study, the average age at which dancers began studying ballet was 5.9 years of age ($SD = 3.5$; ranging from 2 to 15 years). The majority of participants ($n = 23, 45\%$) reported that they began ballet lessons because they had expressed an interest in doing so. Other girls began taking ballet lessons because their parents wanted them to take ballet ($n = 19, 36\%$), because they were recommended to take ballet to improve their skills in another area ($n = 4, 8\%$), or for physical activity and exercise ($n = 1, 2\%$). Five participants (9%) listed alternative reasons why they first began taking ballet lessons,

which included improvement with coordination, “back problems,” and because they were required to take ballet due to their involvement in another performance group.

Only a very small subset of dancers in the current study ($n = 2$, 4%) aspired to become professional ballerinas. Other girls intended to dance in a non-professional dance company ($n = 9$, 19%), wanted to become a dance teacher ($n = 12$, 26%), or improve their skills in another area such as figure skating or gymnastics ($n = 9$, 19%). Approximately 36% ($n = 17$) of dancers indicated “other” reasons for taking ballet lessons, including for fun, enjoyment, and to improve physical health. Three girls listed that “gracefulness,” “flexibility” and “to see how far I can go” were other things they hoped to accomplish from taking ballet lessons.

Furthermore, participants were asked to rank how important they viewed family, school, friends, ballet, hobbies, and part-time jobs. Ballet was not ranked first by any participant. Ballet was ranked second and third by 3% ($n = 1$) of participants, respectively, followed by fourth ($n = 13$, 38%), fifth ($n = 14$, 41%) and sixth ($n = 5$, 15%). Therefore, in the current sample, the majority of girls appear to dance for recreational purposes. This sample may differ from that of other studies involving dancers who plan to make a career out of dancing classical ballet professionally.

It is commonly believed that dancers engage in pathological eating as a means of controlling their weight, since a very svelte physique is required for a professional ballerina. However, in the current study, many dancers ($n = 21$, 48%) did not believe it even possible for them to become a professional dancer. When asked to rank the qualities they believe were important for a professional dancer, only one dancer (3%) ranked

thinness as the most important quality. Dedication, on the other hand, was ranked as the most important quality by the majority ($n = 23$, 68%) of dancers.

One aspect of the dance subculture that may inadvertently increase the risk for pathological eating is the requirement of form-fitting dance attire. In the current sample, 80% ($n = 35$) of dancers were required to wear traditional dance attire (e.g., pink tights, dark leotards, occasional warm up clothing) during their classes. Others were permitted to wear any form of dance attire. When asked how comfortable they were wearing their typical dance attire, only 2% ($n = 1$) of dancers indicated that they were uncomfortable.

However, for 66% ($n = 29$) of dancers, there had been a change in how comfortable they felt wearing their dance clothing. Specifically, 10% ($n = 3$) of participants were much more, and 31% ($n = 9$) were somewhat more comfortable with their bodies at the time of the study compared to when they were younger. Approximately 59% ($n = 17$) of dancers were more comfortable when they were younger. Of these dancers, the average age at which they were most comfortable with their bodies was 10.6 years of age ($SD = 2.8$; ranging from 4 to 15 years of age). Similarly, another unique experience of adolescent dancers which may heighten the risk for eating pathology is frequent rehearsals in front of mirrors. The majority of dancers in the current sample ($n = 34$, 77%) practiced in front of mirrors during their ballet classes. However, most dancers were actually very comfortable ($n = 24$, 55%) or comfortable ($n = 11$, 25%) when rehearsing in front of mirrors. Only 5% ($n = 2$) of dancers were uncomfortable with this aspect of the dance subculture.

Dancers perceived the goals of their teachers as improving girls' dancing techniques ($n = 31$, 48%), providing girls with an opportunity to have fun ($n = 11$, 17%),

raising girls' confidence and self-esteem ($n = 10$, 16%), providing girls with an opportunity to perform ($n = 9$, 14%), and training girls to become professional ballerinas ($n = 3$, 5%). Participants described their dance teachers as warm ($n = 29$, 66%), cold ($n = 3$, 7%), nurturing ($n = 19$, 3%), critical ($n = 26$, 59%), supportive ($n = 41$, 93%), pleasant ($n = 30$, 68%) and unpleasant ($n = 5$, 11%).

It is typically believed that dance teachers exert pressure on young dancers to lose weight. This contention was not supported by findings of the current study. In contrast, only one dancer indicated that her dance teacher made a direct comment to her about eating, body shape or weight. Similarly, only one participant witnessed her dance teacher make a direct comment to one of her classmates. None of the dancers reported that their teacher encourages weight loss. Instead, the majority of dancers ($n = 40$, 93%) indicated that their teacher did not encourage or discourage weight loss and 7% ($n = 3$) indicated that their teacher discouraged weight loss. Moreover, when asked how accepting they believe their teachers were of dancers with different body sizes and shapes, 71% ($n = 31$) were very accepting, 23% ($n = 10$) were accepting, and 5% ($n = 2$) were neither accepting nor unaccepting and 2% ($n = 1$) were unaccepting.

Thus, in the current study, it does not appear that dance teachers reinforce the thin ideal by making direct comments to young dancers about eating, shape and weight. According to dancers, dance schools encourage a variety of goals other than weight loss. Specifically, dance schools encouraged dancers to maintain physical health and wellness ($n = 35$, 80%), lead a balanced lifestyle ($n = 30$, 68%), perform well in school ($n = 28$, 64%), and have parents involved in their progress ($n = 21$, 48%).

Another way in which dancers may perceive pressure to be thin is from other girls in their dance class. Dancers described their peers as warm ($n = 34$, 77%), cold ($n = 6$, 14%), nurturing ($n = 13$, 30%), critical ($n = 14$, 32%), supportive ($n = 35$, 80%), unsupportive ($n = 3$, 7%), pleasant ($n = 37$, 84%), and unpleasant ($n = 4$, 10%). Approximately 23% ($n = 10$) of dancers indicated that at some point, a girl in their dance class had made a direct comment to them about eating, body shape or weight, and 19% ($n = 8$) indicated that a girl had made a direct comment to another girl in their class. This finding suggests that when dancers do encounter direct pressures to be thin, it is likely to be from their peers rather than from their dance teacher.

When asked how many girls in their class are trying to lose weight, 25% ($n = 11$) of dancers indicated that no one was trying to lose weight, 68% ($n = 30$) indicated that a few girls are trying to lose weight, and 7% ($n = 3$) indicated that the majority of their class was trying to lose weight. Only 5% ($n = 2$) of dancers believed that weight loss was highly encouraged by their classmates. Twenty-three percent of dancers ($n = 10$) believed weight loss was encouraged by their classmates, and 71% ($n = 31$) believed weight loss was neither encouraged nor discouraged. One dancer (2%) believed that thinness was discouraged by her peers. Similarly, only one dancer (2%) believed that her peers were unaccepting of dancers with different body sizes and shapes. The majority of dancers ($n = 31$, 71%) believed that their peers were very accepting, accepting ($n = 10$, 23%), or replied neither accepting nor unaccepting ($n = 2$, 5%) of dancers with different body shapes.

Chapter IV

DISCUSSION

This study tested a predictive model of eating pathology in two groups of adolescent girls who were expected to experience different levels of risk. Informed by developmental psychopathological theory, variables with strong empirical support at the individual, interpersonal and sociocultural levels were incorporated into the model. The sample included girls from well-established dance schools who studied classical ballet and a comparison group of girls from high schools who were not currently studying ballet. Results of the research indicated that although ballet dancers had significantly lower BMIs than non-dancers, they did not have higher levels of pathological eating than girls in the general population. However, current findings do support the hypothesis that there are different processes leading to pathological eating within these distinct groups.

Eating Pathology in Non-dancers and Dancers

In this study, ballet dancers did not report more eating pathology and body image concerns than girls in the general population. This was surprising because the majority of previous research in this area has found that dancers are at increased risk for eating and body image disturbances (e.g., Dotti et al., 2002). Interestingly, however, findings that are very similar to those in the current study have very recently been reported by Annus and Smith (2009) and Toro, Guerrero, Sentis, Castro, & Puertolas (2009) using samples of non-elite dancers from the United States and elite dancers from Spain, respectively.

One possible explanation for the current findings may relate to characteristics of the dance schools through which girls were recruited. In early studies of dancers, researchers utilized samples recruited from settings such as a very elite ballet school in

Australia (Abraham, 1996) and national professional dance schools in the U.S. (Braisted et al. (1985), Canada (Garner & Garfinkel, 1980), and Italy ((Dotti et al., 2002); these are institutions that generally admit only those students who are able to pass a highly selective process of auditions. In contrast, the current sample included girls who elected to study ballet at community-based schools, regardless of ability or aptitude. Thus, the majority of dancers who have participated in previous research had greater potential to become professional ballerinas whereas those recruited from dance schools within the community, such as those in the current sample, are unlikely to have that same potential.

Adolescent dancers in this study did have significantly lower Body Mass Indices (BMIs) than non-dancers. These findings parallel those reported by previous researchers (e.g., Garner & Garfinkel, 1980; Davison et al., 2002; Ravaldi et al., 2003; Toro et al., 2009). However, in earlier studies of elite dancers, low BMIs appeared to reflect higher levels of pathological eating. Given that dancers in the current sample did not report more symptoms of eating pathology or greater pressure to be thin from within the dance subculture, they may simply have lower BMIs due to more regular engagement in physical activity relative to non-dancers. Alternatively, girls who tend to be underweight may elect to engage in ballet because it is an extracurricular activity that is compatible with their body type.

Predictors of Eating Pathology in Dancers and Non-Dancers

In the current study, a theoretically-driven model of eating pathology was first evaluated in a sample of girls recruited from a general high school population. The model was modified to achieve the best fit, and then applied to the theoretically higher-risk sample of ballet dancers. It was predicted that different processes would be associated

with eating pathology for these distinct groups. As expected, the model that best fit the data for non-dancers did not adequately fit the data for dancers. Instead, a more intricate model emerged for dancers, suggesting that different processes lead to eating pathology in ballet dancers versus other adolescent girls.

Non-Dancers

For the non-dancers in the current study, body mass index was a significant predictor of body image concerns, which in turn predicted drive for thinness and then bulimia. Internalization of the thin ideal was a significant predictor of both body image concerns and drive for thinness. This model suggests that girls with elevated BMIs experience body image concerns, which in turn leads to a strong drive for thinness. These findings parallel those of previous researchers who found girls with elevated BMIs to be at increased risk for pathological eating (e.g., Kostanski & Gullone, 1998; Shisslak et al., 1998; McVey et al., 2004; Bearman et al., 2006; Dohnt & Tiggeman, 2006). Furthermore, drive for thinness actually predicted more symptoms of bulimia. This can be explained by research evidence indicating that dieting often leads to binge eating and compensatory methods of weight control, which lead to weight fluctuations or weight gains (Stice et al., 1999).

Although internalization of the thin ideal emerged as a significant predictor in the model for non-dancers, it did not moderate the relationship between BMI and body image concerns. This stands in contrast to results reported by previous researchers (e.g., Thompson & Stice, 2001; Stice, 2002) who have found that failure to internalize the thin ideal protects girls from developing body image concerns. In the current study, girls who internalized the thin ideal experienced more body image concerns and drive for thinness

and were therefore at great risk for eating pathology. Thus, it seems that failure to internalize the thin ideal may not always “protect” girls with elevated BMIs from developing body image concerns and pathological eating.

Previous researchers, who have utilized longitudinal methodologies, have identified that both internalizing and externalizing psychopathology predict eating pathology. However, comorbid psychopathology was not a significant predictor of pathological eating for non-dancers in the current study. However, as the current study captured only a “snap shot” of current functioning rather than following development over time, the current sample likely included girls who were currently evidencing pathology, as well as girls in a premorbid state.

Interestingly, sociocultural pressures were not significant predictors of body image concerns for non-dancers in the current study. Research support for the importance of sociocultural pressures is mixed. Whereas some researchers (e.g., Shisslak et al., 1998; Smolak et al., 1999; Stice & Whitenton, 2002) have reported evidence in support of this hypothesis, others have not (e.g., Stice, 2002). There is some evidence for a social contagion effect, wherein pathological eating pathology clusters geographically (Forman-Hoffman & Cunningham, 2008); however, the influence of sociocultural pressures may be more salient in some samples than in others.

Dancers

The final model that fit the data for non-dancers was then applied to the sample of dancers. This model did not adequately fit the data and was adapted through a series of modifications until a model emerged that more closely fit the data for the dancers. As with the non-dancers, body mass index was a significant predictor of body image

concerns, which in turn predicted drive for thinness and then bulimia. Internalization of the thin ideal was also a significant predictor of both body image concerns and drive for thinness.

For ballet dancers, perfectionism was found to be a significant predictor of internalization of the thin ideal. This was an unexpected finding due to a lack of prior research on a relationship between perfectionism and internalization of the thin ideal. However, a relationship between these variables is theoretically plausible. Athletes and ballet dancers have been found to have higher levels of perfectionism than girls who do not participate in those activities (e.g., Anshel, 2004; Schwartz et al., 2005). This finding suggests that perfectionism might be a more salient predictor of eating pathology in certain subgroups of adolescents. Theoretically, one would expect that girls who hold themselves to high standards would be more likely to conform to beliefs that thinness is required for successful performance in dance or athletics. Therefore, participation in dance or athletic activities that emphasize thinness may place perfectionistic girls at an especially high level of risk for eating pathology.

Internalizing psychopathology was not a significant predictor in the model for non-dancers but it led directly to body image concerns for the non-dancers. This finding is consistent with prior research (Johnson et al., 2002). In the current study, it was expected that externalizing psychopathology, not internalizing psychopathology, would lead directly to binge eating (e.g., Mamorstein et al., 2007), but the opposite relationship was found in the model for dancers. It may be that girls who are experiencing internalizing pathologies, such as depression or anxiety, also experience increases in appetite, which results in overeating and subsequent weight gain (APA, 2000).

Dance Variables related to Eating Pathology

Dancers are believed to be more at-risk for eating pathology due to their involvement in a subculture where thinness is highly emphasized and valued. Greater exposure to this subculture was expected to be associated with increased risk for eating pathology. Although recent research in this area has found support for the relationship between greater involvement in ballet and increased risk for eating pathology (Annus & Smith, 2009), this finding was not replicated in the current study. In direct contrast to predictions, less involvement in ballet, as measured by beginning ballet lessons at later ages and fewer years taking ballet lessons, was associated with higher levels of eating pathology.

This finding can be interpreted in different ways. Girls who began ballet lessons “late” may have been at a disadvantage in their cohort with respect to their proficiency in ballet. Within this subset of girls, thinness may have been perceived as a means of improving their technique in ballet, or a way of obtaining more important roles in performances. Alternatively, girls who began ballet lessons late may have been enrolled as a means of weight control, either by their parents or their own volition.

Dancers' Career Aspirations and Eating Pathology

Since eating pathology in ballet dancers has been conceptualized as an understandable reaction to the discipline’s requirements for thin body types, it was expected that girls who intended to make a career out of ballet dancing would have higher levels of eating pathology than girls who dance for recreational purposes. However, in direct contrast to this prediction, non-serious dancers were found to have significantly higher scores on drive for thinness than more serious dancers. Thus, the idea

that girls who aspire to dance professionally engage in drastic methods of weight control may need to be reexamined. Serious dancers may be more aware of the harmful effects that pathological eating habits could have on their future careers in dance.

Although there were no significant differences between groups on BMI, it was observed that non-serious dancers had more range with respect to their BMIs. Within the group of non-serious dancers, there were girls who would be considered underweight and girls who would be considered obese if using the weight classification that is more appropriate for adults (Center for Disease Control and Prevention, 2009). When analyses were re-computed using only serious and non-serious dancers with BMIs in the normative range, there were no significant differences between groups on drive for thinness.

Overall, findings suggest that girls who were overweight and took ballet for reasons other than attaining a career in dance may have been attempting to lose weight by taking ballet lessons. However, since ballet is an anaerobic activity that results in little energy expenditure (Ringham et al., 2006), these dancers may resort to using harmful methods of weight control when they discover that participation in ballet does not yield the results they envision.

Protective Factors for Non-Dancers and Dancers

The influence of various protective factors (i.e., pleasurable activities, academic performance, negative life events, and social support) was investigated in relation to eating pathology for both non-dancers and dancers. Engaging in pleasurable activities was not associated with eating pathology for dancers. For non-dancers, one surprising finding was a small, but significant positive association between engaging in pleasurable

activities and symptoms of bulimia. That is, engaging in more organized sports, extracurricular activities, hobbies and clubs was associated with more bulimia. It may be that girls who engaged in these activities encountered more pressures to be thin by virtue of their participation in these activities. For example, girls who participate in sports may perceive pressure to be thin from their peers or coaches, or they may perceive that altering their body weight would enhance their performance. Also, pathological eating has a social contagion effect in that it tends clusters within groups of girls who are in contact with one another (Forman-Hoffman & Cunningham, 2008). As such, a club with one member who engages in pathological eating may place other club members at risk. Alternatively, girls who engage in more activities may have less unstructured time available for completing homework, socializing with friends or interacting with family, which may lead to higher levels of stress and less effective coping.

Also for non-dancers, poor academic performance was associated with more symptoms of bulimia. Many girls who experience difficulty in school experience psychological distress (Rothon et al., 2009). Symptoms of bulimia may develop due to the propensity for general maladjustment in this sample of girls. This finding was not replicated in dancers, likely due to restricted range; all dancers reported average or above average academic performance.

Negative life events were associated with bulimia for dancers. For non-dancers, negative life events were also associated with drive for thinness, body dissatisfaction and bulimia. This finding is well-established by previous researchers, who have identified negative life events as a risk factor for eating pathology (e.g., McKnight Investigators, 2003; Steinhausen et al., 2005). Other researchers have also found a positive correlation

between the number of stressful life events and eating pathology in a sample of adolescents and young adults (Loth, van den Berg, Eisenberg, & Neumark-Sztainer, 2008). Therefore, exposure to negative life events may increase the risk for general psychological maladjustment, which would in turn increase the risk for pathological eating.

Social support (having supportive people in one's life, and feeling like one can rely on supportive people in one's life), was associated with less body dissatisfaction and drive for thinness for dancers. Dancers are thought to be exposed to an environment in which the risk for developing eating problems is intensified beyond the typical risks that are experienced by girls in the general population. Within this environment, having access to social support may serve an especially important role in buffering girls from developing pathological eating.

Exploratory Analyses

Exploratory analyses were conducted to investigate whether there were differences in eating pathology based on girls' participation in dance or athletic activities, and several unexpected findings emerged. However, caution should be used when interpreting these results due to small sample size which would limit generalizability to the target population. First, in contrast to findings of previous researchers (e.g., Garner, Rosen & Barry, 1998; Smolak et al., 2000), girls who participated in aesthetic sports did not appear more at-risk for eating pathology based on low scores on drive for thinness, bulimia and body dissatisfaction. Second, girls who participated in other forms of dance, (i.e., tap, jazz, hip hop), appeared to have the highest risk for eating pathology within the entire sample.

Results of additional analyses indicated that other dancers were approximately one year younger than other groups. They also had the highest scores on internalization of the thin ideal and reported the most internalizing and externalizing psychopathology throughout the entire sample. Although there were no significant differences between groups, other dancers had highest scores on the weight-teasing from peers scale and negative life events scale.

Thus, other dancers appeared to be significantly more maladjusted than other girls who participated in the research. Given these unexpected findings, data were inspected further, revealing that all girls who participated in other forms of dance attended the same high school. Of these nine girls, four attended the same homeroom grade 9 physical education class, three attended second period dance together, and two both attended third period grade 9 physical education. These findings may suggest a social contagion effect is occurring within this subset of the overall sample. Since other dancers likely resided in the same geographical area, it is possible that they all took lessons at a dance studio that emphasizes thinness. Other commonalities between these participants is that 6 of the 9 other dancers recently began high school and were enrolled in physical education classes. After the onset of high school, adolescents often experience great pressures to conform to their peers. There may have been sociocultural norms within the high school or physical education classes that emphasize thinness. Furthermore, this subset of participants may have had other shared experiences that were not measured in the current research (e.g., a friend with an eating disorder, an overly critical school teacher) that increased their risk for eating pathology. A review of participant's response on the McKnight Risk Factor Survey-IV revealed that of the 9 other dancers, 5 had experienced a death in the past year.

Although many other participants in the research also have experienced the death of a loved one, the possibility exists that other dancers may be maladjusted as a result of experiencing similar stressors or traumas.

In addition, results of the exploratory analyses suggest that within the comparison sample of girls in the general population, there are subsets of girls who are at greater risk for eating pathology than others. There may be differences in predictors of eating pathology for adolescents who participate in other forms of dance, athletics, or other activities that were not directly measured in the research. The fact that there was great variability in the sample may partially explain why only a simple predictive model of eating pathology fit the data for non-dancers.

Dancers' Experiences

One unique aspect of the study was that dancers were asked directly about their subjective experiences of the dance subculture and the hypothesized pressures to be thin that exist within that subculture. This was important because most prior research has made inferences about the dance subculture without actually attempting to quantify relevant information. One recent exception is the work by Annus and Smith (2009), who used expectancy theory as a guiding framework. They proposed that direct comments from teachers or peers about eating, shape or weight may lead to a belief that thinness is necessary for success in dance, which in turn leads to pathological eating. They further speculated that dance schools differ in the extent to which they idealize thinness. Toro et al. (2009) found that girls who perceive the greatest pressure from their dance instructors are at the highest risk for eating pathology. Thus, for dancers, eating pathology may be predicted by particular characteristics of the dance schools they attend.

In the current study, dancers who participated in the research did not perceive ballet to be a priority in their life and very few aspired to dance professionally. Instead, the majority of dancers studied classical ballet dance for recreational purposes. This may be a key difference between this research and past research in this area. Dancers at professional schools are essentially in the early stages of their careers as classical ballerinas. Not only do they have training in ballet, but they also have the aptitude to become a ballerina, otherwise they would not have passed the stringent selection process. Thus, the generally accepted finding that dancers have more eating pathology than non-dancers may require the following specifier: *Dancers with potential who are studying at professional ballet schools are at higher risk for eating pathology than girls in the general population.*

The majority of dancers in the current study believed that dedication was the most important quality that was needed in order to become a professional ballerina. It is possible that within dance schools that emphasize thinness, dancers' level of devotion and commitment to ballet may be a driving force behind pathological eating. According to Piran (1999, p. 85), who has worked extensively with adolescent dancers, "*Many ambitious young girls who study classical ballet feel they should control the process of physical maturation and 'eat like a ballerina,' namely: in a highly restrictive way, both prior to and during the process of puberty. Extreme adherence to these standards of restricted bodily changes and eating is often misinterpreted by students, and at times by their teachers, as indicating serious motivation, dedication, and even talent.*"

It is commonly thought that one aspect of the dance subculture that may contribute to increased risk for pathological eating is the requirement of form-fitting

dance attire. Previous researchers have found that adolescent dancers who were permitted to wear loose-fitting dance attire reported fewer body image concerns and more favorable self-perceptions compared to dancers who wore typical dance attire (Price & Pettijohn, 2006). In the current sample, the majority of dancers were required to wear traditional dance attire (e.g., pink tights, dark leotards, occasional warm up clothing) during their classes. Yet, very few dancers reported that they were uncomfortable in their dance clothing. Dancers did report, however, that they had been more comfortable in their dance clothing when they were younger. This likely reflects the surge in body image concerns that are common amongst adolescent girls at the onset of puberty.

Dance teachers are hypothesized to have a prominent role in emphasizing the thin ideal for ballet dancers. However, the current results do not support this; dancers did not report that their teachers encouraged weight loss. Instead, dancers reported that their teachers had a neutral stance about weight, or actually discouraged weight loss. Only one dancer indicated that a dance teacher had made a direct comment to her about eating, body shape or weight, and only one dancer witnessed her dance teacher make a direct comment to one of her classmates. This finding that dance teachers did not encourage the thin ideal is noteworthy; it is possible that it reflects a move towards greater acceptance of dancers with different body sizes and shapes, at least within the recreational dance world.

On the other hand, it appears that peers may have a more significant role in promoting the thin ideal amongst dancers. Approximately one quarter of the dancers in the current sample reported that they had experienced direct comments to them about eating, body shape or weight from at least one other girl in their dance class.

Approximately 20% reported that they had witnessed girls in their dance class direct comments to classmate about their eating, body shape or weight. Sociocultural pressures in general did not emerge as significant predictors of body image concerns in the predictive model of eating pathology. However, since peer relationships become increasingly more important during adolescence, the role of peer-specific sociocultural pressures as predictors of eating pathology should not be discounted. Experiencing critical comments from peers within the group may be especially threatening during this time.

Limitations of the Current Study

The current research was limited in several areas. The results of the research offer information as to how various factors interact to increase adolescents' risk for developing pathological eating. However, they do provide evidence for causality.

Second, the research relied solely on self-report data from adolescent girls, and the accuracy of such self-reported psychopathology is uncertain. One alternative would have been to incorporate reports by parents, or even teachers. However, researchers have found that there is poor inter-rater agreement between mother and daughter reports of eating pathology (Pendley & Bates, 1996). Symptoms of eating pathology are often difficult to identify by mothers, and as a result, mothers are likely to under-report eating pathology.

Third, one cannot discount the possibility that adolescents with more severe eating pathology purposely did not select themselves to participate in the research. Dancers with more severe eating pathology may have been even particularly reluctant to participate due to fear of identification and subsequent penalties, which might include

restricted participation in dance classes or performances. It is widely understood that girls with clinical eating disorders often deny the seriousness of their condition (Guarda, 2008), under-report symptomatology, refrain from participating in research and terminate treatment prematurely. This methodological weakness is characteristic of all research in the area of eating pathology that relies on participant self-selection and self-report data (Vandereycken, 2006). In a retrospective study conducted in the Netherlands, almost 75% of women with Anorexia Nervosa were found to have denied the problem in the early stages of the disorder (Noordenbos, 1992).

The fourth limitation of the current study was the lack of precisely measured height and weight for dancers and non-dancers. Research on the accuracy of self-reported height and weight indicates that individuals tend to accurately report their weight, with several important caveats (McCabe, McFarlane, Polivy, & Olmsted, 2001; Shapiro & Anderson, 2003). Adolescents who are underweight tend to overestimate their weight, whereas adolescent who are overweight tend to underestimate their weight (McCabe et al., 2001; Abraham, Luscombe, Boyd, & Olesen, 2004). Inability to directly measure height and weight of research participants is a practical dilemma that is frequently encountered in well-designed, large scale research projects (e.g., Chao, 2008; Forman-Hoffman & Cunningham, 2008; McVey, Tweed, & Blackmore, 2008).

Fifth, it is possible that participants in the current study were not representative of adolescent girls in the general population. The sample of non-dancers consisted of high school students enrolled in physical education classes. However, physical education classes are required only for grade 9 students, not for those in grades 10 through 12. Thus, participants in grade 9 were likely representative of the wider population of

adolescent girls in Grade 9, whereas non-dancers in senior grades who were recruited from elective fitness, dance and leadership classes may not be as representative of the population of high school students. Girls who choose such classes as electives may be more athletic, or have more favourable images of their bodies than girls who do not continue in physical education classes beyond grade 9. Alternatively, it is possible that some girls with eating pathology or body image concerns may elect to take physical education classes as a method of weight control.

Sixth, the dancer group consisted of girls who had studied classical ballet within the previous five years for various lengths of time, ranging from as little as one year to as long as 15 years. Although the inclusionary criteria likely captured a sample that was representative of the population of girls who elect to take ballet lessons in community dance schools, one cannot discount the possibility that heterogeneity within the sample of dancers may have impacted the results of the research. An alternative recruitment strategy would have been to focus on dancers who were currently studying ballet, and who had studied ballet for a minimum number of years (e.g., at least 5 years). This sampling method would likely be more feasible in an urban centre that has a sufficiently large population of adolescent dancers.

Seventh, there is a possibility that there were inherent differences between the dance schools that agreed to permit recruitment of participants and those that did not. The schools that did permit recruitment were large, well-known schools that had established reputations for offering high-quality dance instruction within the community. On the other hand, the dance schools that were approached but did not participate were small, lesser-known schools. It is possible that these dance schools declined to participate

because they had students who were known to have eating pathology and they feared identification. Alternatively, just broaching the topic of dance and eating pathology may have sparked concerns about potentially unfavourable publicity that would have a detrimental effect on their business.

Implications

The results of the current research have implications for understanding the processes leading to clinical eating disorders in professional ballet dancers. In the current study, perfectionism led to internalization of the thin ideal, which in turn led to body image concerns and pathological eating. For ballet dancers, perfectionism appears to play a key role in contributing to beliefs in the importance of thinness and concerns about one's body.

Ballet dancers tend to have high levels of perfectionism, possibly because success in ballet involves extreme determination, discipline and technical precision. A highly perfectionistic dancer who perceives that weight loss will improve her success in ballet is at great risk for developing pathological eating habits and eventually, a clinical eating disorder such as Anorexia Nervosa. Several professional ballet dancers are known to have suffered from Anorexia Nervosa. Heidi Guenther, a member of the Boston Ballet Company, died from medical complications of Anorexia Nervosa at age 22. Soon after her death, it was widely publicized that her ballet company encouraged her to lose weight so that she could obtain more prominent performance roles (Ben-Itzak, 1997). Although this is an extreme example, it underscores the need for awareness of eating disorders within the dance community along with a more pro-active approach to prevention.

Dance instructors would benefit from having knowledge about the signs and symptoms of eating disorders. Although symptoms of disordered eating are often difficult to detect (Rome et al., 2003), they are more difficult to conceal in a dance studio than in other settings. Dance instructors may be among the first to observe that a dancer has experienced a change in weight. Also, the physical side effects of Anorexia, such as lanugo, may be visible on parts of the body that are exposed by dance attire. Dancers who engage in harmful methods of weight control may also have difficulty with their concentration and stamina. They may appear lethargic and their may be technique less precise. When the dance teacher suspects one of her students may have an eating disorder, she can communicate with the parents about the importance of treatment. Until the dancer's weight has normalized and she is clearly on the path to recovery, the dancer should be prevented from taking dance classes and participating in performances.

Recreational ballet dancers who aspire to dance professionally would benefit from getting realistic information about their career prospects. Very few dancers have the aptitude for professional ballet. In the year 2006, there were only 8,668 professional dancers employed by arts, recreation or entertainment companies in the United States (Bureau of Labor Statistics, 2008-2009). It is estimated that out of 10,000 aspiring dancers, only one dancer will actually become a professional ballerina (Dotti et al., 2002).

Furthermore, there are many anatomical requirements for a classical ballet dancer that are not related to weight. According to Moss and Leopold (1999, p. 42) of the Joffery Ballet School, *“For ballet dancers, it has been said that anatomy is destiny. Ballet on the performance level is far too demanding unless you’ve got the ideal build – and feet – and*

there is a laundry list of specific qualifications (both aesthetic and athletic), including sloped shoulders (which make the neck look longer); loose hips for a wide turnout, long, slender arms for women; and, also for women (men do not do work en pointe), short, “even” toes for pointe work, a flexible foot (but not too flexible – too high an arch may make pointe work difficult), and other qualifications.” Thus, there are many dancers who are indeed thin, but still do not possess the necessary physical features to become a professional ballerina. Aspiring dancers need this information to ensure that they are not pursuing an unattainable goal.

Professional ballet dancers have been known to suffer from severe eating disorders and there is a need for interventions within this high risk setting. One intervention at an elite ballet school in Ontario has produced favourable outcomes (Piran, 1999). Using guidelines from the World Health Organization on health promoting schools, Piran (1999) implemented a program that focused on emphasizing physical health rather than thinness, discouraging teachers and peers from making comments to dancers about eating, shape and weight, and encouraging dancers to be cognizant of sociocultural pressures to lose weight. The cross-sectional design evaluated dancers in grades 7 through 12 in academic schools at three time periods over 10 years. Over time, dancers reported fewer symptoms of eating pathology, such as restrictive eating, and less body dissatisfaction.

Prevention programs that focus on size and weight acceptance and discourage pathological eating are needed for all children and adolescents. Universal prevention programs have been implemented in school and community-based settings to decrease the risk factors for eating pathology to which adolescents are typically exposed

(Neumark-Sztainer, Levine, Paxton, Smolak, Piran, & Wertheim, 2006). An example of a universal prevention program is the Healthy Schools Healthy Kids Programme (McVey, Tweed & Blackmore, 2007). This programme was implemented in the Ontario school system for students in sixth and seventh grade. The focus was on developing media literacy, encouraging acceptance of people with different body sizes, discouraging teasing, and improving body image. The programme included training for teachers, parent education, peer support groups, focus groups, and interactive activities. Students who participated in the program had lower scores on internalization of the thin ideal, especially for students who were currently trying to alter their body size or weight.

Future Directions

Future research should be directed towards continuing to improve the understanding of predictors of eating pathology in adolescence. The current comparative study could be replicated with other populations of adolescents pursuing aesthetic sports, such as gymnasts or figure skaters. Males were excluded from the study for theoretical and practical reasons, but it is also important that research be conducted with males who may be at higher risk for eating pathology. Findings that different processes lead to maladjustment within different populations will ultimately inform prevention efforts.

Future research should also focus on continuing to improve our understanding of eating pathology in ballet dancers. The current study could be replicated in samples of dancers at professional, rather than recreational schools. It would be important to examine the relationship between eating pathology and dancers' aptitude for a professional career in ballet. Dancers at professional schools undergo a stringent screening process, whereby only those with prior training and natural aptitude for a career

in classical ballet are granted one of the few positions available. As speculated previously, it appears that dancers who have the potential to become a professional ballerina, by virtue of their admittance into a professional dance school, are at increased risk for eating pathology, rather than dancers who take recreational dance lessons.

To date, there appears to be no prior research investigating pathological eating in girls who engage in other forms of dance besides ballet. Thus, there was no apriori reason to expect that girls who study other forms of dance might be at similar risk for eating pathology as ballet dancers. In the current study, adolescents who participated in other forms of dance were retained within the sample of non-dancers. Previous researchers have tended not to assess for history of dance involvement in comparison groups (e.g., Braisted et al., 1985; Abraham, 1990; Ringham et al., 2006). As such, comparative groups in previous studies likely included girls who engaged in other forms of dance. Since adolescent girls are known to participate in a variety of different activities, omitting girls who studied other forms of dance would decrease generalizability to the target population of adolescents. For this reason, and to enhance comparability with prior research, adolescents who participated in other forms of dance were included within the sample of non-dancers for the purpose of testing primary study hypotheses.

Future research should investigate possible differences in eating pathology and predictors of eating pathology for adolescents who study various forms of dance. This would be most feasible in larger urban centres that have sufficiently large populations of adolescent dancers. Although it remains an under-investigated area, it makes sense conceptually that ballet dancers would have a higher risk for eating pathology than dancers who study other forms of dance. The histories of other forms of dance are

markedly different from that of ballet. Ballet dancing originated within the Italian courts and was further developed in France. Over time, ballet evolved to have a specific set of vocabulary and rules. There are precise techniques that dictate appropriate positions of the legs, hands and arms. A ballet dancer's posture and turn-out of the legs is of central importance. Jazz and tap dancing have roots in African forms of dance that were brought to the United States from African slaves (Ambrosio, 2003). These styles of dancing involve isolation of various body areas and rhythmic pelvic and torso movements that are unheard of in ballet. Modern dance forms rejected the stringent rules of classical ballet as being stifling to an artist's creativity. Thus, in contrast to ballet, other forms of dance allow for much more freedom and individual interpretation in dance movement. It is actually quite difficult for a classically-trained ballet dancer to essentially "let go" of the rules of dance that have been learned in order to embrace less structured forms of dance.

Within the recreational dance community, ballet dancers also have quite different experiences than girls who take other forms of dance. First, ballet dancers are often required to wear pink tights, dark colored leotards and have their hair secured in a bun. Individuality in appearance is rarely permitted. However, in other forms of dance, girls are often permitted, even encouraged, to be creative in their dance attire and to have their hair pulled up or leave it down. Ballet dancers typically follow a graded syllabus and participate in annual ballet examinations. In other forms of dance, such as tap or jazz, the focus is on performance for the purpose of entertainment.

Within professional dance, diversity of body sizes and shapes is less acceptable in ballet than in other forms of dance (Moss & Leopold, 1999). Ballet dancers are also

accepted into professional schools at young ages, typically between age 15 and 21 (Ringham, 2006). In contrast, in other forms of dance, dancers are often accepted into performance companies in adulthood. Finally, it is not uncommon for a talented ballet dancer to be denied admittance to a ballet company due to her body type. The same dancer, however, could conceivably have a lucrative career dancing in a modern dance company or performance group.

Contributions of the Current Research

The current research addressed several shortcomings of previous research in this area. First, a predictive model of eating pathology was tested in adolescent girls using individual, interpersonal and sociocultural variables that were developmentally relevant. This was the first known investigation of how the processes leading to eating pathology might differ between a group of ballet dancers and adolescents in the general population. Prior researchers have found between-group differences between dancers and non-dancers on variables known to increase risk for pathological eating. However, in the current study, the mechanism through which these variables might influence the development of pathological eating was examined. Second, this was the first known study to test a predictive model of eating pathology in adolescent dancers rather than adult dancers. Third, rather than making assumptions about the pressures that exist within the dance subculture, dancers were asked directly about their subjective experiences.

Notably, within the community in which the current research was conducted, there has been a movement towards “dance wellness,” which refers to promoting the overall health and development of dancers (Cardinal, 2009). The dance schools that permitted recruitment of participants are known to have values and practices that directly

encourage physical and psychological wellness. In addition to providing dance education and preparing dancers for a career in professional dance, these schools focus on development of positive self-esteem, discipline, poise and comportment. A teacher at one of the participating dance schools also teaches ballet at a local high school with an exclusive arts program that requires auditioning for admittance. She encourages dancers to lead a balanced lifestyle and perform well in school. These “dance wellness” practices may explain why dancers in the current study did not appear to be at elevated risk for eating pathology.

At all levels of ballet, from recreational to professional, instructors can have a prominent role in encouraging the development of disordered eating. Since dance schools differ in the extent to which they emphasize wellness, it is important for parents who are considering enrolling their children in ballet to be aware of the school's mission statement, practices, policies, and attitude about thinness. There is anecdotal evidence that teachers at recreational dance schools directly encourage girls to lose weight and that girls who are overweight are prevented from participating in performances. However, as demonstrated in the current study, not all dance schools engage in these practices and participation in ballet can be a positive experience for many girls. The majority of dancers in the current study believed ballet was a positive experience in their lives.

In summary, although dancers in the current sample had significantly lower BMIs than non-dancers, they did not have higher levels of pathological eating. However, results of the research indicated that the processes leading to pathological eating among dancers and non-dancers do differ. Analyses of dancers' experiences suggested that dancers did not perceive direct pressures to be thin from instructors. Overall, dancers who

participated in the current study perceived ballet to be a positive experience in their life with a health-promoting effect. Although the current study added to the literature by investigating the processes leading to eating pathology, investigating dance variables related to pathology logical eating, and quantifying dancers' experiences, the research also exposed under-investigated areas. Specific areas for further study include examining the risk for eating pathology in adolescents who study other forms of dance and how the etiological processes leading to eating pathology may differ between groups of adolescents.

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Appendix A: Dance School Information Letter



**Adolescent Eating Habits and Self-Perceptions Study
Dance Teacher Information Letter**

Dear Dance Teacher,

We are contacting you to invite your school to participate in a study conducted by Alison Spadafora, M.A and Cheryl Thomas, Ph.D., C. Psych. from the Department of Psychology at the University of Windsor. The purpose of this study is to examine factors that contribute to eating pathology in adolescent girls. The results of the study will potentially provide important information about how to target interventions with this population, while raising awareness about eating pathology in general. This research has been cleared by the Research Ethics Board at the University of Windsor.

We would like to provide you with information about our research study and to ask your permission to recruit participants from your school. After data collection is complete within your school, I would be happy to provide an information workshop to female students in grades 9-12 on healthy eating and body.

As you know, many adolescent girls are concerned about their body image and engage in harmful methods of weight loss. These behaviours can lead to serious eating disorders that are associated with significant physical side effects and impairments in social and academic functioning. The purpose of the Adolescent Eating Habits Study is to identify variables that put adolescent girls at risk for eating disorders. The results of the study will raise awareness about eating pathology in general and will provide potentially important information about how to target interventions within this population.

This project has recently received approval from the University of Windsor Research Ethics Board. Below is a summary of the recruitment and research procedures.

Female ballet students who are currently in high school (grades 9-12, approximately 14 to 18 years of age) will be provided with an information letter and consent forms for them to take home to their parents, and they will be asked to return the consent forms to the school by a specified date. On the date of testing, students who returned the consent forms will be asked to fill out 7 questionnaires after their dance class. The questionnaires will take approximately 1.5 hours to complete. Students who consent to having their height and weight taken will be measured by a female research assistant in a private area. Afterwards, students will be provided with a research summary letter with a list of community resources. Students who participate in the research have the option of including their name in a draw for a \$25 mall gift certificate. The draw will be held after data collection for the study is complete, and the student who wins will receive the gift certificate in the mail.

We appreciate that instructional time is extremely valuable. We are asking permission to conduct this study either after or before a dance class on a specified date. Alternatively, students who wish to participate could be provided with the questionnaire packages and be asked to return them to the school by a specified date.

If you give permission for your dance school to participate in the study, please complete the form on the following page and return it to the researcher in the stamped, addressed envelope that is provided. You can keep this letter for your records. If you have any questions about the study, or would like to discuss the project further, please contact Alison Spadafora at (519) 944-8180 or spadaf6@uwindsor.ca



**Adolescent Eating Habits and Self-Perceptions Study
Letter of Permission from Dance Schools**

I understand the information provided for the “Adolescent Eating Habits and Self-Perceptions Study” as described herein. My questions have been answered to my satisfaction, and I agree for my dance school to participate in this study.

Name of Dance School

Name of Dance Teacher

Signature of Dance Teacher

Date

PLEASE RETURN THIS FORM IN THE STAMPED ADDRESSED ENVELOPE TO:

Alison Ann Spadafora, M. A.
Department of Psychology,
University of Windsor
N9B 3P4

Appendix B: Information Letter and Consent Form for Dancers Under Age 16

**ADOLESCENT EATING HABITS AND SELF-PERCEPTION STUDY
CONSENT TO PARTICIPATE IN RESEARCH**

Title of Study: Adolescent Eating Habits and Self-Perceptions Study

We are asking for your consent to have your daughter participate in the above research study conducted by Alison Spadafora, M.A. and Dr. Cheryl Thomas from the Department of Psychology at the University of Windsor. Your dance school and University of Windsor Research Ethics Boards have reviewed the study and approved this request for participation. If you have any questions or concerns about the research, please feel to contact Alison Spadafora at (519) 944-1822 or Dr. Cheryl Thomas at (519) 253-3000 ext. 2252.

PURPOSE OF THE STUDY

The purpose of the study is to understand girls' eating habits, their feelings about themselves and their bodies, and the pressures that they experience to lose weight.

PROCEDURES

If you agree for your daughter to participate in this study, we would ask for her to do the following things: Students who consent to participate in this study will be asked to complete six or seven questionnaires about their eating habits, feelings about themselves and their body, and pressures that they have experienced to lose weight. They will be asked to fill out these questionnaires after their dance class with a group of students. Students who consent to having their height and weight taken will be measured by a female research assistant in a private area.

POTENTIAL RISKS AND DISCOMFORTS

There are no known risks associated with participating in this research. Potential risks may include mild anxiety, or concern associated with answering questions related to pathological eating behaviours or behavioural problems (e.g., fighting with others). Participants also may be self-conscious about having their height and weight measured; however, this risk will be minimized by having participants weighed in private by a female research assistant.

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

Participants will not benefit directly from participating in this research. However, the results of the study will raise awareness about eating pathology in general and will provide potentially important information about how to target interventions for adolescent girls.

PAYMENT FOR PARTICIPATION

Students who participate in the research have the option of including their name in a draw for a \$25 gift certificate that can be redeemed at the local mall. The draw will be held after data collection for the study is complete, and the student who wins will receive the gift certificate in the mail.

CONFIDENTIALITY

Some of the questionnaires used in the study can identify participants who might be experiencing behavioural or emotional difficulties. If a participant indicates that she is in danger of hurting herself or someone else, the participant who completed with questionnaire will be identified by tracing the number on the questionnaire to the number and associated name on the attendance immediately after the research has taken place within the dance school. If your daughter is at-risk, we will contact you immediately. It is also possible, however, that some girls who are experiencing behavioural or emotional difficulties will not report their problems on the questionnaires. As a result, if you are concerned about your daughter, please contact an agency within the community, such as the Teen Health Centre (519-253-8481) or Help-Link (519-252-2313).

In order to make sure the surveys are anonymous, students' names will not be kept on any of the questionnaires. Participants will sign their name on an attendance sheet and be provided with a questionnaire package. The questionnaire package, and all of the questionnaires within it, will be number coded, and this number will be recorded on the attendance sheet next to the name of the participant to ensure that girls who are experiencing behavioral or emotional difficulties can be identified after they hand in their questionnaires. The surveys that students complete will be stored securely in a locked cabinet by the researcher. Also, when reporting on the results of the study, we will group the information so that no one will know an individual student's responses.

All other information that is collected for this study will remain confidential and will *not* be shared with anyone other than the researcher or research assistant. The only conditions under which confidentiality will be breached is if we obtain information that indicates that a student is experiencing significant behavioural or emotional difficulties that require immediate intervention, as described above.

PARTICIPATION AND WITHDRAWAL

You can choose whether you want your daughter to be in this study or not. If your daughter participates in the study, she may withdraw at any time without consequences of any kind. She can also refuse to answer any questions that she doesn't want to answer and still remain in the study. The investigator may withdraw her from this research if circumstances arise which warrant doing so.

FEEDBACK OF THE RESULTS OF THIS STUDY TO THE SUBJECTS

If you are interested in learning about the results once the study is complete, please visit the University of Windsor Research Ethics Board (REB) website at:

www.uwindsor.ca/REB or contact Alison Spadafora at spadaf6@uwindsor.ca

SUBSEQUENT USE OF DATA

The information collected in this study may be used in future studies. In the future, new research questions may be developed and answered by using data from the current study. Please indicate if you consent for the future use of the data from this study on the consent form.

RIGHTS OF RESEARCH SUBJECTS

You and your daughter may withdraw your consent at any time and discontinue participation without penalty. If you have questions regarding your daughter's rights as a research subject, contact: Research Ethics Coordinator, University of Windsor, Windsor, Ontario N9B 3P4; Telephone: 519-253-3000, ext. 3948; e-mail: ethics@uwindsor.ca

SIGNATURE OF PARENT OR GUARDIAN

I understand the information provided for the "Adolescent Eating Habits and Self-Perceptions Study" as described herein. My questions have been answered to my satisfaction, and I agree for my daughter to participate in this study. I have been given a copy of this form to keep.

PLEASE RETURN THIS FORM TO YOUR DAUGHTER'S SCHOOL BY (Day, Month, Year)

Name of Parent or Guardian

Signature of Parent or Guardian

Date

Your Daughter's Name

Your Daughter's Grade/Level in Ballet

Day of the week & Time Dance class

Do you give consent for the future use of the data from this study? Yes No

SIGNATURE OF INVESTIGATOR

These are the terms under which I will conduct research.

Signature of Investigator

Date

Appendix C: Information Letter and Consent Form for Dancers Over Age 16



ADOLESCENT EATING HABITS AND SELF-PERCEPTION STUDY CONSENT TO PARTICIPATE IN RESEARCH

Title of Study: Adolescent Eating Habits and Self-Perceptions Study

You are asked to participate in a research study conducted by Alison Spadafora, M.A. and Dr. Cheryl Thomas from the Department of Psychology at the University of Windsor. Your dance school and University of Windsor Research Ethics Boards have reviewed the study and approved this request for participation. If you have any questions or concerns about the research, please feel to contact Alison Spadafora at (519) 253-3000 ext. (2215) or Dr. Cheryl Thomas at (519) 253-3000 ext. 2252.

PURPOSE OF THE STUDY

The purpose of the study is to understand girls' eating habits, their feelings about themselves and their bodies, and the pressures that they experience to lose weight.

PROCEDURES

If you agree to participate in this study, we would ask you to do the following things: Students who consent to participate in this study will be asked to complete six or seven questionnaires about their eating habits, feelings about themselves and their body, and pressures that they have experienced to lose weight. They will be asked to fill out these questionnaires after their dance class with a group of students. Students who consent to having their height and weight taken will be measured by a female research assistant in a private area.

POTENTIAL RISKS AND DISCOMFORTS

There are no known risks associated with participating in this research. Potential risks may include mild anxiety, or concern associated with answering questions related to pathological eating behaviours or behavioural problems (e.g., fighting with others). Participants also may be self-conscious about having their height and weight measured; however, this risk will be minimized by having participants weighed in private by a female research assistant.

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

Participants will not benefit directly from participating in this research. However, the results of the study will raise awareness about eating pathology in general and will provide potentially important information about how to target interventions for adolescent girls.

PAYMENT FOR PARTICIPATION

Students who participate in the research have the option of including their name in a draw for a \$25 gift certificate that can be redeemed at the local mall. The draw will be held after data collection for the study is complete, and the student who wins will receive the gift certificate in the mail.

CONFIDENTIALITY

Some of the questionnaires used in the study can identify participants who might be experiencing behavioural or emotional difficulties. If a participant indicates that she is in danger of hurting herself or someone else, the participant who completed with questionnaire will be identified by tracing the number on the questionnaire to the number and associated name on the attendance sheet after the research has taken place within the dance school. If the participant is at immediate risk (i.e., she reports she will hurt herself or someone else), she will be directed to the emergency room at a local hospital. If she is not at immediate risk, she will be directed to the appropriate agency (e.g., Teen Health Centre, Medical and Health Services) for assistance.

In order to make sure the surveys are anonymous, students' names will not be kept on any of the questionnaires. Participants will sign their name on an attendance sheet and be provided with a questionnaire package. The questionnaire package, and all of the questionnaires within it, will be number coded, and this number will be recorded on the attendance sheet next to the name of the participant to ensure that girls who are experiencing behavioral or emotional difficulties can be identified after they hand in their questionnaires. The surveys that students complete will be stored securely in a locked cabinet by the researcher. Also, when reporting on the results of the study, we will group the information so that no one will know an individual student's responses.

All other information that is collected for this study will remain confidential and will *not* be shared with anyone other than the researcher or research assistant. The only conditions under which confidentiality will be breached is if we obtain information that indicates that a student is experiencing significant behavioural or emotional difficulties that require immediate intervention, as described above.

PARTICIPATION AND WITHDRAWAL

You can choose whether you want to be in this study or not. If you choose to participate in the study, you may withdraw at any time without consequences of any kind. You can also refuse to answer any questions that you don't want to answer and still remain in the study. The investigator may withdraw you from this research if circumstances arise which warrant doing so.

FEEDBACK OF THE RESULTS OF THIS STUDY TO THE SUBJECTS

If you are interested in learning about the results once the study is complete, please visit the University of Windsor Research Ethics Board (REB) website at: www.uwindsor.ca/REB or contact Alison Spadafora at spadaf6@uwindsor.ca

SUBSEQUENT USE OF DATA

The information collected in this study may be used in future studies. In the future, new research questions may be developed and answered by using data from the current study. Please indicate if you consent for the future use of the data from this study on the consent form.

RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time and discontinue participation without penalty. If you have questions regarding your rights as a research subject, contact: Research Ethics Coordinator, University of Windsor, Windsor, Ontario N9B 3P4; Telephone: 519-253-3000, ext. 3948; e-mail: ethics@uwindsor.ca

SIGNATURE OF RESEARCH PARTICIPANT

I understand the information provided for the “Adolescent Eating Habits and Self-Perceptions Study” as described herein. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form to keep.

PLEASE RETURN THIS FORM TO YOUR SCHOOL BY (Day, Month, Year)

Your Name

Your Signature

Date

Your Grade/Level in Ballet

Day & Time of Dance class

Do you give consent for the future use of the data from this study? Yes No

SIGNATURE OF INVESTIGATOR

These are the terms under which I will conduct research.

Signature of Investigator

Date

**Appendix D: Information Letter to Superintendent of Windsor Essex Catholic
District School Board**



**Adolescent Eating Habits Study
Superintendent Information Letter**

Dear Superintendent,

We are contacting you to invite the Windsor-Essex Catholic School Board to participate in a study conducted by Alison Spadafora, M.A and Cheryl Thomas, Ph.D., C. Psych. from the Department of Psychology at the University of Windsor. The purpose of this study is to examine factors that contribute to eating pathology in adolescent girls. As you know, many adolescent girls engage in harmful methods of weight loss. These behaviours can lead to serious physical side effects and clinically significant eating disorders. Within the adolescent population, girls who take ballet are considered to have an even greater level of risk for developing eating pathology due to increased sociocultural pressures to be thin.

Although there is a good understanding of variables that predict eating pathology for adolescent girls in general, very little is known about variables that predict eating pathology for dancers. To address these limitations, the present research will identify variables that predict eating pathology in adolescent dancers recruited from local dance schools, and in adolescents who do not take dance lessons recruited from local high schools. The results of the study will potentially provide important information about how to target interventions with this population, while raising awareness about eating pathology in general. We are hoping you will agree to allow high schools within the Windsor-Essex Catholic School Board to participate in the study, and after data collection is complete within a school, I would be happy to provide an information workshop to female students in grades 9-12 on healthy eating and body image. This project recently received approval from the University of Windsor Research Ethics Board. Below is a summary of the project and school participation.

Female students in grades 9-12 will be provided with an information letter and consent forms for them to take home to their parents, and they will be asked to return the consent forms to the school by a specified date. On the date of testing, students who returned the consent forms will be asked to fill out 6-7 questionnaires that will take approximately 1 hour to complete. Students who consent to having their height and weight taken will be measured by a female research assistant in a private area. Afterwards, participants will be provided with a research summary letter that includes a list of community resources.

If you have any questions about the study, or would like further information, please feel free to contact us.

Appendix E: Principal Information Letter



Adolescent Eating Habits and Self-Perceptions Study

Dear Principal,

We are contacting you to request permission to recruit female students in grades 9 through 12 for participation in a study on adolescent eating habits and self-perception. The study is being conducted by Alison Spadafora, M.A. and Cheryl Thomas, Ph.D., C. Psych. from the Department of Psychology at the University of Windsor. The purpose of this study is to examine factors that contribute to eating pathology in adolescent girls. We would be happy to provide a workshop on healthy eating and body image to your female students after the data collection process has been completed at your school.

The results of the study will provide potentially important information about how to target interventions with this population, while raising awareness about eating pathology in general. This research has been cleared by the Superintendent at the Windsor-Essex Catholic District School Board and the Research Ethics Board at the University of Windsor.

What Participants Will Be Asked to Do

Students who consent to participate will be asked to complete six questionnaires about their eating habits, feelings about themselves and their body, and pressures that they have experienced to lose weight. They will be asked to complete the questionnaires during regular school hours in small groups, and to have their height and weight measured by a female assistant in a private area.

Students who participate in the research may enter names in a draw for a \$25 gift certificate that can be redeemed at a local mall. The draw will be held after data collection for the study is complete, and the gift certificate will be mailed to the recipient. Participation in the study is voluntary; girls who do not wish to participate in the study can withdraw at any time. Following their participation, students will be provided with a research summary letter, including a list of community resources they can contact if they want additional information or wish to access treatment services.

Information that is collected for this study will remain confidential and will *not* be shared with anyone other than the researcher or research assistant. The only conditions under which confidentiality will be breached is if we obtain information that indicates that a student is experiencing significant behavioural or emotional difficulties that require immediate intervention.

Please contact Alison Spadafora at (519) 944-1822 or spadaf6@uwindsor.ca if you have any questions about the study, or would like to discuss the project further. Thank you for your time and consideration.

**Appendix F: Information Letter and Consent Form for High School Students Under
Age 16**

**ADOLESCENT EATING HABITS AND SELF-PERCEPTION STUDY
CONSENT TO PARTICIPATE IN RESEARCH**

Title of Study: Adolescent Eating Habits and Self-Perceptions Study

We are asking for your consent to have your daughter participate in the above research study conducted by Alison Spadafora, M.A. and Dr. Cheryl Thomas from the Department of Psychology at the University of Windsor. The Windsor Essex Catholic District School Board, school Principal and University of Windsor Research Ethics Boards have reviewed the study and approved this request for participation. If you have any questions or concerns about the research, please feel to contact Alison Spadafora at (519) 944-1822 or Dr. Cheryl Thomas at (519) 253-3000 ext. 2252.

PURPOSE OF THE STUDY

The purpose of the study is to understand girls' eating habits, their feelings about themselves and their bodies, and the pressures that they experience to lose weight.

PROCEDURES

If you agree for your daughter to participate in this study, we would ask for her to do the following things: Students who consent to participate in this study will be asked to complete six or seven questionnaires about their eating habits, feelings about themselves and their body, and pressures that they have experienced to lose weight. They will be asked to fill out these questionnaires during regular school hours with a small group of students. Students who consent to having their height and weight taken will be measured by a female research assistant in a private area. Please Note: If your daughter takes ballet lessons, please contact the researcher directly at (519) 253-3000 ext. (TBA), or at spadaf6@uwindsor.ca. It may be possible for her to complete the study at her dance school.

POTENTIAL RISKS AND DISCOMFORTS

There are no known risks associated with participating in this research. Potential risks may include mild anxiety, or concern associated with answering questions related to pathological eating behaviours or behavioural problems (e.g., fighting with others). Participants also may be self-conscious about having their height and weight measured; however, this risk will be minimized by having participants weighed in private by a female research assistant.

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

Participants will not benefit directly from participating in this research. However, the results of the study will raise awareness about eating pathology in general and will

provide potentially important information about how to target interventions for adolescent girls.

PAYMENT FOR PARTICIPATION

Students who participate in the research have the option of including their name in a draw for a \$25 gift certificate that can be redeemed at the local mall. The draw will be held after data collection for the study is complete, and the student who wins will receive the gift certificate in the mail.

CONFIDENTIALITY

Some of the questionnaires used in the study can identify participants who might be experiencing behavioural or emotional difficulties. If a participant indicates that she is in danger of hurting herself or someone else, the participant who completed with questionnaire will be identified by tracing the number on the questionnaire to the number and associated name on the attendance sheet immediately after the research has taken place within the school. If your daughter is at-risk, we will contact you and the school principal. It is also possible, however, that some girls who are experiencing behavioural or emotional difficulties will not report their problems on the questionnaires. As a result, if you are concerned about your daughter, please contact an agency within the community, such as the Teen Health Centre (519-253-8481) or Help-Link (519-252-2313).

In order to make sure the surveys are anonymous, students' names will not be kept on any of the questionnaires. When participants arrive at the testing location within the school, they will sign their name on an attendance sheet and be provided with a questionnaire package. The questionnaire package, and all of the questionnaires within it, will be number coded, and this number will be recorded on the attendance sheet next to the name of the participant to ensure that girls who are experiencing behavioral or emotional difficulties can be identified after they hand in their questionnaires. The surveys that students complete will be stored securely in a locked cabinet by the researcher. Also, when reporting on the results of the study, we will group the information so that no one will know an individual student's responses.

All other information that is collected for this study will remain confidential and will *not* be shared with anyone other than the researcher or research assistant. The only conditions under which confidentiality will be breached is if we obtain information that indicates that a student is experiencing significant behavioural or emotional difficulties that require immediate intervention, as described above.

PARTICIPATION AND WITHDRAWAL

You can choose whether you want your daughter to be in this study or not. If your daughter participates in the study, she may withdraw at any time without consequences of any kind. She can also refuse to answer any questions that she doesn't want to answer and still remain in the study. The investigator may withdraw her from this research if circumstances arise which warrant doing so.

FEEDBACK OF THE RESULTS OF THIS STUDY TO THE SUBJECTS

If you are interested in learning about the results once the study is complete, please visit the University of Windsor Research Ethics Board (REB) website at: www.uwindsor.ca/REB or contact Alison Spadafora at spadaf6@uwindsor.ca

SUBSEQUENT USE OF DATA

The information collected in this study may be used in future studies. In the future, new research questions may be developed and answered by using data from the current study. Please indicate if you consent for the future use of the data from this study on the consent form.

RIGHTS OF RESEARCH SUBJECTS

You and your daughter may withdraw your consent at any time and discontinue participation without penalty. If you have questions regarding your daughter's rights as a research subject, contact: Research Ethics Coordinator, University of Windsor, Windsor, Ontario N9B 3P4; Telephone: 519-253-3000, ext. 3948; e-mail: ethics@uwindsor.ca

SIGNATURE OF PARENT OR GUARDIAN

I understand the information provided for the "Adolescent Eating Habits and Self-Perceptions Study" as described herein. My questions have been answered to my satisfaction, and I agree for my daughter to participate in this study. I have been given a copy of this form to keep.

PLEASE RETURN THIS FORM TO YOUR DAUGHTER'S SCHOOL BY (Day, Month, Year)

Name of Parent or Guardian

Date

Signature of Parent or Guardian

Your Daughter's Name

Grade

School

Do you give consent for the future use of the data from this study? Yes No

SIGNATURE OF INVESTIGATOR

These are the terms under which I will conduct research.

Signature of Investigator

Date

**Appendix G: Information Letter and Consent Form for High School Students Over
Age 16**

**ADOLESCENT EATING HABITS AND SELF-PERCEPTION STUDY
CONSENT TO PARTICIPATE IN RESEARCH**

Title of Study: Adolescent Eating Habits and Self-Perceptions Study

You are asked to participate in a research study conducted by Alison Spadafora, M.A. and Dr. Cheryl Thomas from the Department of Psychology at the University of Windsor. The Windsor Essex Catholic District School Board, school Principal and University of Windsor Research Ethics Boards have reviewed the study and approved this request for participation. If you have any questions or concerns about the research, please feel to contact Alison Spadafora at (519) 944-1822 or Dr. Cheryl Thomas at (519) 253-3000 ext. 2252.

PURPOSE OF THE STUDY

The purpose of the study is to understand girls' eating habits, their feelings about themselves and their bodies, and the pressures that they experience to lose weight.

PROCEDURES

If you agree to participate in this study, we would ask you to do the following things: Students who consent to participate in this study will be asked to complete six or seven questionnaires about their eating habits, feelings about themselves and their body, and pressures that they have experienced to lose weight. They will be asked to fill out these questionnaires during regular school hours with a small group of students. Students who consent to having their height and weight taken will be measured by a female research assistant in a private area. Please Note: If you take ballet lessons, please contact the researcher directly at (519) 253-3000 ext. (TBA), or at spadaf6@uwindsor.ca. It may be possible for you to complete the study at your dance school.

POTENTIAL RISKS AND DISCOMFORTS

There are no known risks associated with participating in this research. Potential risks may include mild anxiety, or concern associated with answering questions related to pathological eating behaviours or behavioural problems (e.g., fighting with others). Participants also may be self-conscious about having their height and weight measured; however, this risk will be minimized by having participants weighed in private by a female research assistant.

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

Participants will not benefit directly from participating in this research. However, the results of the study will raise awareness about eating pathology in general and will provide potentially important information about how to target interventions for adolescent girls.

PAYMENT FOR PARTICIPATION

Students who participate in the research have the option of including their name in a draw for a \$25 gift certificate that can be redeemed at the local mall. The draw will be held after data collection for the study is complete, and the student who wins will receive the gift certificate in the mail.

CONFIDENTIALITY

Some of the questionnaires used in the study can identify participants who might be experiencing behavioural or emotional difficulties. If a participant indicates that she is in danger of hurting herself or someone else, the participant who completed with questionnaire will be identified by tracing the number on the questionnaire to the number and associated name on the attendance sheet immediately after the research has taken place within the school. The school principal will be contacted, and if the participant is at immediate risk (i.e., she reports she will hurt herself or someone else), she will be directed to the emergency room at a local hospital. If she is not at immediate risk, she will be directed to the appropriate agency (e.g., Teen Health Centre, Medical and Health Services) for assistance.

In order to make sure the surveys are anonymous, students' names will not be kept on any of the questionnaires. When participants arrive at the testing location within the school, they will sign their name on an attendance sheet and be provided with a questionnaire package. The questionnaire package, and all of the questionnaires within it, will be number coded, and this number will be recorded on the attendance sheet next to the name of the participant to ensure that girls who are experiencing behavioral or emotional difficulties can be identified after they hand in their questionnaires. The surveys that students complete will be stored securely in a locked cabinet by the researcher. Also, when reporting on the results of the study, we will group the information so that no one will know an individual student's responses.

All other information that is collected for this study will remain confidential and will *not* be shared with anyone other than the researcher or research assistant. The only conditions under which confidentiality will be breached is if we obtain information that indicates that a student is experiencing significant behavioural or emotional difficulties that require immediate intervention, as described above.

PARTICIPATION AND WITHDRAWAL

You can choose whether you want to be in this study or not. If you choose to participate in the study, you may withdraw at any time without consequences of any kind. You can also refuse to answer any questions that you don't want to answer and still remain in the study. The investigator may withdraw you from this research if circumstances arise which warrant doing so.

Appendix H: About You Background Survey

ABOUT YOU

The following questions are about you. There are no right or wrong answers. Your responses are confidential; please do not put your name on the questionnaire.

1. How old are you in years? I am _____ years of age.

2. What grade are you in?
 - 9
 - 10
 - 11
 - 12
 - Other: _____
(e.g., first year university)

- 3a. Were you born in Canada?
 - Yes
 - No, I was born in _____

- 3b. If you were not born in Canada, how many years have you live in Canada? I have lived in Canada for _____ years

4. What ethnic background do you most identify with?
 - White/Caucasian
 - African/Caribbean Canadian
 - Latina/Hispanic
 - Middle Eastern
 - Asian/Pacific Islander
 - First Nations/Native Canadian
 - Other-
Specify _____

5. What is your parents' marital status?
 - Married
 - Divorced
 - Separated
 - Common-law
 - Remarried
 - Other-
Specify _____

6. What is the highest level of education that your mother completed?
 - Less than grade school (e.g., grades 6, 7)
 - Completed grade school
 - Less than high school (e.g., grades 9, 10)
 - High school diploma or equivalent
 - Some college or university
 - Completed college of university
 - Other-
Specify _____

7. What is the highest level of education that your father completed?
 - Less than grade school (e.g., grades 6, 7)
 - Completed grade school
 - Less than high school (e.g., grades 9, 10)
 - High school diploma or equivalent
 - Some college or university
 - Completed college of university
 - Other-
Specify _____

- 8a. Is your mother currently working?
 - Yes
 - No

- 8b. What is/was your mother's occupation?

- 9a. Is your father currently working?
 - Yes
 - No

- 9b. What is/was your father's occupation?

10. Have you ever taken dance lessons?
- No
 - Yes

12. If you **took dance lessons in the past**, please indicate

- 1) what kind of dance lessons you took
- 2) how long you took lessons
- 3) how old you were when you stopped taking lessons

- I took **Ballet** for ___ years and ___ months and I stopped when I was ___ years of age.
- I took **Tap** for ___ years and ___ months and I stopped when I was ___ years of age.
- I took **Jazz** for ___ years and ___ months and I stopped when I was ___ years of age.
- I took **Hip hop** for ___ years and ___ months and I stopped when I was ___ years of age.
- I took **Ballroom Dancing** for ___ years and ___ months and I stopped when I was ___ years of age.
- I took **Ethnic or Folk Dancing** for ___ years and ___ months and I stopped when I was ___ years of age.
- I took another form of dance (Specify)_____ for ___ years and ___ months and I stopped when I was ___ years of age.

11. Do you take dance lessons now?
- No
 - Yes

13. If you **take dance lessons now**, please indicate

- 1) what kind of dance lessons you take
- 2) how long you have been taking lessons
- 3) how old you were when you started taking lessons

- I have taken **Ballet** for ___ years and ___ months and I started when I was ___ years of age.
- I have taken **Tap** for ___ years and ___ months and I started when I was ___ years of age.
- I have taken **Jazz** for ___ years and ___ months and I started when I was ___ years of age.
- I have taken **Hip hop** for ___ years and ___ months and I started when I was ___ years of age.
- I have taken **Ballroom Dancing** for ___ years and ___ months and I started when I was ___ years of age.
- I have taken **Ethnic or Folk Dancing** for ___ years and ___ months and I started when I was ___ years of age.
- I have taken another form of dance (Specify)_____ for ___ years and ___ months and I started when I was ___ years of age.

- 14a. In the past year, has your mother tried to lose weight?
- Yes
 - No

- 14b. If yes, what has she done to try to lose weight? (Check all that apply).
- Ate healthfully
 - Dieted severely
 - Exercised a little
 - Exercised a lot
 - Other-specify: _____

16. In the past year, have any of your brothers or sisters tried to lose weight?
- Yes
 - No

16b. If yes, please specify how many brothers and/or sisters and their ages. (E.g., 1 sister age 18)

- 16c. If yes, what have your brothers or sisters done to try to lose weight? (Check all that apply).
- Ate healthfully
 - Dieted severely
 - Exercised a little
 - Exercised a lot
 - Other-specify: _____

- 15a. In the past year, has your father tried to lose weight?
- Yes
 - No

- 15b. If yes, what has he done to try to lose weight? (Check all that apply).
- Ate healthfully
 - Dieted severely
 - Exercised a little
 - Exercised a lot
 - Other-specify: _____

- 17a. In the past year, have any of your friends tried to lose weight?
- Yes
 - No

17b. If yes, please specify how many of your friends and their ages. (E.g., 1 female friend age 15)

- 17c. If yes, what have your friends done to try to lose weight? (Check all that apply).
- Ate healthfully
 - Dieted severely
 - Exercised a little
 - Exercised a lot
 - Other-specify: _____

18. What is your current height? (e.g., 5 feet 1 inch) 19. What is your current weight?

20. How long ago did you last weigh yourself?
- Within the past week
 - Within the past month
 - Within the past 1-3 months
 - Within the past 4-6 months
 - Other – Specify: _____

Appendix I: Sociocultural Attitudes Towards Appearance Questionnaire-3

Please read each of the following items carefully and circle the number that best reflects your agreement with the statement.

- 1 = Definitely Disagree
2 = Mostly Disagree
3 = Neither Agree or Disagree
4 = Mostly Agree
5 = Definitely Agree

- 1 2 3 4 5 01. TV programs are an important source of information about fashion and being attractive.
- 1 2 3 4 5 02. I've felt pressure from TV or magazines to lose weight.
- 1 2 3 4 5 03. I do not care if my body looks like the body of people who are on TV.
- 1 2 3 4 5 04. I compare my body to the bodies of people who are on TV.
- 1 2 3 4 5 05. TV commercials are an important source of information about fashion and "being attractive."
- 1 2 3 4 5 06. I do not feel pressure from TV or magazines to look pretty.
- 1 2 3 4 5 07. I would like my body to look like the models who appear in magazines.
- 1 2 3 4 5 08. I compare my appearance to the appearance of TV and movie stars.
- 1 2 3 4 5 09. Music videos on TV are not an important source of information about fashion and "being attractive."
- 1 2 3 4 5 10. I've felt pressure from TV and magazines to be thin.
- 1 2 3 4 5 11. I would like my body to look like the people who are in movies.
- 1 2 3 4 5 12. I do not compare my body to the bodies of people who appear in magazines.
- 1 2 3 4 5 13. Magazine articles are not an important source of information about fashion and "being attractive."
- 1 2 3 4 5 14. I've felt pressure from TV or magazines to have a perfect body.
- 1 2 3 4 5 15. I wish I looked like the models in music videos.

- 1 = Definitely Disagree**
2 = Mostly Disagree
3 = Neither Agree or Disagree
4 = Mostly Agree
5 = Definitely Agree

- 1 2 3 4 5 16. I compare my appearance to the appearance of people in magazines.
- 1 2 3 4 5 17. Magazine advertisements are an important source of information about fashion and "being attractive."
- 1 2 3 4 5 18. I've felt pressure from TV or magazines to diet.
- 1 2 3 4 5 19. I do not wish to look as athletic as the people in magazines.
- 1 2 3 4 5 20. I compare my body to that of people in "good shape."
- 1 2 3 4 5 21. Pictures in magazines are an important source of information about fashion and "being attractive."
- 1 2 3 4 5 22. I've felt pressure from TV or magazines to exercise.
- 1 2 3 4 5 23. I wish I looked as athletic as sports stars.
- 1 2 3 4 5 24. I compare my body to that of people who are athletic.
- 1 2 3 4 5 25. Movies are an important source of information about fashion and "being attractive."
- 1 2 3 4 5 26. I've felt pressure from TV or magazines to change my appearance.
- 1 2 3 4 5 27. I do not try to look like the people on TV.
- 1 2 3 4 5 28. Movie stars are not an important source of information about fashion and "being attractive."
- 1 2 3 4 5 29. Famous people are an important source of information about fashion and "being attractive."
- 1 2 3 4 5 30. I try to look like sports athletes.

Appendix J: Dancers' Experiences Survey

Dancers' Experiences Survey

These questions are about your experiences taking ballet lessons. There is no right or wrong answer. Please answer these questions based on your own personal beliefs. Your responses are confidential; please do not put your name on the questionnaire.

1. How old were you when you first started taking ballet lessons? I was _____ years old.

2. How many years have you taken ballet lessons? I have taken ballet for _____ years.

3. In the past year, how many hours a week do you take ballet lessons? ___ hours each week.

4. In the past year, how many hours a week do you practice ballet at home, or on your own?
 ___ hours each week.

- 5a. Are you in a non-professional dance company or performance group outside of your ballet lessons?
 - No
 - Yes- Specify name of dance company _____

- 5b. If you answered yes to question 5a, how many hours per week do you rehearse with this company? ___ hours per week.

- 6a. Are you on a competitive dance team?
 - No
 - Yes- Specify name of dance team _____

- 6b. If you answered yes to question 6a, how many hours per week do you rehearse with this dance team? ___ hours per week.

7. What method of ballet does your school teach?
 - Royal Academy of Dance (RAD) method
 - Cecchetti method
 - I don't know
 - Other-Specify _____

8. What grade or level are you in your ballet class? _____ grade/level.

9. Have you ever **auditioned for** a professional dance company, such as the Royal Winnipeg Ballet, or the National Ballet of Canada?
 - No
 - Yes- Specify name of professional dance company _____

10. Have you ever **danced for** a professional dance company, such as the Royal Winnipeg Ballet, or the National Ballet of Canada?

- No
- Yes- Specify name of professional dance company

11. Which of the following best describes why you first started taking ballet lessons?

- I wanted to take ballet
- My parents wanted me to take ballet
- I was recommended to take ballet lessons to improve my skills in another area (e.g., figure skating, gymnastics)
- I was recommended to take ballet lessons for physical activity and exercise
- My friends took ballet lessons
- Other-Specify _____

12. Which of the following best describes what you hope to accomplish from taking ballet lessons now?

- I want to become a professional ballerina
- I want to dance in a non-professional dance company and perform
- I want to become a dance teacher
- I hope my ballet training will improve my skills in another area (e.g., figure skating, gymnastics)
- Other-Specify _____

13. If you want to become a professional ballerina, how important is it for you that you achieve this goal?

- Very important
- Important
- Neutral
- Unimportant
- Very unimportant

14. How likely do believe it would be for you to become a professional ballerina, regardless of whether you want to be one or not?

- Very likely
- Likely
- Neutral
- Unlikely
- Very unlikely

15. Please rank the how important the following things are for you (from 1-6, with 1 being the most important and 6 being the least important).

Family	_____
School	_____
Friends	_____
Ballet	_____
Hobbies	_____
Part-time job	_____

16. Please rank how important you think the following traits are in order for someone to become a professional ballet dancer (from 1 to 7, with 1 being the most important and 7 being the least important).

- Beauty/Physical attractiveness _____
- Creativity/Artistic expression _____
- Height _____
- Dedication _____
- Thinness _____
- Flexibility _____
- Physical strength _____

17a. Which of the following best describes what you usually wear during your ballet class?

- Pink tights and dark leotard
- Pink tights and dark leotard plus warm-up clothes (e.g., legwarmers, wrap sweater) during the early part of your class only
- Pink tights and dark leotard plus warm-up clothes (e.g., legwarmers, wrap sweater) for the entire class
- Other-Specify _____

17b. How comfortable with your body are you when wearing what you usually wear to your ballet class?

- Very comfortable
- Comfortable
- Neutral
- Uncomfortable
- Very uncomfortable

18a. Has there been a change in how comfortable you are wearing your usual dance clothes from when you were younger?

- No
- Yes

18b. If you answered yes to question 18a, which of the following best describes this change?

- I am much more comfortable with my body now than when I was younger
- I am somewhat more comfortable with my body now
- I was more comfortable with my body when I was _____ years of age

19a. During your ballet class, do you practice in front of mirrors?

- No
- Yes
- Sometimes-Describe _____

19b. If you usually practice in front of mirrors during your ballet class, how comfortable are you doing this?

- Very comfortable
- Comfortable
- Neutral
- Uncomfortable
- Very uncomfortable

20a. How many performances were you in during the past year? _____ performances.

20b. How many dance competitions were you in during the past year? ____ competitions.

20c. How comfortable are you with your body when performing or competing in front of other people?

- Very comfortable
- Comfortable
- Neutral
- Uncomfortable
- Very uncomfortable

21. How much pressure do you feel to fit into dance costumes?

- An extreme amount of pressure
- A lot of pressure
- Neutral
- A little pressure
- Absolutely no pressure

22. How do you feel about changing your clothes (e.g., from your street clothes into your dance clothes, changing costumes) around other girls in your dance class?

- Very comfortable
- Comfortable
- Neutral
- Uncomfortable
- Very uncomfortable

23. Which of the following do you believe best describes the goals of your teacher?

- To train girls to become professional ballet dancers
- To improve girls' dancing technique
- To raise girls' self-confidence and self-esteem
- To provide girls with an opportunity to perform
- To provide girls with an opportunity to have fun

24. Which of the following traits do you think describes the attitude of your dance teacher? (Check all that apply).

- Warm
- Cold
- Nurturing
- Critical
- Supportive
- Unsupportive
- Pleasant
- Unpleasant

25. How many corrections about your dancing do you receive compared to others in your class?

- A lot more corrections
- More corrections
- About the same as others
- Less corrections
- A lot less corrections

26. How comfortable are you when you receive corrections about your dancing in front of other girls in your class?

- Very comfortable
- Comfortable
- Neutral
- Uncomfortable
- Very uncomfortable

27a. Has your teacher ever made a direct comment to you about eating, body shape, or weight?

- No
- Yes

27b. Have you ever seen your teacher make a direct comment about eating, body shape, or weight to one of your classmates?

- No
- Yes

28a. Has a classmate in your dance class ever made a direct comment to you about eating, body shape, or weight?

- No
- Yes

28b. Have you ever seen a classmate make a direct comment to about eating, body shape, or weight to another one of your classmates?

- No
- Yes

29. Which of the following traits do you think describes the attitude of the other girls in your dance class? (Check all that apply).

- Warm
- Cold
- Nurturing
- Critical
- Supportive
- Unsupportive
- Pleasant
- Unpleasant

30. Which of the following do you think describes the number of girls in your class who are trying to lose weight?

- No one in my dance class is trying to lose weight
- A few girls are trying to lose weight
- Half the class is trying to lose weight
- The majority of my class is trying to lose weight
- Everyone in my class is trying to lose weight

31. Which of the following best describes the attitude of your dance teacher towards weight loss?

- Weight loss is highly encouraged
- Weight loss is encouraged
- Weight loss is neither encouraged nor discouraged
- Weight loss is discouraged
- Weight loss is highly discouraged

32. Which of the following best describes the attitudes of your classmates towards weight loss?

- Weight loss is highly encouraged
- Weight loss is encouraged
- Weight loss is neither encouraged nor discouraged
- Weight loss is discouraged
- Weight loss is highly discouraged

33. How accepting do you think your teacher is of girls in your class with different body sizes and shapes?

- Very accepting
- Accepting
- Neither accepting nor unaccepting
- Unaccepting
- Very unaccepting

34. How accepting do you think the girls in your dance class are of other girls in your class different body sizes and shapes?

- Very accepting
- Accepting
- Neither accepting nor unaccepting
- Unaccepting
- Very unaccepting

35. Please check any of the following activities that are encouraged in your dance class or dance studio.

- Leading a balanced lifestyle
- Physical health and wellness
- Parent involvement in your progress
- Getting good grades at your school
- Other-specify _____

Appendix K: Development and Evaluation of the Dancers' Experiences Survey

The Dancer's Experiences Survey was evaluated in a sample of young women to obtain preliminary data, evaluate the perceived relevance of the individual items, and receive feedback from dancers about any additional items that would be relevant to include on the Dancer's Experiences Survey. This survey was intended for use in another study investigating eating pathology in adolescent dancers. Within the community in which data collection was to take place, there is a relatively small number of adolescent girls who take ballet lessons. Therefore, it was necessary to evaluate the Dancers' Experiences Survey in a sample of dancers who were slightly older, so the sample size of the other study would not be negatively affected.

Survey development proceeded in the following manner (Dillman, 2000). First, the objective of the survey was delineated. The survey objectives were to describe the daily experiences of adolescent dancers and their perceptions of the sociocultural pressures that they experience to be thin. The survey was then designed by the researcher, who drew on her own knowledge of the dance subculture. Items covered a broad range of experiences, from ballet classes and performances to dance attire. Other items focused on dancer's level of involvement in ballet, career aspirations and pressures to be thin from instructors and peers. There were close-ended, partially open-ended, and likert-scale items, as well as items that required ranking and providing numerical information (e.g., number of years taking dance lessons).

The next step of survey preparation involved collaboration with colleagues to revise and augment the survey. The researcher and colleagues each had more than 10 years of involvement in classical ballet. During this step, several items were added. They included items covered what method of ballet girls were studying, whether girls

experienced a change in how comfortable they were in their dance attire, the goals of dance teachers, and positive behaviors that were encouraged in dancers. The final version contained 35 items.

Participant recruitment

An application was submitted to the University of Windsor's Research Ethics Board (REB). After approval was obtained, an application was sent to the University of Windsor Participant Pool requesting participant access. The Participant Pool is accessible to undergraduate students enrolled in psychology courses to allow them to gain additional credit for research participation. Potential participants were able to view a website listing active studies and sign up for participation electronically.

Female University students who studied ballet within the previous 5 years and were permitted to earn bonus marks towards their psychology class were eligible to participate in the study. The researcher submitted a screening question and a description of the study to the participant pool, which was posted on the Participant Pool website. The screening question, which read “Do you currently take ballet lessons, or have you taken ballet lessons during the past 5 years?” was answered by students when they initially signed up for the pool at the onset of the semester. Potential participants who endorsed this item were able to view a description of the “*Dancers’ Experiences Study*” study on the Participant Pool website (Appendix 1).

However, due to a “glitch” in the system, potential participants were unable to sign up for participation electronically via the Participant Pool website. As a result, the researcher obtained a list of names and contact information from the Participant Pool of the potential participants who endorsed the screening question ($N = 75$). Potential

participants were contacted by e-mail and telephone and asked to participate in a study about dancers' experiences. They were informed that participation would involve filling out a series of questionnaires that would take approximately one hour and 30 minutes to complete and would be worth 1.5 bonus marks towards one of their psychology classes. They were also informed that there were two parts of the study that would take place approximately one month apart, and they had the option of signing up for one, or both parts of the study.

Participants Number and Characteristics

Participants included 30 females who were recruited from the University of Windsor. Twelve of these participants completed the test-rest portion. Descriptive statistics are provided in Table 1. The average age of participants was 20.2 years of age ($SD = 2.3$; ranging from 18 to 26 years of age). Participants were predominately Caucasian ($n = 28, 93\%$) and the majority ($n = 23, 77\%$) were born in Canada. Others were born in the U.S.A, Russia, Germany, Scotland, Kenya, and China.

On average, participants took ballet lessons for 8.7 years ($SD = 6.1$). Five participants (17%) were currently taking ballet lessons; others ($n = 25, 83\%$) had taken ballet lessons within the past five years (See Table 2). Of the participants who were currently taking ballet lessons, two were taking one other form of dance as well. Three participants were taking four other forms of dance along with their ballet classes (See Table 3).

Participants were in their first ($n = 9, 30\%$), second ($n = 9, 30\%$), third ($n = 5, 17\%$), fourth ($n = 4, 13\%$), and fifth ($n = 1, 3\%$) year of University. The majority of

Table 1.

Descriptive Statistics for Demographic Variables

Variable	Participants ($N = 30$)	
Age	<i>M</i>	<i>(SD)</i>
	20.2	(2.3)
Year in University^a	<i>N</i>	<i>(%)</i>
1	9	(30%)
2	9	(30%)
3	5	(17%)
4	4	(13%)
5	1	(3%)
Place of Birth^b	<i>N</i>	<i>%</i>
Canada	23	(77%)
Other	6	(20%)
Years in Canada	<i>M</i>	<i>(SD)</i>
	16.0	(6.90)
Ethnicity	<i>N</i>	<i>%</i>
White/Caucasian	28	(93%)
South East Asian	1	(3%)
Chinese	1	(3%)
Parents' Marital Status^c	<i>N</i>	<i>%</i>
Married	18	(60%)
Divorced	5	(17%)
Separated	2	(7%)
Single	2	(7%)
Remarried	1	(3%)
Widowed	1	(3%)

Table 1. (continued)

Variable	Participants (<i>N</i> = 30)	
SES^d	<i>N</i>	(%)
Skilled craftsman Clerical, Sales workers	2	(67%)
Medium business, minor professional, technical	8	(27%)
Major business, Professional	15	(50%)

^a Year in University was missing for two participants.

^b Place of birth was missing for one participant.

^c Parents' marital status was missing for one participant.

^d SES was missing for 5 participants.

Table 2.

Number of Participants Who Studied Each Form of Dance

	Currently Studying	Previously Studied	Years of Involvement		Minimum Years	Maximum Years
			<i>M</i>	<i>(SD)</i>		
Ballet (<i>n</i> = 30)	5	25	8.7	(6.1)	0.5	20.8
Tap (<i>n</i> = 18)	3	15	8.6	(6.6)	0.3	20.8
Jazz (<i>n</i> = 28)	5	23	8.1	(6.0)	0.2	20.8
Hip Hop (<i>n</i> = 17)	3	14	5.4	(4.7)	0.7	15.5
Ethnic (<i>n</i> = 7)	0	7	1.0	-	1.0	1.0
Modern (<i>n</i> = 10)	2	8	6.1	(4.4)	0.7	13.5
Ballroom (<i>n</i> = 6)	1	5	2.3	(3.4)	0.5	9.2

Table 3.

Frequency of Participation in Dance Classes

	Number of Girls	Percentage
Number of Girls Currently Taking Ballet Lessons		
Ballet + One Other Form of Dance	2	40%
Ballet + Four Other Forms of Dance	3	60%
Total	5	100%
Number of Girls Who Currently Take Dance Lessons Other Than Ballet		
One Form of Dance	1	100%
Total	1	100%
Number of Girls Who Previously Took Ballet Lessons		
Ballet + One Other Form of Dance	4	17%
Ballet + Two Other Forms of Dance	7	29%
Ballet + Three Others Forms of Dance	5	21%
Ballet + Four Other Forms of Dance	6	25%
Ballet + Five Other Forms of Dance	2	8%
Total	24	100%

participants' parents were married ($n = 18, 60\%$); others reported that their parents were divorced ($n = 5, 17\%$), separated ($n = 2, 7\%$), single ($n = 2, 7\%$), remarried ($n = 1, 3\%$), and widowed ($n = 1, 3\%$). According to the Hollingshead criteria for measuring socioeconomic status, there were skilled craftsmen, clerical and sales workers ($n = 2, 7\%$), medium business, minor professionals and technical ($n = 8, 27\%$), major business and professional ($n = 15, 50\%$).

Measures

The measures to be used in the research were selected because they were being administered to adolescent girls for whom the Dancer's Experiences Survey was created. Administering them to University students provided information about the approximate length of time it would take younger girls to complete the questionnaires. In addition, it added significantly to a data set about eating pathology in young women.

The measures, which are described elsewhere, included the Eating Disorder Inventory-3 (EDI-3; Garner, 2005), the Sociocultural Attitudes towards Appearance Questionnaire-3 (SATAQ-3; Thompson, van den Berg, Roehrig, Guarda & Heinberg, 2004), the McKnight Risk Factor Survey-IV (MRFS-IV; Mcknight Investigators, 2003), the Youth Self-Report (YSR; Achenbach, 2001), the About You Background Survey and the Dancers' Experiences Survey. For all participants, the About You Background Survey was the first questionnaire and the remaining questionnaires were presented in randomized order to control for ordering effects.

Procedure

Participants completed the study at the University of Windsor. They first met with the researcher in a private room in the Department of Psychology and were provided with

a consent form (Appendix 2) for them to read, sign and return to the researcher. The researcher explained that participating in the study was voluntary; they were permitted to withdraw at anytime, and could refrain from answering any individual item on the survey. After participants consented, they were provided with a package containing the research questionnaires. For participants who were older than 19 years of age, two questionnaires (McKnight Risk Factor Survey-IV and the Youth Self-Report) were removed from the package because they are intended to be completed by adolescents ages 18 years of age or younger. The researcher was available throughout to answer participants' questions.

The last page in the questionnaire package instructed participants to notify the researcher if they consented to having their height and weight measured (Appendix 3). Consenting participants were measured in a private room by the researcher. They were asked to remove their shoes and any bulky clothing (e.g., a winter coat) to ensure a more accurate reading. To measure height, girls were asked to stand against a measuring tape adhered to a wall facing outwards. A ruler was placed over their head and their height was recorded to the nearest 1/8th of an inch or 0.1 centimeter (Center for Disease Control and Prevention, 2007). To measure weight, girls were asked to stand backwards on a digital scale, so they would not face the number provided by the scale. Weight in pounds was recorded to the nearest decimal. Participants who did not consent to this procedure had the option of self-reporting their height and weight.

Afterwards, participants were provided with a research summary letter (Appendix 4), which included a list of community resources. The researcher explained that the purpose of the study was to evaluate at the psychometric properties of the Dancers'

Experiences Survey. During this time, the critical items from the Youth Self Report dealing with harm to self (i.e., question 18 “I deliberately try to hurt or kill myself” and question 91 “I think about killing myself”) and harm to others (i.e., question 57 “I physically attack people,” and question 97 “I threaten to hurt people”) were reviewed by the researcher. If critical items on the YSR were endorsed with a 1 (Somewhat or Sometimes True) or a 2 (Very True or Often True), the researcher assessed whether the participant was at-risk for harming herself or harming someone else. In the current study, no participant was found to be at immediate risk; however, one participant who endorsed a critical item was encouraged to seek mental health services.

Participants were also informed about the test-retest portion of the study, which involved re-administering the Dancers' Experiences Survey. Those who indicated interest were contacted two weeks to one month later through e-mail. Consenting participants ($n = 12$) obtained the survey from the researcher's mailbox in the Department of Psychology, completed the survey, and then returned it to the researcher in her mailbox. Participants were subsequently credited with 0.5 bonus marks towards their psychology class.

Evaluation of the Dancers' Experiences Survey

Feedback from dancers. After participants completed the research questionnaires, they were informed that the Dancers' Experiences Survey was designed to describe the experiences of adolescent dancers. Participants were then asked to provide verbal feedback about the survey. All participants reported that the survey was easy to complete, adequately described their experiences, and agreed it was appropriate for adolescent dancers. When asked if any relevant items were omitted from the survey, only one

participant provided feedback. She expressed that it could be useful to have an item asking respondents to indicate why they quit taking ballet lessons. However, since the survey was intended for girls who were currently taking ballet, an item inquiring about this was not added to the survey. Based on verbal feedback from participants, it was determined that the survey possessed adequate face validity in that it assessed a variety of experiences relevant to dancers.

Test-retest reliability. Test-retest reliability was computed for 12 participants who were re-administered the Dancers' Experiences Survey. Overall, individual items were found to have moderate to perfect correlations (Appendix 5). Items with non-significant correlations typically involved ranking, rather than recalling retrospective information.

Additional Analyses. The average age at which dancers began studying ballet was 7.0 years of age ($SD = 5.0$; ranging from 2 to 18 years). Eight dancers (27%) were involved in a professional dance company or performance group. The majority of participants ($n = 16$, 46%) began taking ballet lessons because their parents wanted them to take ballet. Others began taking ballet because they wanted to ($n = 12$, 34%), they were recommended to take ballet to improve their skills in another area ($n = 4$, 11%), or because their friends took ballet lessons ($n = 3$, 9%).

Regarding what dancers hoped to accomplish from taking ballet lessons, only one dancer aspired to dance professionally ($n = 1$, 3%). Instead, girls aspired to dance in a non-professional dance company ($n = 9$, 23%), wanted to become a dance teacher ($n = 3$, 8%), improve their skills in another area such as figure skating or gymnastics ($n = 5$, 13%). Approximately 54% of dancers indicated “other” reasons for taking ballet lessons, including for fun and enjoyment and to improve physical health through exercise. Two

girls listed “compete,” and “ability” as other things they hoped to accomplish from taking ballet lessons.

Only 27% of dancers were required to wear traditional dance attire (e.g., pink tights, dark leotards) during their classes. Others ($n = 15$, 50%) wore traditional dance attire plus warm up clothing. Approximately 23% of dancers were permitted to wear any form of dance attire. When asked how comfortable wearing their typical dance attire, only 6.6% ($n = 2$) of dancers indicated that they were uncomfortable. Also, the overwhelming majority of dancers ($n = 29$, 97%) practiced in front of mirrors during their ballet classes. However, only 13% ($n = 4$) of dancers were uncomfortable with this aspect of the dance subculture.

Regarding the role of their ballet teachers, dancers perceived the goals of their as improving girls' dancing techniques ($n = 14$, 44%), providing girls with an opportunity to have fun ($n = 7$, 22%), providing girls with an opportunity to perform ($n = 7$, 22%), raising girls' confidence and self-esteem ($n = 2$, 6%) and training girls to become professional ballerinas ($n = 2$, 6%). Participants described their dance teachers as warm ($n = 18$, 60%), cold ($n = 5$, 17%), nurturing ($n = 11$, 37%), critical ($n = 15$, 50%), supportive ($n = 22$, 73%), unsupportive ($n = 1$, 3%), pleasant ($n = 20$, 67%) and unpleasant ($n = 1$, 3%).

Approximately 23% of dancers ($n = 7$) reported that their dance teacher made a direct comment to them about eating, body shape or weight; however, 40% ($n = 12$) witnessed their dance teacher make a direct comment to one of their classmates. The majority of dancers ($n = 24$, 80%) believed that their teacher did not encourage or discourage weight loss. Others ($n = 5$, 17%) believed that their teachers encouraged

weight loss, or discouraged weight loss ($n = 1$, 3%). When asked how accepting they believed their teachers were of dancers with different body sizes and shapes, 23% ($n = 7$) were very accepting, 47% ($n = 14$) were accepting, 23% ($n = 7$) were neither accepting nor unaccepting and 7% ($n = 2$) were unaccepting. Dance schools encouraged dancers to maintain physical health and wellness ($n = 24$, 80%), lead a balanced lifestyle ($n = 15$, 50%), perform well in school ($n = 11$, 37%), and have parents involved in their progress ($n = 6$, 20%).

Regarding other girls in their dance class, dancers described their peers as warm ($n = 19$, 63%), cold ($n = 4$, 13%), nurturing ($n = 9$, 30%), critical ($n = 8$, 27%), supportive ($n = 17$, 57%), unsupportive ($n = 4$, 13%), pleasant ($n = 23$, 77%), and unpleasant ($n = 5$, 17%). Approximately 27% ($n = 8$) of dancers indicated that at some point, a girl in their dance class had made a direct comment to them about eating, body shape or weight and 30% ($n = 9$) indicated that a girl had made a direct comment to another girl in their class.

When asked how many girls in their class were trying to lose weight, 13% ($n = 4$) of dancers indicated that no one was trying to lose weight, 73% ($n = 22$) indicated that a few girls were trying to lose weight, 7% ($n = 2$) indicated that half the class was trying to lose weight, and 7% ($n = 2$) indicated that the majority of their class was trying to lose weight. Only 7% ($n = 2$) of dancers believed that weight loss was highly encouraged by their classmates. Approximately 27% ($n = 8$) of dancers believed weight loss was encouraged by their classmates and 60% ($n = 18$) believed weight loss was neither encouraged nor discouraged. Only 7% ($n = 2$) of dancers believed that thinness was discouraged by their peers. Finally, dancers perceived their classmates as very accepting ($n = 3$, 10%), accepting ($n = 5$, 17%), neither accepting nor unaccepting ($n = 14$, 47%),

unaccepting ($n = 4$, 13%) and very unaccepting ($n = 4$, 13%) of other dancers with different body shapes.

Conclusion

The Dancers' Experiences Survey was designed by former dancers to address the limitations of prior research in neglecting to assess dancers' experiences. While not intended as a measure of underlying constructs, the survey was created to summarize dancers' subjective experiences of sociocultural pressures to be thin that exist within the dance subculture. The survey inquired about level of involvement in dance, beliefs about success in dance, comfort with different aspects of the dance subculture, supportiveness of the environment, and perceived pressure from others. Based on verbal feedback from young adults who had studied classical ballet, the Dancers' Experiences Survey appears to be a useful method of summarizing a variety of experiences of the adolescent dancer. Test-retest reliability was good, as the majority of items had moderate to perfect correlations. Finally, the survey provides rich information about a variety of experiences that are relevant for adolescent ballet dancers.

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**Appendix 1: Description of Dancers' Experiences Study Listed on Participant Pool
Website**

Study Name: Dancers' Experiences Study

Description: The purpose of the study is to examine the experiences of young women who take ballet lessons.

If you volunteer to participate in this study, we would ask you to complete 7 questionnaires about your eating habits, feelings about yourself and your body, and pressures that you have experienced to lose weight. If you consent to having your height and weight measured, you will be measured by a female research assistant in a private area. Participating in the study will take approximately 1-1.5 hours of your time. If you are interested, you can also sign up for a second part of the study that will take place in approximately one month. At this time, we will ask you to complete one additional questionnaire, which will take approximately 30 minutes.

Eligibility Requirements: You must be a female who currently take ballet lessons, or has taken ballet lessons during the past 5 years.

Duration: 90 minutes

Points: Part 1 = 1.5 bonus marks; Part 2 = 0.5 bonus marks

Researcher: Alison Spadafora, Email: spadaf6@uwindsor.ca

Participant Sign-up Deadline: 24 hours before the study is to occur

Study Status: Visible to participants (approved), Active study (appears on list of available studies)

REB Approval Code: # 020

Appendix 2: Information Letter and Consent Form for University Students

**DANCERS' EXPERIENCES STUDY
CONSENT TO PARTICIPATE IN RESEARCH**

Title of Study: Dancers' Experiences Study

You are asked to participate in a research study conducted by Alison Spadafora, M.A. and Dr. Cheryl Thomas from the Department of Psychology at the University of Windsor. The study will contribute to Alison Spadafora's dissertation research for her doctoral degree. If you have any questions or concerns about the research, please feel to contact Alison Spadafora at (519) 253-3000 ext. (2215) or Dr. Cheryl Thomas at (519) 253-3000 ext. 2252.

PURPOSE OF THE STUDY

The purpose of the study is to examine the experiences of young women who take ballet lessons, their eating habits, feelings about themselves and their bodies, and the pressures that they experience to lose weight.

PROCEDURES

If you agree to participate in this study, we would ask you to complete 7 questionnaires about your eating habits, feelings about yourself and your body, and pressures that you have experienced to lose weight. You can fill out these questionnaires in a room in the Department of Psychology with a small group of female students, unless you wish complete the questionnaires alone. If you consent to having your height and weight measured, you will be measured by a female research assistant in a private area.

Participating in the study will take approximately 1.5 hours of your time. If you are interested, you can also sign up for a second part of the study that will take place in approximately one month. At this time, we will ask you to complete one additional questionnaire, which will take approximately 30 minutes.

POTENTIAL RISKS AND DISCOMFORTS

There are no known risks associated with participating in this research. Potential risks may include mild anxiety, or concern associated with answering questions related to pathological eating behaviours or behavioural problems (e.g., fighting with others). Participants also may be self-conscious about having their height and weight measured; however, this risk will be minimized by having participants weighed in private by a female research assistant.

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

Participants will not benefit directly from participating in this research. The results of these studies will add significant information to the literature in psychology about

dancers' experiences and provide potentially important information about how to target interventions for adolescent dancers.

PAYMENT FOR PARTICIPATION

There is no payment for participating in the research. However, participants will receive 1.5 bonus marks towards their psychology courses for participating in this study. Participants who choose to complete the second part of the study in approximately one month will have the option of earning an additional 0.5 bonus mark.

CONFIDENTIALITY

Some of the questionnaires used in the study can identify participants who might be experiencing behavioural or emotional difficulties. If a participant indicates that she is in danger of hurting herself or someone else, the participant who completed with questionnaire will be identified by tracing the number on the questionnaire to the number and associated name on the attendance sheet immediately after the research has taken place. If the participant is at immediate risk (i.e., she reports she will hurt herself or someone else), she will be directed to the emergency room at a local hospital. If she is a not at immediate risk, she will be directed to the appropriate agency (e.g., Teen Health Centre, Medical and Health Services) for assistance.

In order to make sure the surveys are anonymous, participants' names will not be kept on any of the questionnaires. When participants arrive at the testing location within the school, they will sign their name on an attendance sheet and be provided with a questionnaire package. The questionnaire package, and all of the questionnaires within it, will be number coded, and this number will be recorded on the attendance sheet next to the name of the participant to ensure that participants who are experiencing behavioral or emotional difficulties can be identified after they hand in their questionnaires. The surveys that participants complete will be stored securely in a locked cabinet by the researcher. Also, when reporting on the results of the study, we will group the information so that no one will know an individual student's responses.

All other information that is collected for this study will remain confidential and will *not* be shared with anyone other than the researcher or research assistant. The only conditions under which confidentiality will be breached is if we obtain information that indicates that a participant is experiencing significant behavioural or emotional difficulties that require immediate intervention, as described above.

PARTICIPATION AND WITHDRAWAL

You can choose whether you want to be in this study or not. If you choose to participate in the study, you may withdraw at any time without consequences of any kind. You can also refuse to answer any questions that you don't want to answer and still remain in the study. The investigator may withdraw you from this research if circumstances arise which warrant doing so.

FEEDBACK OF THE RESULTS OF THIS STUDY TO THE SUBJECTS

If you are interested in learning about the results once the study is complete, please visit the University of Windsor Research Ethics Board (REB) website at: www.uwindsor.ca/REB or contact Alison Spadafora at spadaf6@uwindsor.ca

SUBSEQUENT USE OF DATA

The information collected in this study may be used in future studies. In the future, new research questions may be developed and answered by using data from the current study. Please indicate if you consent for the future use of the data from this study on the consent form.

RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time and discontinue participation without penalty. If you have questions regarding your rights as a research subject, contact: Research Ethics Coordinator, University of Windsor, Windsor, Ontario N9B 3P4; Telephone: 519-253-3000, ext. 3948; e-mail: ethics@uwindsor.ca

SIGNATURE OF RESEARCH PARTICIPANT

I understand the information provided for the “Dancers’ Experiences Study” as described herein. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form to keep.

Name of Participant

Signature of Participant

Date

Do you give consent for the future use of the data from this study? Yes No

SIGNATURE OF INVESTIGATOR

These are the terms under which I will conduct research.

Signature of Investigator

Date

Appendix 3: Height and Weight Information Form

Did you give consent to have your height and weight measured by the researcher?

Yes No

If yes, please see the research assistant and she will measure your height and weight in private.

Height: ____ feet ____ inches; Weight ____ pounds.

Did you consent to reporting your height and weight without being measured by the researcher?

Yes No

If yes, please indicate your current Height: ____ feet ____ inches; Weight ____ pounds.

Check here if you did not consent to having your height or weight measured by the researcher, and if you did not consent to reporting your height and weight.

Appendix 4: Research Summary Letter



**Dancers' Experiences Study
Research Summary Letter**

Thank you for agreeing to take part in this study. The purpose of the research was to evaluate the psychometric properties of the Dancers' Experiences Survey. The Dancers' Experiences Survey was designed by former dancers for use in another study that will examine predictors of eating problems in adolescent girls who take ballet lessons and girls who do not take ballet lessons. Previous researchers have found that about half of all girls are trying to lose weight, and trying to lose weight can lead to serious health problems. This study is specifically looking the extent to which girls' concerns about their body, pressure to lose weight from parents and peers, personality, mood and behaviour predicts whether they have eating problems.

When the study is complete, results will be posted on the web at www.uwindsor.ca/REB. If you are interested in learning more, you can contact Alison Spadafora at spadaf6@uwindsor.ca.

Many young women who are having problems with eating, mood or behaviours rarely seek help. If you feel that you are having problems, please contact one of the following community agencies.

Bulimia Anorexia Nervosa
Association
2109 Ottawa Street
Windsor, Ontario
N8Y 1R8
(519) 969-2112

Teen Health Centre
1585 Ouellette Avenue
Windsor, Ontario
N8X 1K5
(519) 253-8481

Student Counselling Centre
University of Windsor
Room 293 CAW Student
Centre
Windsor, Ontario
N9B 3P4
(519) 253-3000 ext. 4616

The following websites are recommended if you would like more information about body image and healthy living.

National Eating Disorder Information Centre www.nedic.ca
National Eating Disorder Association www.nationaleatingdisorders.org
Media Awareness Network www.media-awareness.ca
National Heart, Lung and Blood Association <http://www.nhlbisupport.com/bmi/>
Healthy Body Image www.peelregion.ca/health/commhlth/bodyimg/bintro.htm
Canada's Food Guide www.hc-sc.gc.ca/fn-an/food-guide-aliment/index_e.html

Appendix 5: Test-Retest Reliability of the Dancers' Experiences' Survey

Item	Correlation Coefficient
How old were you when you first started taking ballet lessons?	0.83**
How many years have you taken ballet lessons?	0.98**
In the past year, how many hours per week do you take ballet lessons?	0.95**
In the past year, how many hours a week do you practice ballet at home, or on your own?	0.68*
Are you in a non-professional dance company or performance group outside of your ballet lessons?	0.84**
If you answered yes to question 5a, how many hours per week do you rehearse with this company?	0.79
Are you on a competitive dance team?	1.00**
What method of ballet does your school teach?	0.76**
Have you ever auditioned for a professional dance company, such as the Royal Winnipeg Ballet, or the National Ballet of Canada?	1.00**
If you want to become a professional ballerina, how important is it for you that you achieve this goal?	-0.50
How likely do believe it would be for you to become a professional ballerina, regardless of whether you want to be one or not?	0.67 *
Please rank the how important the following things are for you (from 1-6, with 1 being the most important and 6 being the least important).	
Family	0.75**
School	0.26
Friends	0.52
Ballet	0.52

Hobbies	0.28
Part-time job	0.35
Please rank how important you think the following traits are in order for someone to become a professional ballet dancer (from 1 to 7, with 1 being the most important and 7 being the least important).	
Beauty/Physical attractiveness	0.72**
Creativity/Artistic expression	0.89**
Height	0.36
Dedication	-0.23
Thinness	0.90**
Flexibility	0.68**
Physical strength	0.71**
Which of the following best describes what you usually wear during your ballet class?	0.97**
How comfortable with your body are you when wearing what you usually wear to your ballet class?	0.45
Has there been a change in how comfortable you are wearing your usual dance clothes from when you were younger?	0.41
If you answered yes to question 18a, which of the following best describes this change?	0.93**
At what age were you the most comfortable with your body?	0.91*
If you usually practice in front of mirrors during your ballet class, how comfortable are you doing this?	0.72**
How many performances were you in during the past year?	1.00**

How many dance competitions were you in during the past year?	1.00**
How comfortable are you with your body when performing or competing in front of other people?	0.68**
How much pressure do you feel to fit into dance costumes?	0.07
How do you feel about changing your clothes around other girls in your dance class?	0.84**
Which of the following traits do you think describes the attitude of your dance teacher? (Check all that apply).	
Warm	0.68**
Cold	1.00**
Nurturing	0.66*
Critical	0.84**
Supportive	-0.14
Pleasant	0.63**
How many corrections about your dancing do you receive compared to others in your class?	0.55
How comfortable are you when you receive corrections about your dancing in front of other girls in your class?	0.68**
Has your teacher ever made a direct comment to you about eating, body shape, or weight?	0.82**
Have you ever seen your teacher make a direct comment about eating, body shape, or weight to one of your classmates?	0.66*
Have you ever seen a classmate make a direct comment to about eating,	0.52

body shape, or weight to another one of your classmates?

Which of the following traits do you think describes the attitude of the other girls in your dance class? (Check all that apply).

Warm	0.26
Nurturing	0.71**
Critical	0.11
Unpleasant	1.00**

Which of the following do you think describes the number of girls in your class who are trying to lose weight? 1.00**

Which of the following best describes the attitude of your dance teacher towards weight loss? 1.00**

Which of the following best describes the attitudes of your classmates towards weight loss? 0.94**

How accepting do you think your teacher is of girls in your class with different body sizes and shapes? 0.61*

How accepting do you think the girls in your dance class are of other girls in your class different body sizes and shapes? 0.68*

Please check any of the following activities that are encouraged in your dance class or dance studio.

Leading a balanced lifestyle	-0.26
Physical health and wellness	0.26
Parent involvement in your progress	0.53

* $p < .05$, ** $p < .01$

Appendix L: Research Summary Letter for High School Students and Dancers



**ADOLESCENT EATING HABITS AND SELF-PERCEPTION STUDY
RESEARCH SUMMARY LETTER**

Thank you for agreeing to take part in this study. The purpose of this study was to examine predictors of eating problems in girls who take ballet lessons and girls who do not take ballet lessons. Previous researchers have found that about half of all girls your age are trying to lose weight, and trying to lose weight can lead to serious health problems for some girls. This study is specifically looking the extent to which girls' concerns about their bodies, pressure to lose weight from parents and peers, personality, mood and behaviour predicts whether girls have eating problems.

When the study is complete, results will be posted on the web at www.uwindsor.ca/REB. If you are interested in learning more about the study, you can contact Alison Spadafora at spadaf6@uwindsor.ca.

Many teenagers who are having problems with eating, mood or behaviours, or problems functioning at home or school rarely seek help. If you feel that you are having problems, please contact one of the following community agencies.

Teen Health Centre
1585 Ouellette
Avenue
Windsor, Ontario
N8X 1K5
(519) 253-8481

Community Crisis Centre
1030 Ouellette Avenue
Windsor, Ontario
N9A 1E1
24 hour Crisis line (519) 973-
4435

Bulimia Anorexia Nervosa
Association
2109 Ottawa Street
Windsor, Ontario
N8Y 1R8
(519) 969-2112

The following websites are recommended if you would like more information about body image and healthy living.

- http://www.kidshealth.org/teen/food_fitness/
- <http://www.girlshealth.gov/nutrition/index.htm>
- <http://www.girlshealth.gov/fitness/index.htm>
- <http://www.kidshelpphone.ca/en/home.asp> (Get Informed → Girls' Health)
- [http://www.cdc.gov/nccdphp/dnpa/bmi/childrens BMI/about childrens BMI.htm](http://www.cdc.gov/nccdphp/dnpa/bmi/childrens_BMI/about_childrens_BMI.htm)

Appendix M: Assent Form for High School Students Under Age 16



**Adolescent Eating Habits Study
Assent Form**

Your parent/guardian has given permission for you to participate in a study on eating habits in adolescent girls. The study is being carried out by Alison Spadafora, M.A. and Dr. Cheryl Thomas, from the Department of Psychology at the University of Windsor.

If you agree to participate, you will be asked to complete 6-7 questionnaires about your eating habits, feelings about yourself and their body, and pressures that you have experienced to lose weight. The questionnaires have no right or wrong answers.

Involvement in the study is voluntary; you do not have to participate if you do not want to. Even if you consent to participate in the study, you can leave at any time without penalty, or choose not to answer any question(s) that you feel uncomfortable answering. Students who participate in the research have the option of including their name in a draw for a \$25 mall gift certificate.

Information that is collected for this study will remain confidential. That means the information you provide will *not* be shared with anyone other than the researcher or research assistant. The only exceptions are for students who appear to be experiencing serious behavioural or emotional difficulties. Sometimes students have problems that make them feel very sad or unhappy. If we think that a student is having serious difficulties, we will need to contact their parents and other people who can help them.

If you would like to participate in our study, please sign your name below and return the form to one of us. Please let us know if you have any questions about the study now, and when you are completing the questionnaires.

I have read and understand the above information and I agree to participate in this study.

Name (Please Print)

Grade in School

Signature

Date

Appendix N: Internal Consistency Reliabilities for Research Measures

Internal Consistency Reliabilities (Cronbach's Alpha) for Research Measures

Variable	Dancer (N = 45)	Non-Dancer (N = 111)
Eating Pathology		
Drive for Thinness	.88	.87
Bulimia	.76	.81
Body Dissatisfaction	.87	.90
Internalization of the Thin Ideal		
Internalization-General	.94	.93
Sociocultural Pressures		
Direct Comments - Peers	.68	.65
Direct Comments - Parents	.66	.60
Teasing - Parents	.40	.42
Teasing- Peers	.86	.91
Comorbid Psychopathology		
Internalizing Psychopathology	.89	.90
Externalizing Psychopathology	.80	.89
Perfectionism	.85	.76
Protective Factors		
Activities to Feel Good	.51	.42
Negative Life Events	.41	.58
School Performance ^a	-	-
Support Sharing	.32	.50
Support Person	.88	.81

^a Cronbach's alpha not calculated, scale contains one item

VITA AUCTORIS

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