Body image and exercise: The role of eating pathology, internalization, and self-efficacy.

Kelty L. Berardi

University of Windsor

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BODY IMAGE AND EXERCISE: THE ROLE OF EATING PATHOLOGY, INTERNALIZATION, AND SELF-EFFICACY

by

Kelty L. Berardi

A Master’s Thesis
Submitted to the Faculty of Graduate Studies and Research through the Department of Psychology in Partial Fulfilment of the Requirements for the Degree of Master of Arts at the University of Windsor

Windsor, Ontario, Canada

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ABSTRACT

Body image dissatisfaction has been demonstrated to predict engagement in a variety of health-related activities, including exercise. However, not all individuals who are dissatisfied with their bodies engage in exercise. The purpose of the study was to examine how body image dissatisfaction interacts with specific variables to influence exercise behaviour. These variables were eating pathology, internalization of social standards of attractiveness, and self-efficacy related to exercise. Participants included 194 female undergraduate students who completed a questionnaire assessing exercise participation, the Body Image Ideals Questionnaire (BIQ), the Revised Restraint Scale (RRS), the Sociocultural Attitudes Towards Appearance Questionnaire (SATAQ), and the Exercise Self-Efficacy Scale (ESES). The data was analyzed using 2 X 3 between groups factorial ANOVAs. Consistent with predictions, restrained eaters with high body image dissatisfaction exercised significantly more than unrestrained eaters with high body image dissatisfaction, and participants with high self-efficacy for exercise participated in significantly more exercise than those with low self-efficacy. Contrary to expectations, high sociocultural internalization was associated with significantly less exercise than low sociocultural internalization. These findings contribute to the existing literature by clarifying how the relationship between body image dissatisfaction and variables such as dietary restraint, internalization of sociocultural appearance norms, and self-efficacy influence exercise participation.
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Body Image Dissatisfaction and Exercise: The Role of Eating Pathology, Internalization, and Self-Efficacy

Exercise can be defined as planned, structured, and repetitive bodily movement done to enhance or maintain one or more components of physical fitness, which include cardiorespiratory endurance, muscular strength, muscular endurance, and flexibility. It is recommended that adults engage in thirty minutes of moderately intense physical activity daily (National Institutes of Health Consensus Development Panel, 1996). There are many hypothesized psychological and physiological benefits associated with exercise. Psychological benefits include positive mood shifts, an increased sense of self-sufficiency, and greater interpersonal adjustment (Kirkclady & Shephard, 1990). Physiological benefits include greater resistance to cardiovascular disease, enhanced respiratory function, reduced risk of Type II diabetes, colon cancer, back pain, hypertension, obesity, and osteoporosis (Bouchard, Shephard, & Stephens, 1994; U.S. Department of Health and Human Services, 1996). In 1992, the American Heart Association released a statement recognizing that physical inactivity is an independent risk factor for cardiovascular disease (Fletcher et al., 1992). Because of the well-known benefits associated with exercise, the discovery of effective interventions to improve exercise adherence has become a major focus in the scientific literature (Dishman, Oldenburg, O’Neal, & Shephard, 1998; Marcus, Owen, Forsyth, Cavill, & Fridinger, 1998; Simons-Morton, Calfas, Oldenburg, & Burton, 1998). Therefore, understanding potential obstacles and/or facilitators of engagement in exercise is highly relevant.
Body Image and Exercise 2

Statistics indicate that more people exercise on a regular basis now than ever before (Cash, Novy, & Grant, 1994). Surveys in the late 1980s and early 1990s indicated that more than fifty percent of the U.S. population exercised daily. The number of individuals reporting exercising regularly has doubled in the last 25 years (Yates, 1991). The increasing popularity of fitness centres, work out videos, and home exercise equipment is likely an indication of the increasing dedication to health and fitness. However, it is unclear whether the increase in exercise is an indication of concern over health or representative of the intense preoccupation with societal ideals of attractiveness (Davis, Claridge, & Brewer, 1996). Fitness books are full of graphs and charts outlining the calorie burning potential of every possible physical activity, and activities that burn the most calories are often recommended. As the ineffectiveness of dieting has come to be more documented in the scientific literature, exercise is becoming the new “cure” for obesity (Burgard & Lyons, 1994). Wiseman, Gray, Mosiman, and Ahren (1992) studied the content of women’s magazines from 1959 to 1988. An increase in the number of diet and exercise magazines was found over the years. In the past eight years, there were more exercise articles than diet articles.

Despite the known health benefits associated with exercise, health concerns have not been found to consistently predict engagement in exercise. Several studies have demonstrated that body image dissatisfaction motivates women to exercise (Cash, Novy, & Grant, 1994; MacDonald & Thompson, 1992). It seems that for women the new “fitness” craze is motivated by the desire to obtain the “thin ideal” rather than health concerns (Davis, 1992).

Body Image Dissatisfaction
Body image is a multifaceted construct encompassing self-perceptions and attitudes in relation to one’s own body; specifically, its appearance (Cash & Pruzinski, 1990). A disturbance concerning the perceptual component of body image is indicated in distorted perceptions of one’s body size, shape, or appearance. The attitudinal component involves one’s feeling about one’s body. A disturbance involving the attitudinal component can be defined as a subjective unhappiness with an aspect(s) of one’s appearance (Monteath & McCabe, 1997).

Body image disturbance is of great importance because it is associated with psychological distress and functional impairment (Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999). Body image dissatisfaction is associated with poor self-esteem, social anxiety, depression, inhibition, and sexual dysfunction (Cash & Grant, 1995). In the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV; American Psychiatric Association, 1994), body image disturbance is one of the primary defining features of anorexia nervosa, bulimia nervosa, and body dysmorphic disorder.

Among women in society, body dissatisfaction seems to represent a ‘normative discontent’ (Cash & Henry, 1995; Cash & Pruzinski, 1990). Cash and Henry (1995) surveyed 803 adult women in the United States. Almost half of the women surveyed were preoccupied with becoming overweight and reported global dissatisfaction with their appearance. In the often cited 1984 Glamour survey of 33,000 women, it was found that seventy percent of women aged eighteen to thirty five believed they were fat. Only twenty five percent of the sample was actually medically overweight. Forty five percent of the women who reported they were fat were actually underweight. The intensity of body image dissatisfaction is even more evident in the fact that respondents reported that losing ten to fifteen pounds was more important to them than succeeding in work or love (Wooley, Wooley, & Wayne, 1985).
Sociocultural Pressure and Body Image

Many researchers agree that sociocultural factors have a very strong influence on the development and maintenance of body image disturbance. As a result, this hypothesis has received a significant amount of attention in the literature (Fallon, 1990; Heinberg, Thompson, & Stormer, 1995; Heinberg, 1996; Thompson, 1992; Stice et al., 1994).

According to sociocultural theories, body image disturbance is influenced by common or culture wide social ideals, expectancies, and experiences. The feminine ideals of beauty have varied and changed over time. Past research indicates that the preference for an hour glass figure has been replaced by the less curvaceous and more angular body as the current ‘ideal’ (Garner, Garfinkel, Schwartz, & Thompson, 1980). The contemporary ideal of female beauty in Western society is based on attractiveness, thinness, & fitness (Rudd & Lennon, 2000). Although current ideals promote thinness, women often feel pressure to achieve appearance goals that are contradictory to thinness, for example, possessing large breasts or a muscular physique (Thompson & Tantleff, 1992; Striegel-Moore, Silberstein, & Rodin, 1986).

Evidence supporting the idea that a shift in “ideals” has occurred comes, among other sources, from an examination of the weights of Miss America contestants. Miss America contestants from 1979 to 1988 weighed between 13 and 19% below their expected weights for their heights (Wiseman, Gray, Mosimann, & Ahren, 1992). Furthermore, and even more disturbing, is the idea that the majority of women who meet society’s “ideal” based on their low weight, meet one of the DSM-IV diagnostic criteria for anorexia nervosa, which is maintenance of a body weight less than 85% of that expected (American Psychiatric Association, 1994).
In a society where ‘what is beautiful is good’, many women feel extreme pressure to meet this ideal. However, the current societal standard of thinness is out of reach for many women (Franzoi & Herzog, 1987; Striegel-Moore, McAvay, & Rodin, 1990). The media helps women believe that they can achieve these cultural ideals through dieting and exercise. In addition, they are lead to believe they will receive rewards including employment, control, and sexual attention if they do. Negative stereotypes including poor health and lack of control are associated with obesity (Ritnebaugh, 1982). Photographic techniques like airbrushing, soft-focus cameras, editing, and filters may lead society to believe that the models presented through these techniques are realistic representations of actual people (Thompson & Heinberg, 1999). If women compare themselves to these media ideals, given their inability to look like them, they are likely to view their bodies negatively (Wegner, Hartmann, & Geist, 2000).

Research supports the contention that women’s body images are influenced by media portrayals of the thin ideal (Champion & Furnham, 1999; Stormer & Thompson, 1996). For example, it has been demonstrated that following exposure to images of female fashion models, women report less satisfaction with their physical appearance and body weight (Richins, 1991; Irving, 1990). Similarly, Pinhas, Toner, Ali, Garfinkel, & Stuckless (1999) examined how women’s moods change after exposure to pictures of models who represent the ‘thin ideal’. Viewing these images had an immediate effect on mood. Women who were exposed to pictures of models were more depressed and angry compared to the controls, who viewed pictures that did not contain models.

*Body Image and Motives for Exercise*
Given that the female ideal of beauty has moved from one of “curvaceousness” to one of thinness and “firmness” it is not surprising that an increase in the number of women engaging in exercise for reasons related to body image has occurred. Given society’s recent emphasis on physical fitness, more recent research has focused on identifying individuals’ reasons for engaging in exercise. Silberstein, Striegel-Moore, Timko, Rodin (1988) developed the 24 item Reasons for Exercise Inventory to assess women’s motives for exercise. Cash, Novy, & Grant (1994) further validated the Reasons for Exercise Inventory through factor analysis. The scale was administered to 137 university women attending a public university. Subjects ranged in age from 18-52. The resulting factor structure was comprised of four factors labelled fitness/health management, appearance/weight management, stress/mood management and socializing. Only the appearance/weight management factor was significantly correlated with reported exercise frequency in a sample of college women. Women who reported greater body dissatisfaction were more likely to exercise for these reasons.

In an expansion study of Cash et al. (1994), Smith, Handly, & Eldredge (1998) found that only health and fitness factors were predictive of exercise frequency and intensity for women. Women’s dissatisfaction with specific body areas was not related to their reported reasons for exercising. However, similar to results found in the previous study, students who reported more situational body dissatisfaction exercised for appearance and weight control reasons. Similarly, Armstrong, Lange, & Mishra (1992) examined exercise motives in a sample of male and female exercisers 20 years of age and older. They found that most respondents exercised at least three days per week, but felt they needed to exercise more. Particularly among women, weight loss was a widespread motivation to exercise.
Flynn (1998) investigated the relationship between body image, eating, and exercise behaviour in a sample of Black women. She found that obese women with greater body dissatisfaction were more likely to engage in exercise and eat low fat foods than were obese women with less body dissatisfaction. Lewter (1997) evaluated the exercise and eating habits in a sample of college women. She found that the women in her sample did engage in some potentially healthy behaviour, such as exercise, eating low fat foods, and cutting down on junk food. However, these behaviours were engaged in for weight-related purposes rather than for health-related reasons.

Ingledew, Hardy, and De Sousa (1995) studied the influence of body mass index and body dissatisfaction on exercise motives in adults. They found that body mass index positively predicted exercising for weight management reasons in men, but not in women. They found that in women body size discrepancy, how far these women felt from their ideal body regardless of actual BMI, predicted exercising for weight management reasons. The authors concluded that men were more likely to exercise for weight management if they were actually overweight, and women were more likely to exercise for weight management for if they were dissatisfied with their body size, regardless of whether or not they were overweight.

Tiggeman & Williamson (2000) investigated the effect of exercise on body image dissatisfaction and self-esteem. Significant negative relationships between amount of exercise and body image satisfaction were found for young women (mean age of 18.4 years). They found that exercising for weight control and muscle tone was associated with lower body image satisfaction while exercising for health and fitness reasons was associated with increased self-esteem.
Imm and Pruitt (1991) examined the relationship between exercise and body shape satisfaction in a sample of average weight women aged 19 to 30 years. Participants were classified as high frequency exercisers, moderate frequency exercisers, and non-exercisers. They found that the high frequency exercisers had a significantly more negative view of their bodies compared to the moderate exercisers and non-exercisers.

*Heinberg, Thompson, and Mazon’s Model of Exercise Behaviour*

Based on the evidence that body image is a consistent motivator for individuals to engage in exercise (Cash et al. 1994; Smith et al., 1998), Heinberg, Thompson, and Mazon (2001) have argued that some degree of body dissatisfaction may be necessary to motivate individuals to engage in healthy behaviours such as exercising. Heinberg and colleagues (2001) hypothesize that the relationship between body image dissatisfaction and exercise behaviour is not a simple linear one, as previously asserted (i.e. with greater distress leading to greater dieting and exercise behaviours). They assert that the relationship between body image dissatisfaction and exercise could be depicted by an inverted “U”. As body image dissatisfaction has been found to be a consistent motivator to engage in exercise, they hypothesize that a moderate level of body image distress will motivate an individual to engage in exercise. Individuals with no distress may not be sufficiently motivated to engage in exercise behaviour and fall to the left of the curve.

Interestingly, they suggest that individuals high in body image distress may engage in excessive exercise or not engage in exercise at all. High distress may motivate individuals to engage in excessive behaviours (i.e. dieting/binging/purging/excessive exercise). On the other hand, individuals with high body image distress may not engage in any exercise. Heinberg and
colleagues (2001) suggest this may be because they lack the self-efficacy to engage in the behaviours necessary to change their appearance. Thus, highly distressed individuals may fall on the right side of the curve in that they may not engage in healthy levels of exercise, but rather in excessively high, or low levels of exercise.

Heinberg and colleagues (2001) use research from cancer screening to support their hypothesis. Hailey (1991) reviewed 13 studies examining the association between breast cancer risk factors and early detection and screening behaviours. One would predict a linear relationship between risk status and screening behaviour, because early detection increases survival. Surprisingly, this was not found to always be the case. Hailey made a case that anxiety or fear associated with a family history of breast cancer, potentially mediates the relationship between risk status and screening behaviour in a way similar to how fear/anxiety can function in complex tasks. A moderate degree of anxiety facilitates screening but too much anxiety hinders screening.

Heinberg and colleagues (2001) suggest that body image dissatisfaction is not always a negative process, and suggest that it is important to examine how level of body image dissatisfaction interacts with other variables to predict motivation to engage in healthy behaviours. Several variables have been found to affect exercise behaviour including eating pathology, internalization of social standards of attractiveness, and exercise self-efficacy. The effect of these variables on exercise will be explored below.

_Eating Pathology and Exercise_

In addition to exhibiting pathological eating behaviour, individuals with eating disorders often engage in purging behaviours. Some individuals may use exercise as a substitute for more
drastic weight control techniques like laxative use or compensatory vomiting (Hubbard, Gray, & Parker, 1998). Individuals with anorexia nervosa engage in abnormally high levels of physical activity, particularly during times of extreme food restriction (Davis, 1999). Individuals suffering from anorexia who abuse exercise have been found to display more psychological distress and psychopathology than individuals who starve themselves without engaging in exercise activity (Davis, Woodside, Olmstead, & Kaptein, 1999).

Solenberger (2001) did a retrospective analysis of patient’s exercise patterns over the last 6 months prior to hospitalization for an eating disorder. No significant differences were found between diagnostic categories (Anorexia, Bulimia, Eating Disorder Not Otherwise Specified) on the amount and type of exercise in which they engaged. However, high-level exercisers were found to have higher scores on the Eating Attitudes Test and more weight preoccupation than low-level exercise groups. Findings from the study revealed that patients reporting a higher frequency of exercise and greater total aerobic exercise had a significantly greater drive for thinness and required a longer length of hospitalization.

The most important relation between body image and exercise is the extent to which exercise behaviour is, or becomes excessive and compulsive (Smith, Wolfe, & Laframboise, 2001). Excessive or compulsive exercise has been researched under a variety of headings including obligatory exercise, over-commitment to exercise, exercise dependence, and exercise addiction. These terms are used to describe exercise activity that can be harmful to the individual’s physical and psychological well-being (Steffen & Brehm, 1999). For consistency, the term obligatory exercise will be used throughout the remainder of this paper.

Obligatory exercisers are individuals who exercise frequently and seem unable to control their need to exercise even in the face of injury and social demands (Pasman & Thompson,
1988). Specifically, obligatory exercise refers to a ‘subset of exercisers who experience a powerful subjective need to exercise, and are reluctant to cease exercising for any reason’ (Hubbard, Gray, & Parker, 1998; Pasman & Thompson, 1988; Yates, 1991). Obligatory exercisers are characterized by the maintenance of a rigid schedule of intense exercise, guilt and anxiety when they cannot maintain their exercise schedule, a preoccupation with food and lean body mass, exercising even when tired, ill, and/or injured (Yates, 1991). Many similarities between individuals with anorexia nervosa and obligatory exercise have been noted including weight preoccupation, low self-esteem, depression, and body image disturbance.

Matheson and Crawford-Wright (2000) examined the eating disorder profiles in a sample of student obligatory and non-obligatory exercisers. Obligatory exercisers scored significantly higher on four subscales (Drive for Thinness, Ineffectiveness, Interpersonal Distrust, Interoceptive Awareness). Obligatory exercisers did not score higher on the Body dissatisfaction EDI subscale than the non-obligatory exercisers (Yates, 1991).

In a study of adolescent girls from Norway, it was found that excessive exercise at baseline was the strongest predictor of eating pathology later (Wichstrom, 1995). Pasman and Thompson (1988) examined body image and eating disturbance in excessive exercisers and sedentary controls. They found that excessive exercisers had significantly more eating disturbance than controls. This difference was only found on a measure of anorexic tendencies (Drive for Thinness) but not for bulimic behaviours.

Hubbard, Gray, & Parker (1998) investigated differences among women who exercise for ‘food related’ and ‘non-food related’ reasons. Individuals who engage in exercise for ‘food related’ reasons do so to ‘work off’ food they have consumed. ‘Non-food related’ exercisers engage in exercise for other reasons. The ‘food-related’ exercisers exhibited more
symptoms of obligatory exercise, eating disturbance, body dissatisfaction, and lower self-esteem than the ‘non-food related’ group.

Silberstein, Striegel-Moore, Timko, & Rodin (1988) developed the Reasons for Exercise Inventory, a 25 item measure assessing motives for engaging in exercise. They found that women with disturbed eating behaviour were more likely to exercise for weight related reasons than women without disturbed eating. McDonald & Thomson (1992) assessed eating disturbance, body dissatisfaction, self-esteem, and reasons for exercising in a sample of physically active undergraduate males and females. Compared to men, women’s reasons for exercise were more related to weight and tone reasons. Exercising for weight, tone, and attractiveness reasons, was associated with higher scores on the Body Dissatisfaction and Drive for Thinness subscale of the EDI-2. Exercising for health, mood and enjoyment was positively related to self-esteem for both sexes.

In summary, a strong association between exercise participation and eating pathology has been found. Women with eating disorders and disturbed eating patterns have been demonstrated to sometimes engage in excessive exercise that could be potentially harmful to their physical and psychological health.

*Internalization of Societal Ideals and Exercise*

The extent to which an individual internalizes the thin-ideal has been found to be associated with exercise behaviour (Beamer, 1999; Lyter, 1997). Current research is focused on understanding the risk factors associated with body image disturbance. A new avenue of research concerns how the internalization of social ideals of attractiveness is related to the development of
body image disturbance (Thompson et al., 1999). Socialization agents (i.e. family, peers, and the media) reinforce the thin ideal through comments or actions that support and perpetuate this ideal. This ideal can be reinforced through criticism or teasing about weight, being encouraged to diet, and glorification of slender models (Thompson & Stice, 2001). Through these sources, the benefits of thinness are communicated (e.g. increased social acceptance). Because these thin ideals are not attainable for most women, thin ideal internalization likely fosters body dissatisfaction (Thompson et al, 1999). Theoretically, body image dissatisfaction that results from the internalization of the thin ideal encourages dieting and negative affect, which often leads to further eating disordered behaviour (Stice, 2001). Internalization has been demonstrated to predict individual’s willingness to engage in “risky” behaviour. Cashion (2001) investigated the relationship between internalization of the “beauty ideal”, body consciousness, and willingness to undergo plastic surgery. Women who internalized the “beauty ideal” were less satisfied with their body image and more willing to undergo appearance enhancing plastic surgery.

Beamer (1999) investigated how internalization of the thin ideal was related to exercise in a sample of 180 females attending college. She found that women who had internalized the thin ideal had lower self-esteem, higher body image dissatisfaction, and were more preoccupied with exercise than the females who did not internalize. Rudd & Lennon (2000) examined body image and appearance/weight management behaviours in a sample of 99 female college students. Fifty four percent of the sample reported engaging in risky behaviours such as excessive exercise, tanning, and substance use to facilitate weight loss. Participants commonly expressed the belief that the body is malleable and that the cultural ideal of beauty can be achieved through continued effort.
Lewter (1997) investigated the extent to which acceptance of the socially constructed ideal body image impacted college females’ body image dissatisfaction and engagement in risky weight management behaviour. The study found that the strongest predictor of engagement in unhealthy weight management behaviour (i.e. skipping meals, excessive exercise, using diet pills) was BMI, followed next by internalization of the socially constructed ideal body image, and then level of body satisfaction.

In conclusion, results from these studies indicate that the degree to which women internalize the thin ideal is a strong predictor of excessive exercise and preoccupation with exercise. The importance of achieving the thin ideal likely serves as a constant motivator to engage in the behaviours necessary to achieve it.

**Self-Efficacy and Exercise**

According to Bandura (1995), self-efficacy expectations affect behaviour, motivational level, thought patterns, and emotional reactions in response to situations. Self-efficacy expectation can be defined as an individual’s central pervasive belief regarding their capability to exert control over their own behaviour (Bandura, 1991). An individual’s choice to perform a specific behaviour is largely influenced by their beliefs about being able to perform that behaviour (self-efficacy) and also by their beliefs about the consequences of that behaviour (outcome expectation) (Bandura, 1991).

Bandura’s theory of self-efficacy has been found to contribute to the explanation of many diverse forms of health behaviour including control of eating and weight, success of myocardial infarction recovery, and preventive health programs (O’Leary, 1985). Self-efficacy expectation
has often been found to be the strongest correlate of exercise behaviour and has been found to be associated with higher levels of physical activity and adherence (Desharnais, Boullion, & Godin, 1986; Garcia & King, 1991; Martin & Sinden, 2001; McCauley, 1992; Sallis, Pinski, Grossamn, Patterson, & Nader, 1988).

Initial self-efficacy of being able to engage in exercise has been found to predict engagement and adherence in exercise programs for patients suffering from coronary artery disease (Kaplan, Atkins, & Reinsch, 1984). McAuley and Jacobson (1991) found that self-efficacy to engage in exercise was predictive of overall exercise levels in sedentary females participating in an eight-week aerobics program for adults. Desharnais, Bouillon, Godin (1986) evaluated exercise self-efficacy and outcome expectations as potential predictors of adherence to a physical fitness program. They found that both self-efficacy to engage in exercise and outcome expectancies were predictors of adherence to an exercise program, but self-efficacy was found to be a stronger predictor. Dropouts displayed more uncertainty about their ability to attend the program regularly and expected more benefits from the program. In a study of 328 university students, a significant relationship between baseline exercise self-efficacy and frequency of exercise over a seven-week program was found (Dzewalthowski, 1989).

In summary, self-efficacy to engage in exercise has been found to be a strong predictor of engagement in exercise. The individual’s belief that they are capable of engaging in exercise plays a major role in exercise participation.

*Purposes and Hypotheses Guiding the Current Study*
The purpose of this study is to examine how specific variables interact with body image distress to predict exercise levels. Heinberg and colleagues (2001) predicted that body image distress would have an inverted “U” effect on exercise levels, with low distress resulting in very little exercise, and very high distress resulting in either very low levels of exercise because the individual may feel overwhelmed, or resulting in very high, unhealthy levels of exercise. Heinberg et al. (2001) further hypothesized that certain variables may interact with body image dissatisfaction to influence this relationship. Because eating pathology, internalization of social standards of attractiveness, perceived self-efficacy to engage in exercise have been shown to have an impact on exercise, these variables appear to be likely candidates to interact with body image dissatisfaction and thus moderate the relationship between body image dissatisfaction and exercise. The goal of this study is to explore whether the relationship between body image dissatisfaction and exercise is moderated by these three variables.

**Hypothesis 1: Eating Pathology and Exercise**

Based on the associations found between exercise and eating pathology, the first hypothesis of the current study is that eating pathology will moderate the relation between body image dissatisfaction and exercise behaviour. As eating pathology increases, it is predicted that exercise frequency will also increase, therefore a main effect of eating pathology on exercise is expected. It is also predicted that eating pathology will interact with body image disturbance in the following ways. Individuals with low eating disturbances and low to moderate body image disturbance will likely engage in some exercise, likely in the “healthy” range. Individuals with low eating pathology but very high body image dissatisfaction will likely fall on the right side of
the curve and engage in low levels of exercise. These individuals are the most likely to be
overwhelmed by their dissatisfaction and are thus not engaging in any activity to alter their
bodies. Similarly, individuals with high eating pathology but low body image dissatisfaction will
likely engage in low levels of exercise. Their eating pathology is likely not related to body image
dissatisfaction. Finally, it is predicted that women who have the highest eating pathology and
highest body image dissatisfaction will engage in the most frequent or excessive exercise (Figure
1).

![Graph showing the hypothesized effect of body image dissatisfaction and eating pathology on exercise.]

Figure 1.

The Hypothesized Effect of Body Image Dissatisfaction and Eating Pathology on Exercise

Hypothesis 2 Internalization and Exercise

The second hypothesis is that internalization of the social attitudes towards appearance
will interact with body image dissatisfaction to influence exercise behaviour. High internalizers
are individuals who cognitively ‘buy into’ the thin ideal and engage in activities to achieve this
ideal (Thompson et al., 1999). A main effect of level of internalization is expected. As
internalization level increases, so will exercise behaviour. It is predicted that individuals low in internalization and low in body image dissatisfaction will engage in very low levels of exercise. Similarly, individuals who have high internalization but low body image dissatisfaction will engage in low levels of exercise. These individuals believe that achieving the thin ideal is important, but may not be dissatisfied with their bodies because they have achieved it. Individuals with high body image dissatisfaction and a high degree of internalization will be the most likely to engage in increased amounts of exercise behaviour. The combined body image dissatisfaction and acceptance of the message that appearance is important will serve as motivators to engage in frequent or excessive exercise to meet those ideals. Individuals high in dissatisfaction but low in internalization will be more likely to engage in very low levels of exercise, as meeting cultural ideals is not as important to them (figure 2).

![Diagram](image)

**Figure 2.**

The Hypothesized Effect of Body Image Dissatisfaction and Internalization on Exercise

*Hypothesis 3: Self-Efficacy and Exercise*
The third hypothesis of the current study is that perceived self-efficacy to engage in exercise will influence exercise behaviour. A main effect of exercise self-efficacy is expected. As self-efficacy level increases, so will exercise participation. Women with low body image disturbance and low exercise self-efficacy will be the least likely to exercise. Similarly, women with high body image disturbance (without eating pathology) and low exercise self-efficacy may also exercise very little, because they may feel unable to engage in the exercise behaviour necessary to alter their appearance. Women with high self-efficacy but low dissatisfaction will also be likely to engage in lower levels of exercise. They have the belief they can engage in exercise but may be lacking the motivation to do so. Conversely, high body image dissatisfaction combined with high self-efficacy will predict frequent exercise behaviour. Women who are extremely distressed, and believe they are able to engage in exercise activity that may alter their appearance, will be the most likely to engage in frequent or excessive exercise.

Figure 3.

The Hypothesized Effect of Body Image Dissatisfaction and Self-efficacy on Exercise
Method

Participants

One hundred and ninety four undergraduate females enrolled in psychology courses participated in the current study. Participants were randomly recruited from the undergraduate participant pool. Each participant was offered one bonus mark towards their final grade in a psychology course of their choice for their participation in the study. Participants were asked to fill out a booklet of questionnaires that took approximately 25 to 40 minutes. All participants were asked to sign a consent form that outlined the purpose of the study, and indicated that any information they disclose will be anonymous and confidential. Subjects were informed that their participation was voluntary, and that they could withdraw from the study at any time without penalty. All participants were treated in accordance with APA ethical codes.

The mean age of participants was 23.35 years (SD = 6.68). Age of participants ranged from 18 to 61 years of age. Of the one hundred and ninety four participants 72% were Caucasian, 6.7% were African-Canadian, 11.9% were Asian, 2.6% were Native-Canadian, and the remaining 6.7% selected “other” as their ethnic background.

Measures

Demographic Information
All participants were asked to fill out a form entitled “background information”. This included their age, ethnic background, height, weight, and their attitudes concerning exercise. Participants were also asked to indicate whether or not they thought they had an eating disorder, if they had ever been treated for an eating disorder, if they had been diagnosed with an eating disorder, and if so, what eating disorder were they diagnosed with. A questionnaire was created specifically for this purpose (Appendix A).

*Exercise Participation*

Information concerning frequency, intensity, and type of exercise was included on a questionnaire entitled ‘background’ information (Appendix B). Participants were given a list of physical activities that included jogging, swimming, aerobics, cycling, home exercise, organized sports, dance class, weight training, and “others”. They were asked to circle any activities they had participated in over the last year. For each circled activity participants were asked to indicate how many weeks over the past year (1-52) they had engaged in the activity. They were also asked to indicate the average number of times per week they engaged in the activity. Participants were asked to circle the average duration of time (in minutes) they engaged in the activity (1-30, 31-60, 61-90, or 90+). Similar to previous studies (Davis et al., 1995; Davis & Cowles, 1991), exercise level was quantified by multiplying weeks per year by frequency per week by duration per session in half hour units (1,2,3 and 4, consecutively). This method produced a single score, which provided an index of exercise frequency/intensity for each participant.
The Body–Image Ideals Questionnaire

The Body-Image Ideals Questionnaire (BIQ) was created by Cash & Szymanski (1995) (Appendix C). The scale measures the extent to which an individual believes that his/her actual physical characteristics match his/her ideals and also how important the individual believes attaining these ideals is. The BIQ contains 11 physical characteristics: height, skin complexion, hair texture and thickness, facial features, muscle tone and definition, body proportions, weight, chest (or breast) size, physical strength, and physical coordination, and “overall physical appearance”. Participants are asked to think about how they actually are and then to think about how they would like to be. On Part A participants indicate the degree to which they are similar to or match their personal ideals on a 4 point scale, with 0 being “exactly how I am”, 1 being “almost as I am”, 2 being “fairly unlike me”, and 3 being “very unlike me”. Next they are asked to indicate how important it is to them that they exemplify that particular ideal, with 0 being “not important”, 2 being “somewhat important”, 3 being “very important”. The scoring of the BIQ requires calculating the mean of the item by item cross products of discrepancy by importance ratings. Possible BIQ scores range from −3 to 9 with higher scores indicative of greater self-ideal discrepancy with strongly held physical ideals, thus greater overall body image dissatisfaction. Cash & Szymanski (1995) initially validated the BIQ on a sample of 284 college women and found strong evidence of the reliability and validity of the measure. The BIQ was demonstrated to have an internal consistency of 0.76. Test-Retest reliability is not yet available.
The Revised Restraint Scale

The Restraint Scale (RS) was created to assess dietary restraint. The original scale was developed by Herman and Mack (1975). The current version, The Revised Restraint Scale (RRS) (Appendix D), was the principal psychometric measure for assessing eating pathology. It consists of 12 items that tap diet and weight history and concern with food and eating (Heatherton, Herman, Polivy, King, & McGree, 1988). The Revised Restraint Scale has been demonstrated to have high test-retest reliability and internal consistency, .95 and .82, respectively (Allison, Kalinsky, & Gorman, 1992). It consists of two subscales: Weight fluctuation and Concern for Dieting. Sample items of the Concern for dieting subscale include “How often are you dieting” and “Do you have feelings of guilty after overeating”. A sample item from the Weight Fluctuation subscale is “Would a weight fluctuation of 5lbs. affect the way you live your life?”. Similar to past studies, individuals who score under 15 on the questionnaire were classified as “unrestrained” eaters and individuals who score 15 and above were classified as “restrained” eaters.

The Sociocultural Attitudes Towards Appearance Questionnaire

Heinberg, Thompson, & Stormer (1995) developed the Sociocultural Attitudes Towards Appearance Questionnaire (SATAQ)(Appendix E) to assess women’s recognition and acceptance of social standards of appearance. The SATAQ contains 14 items that measure pressures, importance, social comparison, and internalization. The measure consists of two
scales. The Awareness subscale measures the extent to which women recognize these pressures. The Internalization subscale, which is comprised measures the extent to which women internalize and accept these standards. The scale was validated using two samples of college females and has an internal consistency of .95. This measure was chosen to evaluate the relation between internalization of social attitudes towards appearance and exercise behaviour.

*Exercise Self-Efficacy Scale*

The Exercise Self-efficacy Scale (ESAS) was developed by Garcia & King (1991) (Appendix F). It is a 16- item scale specific to exercise self-efficacy. The items were based on previous research with similar populations in which factors related to the discontinuation of exercise participation had been identified. Subjects are asked to rate from 0% to 100% how confident they were they would exercise under a variety of possible conflictual situations, with 0% meaning “I cannot do it at all” and 100% meaning “certain that I could do it”. Sample items include “I could exercise when tired” and “I could exercise when I haven’t reached my exercise goals”. The summary score for this scale is the average of the ratings. An additional item was added at the end of this scale to assess whether or not the participant had a major obstacle (i.e. serious injury) that prevented them from engaging in exercise. In a previous study this scale was demonstrated to have an internal consistency of 0.90 and test-retest reliability of 0.67 (Garcia & King, 1991).
Procedure

All participants were contacted by phone and asked if they wanted to participate in a study to assess their thoughts and behaviours towards exercise. They were told that participation would involve filling out a variety of questionnaires and that they would receive one bonus mark toward a psychology course of their choice. An attempt was made to schedule a number of participants to complete the measures at the same time. Upon arrival to the testing room, participants were greeted by the experimenter. The experimenter went over the consent form in detail with each participant. Subsequently, all participants were asked to read the consent form on their own and to sign it if they agreed to participate in the study. The consent form indicated that participation was completely voluntary and that participants could withdraw consent at any time (Appendix G). Participants were then handed a questionnaire package and instructed to read each question carefully. All questionnaires were numbered to ensure anonymity. Upon completion of the questionnaires, all participants were given a letter of information that contained the same information as the consent form (Appendix H) and a debriefing form outlining the purpose of the current study (Appendix I).
Results

Approach to Data Analysis

All analyses were performed using SPSS for Windows, Version 11.0. Reliability analyses were conducted on the Revised Restraint Scale (RRS), the Exercise Self-Efficacy Scale (ESES), the Sociocultural Attitudes Toward Appearance Scale-Internalization (SATAQ-I), and the Body-Image Ideals Questionnaire (BIQ). Descriptive analyses were performed on all variables included in the study. Following descriptive analyses, several 2 X 3 factorial analyses of variances (ANOVAs) were employed to investigate whether body image dissatisfaction interacts with eating pathology (i.e. dietary restraint), self-efficacy for exercise, and internalization of sociocultural ideals to affect exercise behaviour. A .05 criterion of statistical significance was employed for all analyses.

Participant Information

Approximately 40.5% of participants indicated that they were regular exercisers, while 57.9% indicated that they were not regular exercisers. One point six percent of the sample did not answer the question. Participants were asked to circle on a scale of one to seven how much they enjoy exercising. Lower values represented less enjoyment (1-4), while higher values (5-7) were indicative of higher levels of enjoyment. Only 21.8% of the sample indicated scores ranging from one to four. Seventy five point four percent of participants indicated scores ranging from five (moderately enjoy exercise) to seven (really enjoy exercise). Participants were asked if
they preferred to exercise alone or with others. Forty three point one percent of participants indicated that they would prefer to exercise alone, 42.7% indicated that they would rather exercise with others, and 11.9% were indifferent.

Participants were asked to indicate any exercise activities they had participated in during the last year. Sixty one point five percent reported that they had engaged in jogging or running, 62.1% in swimming, 42.1% in aerobics, 55.6% in cycling, 55.4% in home exercise, 25.6% in sports, 12.8% in dancing, 45.1% in weight training, and 35.4% indicated they had engaged in other physical activities not listed which included activities such as rollerblading, yoga, or walking.

Participants were also asked to circle whether or not they had been diagnosed with an eating disorder, and if so, what eating disorder they were diagnosed with. Of the one hundred and ninety four participants, 6 participants indicated that they had been diagnosed with an eating disorder. Of this six, one participant reported being diagnosed with Anorexia Nervosa, two with Bulimia Nervosa, two with Anorexia Nervosa and Bulimia Nervosa, and one did not report the specific diagnosis.

*Descriptive Information and Scoring of the Measures*

Similar to previous studies (Davis et al., 1995; Davis & Cowles, 1991), exercise behaviour was quantified by multiplying weeks per year by days per week by average length of exercise session (1 = 1-30 min, 2 = 31-60 min, 3 = 61-90 min) for every activity that the participant had engaged in and then summing across activities. Higher scores were representative of higher exercise participation. Prior to conducting further data analyses, the data were explored
and normality of exercise participation was assessed using a Q-Q plot, a histogram of participant’s scores, and the Kolmogorov-Smirnov (KS) statistic (Field, 2000). A visual inspection of the histogram revealed that participants’ scores were positively skewed. Similarly, the Kolmogorov-Smirnov statistic revealed that this was a significant deviation from normality and that the distribution of scores was not normal. A square root transformation is among the recommended suggestions for data that are moderately positively skewed (Tabachnick & Fidel, 1989). The transformation was performed and the data more closely approximated a normal distribution. The mean exercise score for participants was 16.67 (SD = 8.97). Scores ranged from 0 to 39.60.

The customary score of 15 on the Revised Restraint Scale (RRS) was used to distinguish restrained and unrestrained eaters. Participants who scored under 15 were classified as unrestrained eaters and participants who scored 15 and above were classified as restrained eaters. The mean score on the Revised Restraint Scale was 13.61 (SD = 6.37). Scores on this measure ranged from 0-27. One hundred and five participants were classified as unrestrained eaters and 89 participants were classified as restrained eaters.

The Exercise Self-Efficacy Scale (ESES) was scored by calculating each participants’ average self-efficacy rating. The mean exercise self-efficacy rating was 51.18 (SD =20.13). Participant’s scores ranged from 3.13 to 95.63. A median split was performed and participants scoring at the median and below were classified as having low exercise self-efficacy and participants scoring above the median were classified as having high self-efficacy. Ninety-four participants were classified as having low self-efficacy for exercise and 97 were classified as having high self-efficacy.
The Sociocultural Attitudes Towards Appearance Questionnaire-Internalization subscale (SATAQ-I) was scored by summing the responses to all 14 items. Participants’ mean score on this measure was 23.39 (SD = 6.65). Scores ranged from 8 to 37. A median split was performed and participants scoring at or below the median were classified as low internalizers and participants scoring above the median were classified as high internalizers. Ninety-seven participants were classified as low internalizers and 96 were classified as high internalizers.

The Body-Image Ideals Questionnaire (BIQ) was scored by first recoding all discrepancy ratings of 0 to −1. The mean of the item-by-item cross-products of the discrepancy X importance ratings were then calculated. Higher scores were indicative of higher levels of body image dissatisfaction. The mean score was 1.63 (SD = .80). Scores ranged from -.29 to 4.71. Participants were classified as having low, moderate, or high dissatisfaction on the basis of their BIQ scores. Participants who scored one standard deviation below the mean score were classified as having low body image dissatisfaction. Participants who scored one standard deviation above the mean were classified as having high body image dissatisfaction. All participants with scores between these two points were classified as having moderate body image dissatisfaction (Howell, 1997). Twenty-nine participants were classified as having low body image dissatisfaction, 125 as having moderate body image dissatisfaction, and 36 as having high body image dissatisfaction.

The ranges, means, and standard deviations for the participants’ descriptive information and all measures used are displayed in Table 1.
Table 1.

Descriptive Data for Study Measures (N=194)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Range</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Cronbach's Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>18-61</td>
<td>23.35</td>
<td>6.68</td>
<td></td>
</tr>
<tr>
<td>Exercise Behaviour</td>
<td>0-39.6</td>
<td>16.70</td>
<td>8.97</td>
<td></td>
</tr>
<tr>
<td>RRS</td>
<td>0-27 (0-35)</td>
<td>13.61</td>
<td>6.37</td>
<td>.72</td>
</tr>
<tr>
<td>ESES</td>
<td>3-96 (0-100)</td>
<td>51.18</td>
<td>20.13</td>
<td>.92</td>
</tr>
<tr>
<td>SATAQ-I</td>
<td>8-37 (0-40)</td>
<td>23.40</td>
<td>6.65</td>
<td>.79</td>
</tr>
<tr>
<td>BIQ</td>
<td>-29-4.42 (-3-9)</td>
<td>1.63</td>
<td>.80</td>
<td>.84</td>
</tr>
</tbody>
</table>

Note:
RRS = Dietary Restraint Scale
ESES = Exercise Self-Efficacy Scale
SATAQ-I = Sociocultural Attitudes Towards Appearance Scale
BIQ = Body Image Ideals Questionnaire
*The range of possible scores are indicated in brackets
Reliability Analyses

Prior to further analyses, the internal reliability Cronbach alpha coefficients for all the measures were calculated and are included in Table 1. The overall reliability analysis revealed coefficients ranging from 0.72 to 0.92. It has been recommended that reliability for measures used for research purposes range from .70 and up (Kaplan & Saccuzzo, 1997). Thus, all measures were in an acceptable range.

Primary Analyses

The Effect of Body Image Dissatisfaction and Eating Pathology on Exercise

A 2 X 3 between subjects factorial analysis of variance (ANOVA) was used to investigate the effects of body image dissatisfaction (low vs. moderate vs. high) and eating pathology (low vs. high dietary restraint) on exercise behaviour. This analysis revealed no main effect of body image dissatisfaction on exercise behaviour, $F (2, 183) = .45, p > .05$, and no main effect of dietary restraint, $F (1, 183) = 1.53, p > .05$. However, a significant interaction between body image dissatisfaction and dietary restraint was found, $F (2, 183) = 3.51, p < .05$ (Table 2).

To conduct post hoc comparisons the data was split first by dietary restraint and then by body image dissatisfaction and t-tests were performed. Participants with low body image dissatisfaction did not differ on exercise participation regardless of restraint status, $t (27) = 1.04$, ...
Table 2.

*ANOVA Results for Body Image Dissatisfaction and Dietary Restraint*

<table>
<thead>
<tr>
<th>Variable</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body Image Dissatisfaction</td>
<td>2</td>
<td>34.48</td>
<td>.45</td>
<td>.64</td>
</tr>
<tr>
<td>Dietary Restraint</td>
<td>1</td>
<td>117.05</td>
<td>1.53</td>
<td>.22</td>
</tr>
<tr>
<td>Body Image Dissatisfaction X Dietary Restraint</td>
<td>2</td>
<td>267.90</td>
<td>3.51</td>
<td>.03</td>
</tr>
<tr>
<td>Error</td>
<td>183</td>
<td>76.32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>189</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
p > .05. Similarly, there was no difference in moderately dissatisfied participants’ mean exercise participation scores on the basis of restraint status, $t(123) = -1.36, p > .05$. However, restrained eaters with high body image dissatisfaction exercised significantly more ($M = 20.66$) than did unrestrained eaters with high dissatisfaction ($M = 11.17$), $t(33) = -2.56, p > .05$. Post hoc analyses revealed that the unrestrained eaters with low dissatisfaction exercised significantly more ($M = 20.06$) than unrestrained eaters with moderate dissatisfaction, ($M = 14.6$), $t(91) = 2.57, p < .05$, and more than unrestrained eaters with high dissatisfaction ($M = 11.17$), $t(31) = 2.63, p < .05$. (Table 3; Figure 4).

The Effect of Body Image Dissatisfaction and Internalization on Exercise

A 2 X 3 between subjects factorial analysis of variance was performed to investigate whether body image dissatisfaction and internalization of social standards of attractiveness interact to affect exercise participation. There was no main effect of body image dissatisfaction on exercise participation, $F(2, 183) = 1.30, p > .05$. Internalization was found to have a significant main effect on exercise participation, $F(1, 183) = 5.20, p < .05$. However, a significant interaction between internalization and body image dissatisfaction was not found, $F(2, 183) = 1.88, p > .05$ (Table 4). An examination of the overall cell means revealed that participants with low internalization scores exercised significantly more ($M = 18.95$) than individuals with high internalization ($M = 15.33$)(Table 5: Figure 5).
Table 3.

*Body Image Dissatisfaction and Dietary Restraint: Mean Exercise Participation by Group*

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low BID Unrestrained</td>
<td>24</td>
<td>20.06</td>
<td>9.28</td>
</tr>
<tr>
<td>Low BID Restrained</td>
<td>5</td>
<td>15.55</td>
<td>6.05</td>
</tr>
<tr>
<td>Mod. BID Unrestrained</td>
<td>69</td>
<td>14.60</td>
<td>8.89</td>
</tr>
<tr>
<td>Mod. BID Restrained</td>
<td>56</td>
<td>16.67</td>
<td>7.91</td>
</tr>
<tr>
<td>High BID Unrestrained</td>
<td>9</td>
<td>11.17</td>
<td>6.45</td>
</tr>
<tr>
<td>High BID Restrained</td>
<td>26</td>
<td>20.66</td>
<td>10.39</td>
</tr>
</tbody>
</table>
Figure 4.

*The Interaction of Body Image Dissatisfaction with Dietary Restraint*

![Graph showing the interaction between body image dissatisfaction and exercise participation.](image_url)
Table 4.

**ANOVA Results for Body Image Dissatisfaction and Internalization**

<table>
<thead>
<tr>
<th>Variable</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body Image Dissatisfaction</td>
<td>2</td>
<td>97.74</td>
<td>1.30</td>
<td>.27</td>
</tr>
<tr>
<td>Internalization</td>
<td>1</td>
<td>389.47</td>
<td>5.20</td>
<td>.02</td>
</tr>
<tr>
<td>Body Image Dissatisfaction X Internalization</td>
<td>2</td>
<td>140.40</td>
<td>1.88</td>
<td>.16</td>
</tr>
<tr>
<td>Error</td>
<td>183</td>
<td>74.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>189</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 5.

*Body Image Dissatisfaction and Internalization: Mean Exercise Participation by Group*

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low BID Low INT</td>
<td>21</td>
<td>21.42</td>
<td>8.06</td>
</tr>
<tr>
<td>Low BID High INT</td>
<td>8</td>
<td>13.67</td>
<td>8.97</td>
</tr>
<tr>
<td>Mod. BID Low INT</td>
<td>63</td>
<td>17.93</td>
<td>9.57</td>
</tr>
<tr>
<td>Mod. BID High INT</td>
<td>62</td>
<td>13.08</td>
<td>6.43</td>
</tr>
<tr>
<td>High BID Low INT</td>
<td>10</td>
<td>17.50</td>
<td>11.25</td>
</tr>
<tr>
<td>High BID High INT</td>
<td>25</td>
<td>18.52</td>
<td>10.18</td>
</tr>
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</table>
Figure 5. Body Image Dissatisfaction and Internalization

Exercise Participation

Low Internalization
High Internalization

Body Image Dissatisfaction
The Effect of Body Image Dissatisfaction and Exercise Self-Efficacy on Exercise

A 2 X 3 between subjects factorial analysis of variance (ANOVA) was employed to investigate whether body image dissatisfaction interacted with self-efficacy to affect exercise behaviour. A main effect of exercise self-efficacy was found, $F(1, 181) = 15.42, p < .01$. A main effect of body image dissatisfaction was also found, $F(2, 181) = 3.20, p < .05$. However, there was no significant interaction between body image dissatisfaction and exercise self-efficacy, $F(2, 181) = 1.88, p > .05$ (Table 6).

An examination of the overall cell means revealed that individuals with high self-efficacy exercised more ($M = 19.08$) than participants with low self-efficacy ($M = 14.02$). A Bonferroni post hoc comparison revealed that individuals with low body dissatisfaction exercised more ($M = 18.45$) than individuals with moderate dissatisfaction ($M = 15.28$). However, this comparison only approached statistical significance and no other comparisons came close to achieving statistical significance (Table 7; Figure 6).
Table 6.

ANOVA Results for Body Image Dissatisfaction and Exercise Self-Efficacy

<table>
<thead>
<tr>
<th>Variable</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body Image Dissatisfaction</td>
<td>2</td>
<td>233.313</td>
<td>3.20</td>
<td>.04</td>
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<tr>
<td>Exercise Self-Efficacy</td>
<td>1</td>
<td>1124.31</td>
<td>15.42</td>
<td>.00</td>
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<tr>
<td>Body Image Dissatisfaction X Exercise Self-Efficacy</td>
<td>2</td>
<td>87.63</td>
<td>1.20</td>
<td>.30</td>
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<tr>
<td>Error</td>
<td>181</td>
<td>72.91</td>
<td></td>
<td></td>
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<tr>
<td>Total</td>
<td>187</td>
<td></td>
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</table>
Table 7.

*Body Image Dissatisfaction and Efficacy: Mean Exercise Participation by Group*

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low BID</td>
<td>12</td>
<td>13.37</td>
<td>7.50</td>
</tr>
<tr>
<td>Low EFF</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low BID</td>
<td>16</td>
<td>23.50</td>
<td>7.64</td>
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<tr>
<td>High EFF</td>
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<td></td>
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<tr>
<td>Mod. BID</td>
<td>56</td>
<td>12.77</td>
<td>8.52</td>
</tr>
<tr>
<td>Low EFF</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Mod. BID</td>
<td>68</td>
<td>17.78</td>
<td>7.89</td>
</tr>
<tr>
<td>High EFF</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>High BID</td>
<td>25</td>
<td>17.14</td>
<td>10.03</td>
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<tr>
<td>Low EFF</td>
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<td></td>
</tr>
<tr>
<td>High BID</td>
<td>10</td>
<td>20.93</td>
<td>11.14</td>
</tr>
<tr>
<td>High EFF</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 BMI was entered as a covariate and was not found to be significant in the ANCOVA examining dietary restraint, \( F(1, 181) = .17, p > .05 \), internalization, \( F(1, 181) = .89, p > .05 \), and self-efficacy, \( F(1, 179) = .87, p > .05 \). The addition of BMI as a covariate did not change the results of the analyses.
Figure 6. Body Image Dissatisfaction and Exercise Self-Efficacy
Discussion

Hypothesis 1: Body image and Eating Pathology

The first hypothesis of the current study was that eating pathology (i.e. dietary restraint) would moderate the relation between body image dissatisfaction and exercise behaviour. It was predicted that as eating pathology increased so would exercise participation. It was also predicted that eating pathology would interact with body image dissatisfaction in the following ways. Participants with low to moderate eating pathology and low to moderate body image dissatisfaction would likely engage in some exercise activity, likely in the “healthy” range. Participants with low eating pathology but high body image dissatisfaction would be the most likely to fail to engage in exercise activity. And finally, participants with the highest eating pathology and the highest body image dissatisfaction would engage in the most frequent or excessive exercise.

The hypothesis that increased eating pathology would be related to an increase in exercise behaviour was not supported in the current study. However consistent with specific predictions, a significant interaction between eating pathology and body image dissatisfaction was found. Participants who scored high on dietary restraint and high on body image dissatisfaction exercised significantly more than participants who scored low on restraint but high on body image dissatisfaction. In fact, individuals who had high body image dissatisfaction but low restraint had the lowest mean exercise score out of the group.
The results are consistent with the model proposed by Heinberg et al. (2001). Heinberg and colleagues hypothesized that the relationship between body image dissatisfaction and exercise behaviour is not a simple linear one, as previously asserted (i.e. with greater distress leading to greater exercise participation). They hypothesized that the relationship between body image dissatisfaction and ‘healthy’ behaviour could be depicted by an inverted “U”. High body image distress may motivate individuals to engage in excessive behaviours (i.e. dieting/binging/purging/excessive exercise). On the other hand, individuals with high body image distress may not engage in any ‘healthy’ behaviour. Heinberg and colleagues (2001) suggest that body image may interact with other variables to influence exercise behaviour. The finding that the relationship between body image dissatisfaction and exercise was moderated by dietary restraint partially supports their hypotheses.

*Restrained Eaters and Exercise*

There are several variables associated with individuals high in dietary restraint that may help to explain their high levels of exercise with simultaneous high levels of body image dissatisfaction. It is very likely that restrained eaters have very different motives for engaging in exercise than unrestrained eaters. It is also quite likely that participation in exercise has different effects on their body image satisfaction.

Restrained eaters are individuals who are extremely concerned with their weight and shape and have a history of engaging in dieting behaviour. Dietary restraint has been demonstrated to be related to elevated body image dissatisfaction, body focus, body size distortion, and drive for thinness (Davis, Shapiro, Elliot, & Dionne, 1993; Cachelin, Striegel-
Moore, & Paget, 1997). Restrained eaters have been shown to have weight and shape concerns similar to those of individuals diagnosed with eating disorders and place extreme emphasis on their bodies as a source of self-esteem (Herman & Polivy, 1980). McFarlane, Herman, and Polivy (1998) presented both restrained and unrestrained eaters with false information about their current weight. The restrained eaters who were told they were heavier than they thought they were had lower state self-esteem than all of the other groups.

Individuals high in dietary restraint may have perfectionistic tendencies and may set "unrealistic goals" for the appearance of their bodies. McLaren, Gauvin, and White (2001) found that three dimensions of perfectionism (the need to appear perfect, avoid appearing imperfect, and avoid disclosure of imperfections) contributed to the prediction of dietary restraint. The authors concluded that the unrealistic standards for appearance and body weight found in female dieters are likely related to a need for perfection.

Based on the findings that restrained eaters have high, possibly "unrealistic", standards for the appearance of their bodies, it is likely that restrained eaters are exercising for reasons related to body image dissatisfaction. Dieting and exercise are both socially accepted means of achieving the "thin ideal body" (American College of Sports Medicine, 1998). It is likely that an individual whose goal is weight loss will engage in both dieting and exercise behaviours (McLaren, Gauvin, & White, 2001).

Interestingly, the negative feelings restrained eaters have about their bodies and their subsequent efforts to alter their bodies may be unrelated to the actual size of their bodies. Body mass index was entered as a covariate in the ANOVA examining dietary restraint and was not found to be significant. It also did not change the relationship between dietary restraint, body image dissatisfaction, and exercise. The finding that body mass index did not change the
relationship between dietary restraint and exercise suggests that restrained eaters feelings about
their bodies are unrelated to their actual weights. This is consistent with the findings of
Inglede, Hardy, and De Sousa (1995). They found that women’s body size discrepancy, how
far these women felt from their ideal body regardless of actual BMI, predicted exercising for
weight management reasons. Women were more likely to exercise for weight management if
they were dissatisfied with their body size, regardless of whether or not they were overweight.

Davis and Cowles (1991) suggest that regular exercise does little to alter body weight
ideals. For young women this ideal is likely to be extremely thin, which is often impossible to
achieve. It has been suggested that high levels of exercise accompanied by a lack of results may
lead to increased disappointment. Davis and Cowles (1991) found that exercising for weight
control was significantly correlated with lower body image satisfaction and exercising for health
and fitness was related to enhanced self-esteem. Similarly, Hubbard, Gray, and Parker (1998)
found that individuals who exercise to ‘work off’ food they have consumed exhibited more
symptoms of obligatory exercise, eating disturbance, body dissatisfaction, and lower self-esteem
than individuals who exercised for ‘non-food related’ reasons.

It is likely that restrained eaters are exercising for weight-related reasons. Because
restrained eaters have high levels of body focus and place extreme emphasis on their bodies as a
source of self-esteem, it is likely that those who are highly dissatisfied with their bodies will be
more motivated to exercise than restrained eaters with lower levels of dissatisfaction. Further,
restrained eaters are likely to become increasingly dissatisfied with their bodies as their attempts
to reach an “unrealistic” ideal fail. However, their need to appear “perfect” serves as a constant
motivator to continue attempting to alter their body through diet and exercise. The relentless
pursuit of an unattainable goal (i.e. the thin ideal) helps explain restrained eaters’ high levels of exercise and simultaneous high levels of body image dissatisfaction.

*Unrestrained Eaters and Exercise*

In contrast to the restrained eaters with high body image dissatisfaction, the participants who were unrestrained and highly dissatisfied participated in low levels of exercise. It is possible that participants who have high body image dissatisfaction and low dietary restraint are overwhelmed by their dissatisfaction and are missing the added motivation of dietary restraint. These individuals are highly dissatisfied with their bodies, but unlike the restrained eaters, they may not be driven by a need to achieve the thin ideal. In addition, whereas restrained eaters may believe that achieving the thin ideal is possible, unrestrained eaters may not believe that their attempts to alter their bodies will be successful and choose not to even try.

Inconsistent with the predictions of the current study, unrestrained eaters with low body image dissatisfaction participated in more exercise than unrestrained eaters with moderate and high dissatisfaction. One possible and likely explanation is that unrestrained eaters with low body image dissatisfaction who are engaging in frequent exercise are likely engaging in exercise for reasons unrelated to body image dissatisfaction. It is very plausible that these individuals began exercising for motives related to body image dissatisfaction (i.e. weight management), but over time these motives were replaced by more intrinsic motives (i.e. stress relief or mood management). Ingledeuw, Markland & Medley (1998) found in a longitudinal study of British government employees, that whereas appearance and weight management motives are prominent during early stages of change, motives such as enjoyment and revitalisation were important for
maintenance of exercise. Therefore, it is thus possible that unrestrained eaters who engage in exercise do so for reasons unrelated to body image dissatisfaction.

Ingledew & Sullivan (2002) suggest that exercising for body image motives is extrinsically motivating, that is, individuals engage in exercise for some kind of external reward that is attained by participating in the activity. Appearance motives are considered to be extrinsic because it is believed that they arise from sociocultural pressures to achieve a thin ideal (Frederick & Ryan, 1993). Intrinsically motivated individuals engage in exercise for the inherent pleasure they obtain from it. It is suggested that intrinsic motivations are more likely to sustain long-term participation than extrinsic motivations. Further, many individuals may begin to exercise for extrinsic motives, such as body image dissatisfaction, but they may gradually become intrinsically motivated and begin to exercise for other reasons (i.e. enjoyment or stress relief). This suggests that unrestrained eaters with low body image dissatisfaction may engage in exercise for intrinsic motives such as enjoyment or stress relief, and that these motives may be more likely to result in higher levels of consistent exercise.

It is also possible that the association between low body image dissatisfaction and high exercise levels in unrestrained eaters may result from exercise altering their body image. Body image satisfaction has been found to increase with exercise participation. Several studies have investigated the effects of exercise on body image dissatisfaction. Williams and Cash (2001) evaluated the effect of participation in a 6-week circuit training program and evaluated changes in body image compared to controls in a sample of males and females attending college. In contrast to the control group, individuals who participated in the weight-training program had greater body image satisfaction and reduced social physique anxiety as compared to controls. It is very possible that the individuals in the study who had low body image dissatisfaction and
high levels of exercise participation have achieved lower body image dissatisfaction because of their continued participation in high levels of exercise.

However, the finding that exercise participation increases body image satisfaction has not been consistently found in the scientific literature. Several studies have found that in females, exercise participation is associated with decreased body satisfaction. Tiggeman and Williamson (2000) examined the effect of exercise on body satisfaction in males and females. They found that in older females (age 21-60) and in males (age 16 and up), exercise participation was positively correlated with body satisfaction. However, in the sample of females aged 16 to 21, there was actually a negative relationship between exercise and body image satisfaction, as exercise increased, body satisfaction actually decreased. Another study examined the effects of a physical activity intervention on body image concerns in college men and women using the drive for thinness and body dissatisfaction subscale of the EDI-2. Compared to the control group, women who participated in the physical activity had an increase in drive for thinness and no changes in body image dissatisfaction (Zabinski, Calfas, Gehrman, Wilfey, & Sallis, 2001).

An examination of these studies raises the question as to why studies examining very similar populations (i.e. female college students) have found such inconsistent results. It is possible that an inconsistency in the instruments used may explain the discrepant results. Instruments measuring very different components of body image are often used and different types and varying lengths of exercise participation are assessed. Another possible explanation for the inconsistency in the literature is the failure of these studies to measure participants on additional pre-exercise variables in addition to body image dissatisfaction, such as eating pathology (i.e. dietary restraint). In the present study, restrained eaters were found to exercise frequently and have high body image dissatisfaction. The restrained eaters with high
dissatisfaction are likely to become increasingly dissatisfied with their bodies after engaging in exercise fails to enable them to reach the “thin-ideal”. It is possible that restrained eaters may have accounted for the finding of increased body image dissatisfaction after exercise participation in past studies.

In summary, the restrained eaters with high body image dissatisfaction are likely exercising for weight or body image related reasons. They are likely to set unrealistic standards for the appearance of their body. When their attempts to reach this ideal fail, they likely become increasingly dissatisfied with their bodies. However, because of their preoccupation with “perfection” they will continue exercising with the false hope that the ideal body can be achieved. In contrast, unrestrained eaters are likely exercising for motives unrelated to body image dissatisfaction. Although they may have initially started exercising for appearance related ideals, it is likely that over time they continued exercising for more intrinsic (i.e. health related or stress reduction) reasons. Furthermore, unrestrained eaters likely do not set unrealistic standards for the appearance of their bodies, and can feel satisfied with the changes in their bodies that result from exercise.

_Hypothesis 2: Internalization and Exercise_

The second hypothesis of the current study was that internalization of social standards of appearance would interact with body image dissatisfaction to influence exercise behaviour. High internalizers are individuals who cognitively “buy into” the thin ideal and likely engage in activities to achieve this ideal (Thompson et al., 1999). Therefore, a main effect of level of internalization was expected, as internalization level increased so would exercise behaviour. The
combined effect of a high level of body image dissatisfaction and the acceptance of societal messages about the thin ideal were hypothesized to serve as constant motivators to engage in frequent or excessive exercise. Therefore, individuals with high body image dissatisfaction and a high degree of internalization were predicted to engage in the highest amounts of exercise. It was also predicted that individuals with the highest body image dissatisfaction and low internalization would exercise the least, as they may feel overwhelmed by their body image dissatisfaction, and because meeting cultural ideals would not be as important to them.

The hypothesis that body image would interact with internalization to affect exercise participation was not supported in the current study. However, a main effect of internalization was found. Interestingly, the main effect was in the opposite direction of what was predicted. Individuals with low internalization exercised significantly more than individuals with high internalization except when body image dissatisfaction was high. Even though this difference was not significant, visual inspection of the means reveals that high internalizers with high body image dissatisfaction exercised more than low internalizers with high body image dissatisfaction. However, this difference was not significant (see table 5).

Participants with low internalization reported engaging in much higher levels of exercise compared to individuals with high internalization. Low internalizers are individuals who do not believe achieving the thin ideal is important and are less likely to engage in activities to do so (Thompson et al., 1999). Because low internalizers are not driven to achieve the thin ideal, it is quite likely that they are engaging in exercise for reasons unrelated to body image dissatisfaction. It is quite possible that low internalizers are engaging in exercise for more intrinsic motives like health concerns, stress reduction, or mood enhancement, which are associated with more long term exercise participation (Ingledeew, Markland & Medley, 1998).
High internalizers are individuals who cognitively ‘buy into’ the thin ideal and engage in activities to achieve this ideal (Thompson et al., 1999). Thin ideal internalization has been demonstrated to be associated with increased dieting (Stice, Mazotti, Krebs, & Martin, 1998) and has been found to be among the strongest predictors of body image dissatisfaction (Lyter, 1997). Exercising for appearance motives is believed to arise from sociocultural pressures to achieve a thin ideal and is considered an extrinsic motive (Frederick & Ryan, 1993). It seems logical that individuals who are high internalizers are more likely to engage in exercise for appearance-related reasons. However, it has been demonstrated that although appearance related motives to engage in exercise motivate individuals to engage in exercise, they may not be enough to sustain exercise participation and may explain high internalizers’ low levels of exercise (Ingledew & Sullivan, 2002).

In summary, low internalizers engaged in significantly more exercise than individuals who were high internalizers. Because high internalizers attach great importance to achieving the thin ideal, they are more likely to engage in exercise for extrinsic or appearance related reasons. Low internalizers do not “buy into” sociocultural standards of attractiveness and are less likely to engage in exercise to achieve these ideals. They are more likely exercising for intrinsic reasons like stress reduction and mood enhancement. The fact that intrinsic motives are more likely to sustain long-term participation than extrinsic motivations may help to explain why low internalizers exercise significantly more than high internalizers.

*Hypothesis 3: Exercise Self-Efficacy and Exercise*
The third hypothesis of the current study was that perceived self-efficacy to engage in exercise would influence exercise behaviour. It was predicted that participants with low body image dissatisfaction and low exercise self-efficacy would be the least likely to engage in exercise. Similarly, it was predicted that individuals with high body image dissatisfaction and low exercise self-efficacy would also fail to engage in regular exercise. This may be because they feel unable to engage in the exercise behaviour necessary to alter their appearance. It was predicted that high body image dissatisfaction combined with high exercise self-efficacy would predict frequent exercise behaviour. Participants who were extremely dissatisfied, and believed that they are capable of engaging in exercise, were predicted to be the most likely to engage in frequent or excessive exercise.

The hypothesis that exercise efficacy would interact with body image dissatisfaction to affect exercise participation was not supported. However, as predicted, a main effect of efficacy was found. Higher exercise self-efficacy scores were associated with higher exercise participation. This finding is consistent with the literature on exercise and exercise self-efficacy (Desharnais, Boullion, & Godin, 1986; Garcia & King, 1991; Martin & Sinden, 2001; McCauley, 1992; Sallis, Pinski, Grossamn, Patterson, & Nader, 1988).

Contrary to expectations, body image dissatisfaction did not interact with exercise self-efficacy to influence exercise. Individuals with high self-efficacy maintain high energy during exercise, perceive exercise to be less effort, report more positive affect during exercise, and feeling more revitalized after exercise (McCauley & Courneya, 1992). Based on these findings, it is likely that individuals high in self-efficacy are exercising for more intrinsic motives like enjoyment or mood enhancement, which are associated with more long-term exercise adherence. Although body image concerns may initially motivate someone to start exercising, motives such
as enjoyment and revitalization are associated with the maintenance of exercise (Ingledew, Markland & Medley, 1998).

Self-efficacy has been demonstrated to be one of the strongest predictors of exercise participation (Sallis, Pinski, Grossamn, Patterson, & Nader, 1988). The strength of the relationship between self-efficacy and exercise may account for the finding that body image dissatisfaction did not increase exercise participation and that individuals high in self-efficacy sustain exercise participation regardless of body image dissatisfaction.

In conclusion, the findings from the study suggest that body image dissatisfaction alone does not significantly influence exercise participation in females. However, body image dissatisfaction interacted with eating pathology to influence exercise participation. Individuals high in dietary restraint and high in body image dissatisfaction engaged in very high levels of exercise. The combined dissatisfaction and need to be “perfect” likely serves as a constant motivator for the restrained eater to attempt to reach an “unrealistic” goal through exercise.

Interestingly, high internalizers engaged in significantly less exercise than low internalizers. This could be because high internalizers are exercising for body image related reasons. Body image concerns likely motivate an individual to start exercising, but alone are probably not enough to sustain participation. Low internalizers are likely engaging in exercise for intrinsic reasons and are thus more likely to sustain participation in exercise. And finally, individuals high in self-efficacy exercised significantly more than individuals low in exercise self-efficacy regardless of body image dissatisfaction. This finding is likely related to the fact that exercise self-efficacy is a strong predictor of exercise participation and is associated with exercising for intrinsic motives like stress management and enjoyment.
Limitations of the Current Study

A major limitation of the current study was its cross-sectional nature. It has been demonstrated in the literature that body image satisfaction can both improve and decrease with exercise (Williams & Cash, 2001; Tiggeman and Williamson, 2000), and it has also been found that body image dissatisfaction motivates females to exercise (Cash & Novy, 1994). The design of the current study does not allow for conclusions to be drawn on whether exercise participation influenced body image or body image influenced exercise participation.

Another potential limitation of the current study concerns the characteristics of the sample. The sample was composed of primarily a Caucasian university sample of females and thus the ability to generalize the findings to other samples is limited.

In addition, it is possible that using a median split procedure to classify participants into high vs. low categories on the variables under study may have decreased the likelihood of finding significant effects. The fact that the findings were significant considering this type of categorization suggests they are robust. However, it is possible that other significant effects may have been found if participants were classified using another method. An alternative method could have been including only participants with extreme scores and excluding participants scoring in the middle range. However, the size of the sample did not allow for this type of comparison.

Suggestions for Future Research
A suggestion for future research is to assess initial motivations for exercise and changes in exercise motivation longitudinally. Many individuals begin exercising for body image reasons. In some individuals these motives may change over time as they begin to gain secondary satisfaction from exercising. For other individuals, body image dissatisfaction may continue to be their primary motivation for exercise. It is important that individuals be measured on a variety of additional variables such as dietary restraint, internalization, and perfectionism before beginning a physical activity program in order to isolate how these variables may influence subsequent exercise participation. Future research should investigate longitudinally how these variables moderate the relation between exercise participation and body image. For example, using an experimental design, a future study could measure how initial dietary restraint predicts body image changes following the introduction of an exercise program.

The majority of studies that investigated changes in body image after participation in an exercise program measured body image after a period of 6-8 weeks participation (Cash & Novy, 1994; Asci, Kin & Kosar, 1998). It seems logical that the effects of a short-term exercise program may be very different from the effects of a long-term exercise program. Upon beginning an exercise program, some individuals may initially feel increased body image satisfaction, but this satisfaction may begin to wane as over time they fail to continue seeing significant changes in their bodies. In contrast, other individuals may not feel better about their bodies initially because the changes are minimal, but over time may become increasingly satisfied. The influence of short vs. long-term participation on body image dissatisfaction is likely moderated by additional variables. For example, in restrained eaters short term exercise participation is likely associated with increases in satisfaction but over time, as expectations to meet the thin
ideal are not met, body image dissatisfaction will likely increase. In contrast, long-term exercise participation is likely to be associated with increased body image satisfaction in unrestrained eaters because they may not have unrealistic expectations. Using an experimental design, future research should investigate the effects of long-term exercise participation compared to the effects of short-term exercise on body image dissatisfaction while controlling for additional variables such as dietary restraint.

Conclusions

The current study investigated how body image interacts with specific variables to affect exercise participation. The current study was based on the hypotheses proposed by Heinberg and colleagues (2001). Based on research suggesting that body image concerns motivate individuals to diet and exercise, they hypothesized that some body image dissatisfaction may be necessary to motivate individuals to engage in “healthy” behaviours like exercising. However, they suggest that the relationship between body image dissatisfaction and exercise behaviour is not a simple linear one, as previously asserted (i.e. with greater distress leading to greater dieting and exercise behaviours). Heinberg and colleagues (2001) hypothesized that the relationship between body image dissatisfaction and ‘healthy’ behaviour could be depicted by an inverted “U”. High distress may motivate individuals to engage in excessive exercise behaviour. On the other hand, individuals with high body image distress may not engage in any exercise because they are overwhelmed or lack the self-efficacy to do so. They also suggested that body image may interact with other variables to influence exercise behaviour.
Contrary to expectations, internalization and exercise self-efficacy did not interact with body image dissatisfaction to affect exercise behaviour. However, consistent with the hypotheses formulated for this study, the relationship between body image and exercise was moderated by dietary restraint. The findings suggest that individuals high in dietary restraint and high in body image dissatisfaction likely engage in exercise for weight-related reasons. It is possible that an inability to achieve the “thin ideal” results in continued exercise without subsequent increases in body image satisfaction. Inconsistent with the hypotheses of this study, individuals low on dietary restraint and low on body image dissatisfaction had high exercise participation. It is likely that these individuals engage in exercise for non-weight related motives such as stress reduction or mood enhancement, even though they may have begun for weight-related reasons, and exercising for intrinsic motives has been found to be associated with sustained exercise participation (Ingledew, Markland & Medley, 1998). It is also likely that these individuals experience increases in body satisfaction directly related to their increased exercise participation because of their moderate expectations.

The finding that dietary restraint moderates the relationship between exercise and body image has important implications for the therapeutic use of exercise to treat body image dissatisfaction and for the promotion of exercise for health-related reasons. Restrained eaters could possibly develop poorer body image and increased body image focus as a consequence of engaging in an exercise program to increase body image satisfaction. A program designed to challenge the individuals’ pre-existing body image beliefs should be used in conjunction with exercise to improve body image.

Women who exercise for appearance related reasons and believe they can achieve the “thin-ideal”, such as restrained eaters, are more likely to experience increased body image
dissatisfaction when they fail to achieve this goal. Women who exercise for intrinsic motives, like low internalizers and those high in self-efficacy, are more likely to sustain long-term exercise participation and experience increased body image satisfaction. Based on these hypotheses, the goal of future research should be to further assess characteristics associated with a positive outcome from participating in exercise and assist in fostering or promoting these characteristics in individuals. Because exercise is associated with a variety of health benefits, the role of health promotion should be to foster intrinsic motivation for exercise and simultaneously minimize body image dissatisfaction in those at risk.
References


Pasman, L. & Thompson, J.K. (1988). Body image and eating disturbance in obligatory runners,


Appendix A

Background Information

Please answer the following questions:

Age: ______

Sex: ______

What is your ethnic background?
Caucasian
African-Canadian
Asian
Native-Canadian
Other (please specify)

How much do you weigh in pounds? ______ or in kilograms ______

What is your height in feet and inches (e.g. 5’6”) ______ or in centimetres ______

What do you consider to be your ideal weight? ______

Do you consider yourself to be a regular exerciser? ______

Do you prefer to exercise alone or with others?

____________________________________________________________________________________
Do you enjoy exercise? Please circle your level of enjoyment on a scale of 1 to 7.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<tr>
<td>I do not enjoy exercise</td>
<td>I moderately enjoy exercising</td>
<td>I really enjoy exercising</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>at all</td>
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Do you think that you have an eating disorder? (Please circle your answer)

Yes
No
If yes, please give details

Have you ever received treatment for an eating disorder? (Please circle your answer)

Yes
No

What type of eating disorder did/do you have?

Who diagnosed you? (Please circle your answer)
Psychologist
Psychiatrist
Medical Doctor
Other (Please Specify)
Appendix B

Please circle any activities you participated in over the last year and answer the following questions. Please include other activities not listed. Please be careful to include each activity only once (For example: if you do weights at home only count it as either Weight training or Home Exercise. Do not count it in both categories).

<table>
<thead>
<tr>
<th>Activity</th>
<th>How many weeks over the past year (1-52) did you participate in this activity?</th>
<th>What is the average number of times per week you engaged in this activity?</th>
<th>What was the average duration of time you engaged in this activity minutes? (circle your answer)</th>
</tr>
</thead>
</table>
| Jogging/Running           |                                                                                |                                                                            | a) 1-30  
|                           |                                                                                |                                                                            | b) 31-60  
|                           |                                                                                |                                                                            | c) 61-90  
|                           |                                                                                |                                                                            | d) 90+    |
| Swimming                  |                                                                                |                                                                            | a) 1-30  
|                           |                                                                                |                                                                            | b) 31-60  
|                           |                                                                                |                                                                            | c) 61-90  
|                           |                                                                                |                                                                            | d) 90+    |
| Aerobics                  |                                                                                |                                                                            | a) 1-30  
|                           |                                                                                |                                                                            | b) 31-60  
|                           |                                                                                |                                                                            | c) 61-90  
|                           |                                                                                |                                                                            | d) 90+    |
| Cycling                   |                                                                                |                                                                            | a) 1-30  
|                           |                                                                                |                                                                            | b) 31-60  
|                           |                                                                                |                                                                            | c) 61-90  
|                           |                                                                                |                                                                            | d) 90+    |
| Home Exercise             |                                                                                |                                                                            | a) 1-30  
|                           |                                                                                |                                                                            | b) 31-60  
|                           |                                                                                |                                                                            | c) 61-90  
|                           |                                                                                |                                                                            | d) 90+    |
| Organized Sports          |                                                                                |                                                                            | a) 1-30  
|                           |                                                                                |                                                                            | b) 31-60  
|                           |                                                                                |                                                                            | c) 61-90  
|                           |                                                                                |                                                                            | d) 90+    |
| Dance Class               |                                                                                |                                                                            | a) 1-30  
|                           |                                                                                |                                                                            | b) 31-60  
|                           |                                                                                |                                                                            | c) 61-90  
|                           |                                                                                |                                                                            | d) 90+    |
| Weight Training           |                                                                                |                                                                            | a) 1-30  
|                           |                                                                                |                                                                            | b) 31-60  
|                           |                                                                                |                                                                            | c) 61-90  
|                           |                                                                                |                                                                            | d) 90+    |
| Other Activity: Please Specify |                                                                            |                                                                            | a) 1-30  
|                           |                                                                                |                                                                            | b) 31-60  
|                           |                                                                                |                                                                            | c) 61-90  
|                           |                                                                                |                                                                            | d) 90+    |
| Other Activity: Please Specify |                                                                            |                                                                            | a) 1-30  
|                           |                                                                                |                                                                            | b) 31-60  
|                           |                                                                                |                                                                            | c) 61-90  
|                           |                                                                                |                                                                            | d) 90+    |
Appendix C

THE BIQ

Instructions. Please read carefully:
Each item on this questionnaire deals with a different physical characteristic. For each characteristic, think about how you would describe yourself as you actually are. Then think about how you wish you were. The difference between the two reveals how close you come to your personal ideal. In some instances, your looks may closely match your ideal. In other instances, they may differ considerably.

On Part A of each item, rate how much you resemble your personal physical ideal by circling a number from 0 to 3. Your physical ideals may differ in their importance to you, regardless of how close you come to them. You may feel strongly that some ideals embody the way you want to look or to be. In other areas, your ideals may be less important to you. On Part B of each item, rate how important your ideal is to you by circling a number on the 0 to 3 scale.

1. A. My ideal height is:

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<thead>
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<tbody>
<tr>
<td>Exactly As I Am</td>
<td>Almost As I Am</td>
<td>Fairly Unlike Me</td>
<td>Very Unlike Me</td>
<td></td>
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B. How important to you is your ideal height?

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2. A. My ideal skin complexion is:

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</table>
B. How important to you is your ideal skin complexion?

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3. A. My ideal **hair texture and thickness** are:

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B. How important to you are your ideal hair texture and thickness?

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4. A. My ideal **facial features** (eyes, nose, ears, facial shape) are:

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B. How important to you are your ideal facial features?

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5. A. My ideal **muscle tone and definition** is:

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<td>Almost As I Am</td>
<td>Fairly Unlike Me</td>
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</table>
B. How important to you is your ideal muscle tone and definition?

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<td>Not Important</td>
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6. A. My ideal body proportions are:

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<td>Exactly As I Am</td>
<td>Almost As I Am</td>
<td>Fairly Unlike Me</td>
<td>Very Unlike Me</td>
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B. How important to you are your ideal body proportions?

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<td>Not Important</td>
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7. A. My ideal weight is:

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<td>Exactly As I Am</td>
<td>Almost As I Am</td>
<td>Fairly Unlike Me</td>
<td>Very Unlike Me</td>
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</table>

B. How important to you is your ideal weight?

<table>
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<td>Not Important</td>
<td>Somewhat Important</td>
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8. A. My ideal chest size is:

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<td>Exactly As I Am</td>
<td>Almost As I Am</td>
<td>Fairly Unlike Me</td>
<td>Very Unlike Me</td>
</tr>
</tbody>
</table>
B. How important to you is your ideal chest size?

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<th>3</th>
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<td>Important</td>
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9. A. My ideal **physical strength** is:

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B. How important to you is your ideal physical strength?

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10. A. My ideal **physical coordination** is:

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B. How important to you is your ideal physical coordination?

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11. A. My ideal **overall physical appearance** is:

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<td>I Am</td>
<td>Almost As</td>
<td>Fairly</td>
<td>Very</td>
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<tr>
<td>I Am</td>
<td>I Am</td>
<td>Unlike Me</td>
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<td>Unlike Me</td>
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</tbody>
</table>
B. How important to you is your overall physical appearance?

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<td>Important</td>
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Appendix D

The following questions refer to your normal eating patterns and weight fluctuations. Please answer accordingly.

1. How often are you dieting?
   - Never
   - Rarely
   - Sometimes
   - Usually
   - Always

2. What is the maximum amount of weight (in pounds) you have ever lost within one month? (Circle one)
   - 0-4
   - 5-9
   - 10-14
   - 15-19
   - 20+

3. What is your maximum weight gain within a week (in pounds)?
   - 0-1
   - 1.1-2
   - 2.1-3
   - 3.1-5
   - 5.1+

4. In a typical week, how much does your weight fluctuate (in pounds)?
   - 0-1
   - 1.1-2
   - 2.1-3
   - 3.1-5
   - 5.1+

5. Would a weight fluctuation of 5lbs. affect the way you live your life?
   - Not at all
   - Slightly
   - Moderately
   - Very Much

6. Do you eat sensibly in front of others and splurge alone?
   - Never
   - Rarely
   - Often
   - Always

7. Do you give too much time and thought of food?
   - Never
   - Rarely
   - Often
   - Always

8. Do you have feelings of guilt after overeating?
   - Never
   - Rarely
   - Often
   - Always

9. How conscious are you of what you’re eating?
   - Not at all
   - Slightly
   - Moderately
   - Extremely

10. What is your maximum weight ever?

11. How many pounds over your desired weight were you at your maximum weight?
    - 0-1
    - 1-5
    - 6-10
    - 11-20
    - 21+

12. When you break your diet you react by: (Circle one)
    - Going right back on the diet
    - Compensating by eating less for a while
    - Continue to eat non-diet foods and start the diet another day
    - Get rid of the food by vomiting or taking laxatives
    - Not applicable.
Appendix E

Sociocultural Attitudes Toward Appearance Questionnaire (SATAQ)

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

1) Women who appear on TV shows and movies project the type of appearance I see as my goal.
   1   2   3   4   5
   Completely disagree  Neither agree or disagree  completely agree

2) I believe that clothes look better on models.
   1   2   3   4   5
   Completely disagree  Neither agree or disagree  completely agree

3) Music Videos that show thin women make me wish that I were thin.
   1   2   3   4   5
   Completely disagree  Neither agree or disagree  completely agree

4) I do not wish to look like the models in the magazines.
   1   2   3   4   5
   Completely disagree  Neither agree or disagree  completely agree

5) I tend to compare my body to people in magazines and on T.V.
   1   2   3   4   5
   Completely disagree  Neither agree or disagree  completely agree

6) In our society, fat people are not regarded as unattractive
   1   2   3   4   5
   Completely disagree  Neither agree or disagree  completely agree

7) Photographs of thin women make me wish that I were thin.
   1   2   3   4   5
   Completely disagree  Neither agree or disagree  completely agree

8) Attractiveness is very important if you want to get ahead in our culture.
9) It’s important for people to work hard on their figures/physiques if they want to succeed in today’s culture.

1 2 3 4 5
Completely disagree Neither agree or disagree completely agree

10) Most people do not believe that the thinner you are the better you look.

1 2 3 4 5
Completely disagree Neither agree or disagree completely agree

11) People think that the thinner you are the better you look in clothes.

1 2 3 4 5
Completely disagree Neither agree or disagree completely agree

12) In today’s society, it’s not important to always look attractive.

1 2 3 4 5
Completely disagree Neither agree or disagree completely agree

13) I wish I looked like a swimsuit model.

1 2 3 4 5
Completely disagree Neither agree or disagree completely agree

14) I often read magazines like Cosmopolitan, Vogue, and Glamour and compare my appearance to the models.

1 2 3 4 5
Completely disagree Neither agree or disagree completely agree
Appendix F

Using the scale below as a yardstick, please answer the following: How confident are you that you could exercise under each of the following conditions over the next six months?

<table>
<thead>
<tr>
<th>0%</th>
<th>10%</th>
<th>20%</th>
<th>30%</th>
<th>40%</th>
<th>50%</th>
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</tbody>
</table>

| a. When tired. | |
| b. During or following a personal crisis | |
| c. When feeling depressed | |
| d. When feeling anxious | |
| e. During bad weather | |
| f. When slightly sore from the last time I exercised | |
| g. When on Vacation | |
| h. When there are competing interest (like my favourite TV show) | |
| i. When I have a lot of work to do | |
| j. When I haven’t reached my exercise goals | |
| k. When I don’t receive support from my family/friends | |
| l. When I have not exercised for a prolonged period of time | |
| m. When I have no one to exercise with | |
| n. When my schedule is hectic | |
| o. When my exercise workout is not enjoyable | |

In general I believe that I could exercise at my target heart rate three to five times per week for 30-40 minutes over the next six months
At the current time, is there a major obstacle in your life that is preventing you from exercising? If yes, please describe
Appendix G

CONSENT TO PARTICIPATE IN RESEARCH

Body Image and Exercise: The Role of Eating Pathology, Self-Efficacy, and Internalization.

You are asked to participate in a research study conducted by Kelty Berardi and Dr. Josee Jarry at the University of Windsor. The results will be contributed to a Master’s thesis.

If you have any questions about the research study feel free to contact Dr. Josee Jarry at 253-2000 ext. 2237 or Kelty Berardi at 253-3000 ext. 2218.

The purpose of the current study is to examine your thoughts and behaviours regarding exercise and eating. If you volunteer to participate in this study, you will be asked to complete questionnaires that will take approximately 30 minutes of your time. The questionnaires involve a variety of questions concerning your exercise and eating habits. You will receive one bonus marks towards a psychology course of your choice.

You will be asked a variety of questions concerning your lifestyle practices. A risk associated with this study is the possibility that thinking about these practices may raise some psychological and emotional concerns for you. If during or after the study, you have concerns you wish to discuss please contact the Psychological Services Centre on Sunset at 253-3000 ext. 7012 or the Bulimia and Anorexia Nervosa Association at 969-2112.

You will not benefit from the current study other than the opportunity to learn about and contribute to psychological research. The benefit to society is increasing scientific knowledge in the area of exercise motivation.

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission. Your name will not appear on any of the questionnaires you fill out. The data you supply will only be identified by number. Data will be stored for 2 years in a secure filing cabinet.

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

You may withdraw your consent at any time and discontinue participation without penalty. This study has been reviewed and received ethics clearance through the University of Windsor Research Ethics Board. If you have questions regarding your rights as a research subject, contact:
SIGNATURE OF RESEARCH SUBJECT

I understand the information provided for the study “Body Image and Exercise: The Role of Eating Pathology, Self-Efficacy, and Internalization. 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.

______________________________
Name of Subject

______________________________  __________________
Signature of Subject            Date

SIGNATURE OF INVESTIGATOR

In my judgement, the subject is voluntarily and knowingly giving informed consent to participate in this research study.

______________________________  __________________
Signature of Investigator       Date
Appendix H

LETTER OF INFORMATION

You are asked to participate in a research study conducted by Kelty Berardi and Dr. Josee Jarry at the University of Windsor. The results will be contributed to a Master’s thesis. The purpose of the current study is to examine the relation between body image and exercise. If you volunteer to participate in this study, you will be asked to complete a variety of questionnaires that will take approximately 30 minutes of your time. The questionnaires involve a variety of questions concerning your exercise and eating habits. You will receive one bonus mark towards a psychology course of your choice.

You will be asked a variety of questions concerning your lifestyle practices. A risk associated with this study is the possibility that thinking about these practices may raise some psychological and emotional concerns for you. If during or after the study, you have concerns you wish to discuss please contact the Psychological Services Centre on Sunset at 253-3000 ext. 7012 or the Bulimia and Anorexia Nervosa Association at 969-2112.

You will not benefit from the current study other than the opportunity to learn about and contribute to psychological research. The benefit to society is increasing scientific knowledge in the area of exercise motivation.

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission. Your name will not appear on any of the questionnaires you fill out. The data you supply will only be identified by number. Data will be stored for 2 years in a secure filing cabinet.

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Research Ethics Co-ordinator
University of Windsor
Ontario N9B 3P4

Telephone: (519) 253-3000, #3916
E-mail: ethics@uwindsor.ca

Windsor,
Appendix I

DEBRIEFING FORM

You participated in a study investigating body image and exercise. A significant amount of literature indicates that body image dissatisfaction motivates women to exercise. The purpose of the study was to examine how body image dissatisfaction interacts with certain variables to predict exercise behaviour. These variables are eating pathology, self-efficacy for exercise, and internalization of social standards of attractiveness.

Thank you for participating in the current study. If you have any concerns about the current study or are interested in finding out the results from this study please contact me via email at kberardi@sympatico.ca. The results of this study will be available in January 2003.
VITA AUCTORIS

Kelty Berardi was born in 1976 in Thunder Bay, Ontario. She graduated from Sir Winston Churchill Collegiate Institute in 1995. From there she went on to study at Lakehead University where she obtained a Bachelor of Arts with First Class Standing in Psychology. She is currently working towards a Doctor of Philosophy in Clinical Psychology at the University of Windsor.