

EFFECT OF THIN MEDIA IMAGES ON THE FOOD CONSUMPTION AND AFFECT OF
BINGE EATERS: EXAMINING THE ROLE OF SOCIAL COMPARISON

By

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Abstract

Binge eating has become a prevalent issue for young women. A great deal of attention has focused on the etiological mechanisms underlying binge behaviour. Affect regulation models have received empirical support suggesting negative affect is an antecedent to binge eating. The sociocultural pressure to be thin is also a known risk factor for the development of Binge Eating Disorder. Previous research has shown that women eat less when exposed to thin media images compared to neutral images. A large portion of the literature also indicates that thin images cause women to engage in social comparison resulting in negative affect and body dissatisfaction. Nevertheless, some research has shown that for dieters, thin images appear to have self-enhancement effects. The current study explored the role of social comparison in the effect of thin media images on the affect and food consumption of binge eaters and nonbinge eaters. Seventy-nine undergraduate students participated in the current experiment, during which they were exposed to thin media images and asked to engage in social comparison with the models or were asked to focus on the aesthetic qualities of the image. Results indicated that binge eaters ate more overall compared to nonbinge eaters. Specifically, binge eaters who were asked to self-compare to the thin media images ate more compared to binge eaters who are asked to focus on the aesthetic qualities of the image. It was found that binge eaters displayed more negative affect at two separate time points in the study compared to nonbinge eaters. Further, it was found that binge eaters reported more difficulty in avoiding the thin model (e.g., aesthetic quality task) compared to nonbinge eaters. The implications of the study's findings for the etiological models of binge eating, impact of the media, and role of social comparison are discussed.

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Effect of Thin Media Images on the Food Consumption and Affect of Binge Eaters:
Examining the Role of Social Comparison

Eating disorders are becoming increasingly prevalent in society today. Many contributing factors have led women to develop eating pathologies such as uncontrollable overeating. At present in Western culture, a large proportion of the population (predominantly women) engage in dieting behaviours in an attempt to exert control over their weight. The increased sociocultural pressure to achieve an ideal body type and to lose weight leads many women to struggle with dieting. Dieting and the battle to lose weight are often accompanied by increased appetite, food cravings and the impulse to overeat (Polivy, Heatherton, & Herman, 1988). Further, in certain cases with increased severity, the urge to overeat can result in a loss of control of food intake, which can be conceptualized as a symptom of pathological eating (Fairburn & Wilson, 1993). The urge to overeat and consume a large amount of food accompanied by a perceived loss of control is known as binge eating, an important phenomenon that plays some role in all eating disorders.

Binge Eating Defined

In both clinical practice and research, a binge is defined by a two-part criteria. The current *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision* (DSM-IV-TR, APA, 2000) outlines the first criterion by defining binge eating as the consumption of an amount of food that is significantly larger than what most people would eat within a similar time period and under similar circumstances. Along with this criterion, the binge episode must be accompanied by a sense of loss of control over eating. Thus, the individual must feel that he or she cannot control what he or she is eating or the amount of food that is being consumed. Binge eating is also a criterion for Bulimia Nervosa (BN). Individuals with BN show

a pattern of recurrent episodes of binge eating followed by inappropriate compensatory behaviours that are sought in order to prevent weight gain. Examples of inappropriate compensatory behaviours are misuse of laxatives, self-induced vomiting, and excessive exercise (APA, 2000).

The criterion that a binge episode involve eating a large amount of food is consistent with both laboratory findings and self-report caloric intake during binges in patients with bulimia nervosa (Walsh & Garner, 1997). However, some researchers have suggested that the amount of food consumed during a binge is not the defining feature of the binge. For example, some studies have shown that approximately one third of patients, who otherwise satisfy the criteria for bulimia nervosa, reported consuming a relatively small number of calories during a binge (Fairburn & Wilson, 1993). It may be that there is a subjective component to what constitutes a 'binge' rather than it solely relying on calories consumed. It is possible that individuals with eating disorders consider varying amounts of food or the consumption of specific foods (that are considered forbidden) to be engaging in a 'binge.' That is, it is not necessarily consuming a large number of calories or large amounts of food that may cause one to feel that they have engaged in a binge episode (Rosen, Leitenberg, Fisher, & Khazam, 1986). Currently, studies differ in their definition of binges, with some accepting the Eating Disorder Examination's (Fairburn & Cooper, 1993) definition of subjective overeating (amount of food eaten is not "large" but viewed by the individual as excessive) with others adopting the DSM-IV-TR definition of a binge episode.

The second part of the DSM-IV-TR (APA, 2000) binge criterion is a subjective sense of loss of control over eating. This criterion is important to decipher a binge from general overeating. This comes as a result from concern over whether the symptom of binge eating itself

distinguishes individuals with disordered eating from individuals who periodically engage in overeating. The DSM-IV-TR includes a loss of control in the diagnostic criteria for binge episodes, both in the context of Binge Eating Disorder (BED) and BN (Devlin, Goldfein, & Dobrow, 2003). The two-part criteria for binge episodes (regularly occurring consumption of large amounts of food and the loss of control during a binge episode) reduces the number of individuals who meet the criteria for binge eating episodes and further differentiates them from those who are occasional overeaters (Devlin et al., 2003).

Binge Eating and Eating Disorders

The American Psychological Association describes eating disorders as complex psychiatric and medical conditions whereby individuals suffer from persistent disturbances in their eating (APA, 2000). Eating disorders are found predominantly among young women in Western countries. The most defined eating disorders are anorexia nervosa (AN) and bulimia nervosa (BN) (APA, 2000). Garfinkel, Lin, and Goering (1995) report that the lifetime prevalence of AN in Canada was found to be 0.56% for females and 0.16% for males; the lifetime prevalence of BN was found to be 1.1% for females and 0.1% for males. McVey et al. (2005) recently reported that one in four females in Ontario, Canada report symptoms associated with eating disorders. Thus, eating disorders are prevalent in society and are an important area for research.

At present, binge eating can be a symptom of each of the eating disorders included in the DSM-IV-TR. Binge eating is the key feature of BN and BED. In addition, in the DSM-IV-TR, binge eating has also been included as part of a subtype of AN referred to as the 'binge-eating/purging type' whereby individuals engage in either binge eating or purging (APA, 2000).

Prevalence rates for binge eating vary among different populations. Weekly binge eating episodes have been reported in 1.5%-10% of female college students and approximately 1.1% of college males (Fairburn & Wilson, 1993; Katzman, Wolchik, & Braver, 1984). Also, prevalence rates of binge eating for those in weight loss programs are much higher, with reported rates of 18%-35% (Ramacciotti et al., 2000). Such high prevalence rates justify the need for continued research into the psychological mechanisms associated with this behaviour.

Binge eating is a defining feature of BN, in which the binge behaviour is typically followed by inappropriate compensatory behaviours such as the use of laxatives, excessive exercise and/or self-induced vomiting (APA, 2000). The motivation behind inappropriate compensatory behaviours is to prevent weight gain. Compensatory behaviours provide a distinguishing factor from those with BN and a group of individuals who engage in binge eating alone. Binge eating has thus been designated its own category in the DSM-IV-TR (APA, 2000) as BED with the absence of inappropriate compensatory behaviours to prevent weight gain. Like BN, BED requires further research and understanding.

Characteristics Associated with Binge Eating

Individuals who engage in binge eating have been found to exhibit greater body image dissatisfaction and other associated psychopathology compared to their nonbinge counterparts (Mitchell & Mussell, 1995). In addition, individuals who engage in binge eating display a tendency toward having elevated rates of comorbid Axis I disorders compared to controls. The rate of comorbid affective disorders, particularly major depressive disorder, is much higher in binge eaters, compared to nonbinge groups (Telch & Stice, 1998).

Research has also demonstrated that binge eating severity correlates with the severity of general psychological disturbance in areas such as depression and anxiety (Mitchell & Mussell,

1995). Comorbidity studies have also identified higher rates of Axis II disorders in binge eaters than in nonbinge eating controls; in particular, avoidant personality disorder and borderline personality disorder (Yanovski, Nelson, Dubbert, & Spitzer, 1993).

Binge eaters are at risk for more than comorbid psychological disorders. Individuals who engage in binge eating in the absence of compensatory weight loss methods are at an increased risk of obesity. Binge eating disorder is associated with weight gain and obesity, as evidenced by findings from clinic, community and population-based studies, with more than 30% of binge eaters falling into the obese weight range (Yanovski, 2002).

Etiological Models of Binge Eating

The etiology of binge eating has received attention and speculation. There is still little consensus about what causes binge eating. As a result, many etiological theories have been proposed. There is currently no consensus as to whether binge eating has one specific etiological foundation or whether it arises from the interplay between several different etiological factors. Current literature regarding etiological foundations has focused primarily on two principal explanatory models: the restraint model and the affect regulation model. Both of these models focus on the antecedent factors of binge eating, yet differ with respect to the point in time at which these antecedents are thought to occur.

Restraint Model

The restraint model is one of the most highly regarded etiological models of binge eating (Polivy & Herman, 1985). It proposes that the current sociocultural pressure to be thin is a causal pathway leading to binge eating. In this model, the internalization of the thin ideal leads to chronic body dissatisfaction, which further leads to dieting. Chronic dieting has been established as a contributing factor in the development of binge eating (Howard & Porzelius, 1999; Abraham

& Beumont, 1982; Heatherton & Polivy, 1992; Polivy & Herman, 1985). Restrained eaters are individuals traditionally operationally defined as those who score 15 or above on the Revised Restraint Scale (RRS) (Herman, Fitzgerald, & Polivy, 2003) and tend to diet and/or experience weight fluctuation (see measures below).

The restraint model has been founded in laboratory research. Restrained eaters are thought to cognitively regulate their food intake until their cognitive restraint is disrupted. Laboratory studies have shown that the temporary disruption of cognitive restraint has led restrained eaters to disinhibit and overeat or engage in counterregulatory eating behaviours (Polivy & Herman, 1985, 1999). Currently, most research in the area of restraint and binge eating has focused on women. Those who internalize the thin ideal and strive to attain the ideal body tend to adopt unhealthy means in hopes of achieving their goal. However, attaining the goal of the perfect body and weight loss is not likely, leaving restrainers nutritionally deprived and with more negative affect. These physiological and psychological experiences put individuals at a heightened risk of loss of control over eating, or binge episodes (Heatherton, Polivy, & Herman, 1990; Herman & Polivy, 1990). Telch and Agras (1993) found that dieters reported that food cravings resulting from dieting led to the onset of binge episodes. In addition, it has been noted that similarities exist between the binge eating behaviour in bulimia nervosa and laboratory induced overeating in dieters (Davis, Freeman, & Garner, 1988). Moreover, significant correlations have been found between the degree of dietary restraint and the severity of binge eating (Leon, Fulkerson, Perry, & Cudek, 1993). Thus, it appears that dieting behaviour is a key component to binge eating, often preceding the episode.

The restraint model is not easily applied to individuals with BED. Some studies have found that a significant portion of BED individuals report that their first binge episodes occurred

before their first diet (Spurrell, Wilfley, Tanofsky, & Brownell, 1997; Spitzer et al., 1993). However, it is important to note that more research is needed with this specific population as some researchers have found that individuals with BED have reported dieting behaviour to precede binge episodes (Mussell et al., 1995). Also, studies in this area have been criticized for many methodological limitations (Howard & Porzelius, 1999). Currently, there are mixed findings on whether dieting is a precursor to binge eating or the result of binge eating in individuals with BED. As a result, the restraint model cannot currently explain binge eating for all individuals with BED.

Affect Regulation Models

Many models have been proposed with a focus on negative affect as a precursor to binge eating (Heatherton & Baumeister, 1991). The affect regulation model suggests that heightened emotional disturbance increases the likelihood that an individual will binge eat (Abraham & Beumont, 1982; Baucom & Aiken, 1981; Greeno, 2000; Paxton & Diggins, 1997). That is, binge eating serves to decrease the experience of negative affect by providing comfort and/or distracting individuals from distress. Thus, in these models, negative affect is a proximal antecedent of binge eating (Telch & Agras, 1996).

Comfort Model

According to the comfort model, binge eating provides comfort to emotionally distressed dieters or obese individuals who frequently diet (Polivy & Herman, 1999). The comfort hypothesis posits that food and eating provide a great deal of comfort to binge eaters. It is suggested that in nonbinge eaters, food/eating does not comfort individuals enough to allow for the offset of appetite suppressing effects that are ordinarily activated by stress. That is, in nonbinge eaters, high levels of distress activate the nervous system causing appetite suppression.

On the other hand, in binge eaters (who find comfort in eating), distress acts as a trigger for the desire to eat. The desire to eat and binge behaviour is sought out to provide some comfort.

Escape Model

Heatherton & Baumeister (1991) posit that binge eating may be motivated by a need to escape from aversive self-awareness. Binge eaters are considered to possess high personal expectations related to their body weight and shape. As a result, their self-image is strongly tied to their appearance and they are highly susceptible to the sociocultural pressure to be thin, resulting in the internalization of the thin ideal (Polivy et al., 1988). Escape model also posits that binge eaters evaluate themselves in relation to high standards, are avoidant of the stigma associated with obesity, and display a strong desire to be perceived favourably by others (Heatherton & Baumeister, 1991). The model further suggests that because binge eaters hold high standards and have high self-awareness, they tend to regard themselves negatively in comparing themselves to others. Thus, binge eaters are thought to reduce their level of resulting aversive self-awareness by engaging in binge behaviour. This eating behaviour is suggested to help individuals escape as attention is focused on the actions and sensations of eating. That is, it is conceptualized that thoughts about the self are put out of mind and are replaced by the physical sensations associated with eating.

Empirical Evidence for Affect Regulation

Currently, there are mixed findings as to whether binge eating to regulate mood is motivated by comfort, distraction, or an escape from self-awareness. Nevertheless a large portion of research supports negative affect as an antecedent of binge eating.

Abraham and Beumont (1982) conducted a study of bulimic patients. They found that the majority of participants reported that their binge episodes were usually preceded by anxious,

and dysphoric mood states. Kenardy, Arnou, and Agras (1996) found that binge eaters reported greater distress and lower tolerance of negative moods compared to nonbinge eaters. Further, binge eaters reported emotions such as anger, depression and anxiety to precede binge episodes. A sample of overweight women who engaged in binge behaviour reported more severe binge eating in response to negative affect compared to low levels of emotional distress (Henderson & Huon, 2002), suggesting that negative affect is a precursor to binge eating and binge severity. Self-reports of individuals with BED found that participants reported a greater tendency to eat in response to negative mood states as compared to controls (Eldredge & Agras, 1996). Self-monitored reports of mood and eating showed that binge eaters reported more negative affect on binge days as compared to nonbinge days (Wegner et al., 2002).

Deaver, Miltenberger, Smyth, Meidinger, and Crosby (2003) conducted a study with university students. Participants were asked to self-monitor and record their level of pleasantness on an affect grid at 2-minute intervals before, during, and after a binge as well as during mealtimes. Results indicated that participants experienced more negative affect before binge episodes, which lessened during the binge episode, and increased immediately after the binge episode. Thus, it is likely that binge eating relieved some of the negative affect experienced.

Telch and Agras (1996) examined the influence of negative affect on binge eating in BED subjects. They conducted a mood induction experiment using vivid negative or neutral imagery. Results indicated that negative emotional states were associated with loss of control over eating and labeling an eating episode as a binge. Those participants who labeled their eating as a binge also reported a more negative affective state. However, contrary to predictions, exposure to negative imagery failed to potentiate subsequent consumption of excess food. The

results did not support that binge eaters exposed to vivid negative imagery ate more than other groups. The authors suggest that the laboratory setting may not have imitated factors that influence eating in binge eaters' natural environments. In addition, it is suggested that the negative mood induction may not have been negative enough to trigger a binge episode (Telch & Agras, 1996).

In a study by Stickney, Miltenberger, and Wolff (1999), college women who engaged in binge eating reported feeling down or sad, upset, empty, hopeless, stressed, and overwhelmed prior to binge eating. These women reported feeling better, relieved, good, and content during the binge episode. These results are consistent with the affect regulation model whereby participants who experience negative affect before binge eating report less negative affect during binges, with an increase in negative affect after the binge. Other studies have found similar results (Deaver et al., 2003; Telch & Agras, 1996).

Davis and Jamieson (2005) examined the functional nature of binge eating by developing a measure called the Binge Eating Adjective Checklist (BEAC). A clinical sample of 405 adult women who presented to an eating disorders clinic completed the study. The BEAC is comprised of 103 adjectives that describe different moods and feelings. Participants were asked to complete the BEAC, which instructed them to indicate which adjectives best described how they felt before a binge episode. A second administration of the BEAC instructed participants to indicate which adjectives described how they felt during a binge episode. Results showed that two-thirds of the participants reported feeling anxious, depressed, frustrated, helpless, lonely, bored, a lack of will power, out of control, and craving food prior to a binge episode. Further, participants reported an amelioration of negative psychological and physiological states during the binge episode. The results of this study support the notion of the functionality of binge

eating such that negative experiences or distress often precede a binge episode, and are alleviated during the episode.

In a laboratory study examining the effects of negative affect on eating in restrained or unrestrained eaters, results indicated that exposure to a frightening film versus a neutral film resulted in increases in anxiety, sadness and anger. Restrained eaters who were exposed to the frightening film were found to eat more than restrained eaters who saw the neutral film as well as unrestrained eaters in either condition (Schotte, Cools, & McNally, 1990). These results show that negative affect influences eating behaviour differently in restrained and unrestrained eaters.

Aubie and Jarry (in press) conducted two studies examining the impact of weight-related teasing on the affect and eating behaviour among binge eaters and nonbinge eaters. The studies were masked as studies examining the impact of mood on taste ratings. Eighty-eight female undergraduates participated in the first study. Binge eaters and nonbinge eaters were assigned to read a weight-related teasing vignette or a neutral vignette. After reading the vignettes, a measure of affect was obtained. Participants also completed a taste-test of three different types of cookies. Finally, participants completed a battery of psychological measures. Results showed that participants who read the weight-related teasing vignette reported more negative affect compared to participants who read the neutral vignette. Further, binge eaters were found to eat more overall compared to nonbinge eaters, and to eat significantly more in response to the weight-related teasing vignette. The second study examined the specific effect of weight-related teasing by incorporating a third vignette about academic teasing. The same procedure as study one was adopted except three candies replaced the three cookies that were used as food stimuli. One hundred and twenty-one females participated in study two. Results showed that binge eaters ate significantly more after reading the weight-related teasing vignette compared to the neutral

and academic teasing vignettes. Thus, these studies support the notion that negative affect is an antecedent to binge eating behaviour with specific attention to weight-related material.

Though there are many studies that support the affect regulation models, studies have also shown that there are multiple factors that play a role in binge eating (e.g., Womble et al., 2001). It is becoming increasingly clear that the etiological mechanisms underlying binge eating are complex and vary across different groups of people. Thus, further research will be needed to allow for a clearer understanding of binge behaviour.

Additional Factors Associated with Binge Eating

As evident by the existing literature, binge eating is a complex behavioural pattern that cannot be accounted for by any single cause (Polivy & Herman, 1993). Many researchers have suggested factors that may play a causal role in binge eating such as gender-role socialization (Streigel-Moore, 1995), self-concept and self-evaluation (Jacobi, Paul, de Zwaan, Nutzinger, & Dahme, 2004), shame and guilt (Sanftner & Crowther, 1998).

Self-Esteem

It has been suggested that low self-esteem leads to an increased vulnerability to the sociocultural pressure to be thin. Susceptibility to this pressure makes individuals more likely to diet (Polivy & Herman, 1993). Studies have found a significant relationship between self-esteem and chronic dieting status, and between self-esteem and body dissatisfaction (Heatherton & Polivy, 1992). Button and colleagues (1996) conducted a longitudinal study in which they found that low self-esteem in 11-12 year old females predicted the onset of eating disorder symptoms 5 years later. Sanftner and Crowther (1998) showed that a sample of women in university who engaged in binge eating reported greater fluctuations in their self-esteem with more reports of shame and guilt.

Low self-esteem has also been linked to body image dissatisfaction. Masheb and Grilo (2003) found that binge eaters' changes in body dissatisfaction were significantly correlated with changes in self-esteem. Increased body dissatisfaction may lead individuals to be more vulnerable to internalizing the thin ideal. Attempting to achieve the thin ideal increases the likelihood that the individual will diet, which may lead to a cycle of dieting, breaking their diet and binge eating. As a result, dieters who fall into this cycle and do not meet successful weight loss experience decreases in self-esteem with each successive dieting failure (van den Berg, Thompson, Obrowski-Brandon, & Covert, 2002). Thus, low self-esteem has been shown to be a factor at the onset of dieting and binge eating as well as a result of unsuccessful dieting and binge eating (Polivy & Herman, 1993). Although it is currently unknown whether self-esteem is a precursor or the result of dieting, binge eating does appear to be more prevalent in those with low self-esteem (Polivy et al., 1988).

Sociocultural Pressure

A significant portion of the literature on eating disorders has focused on the sociocultural pressure to be thin, and the corresponding impact that the thin ideal has on the prevalence of eating disorders (Thompson, Covert, & Stormer, 1999). Women in Western society are bombarded with messages and images that place an increased demand upon them to attain thinness. Sociocultural notions of beauty in Western cultures equate thinness with beauty, femininity and happiness (Striegel-Moore & Smolak, 2000). The repeated exposure to these messages has led to an acceptance and internalization of the thin ideal (Cash, 1995). The current thin ideal that is portrayed in Western society is not realistically attainable for many women. A lack of success leads women to fall into a trap and face failure. Thus, the internalization of the thin ideal has also been accompanied by a high degree of body-image

dissatisfaction (Brown, Cash, & Lewis, 1989). Body dissatisfaction and wanting to be thinner has contributed to the increasing prevalence of dieting (Polivy & Herman, 1993). Further, dieting has been found to put females at an increased risk of developing eating disorder symptoms (Patton et al., 1990). The media has recently received attention for its portrayal of the thin ideal and the messages conveyed to women to be physically attractive and achieve thinness.

Impact of the Media

With the increased interest in the impact of the sociocultural pressure to achieve the thin ideal, the media has received attention for its role in the development of eating disturbance and body image concerns. Research has recently been active in this area and many studies support that media influence appears to have negative consequences for women.

A recent study found that women exposed to thin female images, ate less than when exposed to a neutral image or plus size image (Strong, 2001). Seddon and Berry (1996) found that restrained eaters ate more than unrestrained eaters when viewing video images of stereotypically thin and attractive women.

Results of a study examining the effects of thin media images in men and women found participants to report increased body dissatisfaction in response to the thin images. Moreover, participants showed improved body satisfaction after viewing overweight images (Ogden & Munday, 1996). Champion and Furnham (1999) examined the impact of media images on adolescent females. Though they did not confirm the hypothesis that girls would report increased body dissatisfaction in response to media images, they did find that girls reported an aspiration to be thinner. This suggests that girls are influenced by the pressure to be thin.

Pinhas, Toner, Ali, Garfinkel, and Stuckless (1999) examined the impact of thin media images of supermodels on the mood and body satisfaction of female university students. The

comparison group was shown images that contained no pictures of people. Results showed that participants exposed to the images of thin models reported greater depressed mood and more feelings of anger. In addition, it was suggested that women with greater degrees of body dissatisfaction and eating disorder symptomology are more vulnerable to thin media images.

In a study by Birkeland and colleagues (2005), college females were exposed to one of four conditions: media images of an attractive model with an appearance-related product, an appearance-related product alone, an attractive model with a neutral product, or a neutral product alone. Participants completed mood ratings prior to viewing images and after viewing images. The study found that participants who viewed images with models reported an increase in mood disturbance and higher levels of body dissatisfaction compared to advertisements with products alone (Birkeland et al., 2005). Thus, these findings support the notion that media images negatively impact women.

Though a large portion of the research supports the negative impact of the media's portrayal of the thin ideal, some researchers have recently shown that women's reaction to the thin ideal varies as a function of their own body perception and dieting status. For example, Henderson-King and Henderson-King (1997) investigated the effects of media images on women's body satisfaction. Female participants engaged in an experimental task by viewing images of 'thin' women or neutral women. Results indicated that exposure to thin images resulted in positive feelings among thinner participants while heavier participants reported more negative feelings (Henderson-King & Henderson-King, 1997). The results of this study show that women react to media images differently based on their own body shape. Further, it has also been shown that exposure to 30 minutes of television and advertisements portraying the thin

ideal can alter women's perceptions of their body shape whereby they report positive experiences of feeling thinner in response to thin images (Myers & Biocca, 1992).

Recently, Mills, Polivy, Herman, and Tiggemann (2002) conducted a series of studies examining the effect of thin media images on eating, body image and the mood of restrained and unrestrained eaters. Ninety-eight female undergraduate participants viewed 12 advertisements from popular women's magazines. Participants were randomly assigned to one of three conditions: advertisements showing thin bodies, large bodies, or no bodies. Restrained eaters were found to disinhibit and eat more in response to viewing thin images compared to unrestrained eaters. Restrained eaters also reported a thinner personal ideal and current body size following exposure to the thin images (Mills et al., 2002). Moreover, restrained eaters found the thin images to provide self-enhancement effects in that they reported wanting to be thinner along with reporting that they are thinner. Results of this study support the notion that thin media images may not be entirely negative and may have positive enhancing effects for women.

Joshi, Herman, and Polivy (2003) conducted a similar study to Mills et al. (2002) in which they examined the impact of thin media images on the mood, self-esteem and self-image ratings of restrained and unrestrained eaters. Results indicated that restrained eaters exposed to thin images rather than neutral ones reported more favourable self-image and social self-esteem (Joshi et al., 2003). Currently, there are mixed findings as to whether thin media images result in negative consequences or positive experiences for women. One factor that may play a role in how women react to thin media images is social comparison.

Bola and Jarry (2006) conducted a preliminary study examining the impact of thin media images on the affect and food consumption of binge eaters. Sixty-four female students participated in the study. Baseline data measuring affect was collected prior to the experimental

task. Binge eaters and nonbinge eaters were exposed to either thin media images or neutral images of interior design. Participants were instructed to view the images and write a paragraph about their own perception of the images. During the task, participants were offered M&Ms that were pre-counted and pre-weighed and told that they were left over from a cancelled study and to feel free to have as many as they would like. After the 15-minute task, all materials including the M&Ms were collected and a battery of instruments including the post-experimental affect measure was given to the participants. During this time, the M&Ms were weighed and counted to determine food consumption. Results showed that binge eaters ate more overall compared to nonbinge eaters. Further, binge eaters ate significantly more than nonbinge eaters when exposed to the thin media images. Interestingly, binge eaters were found to report an increase in positive affect after viewing thin media images whereas nonbinge eaters reported a decrease in positive affect after viewing the thin images. The results of this study suggest that binge eaters viewed the images in a positive light regardless of their consumption of more food. However, it is unclear as to whether the images themselves caused the reports of positive affect or whether it had something to do with the act of eating itself. Further, it is unclear whether binge eaters and nonbinge eaters attended to the thin models or based their perceptions on other qualities of the image such as the colour, background or props used in the images.

Social Comparison Theory

Festinger's (1954) social comparison theory posits that individuals have a drive to evaluate themselves, which can be satisfied by engaging in social comparison with others. Festinger's theory has been applied to body image wherein individuals are thought to compare themselves in terms of appearance, weight and body shape. It is suggested that women in society are inundated with numerous messages and ideals through channels such as the media

(magazines, tv), which provide occasions for comparison (Thompson et al., 1999). Moreover, it is suggested that such comparisons will result in the motivation to meet certain goals that may not be realistically attainable. In addition, it is thought that individuals make automatic comparisons when seeing media images without being consciously aware of it (Botta, 1999). Studies examining the impact of the media predict that many individuals are vulnerable to making comparisons with thin images. However, it is suggested that individuals vary in how motivated they are to make comparisons and, for some, comparison is part of an automatic process. According to the theory, individuals who view thin media images and engage in comparisons tend to be more motivated to look like the individuals in the images (Goethals, 1986). It has also been proposed that individuals who view such images are unable to avoid making comparisons (Botta, 1999).

Shaw and Waller (1995) reviewed evidence for the impact of media images of the thin ideal on body image disturbance. The authors suggest that the media's impact appears to be mediated in part by a social comparison process, particularly during adolescence. Botta (1999) examined social comparison theory and thin ideal internalization. Two hundred and fourteen females were asked to fill out a survey and report on television viewing and how often they made self-comparisons to media images. In addition, participants were asked to respond to several measures assessing endorsement of the thin ideal, body image disturbance/dissatisfaction, drive for thinness, and bulimic behaviours. It was found that the media did impact body image disturbance. Females were found to compare themselves to images and strive to obtain the thin ideal, dislike their bodies, and engage in unhealthy behaviours. Further, endorsing the thin ideal accounted for 8.0% of variance in body dissatisfaction, 18.2% for drive for thinness, and 9.1% for bulimic tendencies (Botta, 1999). Moreover, appearance-based social comparison played a

role as a mediating link between social feedback, body image and eating disturbance (Thompson et al., 1999). Younger females in 4th, 8th, and 12th grade were found to engage in social comparisons with models and this increased with age. Also, comparisons were greater for females with low self-perceptions of attractiveness and/or self-esteem (Martin & Kennedy, 1993).

Richins (1991) conducted a series of studies exploring the social comparison and idealized images in advertisements. Over a series of four studies, it was found that female college students in the context of focus groups indicated that they engage in social comparison, with some females reporting optimism and positive feelings when viewing such images. Exposure studies to advertisements with idealized images of models found that subjects exposed to idealized images reported lower satisfaction with themselves. More specifically, subjects exposed to highly attractive ads reported less satisfaction with their own physical attractiveness (Richins, 1991). The series of studies supports that many female engage in social comparison and as a result many report feeling less satisfied and less physically attractive.

Heinberg and Thompson (1992) conducted a study with 189 female and 108 male undergraduates to rate the importance of six groups as comparison targets for seven different attributes. The authors investigated the impact of social comparison in examining the effects of other's appearance on both body image and eating disturbance. Results showed that comparisons made to images with celebrities were significantly associated with increased body dissatisfaction, increased bulimic behaviours, and an increased drive for thinness (Heinberg & Thompson, 1992). In a similar study, Harrison and Cantor (1997) found that television viewing was linked to higher body dissatisfaction. Specifically, when females in the study engaged in social comparison with females on television, media use was found to predict eating disorder

symptomatology, drive for thinness, body dissatisfaction, and ineffectiveness. Taken collectively, the results of these studies support the notion that social comparisons with idealized media images have a negative impact on many women's body image and eating behaviour.

Goals of the Present Study

At present, there is a general consensus in the literature that the media's portrayal of the thin ideal plays a role in body image disturbance, negative mood and disinhibited eating (Botta, 1999; Heinberg & Thompson, 1992; Mills et al., 2002; Ogden & Munday, 1996; Pinhas et al., 1999; Richins, 1991). There is also a general consensus that negative affect is linked to the proximal onset of binge eating (Deaver et al., 2003; Heatherton & Baumeister, 1991; Telch & Agras, 1996). To date, there are no published studies examining the impact of the media on the eating behaviour, affect and body image concerns of binge eaters and nonbinge eaters. As described earlier, experimental studies have been successful in measuring the eating behaviour of binge eaters and nonbinge eaters in response to mood induction procedures (Baucom & Aiken, 1981; Schotte et al., 1990; Telch & Agras, 1996). Though the studies used different mood induction procedures, none have examined the impact of media images on the eating behaviour of binge eaters.

The present study built on previous studies examining the impact of thin media images on eating behaviour, affect and body dissatisfaction. However, the present research expanded previous research to include binge eaters. Further, the current study used social comparison to thin media images to induce negative mood in the experimental condition and to examine whether social comparison is truly automatic or avoidable in the comparison group. The taste test format (Herman et al., 2003) was used to determine the impact of thin media images on eating behaviour. The taste test method was used to obtain a measure of food consumption after the

manipulation in an experimental study. Participants were told that they would be taking part in a taste test and were asked to rate different types of food stimuli. They were further instructed to feel free to help themselves, as there was “plenty left” (Herman et al., 2003, p. 17). The researcher measured the food both before and after the taste test to determine the amount of food consumed. Thus, eating behaviour was measured by food consumed, which was used as an analogue to binge eating behaviour.

Hypotheses

Three primary predictions were hypothesized for the current study.

1. To examine the efficacy of using social comparison to thin media images to induce negative mood, it was predicted that participants who were asked to self-compare to the media images would report higher levels of negative affect as compared to those who were asked to focus on the aesthetic qualities of the image.

2. With respect to eating behaviour, it was predicted that binge eaters would eat more than the nonbingeing comparison group in vivo. It was also predicted that there would be an interaction between binge status (binge eater vs. nonbinge eater) and thin media images condition (social comparison). Specifically, binge eaters who were asked to self-compare to the thin media images would eat more than binge eaters who were asked to focus on the aesthetic quality of the image.

3. In examining the experimental manipulation of inducing social comparison compared to experimenter instructions to focus on the aesthetic quality of the image, it was predicted that binge eaters in the latter condition would attend to the thin model more than the nonbinge eaters. That is, it would be more difficult for binge eaters to refrain from engaging in social comparison in the aesthetic quality task.

Method

Experimental Design

The study implemented a two-between (binge status; instructional set for exposure to thin media images) one-within (time) ANOVA design. The two primary independent variables explored in this study were binge status (binge eater, nonbinge eater) and instructional set during exposure to thin media images (social comparison, aesthetic quality). The primary dependent variables were affect and food consumption.

Participants

Eighty females enrolled in the first year undergraduate psychology course at Lakehead University were recruited to participate in the study. All participants received course credit (1 bonus mark) for their participation in the study.

Participants were asked to respond to several screening questions (See Appendix A for the consent form and screening questionnaire). Two researchers in the same lab for their respective studies used the screening questionnaire. Screening questions used for recruitment purposes in this study were as follows: (1) During the last 6 months, have there been times when you felt you have eaten what other people would regard as an unusually large amount of food given the circumstances (e.g. a quart of ice cream) and (2) If you did experience times when you ate an unusually large amount of food, did you experience a loss of control (feel that you couldn't stop eating or control what or how much you were eating)?

On the basis of students' responses to the above screening questions, the researcher generated a list of potential participants. Random lists of females who responded affirmatively to the two screening questions were generated, as were a similar random list of females who responded negatively to both screening questions. Potential participants' responses to these

initial screening questions were not the sole determinant in assignment to the comparison or binge eater group, but rather served as screening measure to help the researcher more effectively target the desired group of binge eaters. Assignment to the binge group was based on participants' responses to two specific questions on the Binge Scale, further verified with corroborating responses on the Eating Disorder Examination-Questionnaire (See questionnaires below).

Participants who reported binge eating "at least once or twice a week" and feeling at least "somewhat out of control" on the Binge Scale were assigned to the binge group. The nonbinge comparison group was comprised of individuals who reported that they do not binge eat at least once a week and do not experience loss of control over their eating.

The screening questionnaire was also used to ensure that participants did not present with any food aversions or allergies to chocolate and/or peanut butter. Further, participants were screened for treatment of depression and/or an eating disorder.

Materials

Food Stimuli

Three flavors of chocolate candies M&M's, Smarties, and Reese's Pieces were used as the food stimuli in this study; each of the three bowls presented to participants contained 150 candies for a total of 450 per participant. Each bowl of candies was counted and weighed with a standard digital scale both before and after being presented to the participant.

A recent taste test study used these three types of chocolate candies as food stimuli (Aubie & Jarry, in press). Previous research has used M&M's as food stimuli in eating studies (Bola & Jarry, 2006; Cavallo & Pinto, 2001; Copeland, Woods, & Hursey, 1995). Binge eaters have been found to select foods high in sugar, and/or carbohydrates for their binge episodes, and

they also show a preference and/or craving for chocolate (Anderson, Williamson, Johnson, & Grieve, 2001). Thus, the current study used the three types of candies to build on existing findings. Consistent with previous research that binge eaters objectively exhibit abnormal eating behaviour in a laboratory setting (Walsh & Boudreau, 2003), food stimuli was used in the present study to obtain an objective measure of food consumed.

Thin Media Images

Ten media images were used that were selected from various popular women's magazines and used in a prior study by the researcher (Bola & Jarry, 2006). Magazines were selected based on popularity and accessibility to the public. Among the magazines were Glamour, Bazaar and Flare. The images selected were of women representing the thin ideal as rated by other researchers in the study lab. Researchers viewed over 20 images and based on the ratings, 10 images were selected. An attempt was made to choose images with the least amount of advertisements and images of everyday women (not just models and/or celebrities). The images were selected of women that were rated as both attractive and thin with all ads being generally appealing to viewers, as done in previous research (Mills et al., 2002). All images were full body portraits on laminated paper (letter size). See Appendix B for the media images.

Positive and Negative Affect Schedule (PANAS)

The PANAS (Watson, Clark, & Tellegen, 1988) was used to assess both positive and negative affect when viewing the media images. The PANAS is a 20-item self-report measure that is divided into two subscales measuring positive and negative affect. Using a 5-point Likert scale, respondents indicate the extent to which they experience certain emotions. Sample items from the Positive Affect subscale include: "excited", "enthusiastic" and "proud". Sample items from the Negative Affect subscale include: "upset," "hostile," and "ashamed." Higher scores

reflect greater affect levels (either positive or negative). External validity studies have found that correlations between the Negative Affect subscale and various measures of distress and psychopathology ranged from .51 to .94, indicating that the PANAS is a good measure of negative affect (Watson et al., 1988). The PANAS can also be used to examine affect at different times including moment to moment in the same day. In the present study, participants were asked to respond to how they feel before the study commences, after exposure to the media images and after the taste manipulation. Internal consistency reliability for the two subscales are as follows: Positive Affect ($\alpha = .89$) and Negative Affect ($\alpha = .85$)(Watson et al., 1988). See Appendix C for the PANAS.

Binge Scale

The Binge Scale was used to assess both behaviour and attitudes associated with binge eating, such as frequency of binge eating, and feelings associated with binge eating (Hawkins & Clement, 1980). This is a 9-item self-report scale that uses a multiple choice format and includes questions such as, “How often do you binge? A) Seldom, B) Once or twice a month, C) Once a week, or D) Almost every day”, and “How much are you concerned about your binge eating? A) Not bothered at all, B) Bothers me a little, C) Moderately concerned, or D) Major concern.” The binge scale has been reported as having good internal consistency (Fairburn & Wilson, 1993), good construct validity and has been demonstrated to have one month test-retest reliability greater than .88 (Hawkins & Clement, 1980). See Appendix D for the Binge Scale.

Revised Restraint Scale (RRS)

The RRS was used to measure dietary restraint (Polivy, Herman, & Warsh, 1978). In this study, the RRS was included to determine if there are systematic differences in restraint status between the experimental groups. Further, it was beneficial to have a restraint measure since

many binge eaters show restrained eating behaviours. The scale is comprised of 12 items that assess diet and weight history and concern with food and eating (Heatherton et al., 1988). This self-report measure may also be used to divide participants into restrained and unrestrained eaters. 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 guilt after overeating?” A sample item from the Weight Fluctuation subscale is “Would a weight fluctuation of 5 lbs. affect the way you live your life?” Individuals with scores of 14 and below are classified as “unrestrained” eaters and those who score 15 and above are classified as “restrained” eaters, as has been used in research using female undergraduates (Herman et al., 2003). The Revised Restraint Scale has been demonstrated to have high test-retest reliability (.95) and internal consistency (.82) (Allison, Kalinsky, & Gorman, 1992). See Appendix E for the RRS.

Eating Disorder Examination—Questionnaire (EDE-Q)

The EDE-Q was used to provide a more comprehensive picture of participants’ eating pathology. More specifically, this questionnaire was used in conjunction with the Binge Scale to estimate participants’ number of binge episodes in the last four weeks. The EDE-Q is a self-report measure of eating disorder psychopathology based on the eating disorder examination and focuses participants’ responses on the past 28 days (Fairburn & Beglin, 1994; Fairburn & Cooper, 1993). The measure assesses the main behavioural tenets of eating disorders (e.g., dietary restriction, episodes of binge eating, vomiting) and generates four subscales that assess dietary restraint, eating concern, shape concern and weight concern. It uses a seven-point forced-choice rating scheme for these subscales. Frequencies of key eating disorder behaviours are measured based on the number of days on which each particular behaviour occurs. Cronbach’s

alpha co-efficients for the four subscales ranged from .78-.93, and Pearson co-efficient correlations for the reliability ranged from .81-.94 across the subscales (Luce & Crowther, 1999). See Appendix F for the EDE-Q.

Emotional Eating Scale (EES)

The EES was developed by Arnow, Kenardy, and Agras (1995) to measure the intensity of the relationship between eating and mood. The EES is a 25 item self-report measure that adopts a likert-type format. Respondents are asked to indicate the extent to which they feel the urge to eat in response to a specific emotion. Respondent's answer choices are: "no desire to eat, a small desire to eat, a moderate desire to eat, a strong urge to eat, and an overwhelming urge to eat." Sample items include: "sad, nervous, helpless, and resentful." The EES has three subscales: anger/frustration, anxiety, and depression. The EES has been found to be internally consistent, demonstrate adequate temporal stability and show efficient discriminant validity (Arnow et al., 1995). Research has found that the subscales of the EES correlate significantly with one week recall of binge episodes suggesting that binge episodes are associated with eating more in response to negative affect (Arnow et al., 1995), which is of interest for the current study. See Appendix G for the EES.

Emotional Overeating Questionnaire (EOQ)

The EOQ (Masheb & Grilo, 2006) is a new measure that assesses the frequency of overeating in response to emotions. The EOQ is a six-item self-report measure that has a similar style to the EDE-Q. Respondents are asked to reflect on the past 28 days and report the frequency of eating an unusually large amount of food in response to a specific emotion. The emotion is presented along with synonyms to provide clarity of the emotion. The six emotions assessed are: anxiety, sadness, loneliness, tiredness, anger and happiness. A sample is:

“SADNESS (blue, down, depressed).” The EOQ provides a frequency response set, which is standard in most eating disorder research (Wilson, 1993). The EOQ has been found to be internally consistent (.85) with good test-retest reliability (intraclass correlation coefficients = .62 to .73) (Masheb & Grilo, 2006). The EOQ was beneficial to this study, as it has found significant associations for binge frequency. In addition, the EOQ also tests for positive emotional experience as an antecedent to overeating rather than negative affect alone. See Appendix H for the EOQ.

Procedure

Participants selected after being screened for their binge status (along with food aversions/allergies and treatment of depression/eating disorders) were contacted by the researcher. Participants were asked to participate in a taste test study investigating the effects of perception and memory on taste ratings. This cover story was used to mask the true purpose of the study. Participants were instructed to eat a moderate amount of food between 1 and 3 hours before their appointment in the lab. This was done to help assure some uniformity and a relatively neutral state of hunger for all participants. In addition, participants were asked at the time of initial contact if they present with any allergies and/or aversions to either chocolate or peanut butter. This was done to ensure participant’s safety and to ensure that participants would be able to participate in the taste test (See Appendix I for the contact script).

All participants were tested individually by the same investigator, a master’s candidate in clinical psychology. Individual testing appointments were booked between the hours of 12 and 6 p.m., as is standard procedure in “taste test” style eating studies (McFarlane, Polivy, & Herman, 1998). The complete study took approximately 45 minutes to complete. Upon arrival in the lab, participants were asked to read the letter of information and sign the consent form and were

given a copy for their own records (See Appendix J). At this time, participants were reminded that the purpose of the study was to investigate the manner in which individual perception and memory affect taste perception. Further, they were informed that they would be taste-testing three kinds of candy. After consenting to participate, participants were randomly assigned to the social comparison group or the aesthetic quality group and were given the corresponding task (See Appendix K for the instructional sets). All 10 images were presented to the participants along with a pencil and sheet of paper. Participants in the aesthetic quality task were shown the images and asked to write a paragraph about what they perceived in the images (such as colour, background, props). In this task, participants were told to focus on the aesthetic quality of the image. This was done to assess whether participants could focus attention away from the thin image and further provided a comparison group for the experimental condition. Participants in the social comparison task were shown the same images and asked to write a paragraph on how they perceived themselves in comparison to the images (e.g., in terms of physical appearance and body image). This group was asked to focus on the thin image for their task. This was done to induce social comparison and examine how people felt about themselves and the images. Both groups were given 15 minutes to complete the task. During this time, the investigator left the room to allow the participants to view the images and complete the task in private.

Following completion of the task, participants were told that the experimenter was not quite finished getting the candies ready for the taste test and they were asked whether they would mind completing a questionnaire for another student doing a study while they waited for the candies. At this time, the PANAS was administered, along with a series of demographic questions (See Appendix L). The cover story at this point was intended to mask the importance of the mood variable to control for possible expectancy effects (Aubie & Jarry, in press).

Once these questionnaires were completed, the experimenter re-entered the room, this time carrying a tray with the three bowls of candies and a bottle of water. Participants were given the candy taste rating form and were informed that they were going to sample three flavours of candies. The candies were presented to the participant as either candy “A,” “B,” or “C”, the order of which was randomly determined. Each small bowl contained 150 candies. Each bowl of candies was weighed before and after being presented to the participant.

Participants were given the entire instructions for the taste test before being left alone in the room to complete this part of the study (See Appendix K). Participants were instructed to begin by taking a sip of water to cleanse their palate and then to begin testing candy “A.” They were instructed to eat as many of these candies as necessary to complete their ratings. Participants were told that once they were satisfied with their ratings of candy “A,” they were to proceed to candy “B,” following the same protocol. Participants were asked that once they move to candy “B,” that they not go back and change their ratings of candy “A.” Participants were told that once candy “B” is rated, they take another sip of water and continue on to candy “C.” After these instructions, the experimenter left the room and informed the participants that she would return in 10 minutes, which is the standard time period in taste test studies (McFarlane et al., 1998). In addition, the researcher informed participants that once their ratings were done, they should feel free to have as many candies as they please as there are “plenty” left. See Appendix M for rating forms.

Following the taste-test period, the experimenter removed the three bowls of candies and asked the participants to complete a questionnaire package as the final phase of the study. Participants completed: the Binge Scale, the Revised Restraint Scale, the Eating Disorders Examination-Questionnaire, the Emotional Eating Scale, and the Emotional Overeating

Questionnaire. The questionnaire package also included the Positive and Negative Affect Schedule in order to provide a second mood rating after the taste test, which was presented first in the package to avoid a possible confound of other measures causing a change in affect compared to engaging in the taste test itself. Finally, participants were asked to complete a few post-experimental questions to determine the credibility of the thin ideal representation of the images and the social comparison or aesthetic quality manipulation (See Appendix N). During this time, the candies were counted to determine participants' food consumption. The candies were also weighed in order to verify accuracy in measurement. This procedure replicated previous studies (Aubie & Jarry, in press; Bola & Jarry, 2006).

Once the questionnaires were completed (approximately 15 minutes), participants were reminded that they would be contacted via email or telephone after approximately one month once data collection had been completed. Participants were emailed a brief description of the study's results along with a full debriefing (See Appendix O) in which the true purpose of the study was explained to the participant. Participants were debriefed after all of the data was collected in order to prevent contamination of results and to protect the internal validity of the study.

Results

Analytical Strategy

Group differences in binge status (binge vs. nonbinge) by instructional set (aesthetic quality vs. social comparison) for the amount of food consumed were analyzed by univariate analysis of variance (ANOVA). In addition, both group differences by instructional set for positive and negative affect were analyzed by ANOVAs. A measure of affect was obtained at

two different time points in the study¹; a possible change in affect was assessed by conducting a repeated measures ANOVA. A multivariate analysis of variance (MANOVA) was used to analyze group differences in variables related to eating pathology and emotional eating.

Independent samples *t* tests were used to analyze differences in restrained eating and body mass index. Differences in emotional overeating were analyzed using univariate ANOVA. Further, qualitative data provided by participants in their written paragraphs as part of the instructional set task were coded into categories according to the number of comments made about weight/shape, model appearance, self-mood, and model-mood. Differences in the frequency of participants writing comments made in each category were analyzed by Chi-Square analyses. Further analyses were conducted by comparing means (independent samples *t* tests) on single items such as the manipulation checks for each condition.

Participant Screening

Participants were administered the screening questionnaire in order to determine eligibility on the basis of inclusion criteria for binge eating; that is, engaging in binge eating episodes accompanied by a perceived loss of control during the episodes. Exclusion criteria included allergies to chocolate or peanut butter, and currently receiving treatment for an anxiety disorder, eating disorder, or depression. Two hundred and fifty-nine students completed the screening questionnaire. One hundred and eighty-five participants in total were eligible to participate in the study, of which 56 participants met binge criteria and 129 met nonbinge criteria. Results of the screening questionnaire are presented in Table 1.

Participants Included and Excluded

¹ The first measure of affect was obtained directly after viewing the thin media images and engaging in the task. The second measure of affect was obtained after the taste-test portion of the study.

A total of 79 participants completed the experiment. Two of these participants were excluded from data analyses due to concerns about their validity: one participant had different responses on the screening questionnaire compared to the actual study questionnaires, and the other participant was noncompliant with the instructions of the task. Of the remaining 77 participants, a further 17 were excluded from the data analyses because they did not meet criteria for binge eating as outlined by the DSM-IV-TR (APA, 2000). That is, participants included in the study for binge eating met the criteria of binge eating at least twice a week or more accompanied by a perceived loss of control over eating. The nonbinge participants reported seldom binge eating or none at all. It was difficult to not include the seldom binge eaters due to the high percentage of participants (46%) who reported some binge eating behaviour on the screening questionnaire. Participants' binge eating was assessed post-screening with the Binge Scale and items assessing binge eating on the EDE-Q. Thus, data analyses were conducted on a final sample of 60 participants. Participants were divided into two groups (binge vs. nonbinge) and randomly assigned to two conditions of instructional set (aesthetic quality vs. social comparison). There were a total of 29 binge eaters and 31 nonbinge eaters. Further, 32 participants received the instructional set for the aesthetic quality condition and 28 participants were assigned to the social comparison condition.

Data Preparation

Data was cleaned and examined for outliers using SPSS Explore. In addition, values for the main dependent variable of food consumed were converted to z scores and examined for outliers meeting criteria of 3 standard deviations above or below the mean. Data screening did not reveal any outliers. The affect measure (PANAS) was found to be negatively skewed; thus, log transformations were computed for this variable. The data screening revealed a few missing

Table 1

Participant Screening Results

	Binge Group	Nonbinge Group	Mixed Group
Total participants screened	61	130	68
Engage in binge eating (Mixed group- no loss of control)	61	0	38
Experience loss of control (Mixed group- no binge episodes)	61	0	18
Food allergies (chocolate/peanut butter)	1	1	2*
Treatment for depression	3	0	5*
Treatment for eating disorder	1	0	1*
Treatment for anxiety disorder	0	0	4*
Total participants meeting criteria	56	129	68

Note. The mixed group is comprised of individuals who may have engaged in binge eating and may not have experienced a loss of control or vice versa. * Indicates that there may be overlap among the disorders (and/or allergies), in which an individual may be seeking treatment for more than one disorder (or also has allergies).

data points. In two cases, one item on the RRS was prorated according to the participant's item mean rounded to the nearest whole number. On the EDE-Q, in two cases, one item was prorated to the participant's item mean for that subscale. In one case, two items were prorated to the participant's item mean for that particular subscale. On the EES, in 8 cases, one item was prorated to the participant's mean score for that scale. In two cases for both the EES and EOQ, the full questionnaire was left blank resulting in those two cases being dropped from the analyses of those specific two measures.

Sample Characteristics

Analyses were conducted on 60 females meeting the inclusion/exclusion criteria for the study. The age of the sample ranged from 17 to 34 years with the mean age of 19.4 ($SD = 2.88$). Approximately 92% of the sample indicated their relationship status to be single, 5% were married or in a common law relationship, and 3% were divorced or separated. The majority of the sample were Caucasian (76%), 7% were European, 5% were Native Canadian, 2% were East Asian, 2% were Hispanic, and 8% indicated 'other' as their background. Ninety-eight percent of the sample were full-time students, while 2% indicated that they attend school on a part-time basis.

Analysis of Food Consumption

A 2 (binge eater vs. nonbinge eater) X 2 (social comparison vs. aesthetic quality) between-subjects ANOVA was conducted to test the hypothesis that binge eaters would consume more food compared to the nonbinge comparison group. Further, it was predicted that binge eaters would consume more food as a function of instructional set. More specifically, binge eaters would eat more in the social comparison task compared to nonbinge eaters. Further, it was predicted that a similar effect would not occur in the aesthetic quality condition. That is, the

researcher predicted that the impact of thin media images on the food consumed by binge eaters and nonbinge eaters would be a function of social comparison. The means and standard deviations of food consumed (number of candies eaten) in each condition are presented in Table 2.

Analysis revealed a significant main effect of binge status such that binge eaters ate more ($M = 41.21, SD = 20.24$) compared to nonbinge eaters ($M = 22.16, SD = 15.51$), $F(1, 59) = 17.75, p < .01, \eta_p^2 = .24$ (partial Eta squared; measure of strength of relationship). The main effect for instructional set was not significant. The main effect of binge status was qualified by a significant two-way interaction with the instructional set, $F(1, 59) = 4.03, p = .05, \eta_p^2 = .07$. The interaction is displayed in Figure 1.

The simple effect of binge status upon amount of food consumed under the instructional set of aesthetic quality was not significant. This simple effect revealed a statistical trend for instructions of social comparison, with binge participants consuming more candies than nonbinge counterparts, $F(1, 28) = 3.44, p = .07, \eta_p^2 = .11$.

Analysis of Affect

A 2 (binge eater vs. nonbinge eater) X 2 (social comparison vs. aesthetic quality) between-subjects ANOVA was computed to examine the effect of instructions to engage in social comparison to thin media images upon subsequent affective states. It was predicted that participants who were asked to self-compare to the media images would report higher levels of negative affect on the PANAS as compared to those who were instructed to focus on the aesthetic qualities of the image. Analyses failed to reveal significant main effects of instructional set or interaction with binge status. However, binge status itself was a statistically

Table 2

Amount of Food Consumed in Each Experimental Condition as a Function of Binge Status and Instructional Set

Instructional Set	Binge		Nonbinge	
	<i>n</i>	<i>M(SD)</i>	<i>n</i>	<i>M(SD)</i>
Aesthetic Quality	14	34.29(20.2)	18	24.22(17.28)
Social Comparison	15	47.67(18.66)	13	19.31(12.77)

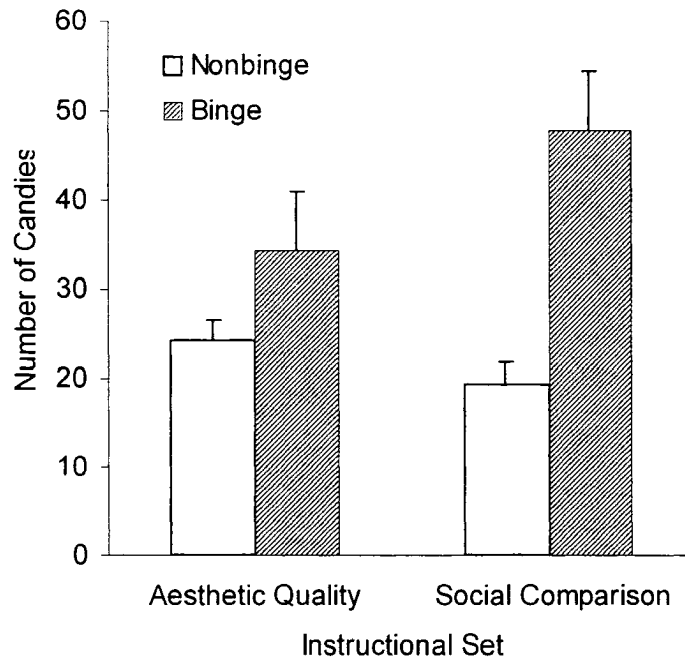


Figure 1. Mean number of candies consumed (+ SE) for binge and nonbinge groups in aesthetic quality and social comparison conditions.

significant main effect. The means and standard deviations for the negative affect scores as a function of binge status are presented in Table 3. Binge eaters reported more negative affect after viewing the images (time one) compared to nonbinge eaters, $F(1, 59) = 8.64, p = .005, \eta_p^2 = .13$.

Additionally, a 2 (binge eater vs. nonbinge eater) X 2 (social comparison vs. aesthetic quality) between-subjects ANOVA was conducted to examine the impact of engaging in eating behaviour during the taste test on ratings of affect. Analyses failed to reveal a significant difference in negative affect after eating (time two) as a function of instructional set. However, significant differences were found as a function of binge status. The means and standard deviations for the negative affect scores as a function of binge status are presented in Table 3. Binge eaters reported more negative affect immediately after the taste test in comparison to nonbinge eaters, $F(1, 59) = 5.66, p = .02, \eta_p^2 = .09$.

In order to evaluate a possible change in negative affect over time, a repeated measures univariate analysis of variance (ANOVA) was conducted. The time main effect and time x binge status interactions were not significant. However, main effect of binge status was significant such that collapsed over time one and time two, binge eaters reported more negative affect on the PANAS compared to nonbinge eaters, $F(1, 59) = 7.26, p < .01, \eta_p^2 = .12$.

Further, a 2 (binge eater vs. nonbinge eater) X 2 (social comparison vs. aesthetic quality) between-subjects ANOVA was conducted to examine the impact of instructional set and binge status on ratings of positive affect on the PANAS. Analyses failed to reveal significant main effects of instructional set or interaction with binge status. Further, no significant differences were found in positive affect as a function of time.

Qualitative Data Analyses

Table 3

Mean Scores for Negative Affect as a Function of Binge Status and Instructional Set

Mean Scores	Binge		Nonbinge	
	<i>n</i>	<i>M(SD)</i>	<i>n</i>	<i>M(SD)</i>
Time one	29	17.17(5.92)	31	13.10(4.60)
Time two	29	16.34(6.36)	31	12.55(5.64)

Note. Time one was measured immediately after viewing the images and conducting the experimental task. Time two was measured immediately after completing the taste test portion of the study.

As part of the task in the experiment, participants were asked to write a paragraph as per the instructions provided (See Appendix K). In order to analyze the qualitative data, the researcher developed four areas to categorize the written comments made by each participant; weight/shape (model or self), model appearance, self-mood and model-mood. Each of the four areas was then subcategorized as to the affective valence of the written comment; positive, negative, neutral, and total. The researcher and two prototypic raters read through all participants' paragraphs and rated the number of positive, negative, neutral, and total comments made in each area. Raters were provided with specific instructions to complete the ratings as well as examples of comments that would fit under each of the categories (See Appendix P). The two raters showed 80% agreement across all ratings.

Eight separate Chi-Square Tests for Independence (four comment types x two affective valences of positive and negative) were conducted to test the null hypothesis of no experimental effect of binge status or instructional set upon the percent of participants who wrote one or more comments of a given type and valence. Results led to the rejection of the null in four of eight tests of the hypothesis: Specifically, (a) positive weight/shape comments, $\chi^2(3, N=60) = 7.32, p < .05, \phi = .35$ (phi coefficient; measures of strength of association for a contingency table); (b) negative weight/shape comments, $\chi^2(3, N=60) = 10.83, p < .001, \phi = .42$; (c) positive self- mood comments, $\chi^2(3, N=60) = 13.67, p < .01, \phi = .48$; and (d) negative self-mood comments, $\chi^2(3, N=60) = 22.68, p < .001, \phi = .61$ (See Table 4). The Chi-Square Tests of Independence were not statistically significant for the positive and negative comments written about models' appearance and mood.

In order to examine the specific effects of the Chi-Square analyses across cells, post-hoc comparisons were conducted comparing binge status (binge vs. nonbinge) across instructional

Table 4

Percent of Participants in Each Condition Who Wrote One or More Comments By Category

Comment Type	Social Comparison		Aesthetic Quality	
	Binge	Nonbinge	Binge	Nonbinge
Weight/Shape				
Positive	46.7	38.5	14.3	11.1
Negative	80	61.5	21.4	44
Self-Mood				
Positive	40	23.1	0	0
Negative	60	38.5	0	0
Model Appearance				
Positive	73.3	69.2	71.4	38.9
Negative	46.7	61.5	57.1	61.1
Model-Mood				
Positive	20	0	7.1	16.7
Negative	20	38.5	21.4	27.8

set, and instructional set (social comparison vs. aesthetic quality) across binge status. This resulted in 16 separate Chi-Square Tests for Independence (two comment types x two affective valences of positive and negative x 4 filtered variables of binge status and instructional set).

When examining effects of binge status across instructional set, the Chi-Square Tests of Independence were not statistically significant.

However, examining the effects of instructional set in binge and nonbinge eaters yielded 7 out of 8 statistically significant findings. Specifically, for binge eaters, (a) positive weight/shape comments, $\chi^2(1, N=29) = 3.55, p < .01, \phi = .35$; (b) negative weight/shape comments, $\chi^2(1, N=29) = 9.95, p < .001, \phi = .59$; (c) positive self- mood comments, $\chi^2(1, N=29) = 7.06, p < .001, \phi = .49$; and (d) negative self-mood comments, $\chi^2(1, N=29) = 12.18, p < .001, \phi = .65$. For nonbinge eaters, (a) positive weight/shape comments, $\chi^2(1, N=31) = 3.23, p < .01, \phi = .32$; (b) positive self- mood comments, $\chi^2(1, N=31) = 4.60, p < .01, \phi = .39$; and (c) negative self-mood comments, $\chi^2(1, N=31) = 8.25, p < .01, \phi = .52$.

Summarizing the results of these 7 statistical tests, it appears that both binge and nonbinge participants responded similarly across all comment types and affective valences except for negative comments about weight/shape (See Table 4). That is, a similar percentage of binge eaters and nonbinge eaters wrote one or more comments for the given categories in each condition, with the higher percentage of comments being made in the social comparison condition. A higher percentage of binge eaters (80%) tended to write one or more negative comments about weight/shape in the social comparison condition compared to 20% of binge eaters in the aesthetic quality condition. Of the remaining binge participants, 20% in the social comparison condition and 78.6% in the aesthetic quality condition did not write any comments about weight/shape. On the other hand, the same percentage (50%) of nonbinge eaters wrote one

or more negative comments about weight/shape in both the social comparison and aesthetic quality conditions.

Summarizing the results of these four statistical tests (including the post-hoc analyses), it would appear that experimental instructions to engage in social comparison with the model images is associated with a greater probability over aesthetic quality instructions to subsequently write one or more positive and negative comments about weight/shape and one's own mood.

Avoidance of Thin Model

An independent samples t test (binge eater vs. nonbinge eater) was used to test the hypothesis that binge eaters would have a more difficult time avoiding the thin model in the aesthetic quality condition compared to nonbinge eaters. Participants were asked to rate a single item on a likert-type scale (1 to 9) indicating whether they were able to focus solely on the aesthetic quality of the images as per the instructions given. The lower end of the scale represented a greater ability to focus on the aesthetic quality of the images and the higher end of the scale represented a tendency to focus more on the thin model. Overall, the average response to the item was 4.21 ($SD=1.52$). Analyses revealed a significant main effect whereby binge eaters reported more difficulty in avoiding the thin model and focusing solely on the aesthetic qualities of the images ($M = 4.87, SD = 1.46$) compared to nonbinge eaters ($M = 3.50, SD = 1.29$), $t(27) = 2.67, p = .01, \eta_p^2 = .21$.

Body Mass Index

Data were analyzed in order to assess for group differences between the binge eaters and nonbinge eaters as a function of BMI. It was important to rule out BMI as a confounding factor for participant's reaction to the thin media images. Results did not show a significant difference

between binge eaters ($M = 25.36, SD = 4.49$) and nonbinge eaters ($M = 23.98, SD = 4.34$), $p = .23, r = .15$.

Restraint

Data were analyzed in order to assess the restraint status of binge eaters and nonbinge eaters. An independent samples t test was conducted to analyze differences between binge eaters and nonbinge eaters on their total RRS scores. Analyses revealed a main effect of binge status such that binge eaters were more restrained and met restraint status ($M = 18.21, SD = 4.94$) as compared to nonbinge eaters who were less restrained and did not meet restraint status ($M = 10.87, SD = 4.94$), $t(58) = 4.97, p = .001, \eta_p^2 = .3$.

Eating Pathology

A multivariate analysis of variance (MANOVA) was computed to assess for significant differences between binge eaters and nonbinge eaters on the measure of eating pathology contained within the EDE-Q. The multivariate statistic was significant, indicating an overall pattern of differences in scores as a function of binge status, Wilk's $\Lambda = 0.6, F(4, 55) = 9.13, p < .001, \eta_p^2 = .4$. Binge eaters reported higher scores on the Restraint subscale as compared to nonbinge eaters, $F(1, 59) = 15.31, p < .001, \eta_p^2 = .21$. Binge eaters also reported higher scores on the Eating Concerns subscale compared to nonbinge eaters, $F(1, 59) = 21.66, p < .001, \eta_p^2 = .27$. Further, binge eaters reported higher scores on the Shape Concerns subscale compared to nonbinge eaters, $F(1, 59) = 37.5, p < .001, \eta_p^2 = .39$. Binge eaters also reported higher scores on the Weight Concerns subscale compared to nonbinge eaters, $F(1, 59) = 34.23, p < .001, \eta_p^2 = .37$. Finally, binge eaters reported a higher global (total) score on the EDE-Q compared to nonbinge eaters, $F(1, 59) = 35.77, p < .001, \eta_p^2 = .38$. The means and standard deviations for the subscales and global score of the EDE-Q are presented in Table 5.

Table 5

Mean Scores (Standard Deviations) on the EDE-Q as a Function of Binge Status

Subscales	Binge		Nonbinge	
	<i>n</i>	<i>M(SD)</i>	<i>n</i>	<i>M(SD)</i>
Restraint	29	2.01(1.36)	31	.80(1.02)
Eating Concerns	29	1.7(1.17)	31	.54(.75)
Shape Concerns	29	3.72(1.35)	31	1.68(1.23)
Weight Concerns	29	3.28(1.38)	31	1.31(1.23)
Global	29	2.68(1.16)	31	1.08(.90)

Emotional Eating

Differences in emotional eating as a function of binge status were assessed by MANOVA. The EES was used as a measure of eating in response to different emotions. The multivariate statistic was significant, indicating an overall difference in emotional eating for binge eaters and nonbinge eaters, Wilk's $\Lambda = 0.65$, $F(3, 56) = 9.34$, $p < .001$, $\eta_p^2 = .35$. Binge eaters reported higher scores on the anger/frustration subscale (i.e., endorsing eating in response to related emotions) compared to nonbinge eaters, $F(1, 59) = 9.64$, $p < .01$, $\eta_p^2 = .15$. Binge eaters also reported higher scores on the depression subscale compared to nonbinge eaters, $F(1, 59) = 22.94$, $p < .001$, $\eta_p^2 = .3$. Finally, binge eaters reported a higher total score on the EES compared to nonbinge eaters, $F(1, 59) = 12.95$, $p < .001$, $\eta_p^2 = .19$. There were no significant differences as a function of binge status on the anxiety subscale. The means and standard deviations for the subscales and total score of the EES are presented in Table 6.

Emotional Overeating

A 2 (binge eater vs. nonbinge eater) X 2 (social comparison vs. aesthetic quality) between-subjects ANOVA was computed to examine differences between binge eaters and nonbinge eaters with respect to emotional overeating on the EOQ. Additionally, it was of interest to see if items related to emotional overeating were endorsed more as a function of instructional set. Results showed a significant main effect of binge status such that binge eaters endorsed higher scores (i.e., endorsed overeating in response to emotions) ($M = 1.54$, $SD = .91$) compared to nonbinge eaters, ($M = .65$, $SD = .84$), $F(1, 57) = 15.04$, $p < .001$, $\eta_p^2 = .22$. Further, there was a main effect of instructional set, such that participants in the social comparison condition endorsed higher scores on the EOQ ($M = 1.35$, $SD = 1.11$) compared to participants in the aesthetic quality condition ($M = .84$, $SD = .76$), $F(1, 57) = 4.51$, $p < .05$, $\eta_p^2 = .08$.

Table 6

Mean Scores (Standard Deviations) on the EES as a Function of Binge Status

Subscales	Binge		Nonbinge	
	<i>n</i>	<i>M(SD)</i>	<i>n</i>	<i>M(SD)</i>
Anger/frustration	29	1.25(.66)	31	.66(.69)
Depression	29	2.34(.74)	31	1.39(.75)
Anxiety	29	1.03(.61)	31	.79(.65)
Total	29	1.54(.55)	31	.95(.64)

*Manipulation Checks**Cover story*

Upon completion of the study and once all data was collected, participants were debriefed via email. At this time, participants were asked to answer a final question asking whether they believed the ‘cover story’ that the study was investigating the relationship between perception of visual images and taste perception. Of the 60 participants in the study, 24 responded to the email. The single item was presented on a likert-type scale (from 1 to 9) with the lower end indicating complete disbelief in the cover story and the higher end indicating total belief in the cover story. Participant’s mean answer to the item was 6.96 ($SD = 2.26$).

Independent samples t tests were computed to examine whether there were differences in belief in the cover story as a function of binge status as well as instructional set. Analyses revealed a main effect of binge status such that binge eaters reported less belief in the cover story ($M = 5.69$, $SD = 2.32$) compared to nonbinge eaters ($M = 8.45$, $SD = .82$), $t(22) = 3.74$, $p < .001$, $\eta_p^2 = .39$.

Thin media images

In order to assess whether the images were thought to portray the thin ideal as presented in the media, all participants were asked to rate a single item asking if the images viewed were an accurate representation of the thin ideal portrayed by the media. The item was presented on likert-type scale from 1 to 9. The lower end of the scale indicated that the images did not accurately portray the thin ideal and the higher end indicated that the images did accurately portray the thin ideal as presented in the media. The average score of 58 respondents was 7.34 ($SD = 2.06$). Analyses did not reveal any significant differences in ratings of the images as a function of binge status or instructional set.

Social comparison task compliance

Participants assigned to the social comparison task were asked to rate a single item asking if they followed the instructions provided and compared themselves to the images. The item was presented on likert-type scale from 1 to 9. The lower end of the scale represented participants not engaging in social comparison with the thin models in the images and the higher end represented full social comparison to the thin models in the images. The average score of the 29 respondents assigned to this task was 5.17 ($SD=2.19$). Analyses did not reveal any significant differences in ratings of the degree of social comparison to the thin model in the image as a function of binge status.

Discussion

The goals of the present study were to examine the impact of thin media images on the eating behaviour and affect of binge eaters and nonbinge eaters. Whereas the majority of the literature in this area has focused on restrained eaters (dieters) and specific eating disorders (such as AN and BN), the present study expanded previous research to include binge eaters. Further, the current study used social comparison to thin media images to induce negative mood in the experimental task and to examine whether social comparison is truly automatic or avoidable.

It was predicted that binge eaters would eat more than the nonbingeing comparison group in vivo, particularly while under instructions to engage in social comparison relative to instructions to attend to the aesthetic qualities of the images. This was confirmed in the present study. This finding is consistent with previous studies (Bola & Jarry, 2006) where binge eaters ate more when viewing thin images versus neutral images. Similar results have also been found for restrained eaters (e.g., Mills et al., 2002), whereby restrained eaters were found to disinhibit and eat more compared to unrestrained eaters when viewing thin media advertisements.

Additionally, it was predicted that participants who were asked to self-compare to the media images would report higher levels of negative affect compared to those who were asked to focus on the aesthetic qualities of the image. This hypothesis was not supported in the current study. The only significant finding with respect to affect found in the current study was that binge eaters reported more negative affect at both time one (after viewing the images) and time two (after the taste-test procedure) compared to nonbinge eaters. It is possible that binge eaters report more negative affect in general, compared to nonbinge eaters. The current study did not have a baseline measure for affect due to the concern that multiple measures of affect in a short amount of time would invalidate the mood ratings or the cover story presented to the participants. However, a possible effect of negative affect overall was controlled for by random assignment to the tasks (instructional set). That is, by randomly assigning participants to each task, one would not expect that differences as a function of instructional set would be attributable to binge eaters displaying an overall negative affect. If binge eaters were showing general negative affect throughout the study, we would not expect any differences in the means of their affect scores in each task as well as at both times.

There was no effect of instructional set on the affect of participants. These findings do not support the affect regulation models; in that, binge eaters did not eat in response to negative affect as induced by the experimental condition. However, it is possible that the PANAS was not able to capture sudden changes in affect given the short time interval between administrations. It may have been more beneficial to use a different measure such as a visual analogue scale to capture sudden changes in mood. Further, the first measure of affect was masked as a measure for another researcher's study. Therefore, participants may have filled the measure out differently and reported on their general affect to separate it from the current study. That is, they

may have deliberately chosen to rate the items on the PANAS in a certain manner so that they reported on their general affect and not their affect in response to viewing the images. Finally, it is possible that the items on the PANAS may not have tapped into the affect states associated with viewing thin media images. For example, negative items such as afraid, scared and hostile may not have captured reactions to the images whereas items such as sadness and inferiority may have been more suitable. By the same token, positive affect items such as “enthusiastic”, “inspired” and “excited” may not have captured positive affect reactions to the images whereas items such as content, happy, and pleasant may have been more suitable.

Exploratory analyses with the qualitative data showed that a higher percentage of binge eaters and nonbinge eaters made one or more negative comments about the model’s or their own weight/shape and own mood in the social comparison condition compared to the aesthetic quality condition. However, a higher percentage of binge eaters made one or more negative comments about weight/shape in the social comparison condition compared to the aesthetic quality condition, whereas the percentage of nonbinge eaters who made one or more negative comments about weight/shape was the same for each condition. Perhaps, more binge eaters made such negative comments in the social comparison condition as a function of being asked to compare themselves to the models in the images. Also, it may be possible that both binge eaters and nonbinge eaters may have given an inaccurate reporting of weight/shape comments in the aesthetic quality task as a function of the instructions provided.

Interestingly, binge eaters and nonbinge eaters responded similarly on all other comment types and affective valences. That is, binge eaters and nonbinge eaters responded similarly for positive comments made about weight/shape, and both positive and negative comments made about self-mood. Perhaps the social comparison task led binge eaters to respond differently with

respect to positive and negative comments about weight/shape, where nonbinge eaters responded similarly. Similarity in the number of positive and negative written comments about self-mood is likely better accounted for by the fact that all comments about self-mood were made in the social comparison condition. Therefore, binge eaters and nonbinge eaters only wrote comments about self-mood in the social comparison condition as no comments were written in the aesthetic quality condition. Further studies will help clarify the function of the model's weight/shape in binge eating and this group's response to thin media images.

In examining the experimental manipulation of inducing social comparison compared to instructions to focus on the aesthetic quality of the image, it was predicted that binge eaters in the latter condition would attend to the thin model more than the nonbinge eaters. This hypothesis was supported in the current study. Binge eaters reported that it was more difficult to avoid the thin model compared to nonbinge eaters. Perhaps, binge eaters are more sensitive to thin media images including the weight and body shape of the models as compared to nonbinge eaters. This finding lends support to social comparison theory (applied to body image) whereby women may use media channels to engage in comparisons in relation to appearance, weight and body shape (Thompson et al., 1999). Also, the difficulties in avoiding the thin model lend support the idea that such comparisons to media images may occur automatically (Botta, 1999).

Secondary Analyses

It was found that binge eaters were more restrained than nonbinge eaters. This finding lends support to previous studies that have looked at the effect of exposing restrained and unrestrained eaters to thin media images (Joshi et al., 2003; Mills et al., 2002). However, it is important to note that in the current study, the participants were asked to self-compare to the media images and were not simply exposed to the media images. Also, binge eaters were

exposed to the same images in the aesthetic quality condition. Thus, if eating more (candies) were a sole function of exposure to the media images, we would not expect differences in the amount of food consumed in each task (social comparison and aesthetic quality). Since this difference was found, it is likely that the task (e.g., social comparison) influenced the eating behaviour of binge eaters and nonbinge eaters.

Significant differences were not found with respect to body mass index for binge eaters and nonbinge eaters. This finding was important to rule out body mass index as a potential confounding factor in the study. For example, if all binge eaters reported significantly higher body mass index scores than nonbinge eaters, their reaction to the thin media images may have been different (especially as function of instructional set). That is, larger women may have reacted to the thin media images differently compared to women of similar size. A lack of support for body mass index differences suggests that binge eaters were similar to nonbinge eaters in terms of weight and perhaps differences would not be found based on binge status. However, this was not the case, suggesting that other factors differentiating binge eaters and nonbinge eaters may have played a more significant role in the effect of the thin media images on the variables studied for these groups.

The current study also explored differences in eating pathology for binge eaters and nonbinge eaters. Binge eaters were found to report higher eating pathology scores compared to nonbinge eaters. That is, binge eaters reported higher scores for restraint, eating concerns, shape concerns, weight concerns, and global scores. It is possible that these differences in eating pathology between binge eaters and nonbinge eaters accounted for the different effect of thin media images on these groups with respect to food consumed and ability to avoid the thin model. Higher scores on the eating concerns subscale may lend support to binge eaters eating more in

response to social comparison to the images compared to nonbinge eaters. Further, given that binge eaters were more restrained than nonbinge eaters, eating behaviour may be explained by restraint theory. That is, binge eaters may have disinhibited and eaten more as a function of their restraint status. In addition, higher scores on the weight and shape subscales may explain binge eaters reporting more difficulty in avoiding the thin model (in the aesthetic quality instructional set) as compared to nonbinge eaters.

The current study lends support to the notion that binge eaters eat in response to certain emotions more than nonbinge eaters. Binge eaters reported eating more in response to anger/frustration and depression, as well as reporting higher total scores on the EES. The finding that binge eaters reported eating more in response to certain emotions is consistent with research providing evidence for the affect regulation models, suggesting that negative affect is an antecedent to binge eating (Aubie & Jarry, in press; Davis & Jamieson, 2005). Further, no differences were found on the anxiety subscale suggesting that binge eaters and nonbinge eaters do not eat differently in response to anxiety. For future research, it would be interesting to see if inducing social comparison to the thin images induces anxiety in binge eaters and nonbinge eaters and what effect this has on eating behaviour and affect.

Though binge participants reported eating in response to certain emotions; in the current study, participants did not report more negative affect as a result of social comparison to the thin media images. Perhaps binge eater's eating behaviour can be explained by escape theory whereby binge eaters may have been in a state of negative self-awareness during the comparison task leading them to eat more as a mechanism of escaping and averting self-awareness.

Along with emotional eating, significant differences in emotional overeating were found as a function of binge eating and instructional set. Binge eaters were found to report more

overeating in response to certain emotions (predominantly negative) compared to nonbinge eaters. Further, overeating in response to emotions was endorsed more in the social comparison condition compared to the aesthetic quality condition. These findings are consistent with the results for the amount of food consumed, such that binge eaters ate more in the social comparison condition compared to nonbinge eaters. These measures of emotional eating and overeating were used for secondary and exploratory analyses in the current study. Future research might benefit from directly examining the influence of these variables on binge eating.

Manipulation Checks

Participants were asked via email to rate their belief in the cover story. Only 24 participants completed this rating. The small number of respondents was likely due to the fact that participants were asked to respond to an email. However, it was apparent that overall, participants believed the cover story and did not know the true purpose of the study. Interestingly, binge eaters believed the cover story less than nonbinge eaters.

As part of the study, participants were asked to rate the extent to which they believed that the thin media images were representative of the images they see in the media. Participant ratings confirmed that the images used in the study were an accurate representation of thin media images. There were no differences in the ratings between binge eaters and nonbinge eaters. This suggests that the images were representative to both groups, thus ruling out media representation as a potential confounding factor. For example, if the groups had differed in their opinions as to whether the images represented the thin ideal, this would have implications for their reaction to the images for both affect and the amount of food consumed.

Finally, participants in the social comparison group were asked to rate their compliance with the task. The task compliance was average. This may have affected the results. Higher

compliance with the task may have yielded different results. Also, a single measure was used to assess compliance. Perhaps, a more comprehensive measure of compliance would have been useful. Further, participants were given instructions to compare themselves, perhaps more detailed instructions such as a checklist or specific questions addressing these comparisons would have been useful and kept participants on track in making comparisons in key areas (e.g., mood, weight/shape, appearance).

Strengths and Limitations

A strength of the present study is that it is the first to examine the role of social comparison to thin media images with a sample of the binge eating population. The current study is also one of the first studies (besides Bola & Jarry, 2006) to examine the impact of thin media images on the eating behaviour and affect of binge eaters. Other studies have focused on restrained eaters and individuals with eating disorders. Next, the current study adopted strict inclusion criteria. The binge group was comprised of individuals who met binge criteria as outlined in the DSM-IV-TR (APA, 2000). Adopting such criteria allows the sample to be more comparable to a clinical sample.

Another strength of the study is that it employed an experimental design. Previous studies and theories (e.g., restraint theory) were founded in laboratory research (Polivy & Herman, 1985, 1999). The current study adds to this body of literature. In order to replicate some of the experimental studies in the literature, the current study used deception. This was a strength of the study because participants did not know the true purpose of the study, which protected the internal validity of the study. If participants knew what the study was truly about, they may not have endorsed certain items on measures. More importantly, they may not have eaten as they normally would have in response to such images.

A final strength of the current study is the qualitative data that was provided by participants as part of their tasks. This information was valuable in order to get additional indications of participant's mood in response to the thin media images. Further useful information was obtained by participant's comments made about the model's weight/shape. The qualitative data also gave participants a chance to voice their opinions (whether positive or negative) about the thin media images.

The present study is not without limitations. First, the sample size was small. A number of participants were dropped from the study in order to adhere to the strictest inclusion criteria for binge eating. That is, the researcher chose to omit cases that did not meet diagnostic criteria for binge eating. This was done in order to obtain a sample that would be similar to a clinical sample. By choosing stricter criteria, some cell sizes were uneven. This was most apparent in the nonbinge group. Though it was attempted to obtain a sample similar to a clinical sample, generalizability is still an issue. The results of this study are generalizable to other university samples, but further research would need to be done in order to match a clinical sample.

Another limitation of the study was affect measurement. First, a baseline measure of affect was not obtained. As a result, it is possible that binge eaters have more negative affect as a trait quality rather than a state quality. It is also possible that the study had too short of a time window in order to capture changes in affect. Perhaps the use of the PANAS to capture these changes was not the best method, using a more succinct measure (e.g., visual analogue scale) looking at specific items that were more specific to internalization of thin media images might have yielded different results.

Another possible limitation of the study is that while the researcher instructed participants to eat a moderate amount of food 1 to 2 hours before the study, there was no check in place to

see if participants complied with this instruction. However, it is likely that this limitation was controlled for with random assignment.

Another limitation of the study is that the instructions for the tasks could have been stricter. Participants were told the instructions and also told that the task was looking at individual perceptions. Thus, participants may not have adhered strictly to the instructions. This may explain why the task compliance is not as high as expected. Perhaps, providing stricter instructions with a checklist or objective measure (e.g., a social comparison questionnaire) would have yielded different results.

A final limitation is that the nonbinge group endorsed none or seldom binge eating. That is, almost all students reported that they engage in some binge eating behaviour. It was not possible to get a nonbinge group who reported that they never engage in binge eating. It is possible that individuals who engage in some binge behaviour (even seldom) may be more similar to binge eaters who engage in binge behaviour more frequently. Future studies may want to compare individuals who show no restrained eating and/or binge eating with individuals who engage in frequent binge eating.

Implications and Future Research

The present research is important for many reasons. First, knowing about media influence on participant's mood and body image concerns could be important in treatment for eating disorders. The impact of thin media images can be incorporated into psycho-education models in treatment. Second, this information is important for the prevention of eating disorders. Eating disorders are becoming increasingly prevalent and at a young age, thus media awareness could be taught in schools (at an early age) as a prevention tool. Such research is important for the development of prevention programs that educate young women about the realities of thin media

images (e.g., airbrushing) and information that highlights that the women in these images do not necessarily represent a healthy norm for all women.

The current study has important implications for media policy and procedures. Studies such as the present study, which show that thin media images may have negative effects on women's eating behaviour are important and could make shifts in the types of images we see through sociocultural channels such as the media. Perhaps it is more ideal to have women of various shapes and sizes in the media to alleviate some of the sociocultural pressures to be thin. Future studies may want to look at different channels of media to examine the impact of the thin ideal on the eating behaviour and affect of binge eaters and nonbinge eaters. For example, studies may want to investigate television shows or movie clips that include thin women. Future research may benefit from comparing clinical samples and nonclinical examples of binge eaters to assess for differences in responses to thin media images on similar variables (eating behaviour and affect).

Additionally, future studies may want to consider the effect of comorbid disorders such as depression and the anxiety disorders, which have been associated with binge eating (Telch & Stice, 1998). It may also be beneficial to examine other factors associated with binge eating such as self-esteem (e.g., Masheb & Grilo, 2003), in relation to thin media influence. The inclusion of such variables may be helpful in providing more insight into the role of media influence on binge behaviour and affect.

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Appendix A

Consent Form and Screening Questionnaire

My signature on this form indicates that I agree to the following questionnaire.

I fully understand the information that has been provided to me and what I am required to do. I understand that I will only receive a bonus mark for Psychology 1100 should I be selected and participate in the study. The information that I provide will remain confidential, and be stored at Lakehead University for seven years. I give my permission to be contacted by telephone or email should I be selected to participate the study.

Name of participant (please print)

Date

Signature of participant

Screening Questionnaire

If you are interested in participating in a research study in the Department of Psychology, please answer the following questions. Participants will be selected based upon the answers they provide to this brief questionnaire.

Name: _____ Date of Birth: _____

Email: _____ Phone number: _____

How do you prefer to be contacted? Email Phone

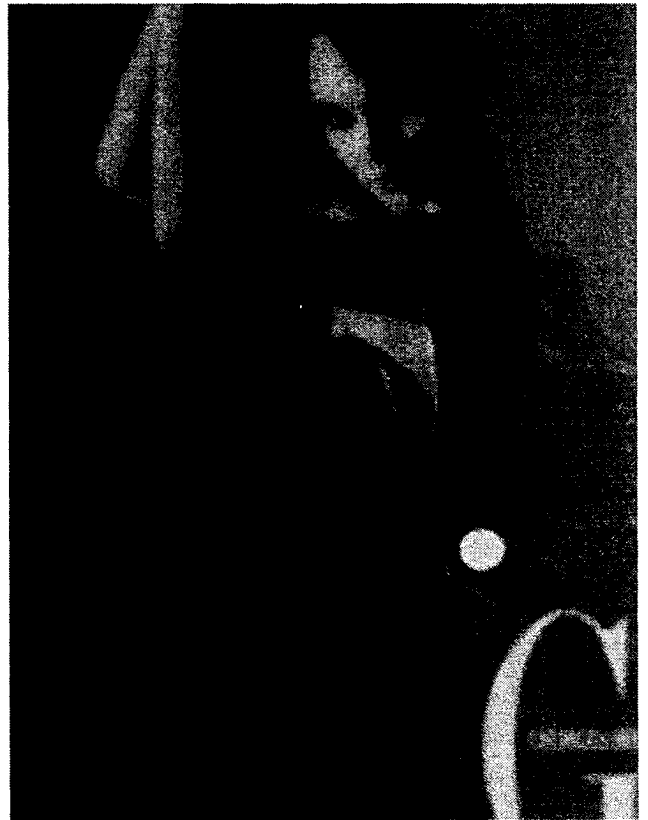
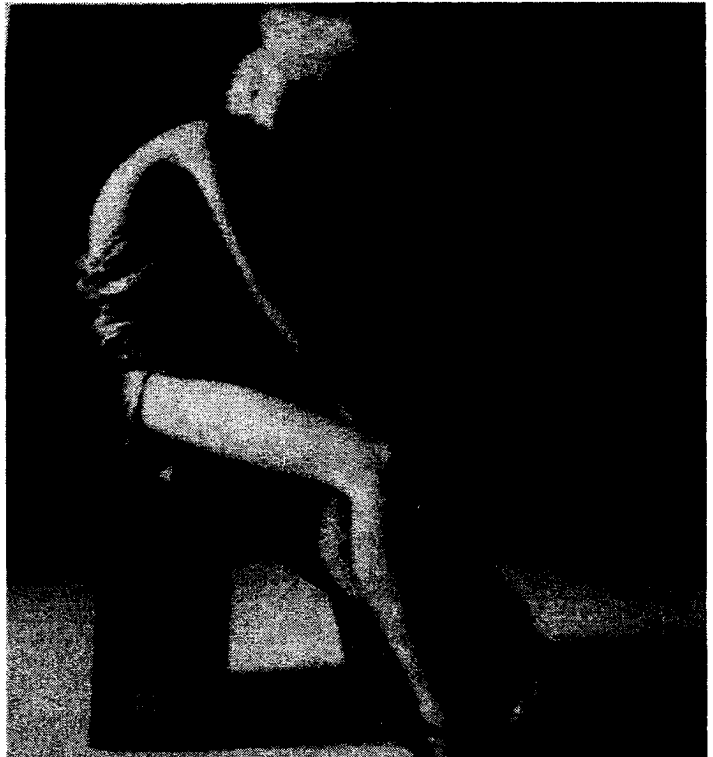
What is your preferred time to be contacted? Day/time _____

Please circle your answer:

1. Do you currently smoke cigarettes? YES or NO
2. During the last 6 months, have you taken oral contraceptives, or are you currently taking oral contraceptives? YES or NO
3. During the last 6 months, have there been times when you felt you have eaten what other people would regard as an unusually large amount of food given the circumstances (e.g., a quart of ice cream)? YES or NO
4. If you did experience times when you ate an unusually large amount of food, did you experience a loss of control (feel that you couldn't stop eating or control what or how much you were eating)? YES or NO.
5. During the last 6 months, have there been times where you have consumed a large number of alcoholic drinks (e.g., more than 5 drinks) in a short period of time? YES or NO
6. Do you have any food aversions or allergies to chocolate? YES or NO
7. Do you have any food aversions or allergies to peanut butter? YES or NO
8. Are you currently being treated by a health care professional for any of the following:
 - (a) Depression? YES or NO
 - (b) Eating disorder? YES or NO
 - (c) Anxiety disorder? YES or NO

Appendix B

Sample Media Images



Appendix C

The PANAS

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way *right now*, that is, at the *present moment*. Use the following scale to record your answers.

1
very slightly
or not at all

2
a little

3
moderately

4
quite a bit

5
extremely

_____ interested

_____ distressed

_____ excited

_____ upset

_____ strong

_____ guilty

_____ scared

_____ hostile

_____ enthusiastic

_____ proud

_____ irritable

_____ alert

_____ ashamed

_____ inspired

_____ nervous

_____ determined

_____ attentive

_____ jittery

_____ active

_____ afraid

Appendix D

Binge Scale (BS)

Binge eating is a rapid consumption of a large amount of food in a period of time usually less than two hours.

Read the items carefully and check the option (a, b, c, d, or e) that best applies to your binge eating.

1. How often do you binge eat?
 - A. Never
 - B. Seldom
 - C. Once or twice a month
 - D. Once or twice a week
 - E. Almost every day

If you answered “Never” to this question, please go to the next questionnaire.

2. What is the average length of a binge episode?
 - A. Less than 15 minutes
 - B. 15 minutes to one hour
 - C. One hour to four hours
 - D. More than four hours
3. Which of the following statements best applies to your binge eating?
 - A. I eat until I have had enough to satisfy me
 - B. I eat until my stomach feels full
 - C. I eat until my stomach feels painfully full
 - D. I eat until I can't eat anymore
4. Do you vomit after a binge?
 - A. Never
 - B. Sometimes
 - C. Usually
 - D. Always
5. Which of the following best applies to your eating behaviour when binge eating?
 - A. I eat more slowly than usual
 - B. I eat about the same as usual
 - C. I eat very rapidly

6. How much are you concerned about your binge eating?
 - A. Not bothered at all
 - B. Bothers me a little
 - C. Moderately concerned
 - D. Major concern

7. Which best describes your feelings **during** a binge?
 - A. I feel that I could control the eating if I chose
 - B. I feel that I have at least some control
 - C. I feel completely out of control

8. Which of the following describes your feelings **after** a binge?
 - A. I feel fairly neutral, not too concerned
 - B. I am moderately upset
 - C. I hate myself

9. Which of the following describes your feelings after a binge?
 - A. Not depressed at all
 - B. Mildly depressed
 - C. Moderately depressed
 - D. Very depressed

Appendix E

Revised Restraint Scale

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

1. How often are you dieting?
a. Never b. Rarely c. Sometimes d. Usually e. Always
2. What is the maximum amount of weight (in pounds) you have ever lost within a month?
a. 0-4 b. 5-9 c. 10-14 d. 15-19 e. 20+
3. What is the maximum weight you have gained within a week?
a. 0-1.0 b. 1.1-2.0 c. 2.1-3.0 d. 3.1-5.0 e. 5.1+
4. In a typical week, how much does your weight fluctuate?
a. 0-1.0 b. 1.1-2.0 c. 2.1-3.0 d. 3.1-5.0 e. 5.1+
5. Would a weight fluctuation of 5 pounds affect the way you live your life?
a. Not at all b. Slightly c. Moderately d. Very much
6. Do you eat sensibly in front of others and splurge alone?
a. Never b. Rarely c. Often d. Always
7. Do you give too much time and thought to food?
a. Never b. Rarely c. Often d. Always
8. Do you have feelings of guilt after overeating?
a. Never b. Rarely c. Often d. Always
9. How conscious are you of what you are eating?
a. Not at all b. Slightly c. Moderately d. Extremely
10. How many pounds over your desired weight were you at your maximum weight?
a. 0-1 b. 1-5 c. 6-10 d. 11-20 e. 21+
11. What is your maximum weight ever?
12. When you break your diet, do you react by?
a. Going right back on the diet
b. Compensating by eating less for a while
c. Continuing to eat non-diet foods and start the diet another day
d. Get rid of the food by vomiting or taking laxatives
e. Not applicable

Appendix F

EDE-Q

The following questions are concerned with the **PAST FOUR WEEKS ONLY (28 DAYS)**. Please read each question carefully and circle the number on the right. Please answer ALL the questions.

EXAMPLES:	No	1-5	6-12	13-15	16-22	23-27	Every
ON HOW MANY DAYS	days	Days	days	days	days	days	day
OUT OF THE PAST 28							
DAYS.....							
...Have you tried to eat vegetables?	0	1	2	3	4	5	6
...How many times have you walked to school?	0	1	2	3	4	5	6

ON HOW MANY DAYS OUT OF THE PAST 28 DAYS.....	No days	1-5 days	6-12 days	13-15 days	16-22 days	23-27 days	Every day
1. ...Have you been deliberately trying to limit the amount of food you eat to influence your shape or weight?	0	1	2	3	4	5	6
2. ...Have you gone for long periods of time (8 hours or more) without eating anything in order to influence your shape or weight?	0	1	2	3	4	5	6
3. ...Have you tried to avoid eating any foods which you like in order to influence your shape or weight?	0	1	2	3	4	5	6
4. ...Have you ever tried to follow definite rules regarding your eating in order to influence your shape or weight; for example, a calorie limit, a set amount of food, or rules about what or when you should eat?	0	1	2	3	4	5	6
5. ...Have you wanted your stomach to be empty?	0	1	2	3	4	5	6
6. ...Has thinking about food or its calorie content made it much more difficult to concentrate on things you are interested in; for example, read, watch TV, or follow a conversation?	0	1	2	3	4	5	6

7. ...Have you been afraid of losing control over your eating?	0	1	2	3	4	5	6
8. ...Have you had episodes of binge eating?	0	1	2	3	4	5	6

ON HOW MANY DAYS OUT OF THE PAST 28 DAYS.....	No days	1-5 days	6-12 days	13-15 days	16-22 days	23-27 days	Every Day
9. ...Have you eaten in secret? (Do not count binges.)	0	1	2	3	4	5	6
10. ...Have you definitely wanted your stomach to be flat?	0	1	2	3	4	5	6
11. ...Has thinking about shape or weight made it more difficult to concentrate on things you are interested in; for example, read, watch TV, or follow a conversation?	0	1	2	3	4	5	6
12. ...Have you had a definite fear that you might gain weight or become fat?	0	1	2	3	4	5	6
13. ...Have you felt fat?	0	1	2	3	4	5	6
14. ...Have you had a strong desire to lose weight?	0	1	2	3	4	5	6

OVER THE PAST FOUR WEEKS (28 DAYS).....

15. ...On what proportion of times that you have eaten have you felt guilty because of the effect on your shape or weight? (Do not count binges.) (Circle the number which applies.)
0. None of the times
 1. A few of the times
 2. Less than half the times
 3. Half the times
 4. More than half the times
 5. Most of the times
 6. Every time

16. ... Over the past four weeks (28 days), have there been any times when you have eaten what other people would regard as an unusually large amount of food given the circumstances? (Please circle appropriate number).

0- NO
1- YES

17. ...How many such episodes have you had over the past four weeks? (Please write the appropriate number.)

18.During how many of these episodes of overeating did you have a sense of having lost control?

19.Have you had other episodes of eating in which you have had a sense of having lost control and eaten too much, but have not eaten an unusually large amount of food given the circumstances?	0- NO 1- YES
20. ... How many such episodes have you had over the past four weeks?	_____
21.Over the past four weeks have you made yourself sick (vomit) as a means of controlling your shape or weight?	0---NO 1--- YES
22.How many times have you done this over the past four weeks?	_____
23.Have you taken laxatives as a means of controlling your shape or weight?	0--- NO 1--- YES
24.How many times have you done this over the past four weeks?	_____
25.Have you taken diuretics (water tablets) as a means of controlling your shape or weight?	0--- NO 1--- YES
26.How many times have you done this over the past four weeks?	_____
27.Have you exercised hard as a means of controlling your shape or weight?	0--- NO 1--- YES
28.How many times have you done this over the past four weeks?	_____

OVER THE PAST FOUR WEEKS (28 DAYS).....
(Please circle the number which best describes your behaviour)

	NOT AT ALL		SLIGHTLY		MODERATELY		MARKEDLY
29.Has your weight influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
30.Has your shape influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
31.How much would it upset you if you had to weigh yourself once a week for the next four weeks?	0	1	2	3	4	5	6
32.How dissatisfied have you felt about your weight?	0	1	2	3	4	5	6
33.How dissatisfied have you felt about your shape?	0	1	2	3	4	5	6

34.How concerned have you been about other people seeing you eat? 0 1 2 3 4 5 6

OVER THE PAST FOUR WEEKS (28 DAYS).....
 (Please circle the number which best describes your behaviour)

	NOT AT ALL		SLIGHTLY		MODERATELY		MARKEDLY
35How uncomfortable have you felt seeing your body; for example, in the mirror, in shop window reflections, while undressing or taking a bath or shower?	0		1		2		3
					4		5
						6	

36....How uncomfortable have you felt about others seeing your body; for example, in shared changing rooms, when swimming or wearing tight clothes?	0		1		2		3
					4		5
						6	

37. What is your height? _____ inches or _____ cm (guess if you do not know)

38. What is your weight? _____ lbs or _____ kg (guess if you do not know)

Appendix G

Emotional Eating Scale (EES)

We all respond to different emotions in different ways. Some types of feelings lead people to experience an urge to eat. Please indicate the extent to which the following feelings lead you to feel an urge to eat by checking the appropriate box.

	No Desire to eat	A Small Desire to Eat	A Moderate Desire to Eat	A Strong Urge to Eat	An Overwhelming Urge to eat
Resentful					
Discouraged					
Shaky					
Worn Out					
Inadequate					
Excited					
Rebellious					
Blue					
Jittery					
Sad					
Uneasy					
Irritated					
Jealous					
Worried					
Frustrated					
Lonely					
Furious					
On edge					
Confused					
Nervous					
Angry					
Guilty					
Bored					
Helpless					
Upset					

Appendix H

EOQ

The following questions are concerned with the **PAST FOUR WEEKS ONLY (28 DAYS)**. Please read each question carefully and circle the number on the right. Please answer ALL the questions.

ON HOW MANY DAYS OUT OF THE PAST 28 DAYS HAVE YOU EATEN AN UNUSUALLY LARGE AMOUNT OF FOOD, GIVEN THE CIRCUMSTANCES, IN RESPONSE TO FEELINGS OF...	No days	1-5 days	6-12 Days	13-15 days	16-22 days	23-27 days	Every Day
(a)...ANXIETY (worry, jittery, nervous)	0	1	2	3	4	5	6
(b)...SADNESS (blue, down, depressed)	0	1	2	3	4	5	6
(c)...LONELINESS (bored, discouraged, worthless)	0	1	2	3	4	5	6
(d)...TIREDNESS (worn-out, fatigued)	0	1	2	3	4	5	6
(e)...ANGER (upset, frustrated, furious)	0	1	2	3	4	5	6
(f)...HAPPINESS (good, joyous, excited)	0	1	2	3	4	5	6

Appendix I

Contact Script

You are receiving this email/phone call because you filled out a brief questionnaire and indicated that you are interested in participating in a research study for bonus points. I am a graduate student in psychology and am currently looking for females to participate in research that is looking at how perception influences people's sense of taste and will be conducting a taste test with 3 different types of candies. Because this is a taste test, I want to make sure you do not have any food allergies that would affect your participation (chocolate & peanut butter). Also, I would like you to eat a moderate amount of food between 1 and 3 hours before you come in for the taste test.

This study is worth 1 bonus point and can be put toward your introductory psychology course. The study will last for approximately 45 minutes. I am listing the available time slots for participating in this study below. Participants are run individually so if you are interested in a particular time slot, please be aware that I am offering these slots on a first-to-respond basis. Please email me back as soon as possible to reserve a time slot that is good for you. If you are interested in participating in this research study, please reply to this email (sbola@lakeheadu.ca).

Appendix J

Participant Cover Letter and Consent Form

Dear Participant:

Thank you for your interest in participating in a research study about how perception influences taste ratings. This study is being conducted by Sabreena Bola, a Master's candidate and supervised by Dr. Ron Davis from the psychology department at Lakehead University.

The purpose of the study is to examine the impact of viewing and perceiving various images on taste ratings.

If you volunteer to participate in this study, you will be asked to do the following:

You will be randomly assigned to one of two tasks in which you will view a series of images and write a paragraph about what you perceive in accordance with the instructions for that specific task. You will also be asked to participate in a taste test of three different types of candies. In addition, you will be asked to answer a few questionnaires.

The entire study will take approximately 45 minutes to complete. All participants will be contacted via email or telephone in approximately one month when the study is completed in order to receive information about the results of this study.

You will be asked a variety of questions, which may be personal in nature. A risk associated with this study is the possibility that thinking about these personal issues may raise some psychological and emotional concerns for you. If during or after the study, you have concerns you wish to discuss, please feel free to contact the Student Health and Counselling Centre at 343-8361 (UC 1007), or via email at health&counselling@lakeheadu.ca.

If you participate, you will receive one bonus mark toward your introductory course in psychology.

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. Any information you provide will be used for research purposes only, which may eventually include publication in a research article. Your name will not appear on any of the questionnaires you fill out or in any future publications. The data you supply will only be identified by number. Data will be stored securely for 7 years.

If you volunteer to be in this study, you may withdraw at any time without any consequences. You may also exercise the option of removing your data from the study. The investigator may withdraw you from this research if circumstances arise that warrant doing so.

If you have any questions or concerns about this study, please do not hesitate to contact me at sbola@lakeheadu.ca. You may also contact the Lakehead University Research Ethics Board at 343-8283.

Thank you,

Sabreena Bola
M.A. graduate student, Clinical Psychology
Department of Psychology, Lakehead University

Consent Form

I have read and understood the cover letter and information provided for the study entitled "How does perception influence taste?" My questions have been answered to my satisfaction, and I agree to participate in this study.

I am aware that I will be completing a task, a taste test and a series of questionnaires. I realize that some of the questions are of a personal nature and may arouse feelings of discomfort. I am a volunteer and may withdraw at any time from the study. All information that I provide will remain anonymous, and be securely stored at Lakehead University for seven years. I will receive a report of the results to be sent to me upon completion of the study. My name, or any other identifying information, will not appear on any of the data I provide or any future publications.

Name of participant (please print)

Date

Signature of participant

Student number (for Psychology
1100 bonus point)

Name of Psychology 1100 professor

Appendix K

Instruction Scripts

Instructions for exposure to media images tasks:

Social Comparison Group:

The first thing you will be doing today is looking at this series of 10 images. You may spread the images out or look at them one by one. While you are looking at the images, compare yourself to the images as much as you can. Try to compare yourself to the models in terms of appearance, body shape and weight along with any other appearance-related perceptions you may have in comparing yourself to the images. Also, you are provided with a sheet of paper on which you will write one paragraph about these perceptions. Just write one paragraph overall, you may make specific references to certain images if you like. You do not need to number the images or write about all 10 independently. If there are certain images that you would like to focus more on, feel free to do so. You will have 15 minutes to complete this task. Once you are finished this part of the study, I will bring in the candies for the taste test part of the study. Do you have any questions?

Aesthetic Quality Group:

The first thing you will be doing today is looking at this series of 10 images. You may spread the images out or look at them one by one. While you are looking at the images, focus on the aesthetic quality of the images as much as you can. Try to focus on qualities such as the colour, background, and props in the images along with any other perceptions you may have about the aesthetic qualities of the images. Also, you are provided with a sheet of paper on which you will write one paragraph about these perceptions. Just write paragraph overall, you may make specific references to certain images if you like. You do not need to number the images or write about all 10 independently. If there are certain images that you would like to focus on, feel free to do so. You will have 15 minutes to complete this task. Once you are finished this part of the study, I will bring in the candies for the taste test part of the study. Do you have any questions?

Instructions for candy taste test:

There are 3 different types of candies for you to taste today. I will explain how I would like you to go about doing the taste test, and then I will leave you alone to complete your ratings. I would like you to taste the candies in order, so, taste candy A, then candy B and then candy C. Before you taste candy A, please have a drink of the water to cleanse your palate, then taste candy A. You may have as many candies from bowl A as you need to make your taste ratings. Once you have finished rating candy A, take another drink of water to cleanse your palate, then move on to candy B. Make your taste ratings for candy B, have a drink of water again and move onto candy C. It is important that once you have finished rating a candy that you not go back to it and change your ratings.

Once you are all finished making your taste ratings, you can feel free to have as many candies as you like. These are set-aside for only you and there are plenty. I will be back in 10 minutes.

Appendix L

Demographic Questionnaire

Age: _____

Marital status:

Married/common law Divorced/separated Single Widowed

What is your ethnic background?

Caucasian South Asian Hispanic
African-Canadian European Native-Canadian
East Asian Other (please specify): _____

School Enrolment:

Full time student Part time student

What academic program(s) are you in? _____

What is/are your major(s)? _____

Do you restrict your caffeine intake? _____

Appendix M

Candy Taste Rating Form

Please rate each cookie (candy) on the following dimensions on a scale of 1-10
(1 = terrible, 5 = average, 10 = excellent)

Candy A

1. Texture

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

2. Flavour

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

3. Fragrance

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

4. Sweetness

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

5. Crunchiness

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

6. Overall rating

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

7. How much do you like the candy?

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

Score (to be completed by the experimenter)

Candy B

1. Texture

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

2. Flavour

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

3. Fragrance

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

4. Sweetness

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

5. Crunchiness

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

6. Overall rating

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

7. How much do you like the candy?

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

Score (to be completed by the experimenter)

Candy C

1. Texture

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

2. Flavour

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

3. Fragrance

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

4. Sweetness

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

5. Crunchiness

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

6. Overall rating

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

7. How much do you like the candy?

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

Score (to be completed by the experimenter)

Appendix O

Debriefing Script

[Insert a brief summary of results]

There is more to this study than I have told you about so far. But before I tell you exactly what it is, I would like to explain why it is necessary for some kinds of psychological studies not to tell people about the purpose of the study at the very beginning. In some kinds of studies, if we tell people what the purpose of the experiment is and what we predict about how they will react under particular conditions, they might deliberately do whatever they think we want them to do, just to help us out and give us the results that they think we want. If that happened, their reactions would not be a good indication of how they might react in a situation in every day life, where they did not think they were being studied. It is also possible that the opposite might occur where people may deliberately act in a way that would contradict what we predict. This would also make the results invalid, because again, what the people would be responding to is what they thought we were looking for rather than responding naturally.

Now I would like to explain exactly what we are trying to get at in this study. We told you that we were looking at how individual perception might affect people's taste ratings. We told you that you would be completing a taste test so you would be aware that there would be an eating component to this study. However, the study that you participated in looked at the effect that exposure to thin media images has on the amount people eat. Further, there were two conditions. In one group we asked participants to engage in social comparison to the images and in the other we asked them to focus on the aesthetic qualities of the images. There is research that suggests that sometimes when people are upset by something, like thin media images, they consume more food. However, some research also shows that though people eat more in response to these images, they also report positive mood. So, this study was interested in looking at how people react to thin media images in terms of how much they eat and how they feel. With the group that was asked to focus on the aesthetic qualities of the image, we were interested in looking at whether people could focus their attention away from the thin model and how they felt and ate in response to the images.

The other part of the study was looking to see if there is differences between the amounts of candies eaten by people who binge eat and those who do not binge eat. When you were given the screening questionnaire in class, you were asked to answer a number of screening questions. Two of those questions were about binge eating. Some of the participants in this study answered questions saying that they sometimes engaged in binge eating, where they felt their eating was out of control. The other participants in the study answered that they did not binge eat.

Binge eating can be a problem for some people and it is important that psychologists have as much information about it as possible. That is why we are conducting this study. We were afraid that if we told you that we would be paying attention to the amount you ate after viewing the images that you might have changed the amount you would have eaten, or paid more attention to the number of candies you ate than you normally would in everyday circumstances.

As in most psychological research, we are interested in how the average person reacts in this situation. We need to test many people and combine their results in order to get a good indication of how the average person reacts under the different conditions.

Your participation in research is very important. In a study like this where we didn't give you all the information up front, we want to make sure you are satisfied with your participation and that you wish to keep your data in the study. If you tell me that you do not want your data to be used, we will remove it from our pool or data.

We hope you found your experience of participating in this study interesting. I would be glad to answer any questions or address any concerns that you might have.

Please reply to this email indicating that you have received this information. If you could also answer the following question, it would be greatly appreciated:

At the time of the study, did you believe the 'cover' story that you were told?

1	2	3	4	5	6	7	8	9
did not								totally
believe								believed
at all								

Appendix P

Qualitative Data Rating Instructions

We will be rating the number of positive negative, neutral, and total comments made by the participants in each of their individual paragraphs. There are four categories: weight/shape, appearance, self-mood and model-mood. Some of the paragraphs have more than one comment for each category. Please make your ratings on the form provided.

Here are the things we'll be looking for in the categories and some examples.

1. Weight/Shape related comments: these are any comments that are related to the weight or body shape of the models in the images or the person's own weight/shape.

Examples

Negative:

The model is way to skinny
 The model is so skinny she looks unhealthy
 The girls look like they have not eaten for days
 Looking at these women makes me feel that I am fat
 They look like a bunch of twigs

Positive:

The models all have perfect bodies
 The models are all very skinny which is really attractive
 The models are thin and that adds to their overall beauty
 I feel good cause I have the same body and am as skinny as the models

Neutral:

The model is thin
 The model has skinny arms

2. Appearance related comments: these are comments that have to do with appearance. Comments may be about the model's beauty, appeal and/or specific features.

Examples

Negative:

The models are odd looking and not very appealing
 The models look very 'fake'
 The models don't look natural or portray any natural beauty
 The models have really bad hair and make-up
 The girls in the pictures don't look human
 The girls are not attractive at all

Positive:

The models are really beautiful and attractive
Their skin is flawless and they have nice features
The pictures show the women as confident and strong and artistic
The women in the pictures look classy
Their make up is natural and brings out their beauty
All of these women represent what all women should look like
I wish I could look like these women
The models are really sexy
The models look so glamorous

Neutral:

The women look like models
The women are wearing a lot of cosmetics
The women catch my eye

3. Self-mood related comments: these are comments that have to do with the writer's (participant's) mood. They are comments that describe the writer's feelings when viewing the images or in relation to the images.

Examples

Negative:

Looking at these images makes me feel sad
I feel ugly and depressed when I see these women
I know that I can never look like these women and that makes me feel down
I get down about myself because I don't look like these women
Deep down it's hard for me not to think of ways that I could like these women
When I see these images, it makes me self-conscious about myself

Positive:

I enjoy looking at these images and they make me happy
These pictures make me feel confident and strong
These pictures don't affect how I view myself, I am happy
I look natural, which is key to making me feel good
I'd rather be myself and have a normal lifestyle and be who I want and who I am
Anyone can look like these pictures so it doesn't bother me

Neutral:

I am not sure how these pictures make me feel
These pictures affect how I feel

4. Model-mood related comments: these are comments that are made specifically about the model's mood or the portrayal of the model's mood.

Examples

Negative:

The models look so unhappy and sad

None of the models are smiling and the pictures look serious

The models seem uncomfortable with their facial expressions

The models look cold and snobby

They don't seem to be very happy; they look disappointed

Positive:

The models look happy and strong

The models portray confidence

The models look like they are fulfilled

Neutral:

The model looks like she is showing some feeling

She is displaying her emotions

She looks like she is trying to tell me something