

## Don't take another bite: How sociocultural norms for appearance affect women's eating behavior

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### Abstract

Four studies tested the impact of exposure to thin images on women's eating behavior. In Study 1, women who were exposed to commercials containing thin models ate less in a taste test than women exposed to neutral commercials. The next two studies revealed that the impact of the thin images could be reduced by challenging the sociocultural norms for appearance. In Study 2, including images of relatively heavier women who have been successful in life (an indirect challenge to the norm) attenuated the impact of the thin images on women's eating behavior. Study 3 demonstrated that convincing women that their peers do not endorse the sociocultural norms also reduced the impact of the thin images. In Study 4, we found that exposure to thin images led to activation of an association between heaviness and rejection and that the more this association was activated, the less participants ate.

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### Introduction

Women's anxiety about their physical appearance and their tendency to feel dissatisfied with their bodies has been well-documented (Cash, Winstead, & Janda, 1986; Jackson, Sullivan, & Rostker, 1988; Mintz & Betz, 1986; Smolak, 2006). Most women express a desire to lose weight, even women who are not overweight and do not perceive themselves to be overweight (Connor-Greene, 1988; Silberstein, Striegel-Moore, Timko, & Rodin, 1988). In fact, females' dissatisfaction with their bodies is so widespread that some theorists refer to it as a "normative discontent" (Rodin, Silberstein, & Striegel-Moore, 1985; Smolak,

2006). This dissatisfaction is evident throughout a woman's life span (Pliner, Chaiken, & Flett, 1990), with girls as young as nine indicating a desire to lose weight (Schur, Sanders, & Steiner, 2000) and it has led some women to take extreme measures to alter their bodies. Cosmetic surgery procedures have increased by a dramatic 165% since 1992 (Plastic Surgery Information Service, 2001). Young girls and women expend large amounts of time and energy on the pursuit of the perfect body. In the most extreme cases, this pursuit can lead to eating disorders and even death.

*The role of the media in women's dissatisfaction with their bodies*

One force that has been implicated in women's dissatisfaction with their bodies is the media. Body image and eating disorders researchers have harshly criticized the media for creating and perpetuating a

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cultural standard for thinness and beauty which is difficult, if not impossible for most women to attain (Fallon, 1990; Kilbourne, 1994; Wolf, 1991). The average American woman is 5'4" tall and weighs 140 pounds, whereas the average American model is 5'11" tall and weighs 117 pounds (National Eating Disorders Association). Consequently, fashion models are thinner than 98% of American women (Smolak, 2006), and whereas the average woman's body mass index (BMI) falls within the "normal" range, the average model falls into the underweight category which puts them at risk for many serious health outcomes. Thus, models represent not only unattainable, but unhealthy standards.

What impact do these thin images have on women? Although there are some divergent findings (e.g., Mills, Polivy, Herman, & Tiggemann, 2002), a meta-analytic review suggests that the media does typically have a negative impact on women (Groesz, Levine, & Murnen, 2002). Groesz et al. examined forty-three effects reported in twenty-five studies and found that women who were exposed to thin images felt significantly more dissatisfied with their bodies than women who were exposed to control images.

#### *Sociocultural norms for appearance*

Researchers and theorists believe that women's body dissatisfaction, and the subsequent eating problems that accompany body dissatisfaction, are influenced by sociocultural norms for ideal appearance. These norms, which are directed mostly at women, convey the message that a woman's worth is determined by her appearance and that being thin is valued in society (Thompson, 1992; Thompson, Heinberg, Altabe, & Tantleff-Dunn). The standards for attractiveness set by images in the media are very high, and these sociocultural norms suggest to women that it is reasonable to measure oneself against and strive for such standards (Fallon, 1990; Rodin et al., 1985; Thompson et al., 1999).

Thompson and his colleagues have developed a sociocultural model which suggests that the more women internalize the largely unattainable standards for thinness set by the media, the greater their body dissatisfaction (Thompson, 1992; Thompson et al., 1999). In one study testing their model, Heinberg and Thompson (1995) found that when women who were high in thin-ideal internalization were exposed to thin media images, they felt more depressed and more dissatisfied with their bodies. Women low in thin-ideal internalization did not show this pattern of findings. More recently, Dittmar and her colleagues have also

found that only women who scored high in thin-ideal internalization were negatively affected by exposure to thin images (Dittmar & Howard, 2004; Halliwell & Dittmar, 2004). Stice and his colleagues have found evidence that internalization of sociocultural norms also has an impact on dieting behavior (Stice, Mazotti, Weibel, & Agras, 2000). They had women who were high in internalization of the thin-ideal participate in a dissonance-based intervention in which they voluntarily argued against the value of the thin-ideal in our society. They found that these women internalized the ideal to a lesser degree following the intervention and they also showed increases in body satisfaction and decreases in self-reported dieting behavior.

#### *Eating behavior*

Studies that have examined the impact of media images on women have mostly focused on body-image disturbance (Groesz et al., 2002). However, some researchers have looked at the impact of media images on women's eating behavior. Stice and his colleagues have argued that media images should affect eating. For example, they believe that the thin ideal as espoused by the media contributes to eating pathology, and ultimately eating disorders (Stice, Schupak-Neuberg, Shaw, & Stein, 1994). They have investigated these ideas in one correlational study in which they found that self-reported exposure to the media was related to eating disorder symptomatology (Stice et al., 1994). Other researchers have found that women who believe they fall short of the thin ideal were more likely to show signs of disordered eating (Sanderson, Darley, & Messinger, 2002). In an experimental study, Seddon and Berry (1996) found that women who were high in restrained eating disinhibited their restraint following exposure to thin images: they ate more "forbidden foods," such as chocolate-covered peanuts, after viewing thin images than control images. Low restrained eaters ate the same amount regardless of the type of image they were exposed to. Mills and her colleagues have also found evidence of disinhibition amongst restrained eaters following exposure to thin images (Mills et al., 2002).

#### *The current research*

In the present research, we will examine the impact of viewing thin images on women's eating behavior. Thin images in the media convey the message that thinness and beauty is strongly valued in society (Stice, 1998; Thompson, 1992; Thompson et al., 1999). When

presented with these thin images, women may feel that one way they can try and attain a thin body is to limit the amount of food that they eat. Thus, it is hypothesized that viewing thin images will lead women to restrain their eating.

Another focus of the current research is to investigate whether challenging the sociocultural norms for ideal appearance will attenuate the impact of thin images on women's eating behavior. These norms convey the message that women are valued for their bodies and appearance, that standards for attractiveness are very high, and that it is reasonable to measure oneself against and strive for such standards (Thompson et al., 1999). In the current research, we challenge these norms in two different ways. First, the norms are indirectly challenged by presenting women with images of heavier women who have been successful in life. These images subtly suggest that success in life is not contingent on being thin. Second, the norms are directly challenged by convincing women that their peers do not endorse the sociocultural norms for thinness. In both studies, we predict that when the norms have been challenged, the thin images will have a reduced impact on eating behavior.

A final objective of the present research is to determine why thin media images lead women to restrain their eating. Although there are likely multiple processes involved, the current research will examine the role that concern with being rejected by others plays in the relation between exposure to thin images and restrained eating. As stated previously, sociocultural norms for appearance strongly suggest to women that they need to be thin to be accepted in society. Exposing women to thin images will likely make these norms salient and may bring to mind an association between weight and rejection. Other researchers have found that activation of appearance-related schemata leads to body dissatisfaction (Brown & Dittmar, 2005; Hargreaves & Tiggemann, 2002). They found that when women were exposed to thin images, they activated "thin thoughts" and the more these thoughts were activated, the more dissatisfied women felt with their bodies. In the present research, we will investigate whether exposure to thin images leads women to activate an association between being heavy and being rejected, and whether the activation of these concepts, in turn, influences eating behavior.

#### *Overview of studies*

In Study 1, women are exposed to either thin images or neutral images and their eating behavior is assessed.

We predict that women exposed to thin images will eat less than women exposed to neutral images. In Studies 2 and 3, we will test whether challenging the sociocultural norms for thinness reduces the impact of thin images on women's eating behavior. In Study 2, in addition to the thin and neutral images, women are exposed to images of heavier women who have been successful in life. These images indirectly challenge the notion that one needs to be thin to be accepted by society. In Study 3, we will directly challenge the sociocultural norms for appearance by convincing women that their peers do not endorse these norms. In both studies, it is hypothesized that when the norms have been challenged, the thin images will not affect eating.

In the final study, we will examine the psychological process by which media images affect women's eating behavior. Specifically we will examine whether exposure to thin images leads women to activate an association between being heavy and being rejected, and whether the activation of these concepts, in turn, influences eating behavior.

#### **Study 1**

In Study 1, we will investigate whether exposure to thin images has an impact on women's eating behavior. We expect to find that women exposed to thin images will eat less than women exposed to neutral images.

#### *Method*

##### *Participants and design*

Participants were 26 female undergraduates at the University of Waterloo (age range 18–21). Female undergraduates were a convenient sample to study. But, women in university are also at a stage in their lives when they are concerned with their weight and appearance (Pliner et al., 1990), therefore they seemed like an ideal sample for this study. All participants received one experimental credit for their participation. The study was a one (type of commercial: thin vs. neutral) factor design. The main dependent variable, the amount (in grams) of food consumed, was unobtrusively assessed in a taste-testing phase of the experiment.

##### *Procedure*

Participants took part in the experiment individually. During mass testing, participants filled out a Restrained Eating Scale (Herman & Polivy, 1980) to assess their chronic level of restraint with food.

Previous research has shown that restraint status influenced eating behavior, therefore this variable was included as a possible covariate (Mills et al., 2002; Seddon & Berry, 1996).<sup>1</sup> Before the experimental session, each participant was contacted and asked to participate in a long-term memory study. They were told that they would also be eating and rating a variety of different foods for an unrelated study. In line with the cover story, they were asked not to eat or drink anything for 3 h before the experimental session in order to perform these taste tests on an empty stomach. This procedure was used to ensure that all participants would be hungry and therefore willing to eat when they arrived at the lab. Before each participant arrived at the lab, the experimenter placed the four different types of food into large serving bowls. The experimenter then weighed each bowl and recorded the weight.

When they arrived at the experimental session, participants were told that the study they were participating in was a long-term memory study, and that they would watch a series of commercials with the goal of trying to remember as much detail about the commercials as they could. This instruction was given to make certain that participants would pay close attention to the commercials. Participants were randomly assigned to the control or experimental condition. In the control condition participants watched four neutral commercials which contained no images of people. In the experimental condition participants watched the same four neutral commercials plus two additional commercials that contained images of thin women.<sup>2</sup>

The products and companies advertised in the neutral commercials included a cellular phone, a gas station, a pharmacy and an insurance company. One of the thin commercials was for a Victoria Secret bra that featured supermodels modeling the bra. The other thin

commercial was for Dove soap that featured a very thin woman talking about the various features of the soap.<sup>3</sup>

We wanted participants to feel comfortable and natural in our experiment, therefore the laboratory was set up to look like a person's living room. It had couches, chairs, a coffee table and a television set. After watching the commercials participants were told that in order to test their long-term memory, we needed to take a break before the memory task. During this break, participants were asked to taste and rate four different types of food, ostensibly for an unrelated experiment (the foods were popcorn, whole-wheat crackers, Ritz crackers and pretzels). We deliberately chose foods that were moderate in their nutritional value—although probably not seen as healthy, they were not totally lacking in nutritional value like candy or potato chips. The experimenter placed the food in large bowls so that the participants would not feel their eating behavior was being monitored and then left the participant alone to taste the food.

We also told participants that after they had finished rating the food, they were free to eat as much as they liked. Participants rated the foods on a number of different dimensions, including goodness, tastiness and freshness (rated on a scale of 1 to 7 with 1 indicating not at all tasty/good/fresh and 7 indicating very tasty/good/fresh). These ratings lent credibility to our cover story and allowed us to create an index for how much participants liked the food. After 20 min, the experimenter returned to the lab room and told the participant that the experiment was over and that they would not be participating in a memory study after all. Each participant was fully debriefed, probed for suspicion and thanked for participating. Nobody was suspicious of the cover story.

After each participant left, the experimenter weighed the bowls for a second time and recorded the weight. The amount of food eaten was calculated by subtracting the weight of the bowl at Time 2 from the weight of the bowl at Time 1. The dependent variable in this study was the amount of food participants consumed.

## *Results and discussion*

We predicted that participants who watched the thin commercials would eat significantly less than participants who watched the neutral commercials. To test this prediction, we conducted a one-way ANCOVA with

<sup>1</sup> For all of the covariates included in the studies, we tested whether the homogeneity of regression assumption was maintained and in all cases it was.

<sup>2</sup> In all four studies, the number of commercials that participants viewed varied by condition. We thought it was more important to keep content of the ads constant (i.e., everyone watched the same neutral commercials), than length of the commercials constant between the conditions. Although this does mean that participants in the thin commercials condition watched approximately 45 additional seconds of commercials, it is unlikely that this would have caused fatigue amongst participants. Furthermore, simply watching more commercials cannot account for the specific differences that we find between conditions in this and subsequent studies.

<sup>3</sup> This commercial aired prior to the new Dove commercials which feature women with a wide range of body sizes.

score on the restrained eating scale as the covariate, type of commercial as the between-participants factor and amount of food consumed (in grams) as the dependent variable. Score on the restrained eating scale was a marginally significant covariate in this analysis, such that non-restrained eaters tended to eat more than restrained eaters,  $F(1, 23) = 2.83, p = .10$ . We also found a main effect for type of commercial in this analysis. Participants who watched the thin commercials ate significantly less food ( $M_{\text{adj}} = 28.8$  g,  $SD = 15.9$ ) than participants who watched the neutral commercials ( $M_{\text{adj}} = 49.7$  g,  $SD = 27.1$ ),  $F(1, 23) = 4.17, p = .05, \eta^2 = .15$ .

Unfortunately, we did not weigh participants in this study, therefore body mass index scores could not be computed. In future studies, we can investigate whether the effects are moderated by BMI. In this study, we found clear evidence that viewing thin images had an impact on women's eating behavior. Women who watched commercials containing images of thin women ate less food than women who watched the neutral commercials. In Studies 2 and 3 we will examine whether this effect can be reduced by challenging the sociocultural norms for ideal appearance.

## Study 2

Sociocultural norms for appearance strongly convey the message that a woman's worth is determined by her appearance (Thompson, 1992; Thompson et al., 1999). The purpose of the next two studies is to test whether challenging these norms can reduce the impact of images of thin women on eating behavior. In Study 2, we will examine whether exposing women to images of heavier women who are successful (subtly suggesting that success is not dependent on being thin), will attenuate the impact of the images of thin women on eating behavior.

### Method

#### *Participants and design*

Participants were 85 female undergraduates at the University of Waterloo (age range 18–21). All participants received one experimental credit for their participation. The study was a 2 (thin commercials: viewed vs. not viewed)  $\times$  2 (heavy commercials: viewed vs. not viewed) factorial design. The dependent variable was the amount (in grams) of food consumed and this was unobtrusively assessed in a taste-testing phase of the experiment.

### *Procedure*

Participants were contacted under the same cover story, given the same pre-lab instructions, and followed the same procedures as the participants in Study 1, except that instead of watching either neutral commercials or "thin" commercials, participants watched one of four sets of commercials. Participants in the control condition watched the same neutral commercials employed in Studies 1. Participants in the "heavy commercials" experimental condition watched the same four neutral commercials plus two additional commercials containing images of relatively heavy women. Participants in the "thin commercials" experimental condition watched the same commercials containing images of thin women as were employed in Study 1. And, participants in the "thin plus heavy commercials" experimental condition watched the same four neutral commercials plus the two "heavy" commercials and the two "thin" commercials.

The sociocultural norms for appearance within our society suggest that it is thin and beautiful women who are happy and successful. For the heavy commercials condition, we chose commercials which featured Rosie O'Donnell and Camryn Manheim, two actresses who (at the time of this study) were successful in the entertainment industry and who are heavier than most women on television. We deliberately chose heavy women who were successful and happy for the commercials in an effort to subtly challenge the sociocultural norms for ideal appearance in our society.

Just as in Study 1, after watching the commercials participants tasted and rated a variety of foods.<sup>4</sup> The main dependent variable in this study was the amount of food participants consumed. Following the taste test, participants were weighed and were asked for their height. Participants were then fully debriefed, probed for suspicion and thanked for their participation. None of the participants were suspicious about the cover story.

### *Results and discussion*

#### *Body mass index*

Based on height and weight, we calculated a body mass index (BMI) score for each participant. The mean

<sup>4</sup> In this and the following studies participants taste-tested the same foods as in Study 1.

BMI for this sample was 22.6 ( $SD = 5.29$ ) which is within the normal range of 20–25.<sup>5</sup>

### *Eating behavior*

In order to determine the impact of these four different sets of commercials, a two-way ANOVA with thin commercials (viewed vs. not viewed) and heavy commercials (viewed vs. not viewed) as the two between-participants factors was conducted. This analysis revealed a main effect for thin commercials. Participants who viewed the thin commercials ate significantly less than participants who did not view the thin commercials,  $F(1, 81) = 11.71, p = .001, \eta^2 = .12$ .

This main effect was qualified by a significant interaction between presence or absence of thin commercials and presence or absence of heavy commercials,  $F(1, 81) = 8.37, p = .005, \eta^2 = .09$ . Tukey tests revealed that participants who viewed only the thin commercials consumed significantly less food ( $M = 22.5$  g,  $SD = 12.4$ ) than participants who watched only the heavy commercials ( $M = 40.5$  g,  $SD = 21.3$ ) ( $p = .01$ ), participants who watched both the thin and heavy commercials ( $M = 38.5$  g,  $SD = 15.9$ ) ( $p = .03$ ) and participants who watched the neutral commercials ( $M = 47.8$  g,  $SD = 22.7$ ) ( $p = .001$ ) (i.e., neither the thin nor heavy commercials). Thus, women who viewed thin commercials ate significantly less than women in each of the other conditions. The other conditions did not differ significantly from one another.

The findings from this study suggest that the negative impact of the thin images can be attenuated by including images of relatively heavier women. Even when participants viewed the thin images, the presence of the heavier women appeared to have negated the effect of the thin images, resulting in less restrained eating (as evidenced by the fact that these women ate the same amount as participants in the control condition). We suspect the images of heavier, successful women led to less restrained eating because they signaled to women that success and happiness are not contingent on weight and appearance. These findings are consistent with the contention that a challenge to the sociocultural norms for appearance reduces the impact of thin images on eating behavior. However, other interpretations of this study are possible. In Study 3, we will directly test the impact of challenging the norms for ideal appearance.

<sup>5</sup> We tested whether BMI was a significant covariate for any of the analyses in this study and found that it was not. There were also no mean differences in BMI across conditions.

### **Study 3**

In Study 2, we found that the impact of the thin images on women's eating behavior could be reduced by showing participants commercials containing images of heavier women. We argued that these images may have reduced the impact of the thin images because they indirectly challenged the socio-cultural norms for thinness. In Study 3, we tested whether the impact of the thin images can be reduced by directly challenging the sociocultural norms for thinness. Prior to watching the thin commercials, half of the participants were told that other students at their university had watched the commercials and thought the women in these commercials were too thin and did not look healthy. The other half were not told anything about the thin commercials. After watching the commercials, participants ate a variety of different foods for an ostensibly unrelated experiment.

Based on the results of Studies 1 and 2, we predict that participants who view the thin images will eat significantly less food than participants who view the neutral images. But, because the critical information about the images should challenge the sociocultural norms for appearance, we expect that this effect will be qualified by an interaction between the type of commercial and the type of information received, such that the thin images will no longer affect participants who have been told that their peers rated the thin images negatively.

### *Method*

#### *Participants and design*

Participants were one hundred and sixteen female undergraduates at the University of Waterloo (age range 18–21). All participants received one experimental credit for their participation. The study was a 2 (type of commercial: thin vs. neutral)  $\times$  2 (normative information: present vs. absent) factorial design. The main dependent variable, the amount (in grams) of food consumed, was unobtrusively assessed in a taste-testing phase of the experiment.

#### *Procedure*

Participants were contacted under the same cover story, given the same pre-lab instructions as participants in Studies 1 and 2. When participants arrived at the experimental session, they were told that the memory task they were to conduct involved watching a series of commercials. They were also told that because people

often process commercials mindlessly, we wanted to study whether knowing how other people rated a given commercial prior to viewing the commercial would influence people's memory for the commercial. Thus, some participants would be shown other people's rating of the commercials prior to viewing them, whereas other participants would not be shown a rating prior to viewing the commercials.

Participants in the condition in which the normative information was provided were told that other students at their university had viewed the commercials they were about to watch and had made comments about the commercials. They were also told that we had then showed the same commercials along with the first group of students' comments to a separate group of students and asked them to indicate whether they agreed with the first group of students' rating of the commercials. Thus, participants in this condition saw a series of statements along with a number that indicated the number of students who agreed with each statement. All of the "thin" commercials were preceded by negative statements that were ostensibly endorsed by a random sample of undergraduates. For example, one of our commercials containing images of thin women is an advertisement for a "Victoria's Secret" miracle bra. Participants in the condition in which the sociocultural norms for thinness were challenged read the statement, "Those models are unrealistically thin" and were told that 85% of students who viewed the commercial agreed with that statement. For each of the two "thin" commercials, participants read two negative statements which challenged the sociocultural norms for thinness and two neutral statements. For each of the neutral commercials participants read four statements unrelated to women's appearance, two which were relatively positive and two which were relatively negative.

After watching the commercials, participants were left alone in the room to eat and rate a variety of foods ostensibly for an unrelated experiment. After 20 min had passed, the experimenter returned to the lab room, told the participant that the experiment was over, asked their height, weighed them, fully debriefed the participant, probed for suspicion and thanked them for their participation. The dependent variable in this study was the amount of food participants consumed.

## Results and discussion

### Body mass index

Based on height and weight, we calculated a body mass index (BMI) score for each participant. The mean

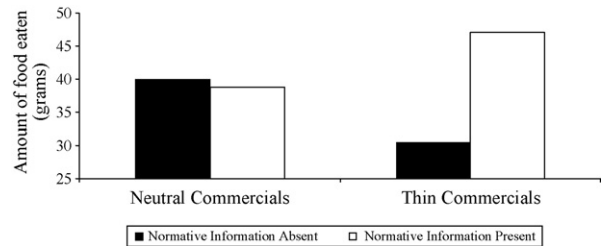


Fig. 1. Study 3 effect of type of commercial and normative information on amount of food eaten.

BMI for this sample was 20.7 ( $SD = 2.48$ ) which is within the normal range of 20–25.<sup>6</sup>

### Eating behavior

We expected participants who were exposed to the thin images would eat significantly less food than participants exposed to the neutral images, but that this main effect would be qualified by an interaction between the type of commercial and whether the sociocultural norm for thinness was challenged or not.<sup>7</sup> To test this hypothesis, we conducted a two-way ANOVA with type of commercial (thin vs. neutral) as one of the between-participants factors and normative information (present vs. absent) as the other between-participants factor. The only effect to emerge was a significant interaction between the type of commercial viewed and the normative information manipulation,  $F(1, 105) = 3.95, p = .05, \eta^2 = .04$ . As can be seen in Fig. 1, the normative information about the commercials had an impact on participants who viewed the thin commercials, but had no impact on participants who viewed the neutral commercials. Simple effect analyses revealed that participants who viewed the thin commercials and received no additional information about the commercials ate significantly less food ( $M = 30.0$  g,  $SD = 16.7$ ) than participants who viewed the thin commercials and were told that their peers did not endorse the cultural norm for thinness ( $M = 44.9$  g,  $SD = 28.7$ ),  $F(1, 105) = 5.12, p = .03$ . As predicted, receiving normative information about the commercials had no impact on participants who viewed the neutral commercials,  $F < 1$ , ns. Simple effect analyses also revealed that participants who viewed the thin commercials (and did not receive normative

<sup>6</sup> BMI was not a significant covariate for any of the analyses in this study and there were no mean differences in BMI across conditions.

<sup>7</sup> Seven participants indicated that they did not believe the cover story, therefore they were dropped from the analyses. The analyses were conducted on the remaining 109 participants.

information) ate marginally significantly less food ( $M = 30.0$  g,  $SD = 16.7$ ) than participants who viewed the neutral commercials (and did not receive normative information) ( $M = 40.5$  g,  $SD = 21.2$ ),  $F(1, 105) = 3.72$ ,  $p = .06$ . In addition, we found that participants who viewed the thin commercials and received the normative information did not differ from the two neutral conditions in the amount of food eaten,  $t(105) = 1.07$ ,  $p = .28$ .

The findings from Study 3 suggest that challenging the sociocultural norms for appearance weakened the impact of the thin commercials on women's eating behavior. Participants who were exposed to thin images, but were also told that their peers criticized the images, did not restrain their eating to the same extent as participants who were only exposed to the thin images. When the women in our study were made aware that – at least at their university – there is little reason to be concerned about sociocultural norms for appearance, the thin images did not affect eating behavior to the same extent.

#### Study 4

Sociocultural norms for ideal appearance suggest to women that they need to be thin to be accepted in society (Fallon, 1990; Rodin et al., 1985; Thompson et al., 1999). In the first three studies, we found that exposure to thin images which reflect these norms led women to restrain their eating. In the final study, we investigated whether an association between weight and acceptance could account for the effect of exposure to thin images on eating behavior. Previous research has shown that activation of appearance-related schemata mediates the relation between exposure to thin media images and body dissatisfaction (Brown & Dittmar, 2005; Hargreaves & Tiggemann, 2002). In the current research, we used an implicit measure of the association between being heavy and being interpersonally rejected by adapting the computer task used by Baldwin and Sinclair (1996). In the computer task, participants were primed with words related to heaviness and unattractiveness and then we measured how these words affected activation of interpersonal rejection. Following the computer task, participants ate a variety of foods, ostensibly for an unrelated experiment. We expect to find that women exposed to thin images will be more likely to activate an association between weight and rejection and that this activation will predict eating behavior.

#### Method

##### *Participants and design*

Participants were thirty-five female undergraduates (age range 18–21). All participants received one experimental credit for their participation. The study was a one (type of commercial: thin vs. neutral) factor design. The main dependent variable, the amount of food consumed, was unobtrusively assessed in a taste-testing phase of the experiment.

##### *Procedure*

Participants were contacted under the same cover story, given the same pre-lab instructions, and followed the same procedures as the participants in Study 1 including the pre-measure of restrained eating, except that in between viewing the commercials and performing the taste test, participants completed a computer task designed to assess whether they believed that weight and interpersonal rejection are associated with one another.

The computer task was a lexical decision-making task (LDT) modeled after Baldwin and Sinclair's (1996) "if . . . then" contingencies of interpersonal acceptance computer task. Following Baldwin and Sinclair's logic, if a person believes that interpersonal rejection is associated with being heavy and unattractive, this belief will facilitate a lexical decision trial in which a prime of *heavy* will facilitate the identification of target words representing *rejection*.

For the computer task, each trial began with a 1-s presentation of an asterisk on which participants were instructed to focus. To familiarize participants with the lexical decision task, they were first given eight practice trials, in which they were shown a letter string and asked to decide if it was a word or a non-word. They pressed the space bar to initiate each trial and then pressed either the letter "z" which was labeled "WORD" to indicate that the letter string was a word, or pressed the letter "m" which was labeled "NON-WORD" to indicate that the letter string was a non-word.

After a set of practice trials, participants were told that in order "to make this task a little more difficult" they would be shown some distractor words before the target letter strings appeared. On each trial, a prime word was presented for 700 ms, followed by a 300 ms pause, and then the target letter string was shown for 2 s. Participants were instructed to attend to the second letter string and to indicate if it was a word or a non-word by pressing the keys labeled "word" and "non-word."



The prime words consisted of eight “heavy/unattractive” words and eight neutral words. The “heavy/unattractive” words used in the task were: fat, ugly, huge, heavy, overweight, obese, large and unattractive. The target words consisted of 12 rejection words and 24 non-words. The rejection words used in the task were: hated, despised, scorn, mocked, disgust, disapproval, disliked, ridiculed, humiliated, rejected, loathed, and ignored. Each prime word was paired with the rejection words and also paired with the non-words. Thus, each prime word appeared twice in the LDT for a total of 16 trials. Prime-targets were presented in a different random order for each participant.<sup>8</sup>

After the lexical decision-making task, participants were asked to taste and rate four different types of food, ostensibly for an unrelated experiment. The experimenter left the participant alone in the room for 20 min to complete the taste-test. When the experimenter returned, they were asked their height and then they were weighed. Following this, the participants were debriefed, probed for suspicion and thanked for their participation. None of the participants were suspicious of the cover story in this study.

## Results and discussion

### Body mass index

Based on height and weight, we calculated a body mass index (BMI) score for each participant. The mean BMI for this sample was 22.0 ( $SD = 4.13$ ) which is within the normal range of 20–25.<sup>9</sup>

### Association between weight and interpersonal rejection

Because we think exposure to thin images will lead participants to think that being heavy and being rejected are more strongly associated, we expect that exposure to thin images will lead to quicker response latencies to the rejection words following the “heavy/unattractive” primes.

In order to test whether the type of commercial had any effect on the association between weight and rejection, we conducted an ANCOVA with type of commercial as the between-participants factor, response latencies on neutral trials as the covariate and response

latencies to rejection words following heavy/unattractive primes as the dependent variable. The data from three participants was excluded because of high error rates.<sup>10</sup> The analyses were conducted on the remaining thirty-two participants.

The ANCOVA revealed a main effect for type of commercial such that participants who were exposed to thin images had faster response latencies to rejection words following heavy/unattractive primes ( $M_{\text{ajd}} = 693.58$ ,  $SD = 125.47$ ) than participants exposed to neutral images ( $M_{\text{ajd}} = 793.23$ ,  $SD = 147.45$ ),  $F(1, 31) = 6.23$ ,  $p = .02$ ,  $\eta^2 = .17$ .

### Eating behavior

Based on the earlier findings, we expected participants who were exposed to the thin images to eat less food than participants who were exposed to the neutral images. In order to test this hypothesis, we conducted a one-way ANOVA with type of commercial as the between-participants factor and amount of food consumed (in grams) as the dependent variable. The participants’ rating of the tastiness of the food was a marginally significant covariate, therefore it was included,  $F(1, 31) = 3.15$ ,  $p = .09$ . The ANCOVA revealed a main effect for type of commercial,  $F(1, 31) = 4.03$ ,  $p = .05$ ,  $\eta^2 = .10$ . Participants who viewed the thin commercials ate less food ( $M_{\text{adj}} = 34.1$  g,  $SD = 13.1$ ) than participants who viewed the neutral commercials ( $M_{\text{adj}} = 50.2$  g,  $SD = 30.5$ ).<sup>11</sup>

### Analyses examining psychological process

In order to test whether the association between weight and interpersonal rejection relates to women’s eating behavior, we first examined the within-cell correlations for participants who viewed the thin commercials and participants who viewed the neutral commercials. Examination of these within-cell correlations revealed that for participants who viewed the thin commercials, response latencies for rejection words following heavy/unattractive primes and participants’ eating behavior were significantly correlated with one another,  $r = .51$ ,  $p = .04$ . The positive correlation indicates that the quicker participants responded to rejection words after being primed with heavy/unattractive words, the less food they consumed. This

<sup>8</sup> In addition to the heavy/unattractive primes, we also included thin/attractive primes which were paired with rejection words. There were no significant effects of the thin/attractive primes, therefore results from these trials will not be discussed.

<sup>9</sup> BMI was not a significant covariate for any of the analyses in this study and there were no mean differences in BMI across conditions.

<sup>10</sup> Participants were excluded if their error rate exceeded 20%.

<sup>11</sup> Because tastiness of the food was only a marginally significant covariate, we also ran the analysis without tastiness of the food as covariate. This ANOVA revealed a marginally significant main effect for the type of commercial,  $F(1, 32) = 3.22$ ,  $p = .08$ .

relation was not significant for participants who viewed the neutral commercials ( $r < .11$ , ns).

This pattern of within-cell correlations indicates that the relation of eating behavior and response latencies to rejection words was moderated by condition. That is, in the thin commercials condition the data suggest that the activation of rejection words is associated with women eating less, whereas in the neutral condition there was no evidence of this relation between activation of rejection words and eating. This pattern of data is consistent with the proposed psychological process indicating that exposure to thin images led participants to activate an association between fat and interpersonal rejection (cf. Spencer, Zanna, & Fong, 2005). And, the more this association was activated, the less participants ate in the taste test.

#### *Meta-analysis*

We conducted a meta-analysis to determine the overall effect of the type of commercial viewed on the amount of food that participants consumed (for Studies 1–4). This meta-analysis revealed that participants who viewed the thin commercials ate significantly less food than participants who viewed the neutral commercials ( $z = 3.88$ ,  $p < .0001$ ). Averaged across all four studies, participants who viewed the thin commercials ate 41% less food than participants who viewed the neutral commercials. Thus, the thin commercials had a large impact on women's eating behavior.

#### *General discussion*

These four studies clearly demonstrate that viewing thin images affects women's eating behavior. In Study 1, we found that women who were exposed to commercials containing thin models ate less food than women exposed to neutral commercials. In the following two studies, we found that challenging the sociocultural norms for ideal appearance reduced the impact of the thin images on women's eating behavior. In Study 2, this effect was attenuated by including images of heavier women who have been successful in life. We suspect the images of heavier, successful women led to less restrained eating because they signaled to women that success and happiness are not dependent on weight and appearance. In Study 3, the sociocultural norms for appearance were directly challenged. Women who were exposed to the thin images, but were also told that their peers did not endorse the norms and had actually criticized the thin media images did not restrain their eating. In fact, they ate the same amount as women in the control condition.

In our final study, we found that exposure to thin images led participants to activate an association between being overweight and being interpersonally rejected. The more this association was activated, the less women ate.

#### *Limitations*

One of the limitations of this research is that all of the studies employ university students. Women in university are dating frequently and socializing regularly and these activities might well lead to increased concerns about weight and appearance. Perhaps if we had used a broader sample of women, we would not have found the same pattern of results. However, research by Pliner and her colleagues suggests that girls as young as ten and women as old as seventy-five are all quite concerned with their weight and body shape (Pliner et al., 1990). Therefore, even though our sample may have been particularly susceptible to the impact of the thin images, it seems likely that media images would have an effect on a broad range of women throughout the life span.

Although every effort was taken to ensure that participants would feel relaxed and natural in our studies, another limitation of this research is that the studies involve somewhat artificial situations. We do not know whether these same effects would occur in a more natural, real-life setting.

It is important to note that the mode of presenting the commercials may have strengthened their effect. In the first two studies and in the final study, participants were simply told that we were testing their long-term memory for the commercials. Given these instructions, participants probably viewed the commercials carefully, but not critically. This passive, non-critical viewing of the commercials might have contributed to the effects of the thin images. That is, if participants had viewed the commercials in a more critical manner, they may not have been as negatively impacted by the thin images. The results from Study 3 lend support to this idea. In Study 3, half of the participants who viewed the thin images read negative statements about the commercials. Reading the negative statements may have placed the participants in a more critical state of mind, which may have contributed to the reduced impact of the thin images in this condition.

One question that remains unanswered by the present research is 'how long do the images have an impact on women?' The dependent measures were always administered directly after viewing the commercials, therefore the findings cannot address whether the thin images have a lasting or only a transient impact on women and their eating behavior. It is quite possible that

the thin images only have a brief impact on women. However, it is important to point out that women see thin images on a regular basis. The vast majority of women in magazines, on television and in the movies are very thin, thus women are frequently exposed to the types of thin images that were used in these studies (Gordon, 1990; Silberstein, Perdue, Peterson, & Kelly, 1986). Perhaps the thin images only have a brief impact, but it seems plausible that given women's repeated exposure to thin images, long-term effects on women's body image and their eating behavior could result from even a transient effect.

#### *Theoretical implications*

This research clearly demonstrates that exposure to thin images leads women to restrain their eating. It also highlights the importance of sociocultural norms for thinness in this process. If women did not see the sociocultural norms as legitimate and accurate, they might be able to de-value the domains of weight and appearance when they are in situations in which it would be self-protective to do so (e.g., when they are confronted with images of thin, beautiful women). The findings from Study 2 and 3 in which we challenged the sociocultural norm for thinness lend support to the idea that the legitimacy of the sociocultural norms is an important factor. Women who were exposed to thin images but were either reminded that success is not contingent on weight (Study 2) or were told that their peers did not think the sociocultural norms for thinness were legitimate (Study 3) did not restrain their eating to the same extent following exposure to thin images.

This research is among the first to examine the process underlying the relation between exposure to thin images and women's eating behavior. In our final study, we found that exposure to thin images led women to activate an association between weight and rejection. The more this association was activated, the less women ate. These findings add to the growing literature that suggests that thin images lead women to activate appearance-related schemata and that, once activated, these schemata are related to how women feel about their weight and appearance (Brown & Dittmar, 2005; Hargreaves & Tiggemann, 2002). Previous research has established that viewing thin images leads women to activate "thin thoughts" and the more these thoughts are activated, the less satisfied women are with their bodies. We have found that exposure to thin images makes women activate an association between being heavy and being rejected and that the activation of this association is related to women restraining their eating.

#### *Broader implications*

The findings from this research also have important implications for society. They suggest that if we could change the message that women need to be thin and beautiful to be accepted, or increase the diversity of body shapes portrayed in the media, then the presence of beautiful models would not have a negative impact on women. In the future we would like to determine whether the majority of people really do endorse the sociocultural norm for thinness or whether a pluralistic ignorance phenomena (Prentice & Miller, 1993) is occurring such that most women don't personally accept the norm, but they believe that everyone else in society does and that is why they are still affected by it.

In addition to important theoretical implications, this research also has important health implications for women. These studies demonstrate that women who were exposed to images that reflect the cultural ideal for thinness ate less food than women who were exposed to neutral images. Restrained eating has been linked to binge eating (Polivy & Herman, 1985) and eating disorder symptomatology (Heatherton & Polivy, 1992). It has been suggested that women who chronically restrain their eating might develop eating disorders (Heatherton & Polivy, 1992). Thus, the present research provides an interesting account of how thin images frequently seen in the media may play a role in the development of eating disorders (Stice & Shaw, 1994; Stice et al., 1994). Frequent exposure to thin images may lead women to regularly restrain their eating. And, this frequent restraint may eventually lead to eating disorders such as bulimia or anorexia nervosa.

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