Inspiring or Dispiriting? The Effect of Diet Commercials on Snack Food Consumption in High School and College-Aged Women

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ABSTRACT
Objective: Recent research offers conflicting views of whether women high in dietary restraint are inspired or demoralized after viewing thin-ideal images. We conducted two studies to explore the impact of diet commercials featuring the thin-ideal image on snack food consumption.

Method: In Study 1, 91 high school women watched a sad movie interrupted with diet or neutral commercials. In Study 2, 102 college women saw diet commercials early or midway through a sad movie.

Results: In Study 1, high restraint participants consumed more snacks after exposure to diet commercials than to neutral commercials. In Study 2, early commercials reduced snacking in low restraint women but not in high restraint women.

Discussion: Thin-ideal images embedded in diet commercials do not inspire high restraint women but can modify the eating of low restraint women.

Keywords: dietary restraint; thin-ideal images; diet commercials; high school women; college women

Introduction
Dietary restraint theory, first conceptualized nearly 30 years ago (Herman & Polivy, 1975), asserts that restrained eaters—people who chronically attempt to maintain strict control over their eating—are at high risk for becoming temporarily disinhibited. The links between dietary restraint and clinical eating pathology are well established (Polivy & Herman, 2002), and dozens of studies detail conditions likely to induce disinhibition (e.g., Kahan, Polivy, & Herman, 2003; Sheppard-Sawyer, McNally, & Fischer, 2000). The current article sought to explore less common terrain—the process of “reinhibition” through which dietary control is reinstated after a lapse.

Strauss, Doyle, and Kreipe (1994) reported one of the few attempts to foster reinhibition. They speculated that images of successful dieters would remind women of their capacity to regulate their eating and thereby help them to reestablish control after becoming disinhibited. Their participants ate snack food while watching a sad movie (a common disinhibiting stimulus) interrupted by diet-related and body-related commercials, neutral commercials, or no commercials. Rather than generating reinhibition, the diet commercials actually elicited overeating among women high in dietary restraint.

Research in the intervening decade sheds some light on these paradoxical results, yet the effect of diet commercials on women’s snack food consumption remains enigmatic. These advertisements, along with other forms of idealized female media images, usually seem to exert a deleterious effect on women’s body image and eating patterns (Groesz, Levine, & Murnen, 2002; Hargreaves & Tiggemann, 2002; Seddon & Berry, 1996). Yet, under certain conditions, they seem to boost self-esteem and body confidence (Durkin & Paxton, 2002; Henderson-King, Henderson-King, & Hoffman, 2001; Mills, Polivy, Herman, & Tiggemann, 2002). Mills et al. (2002) offer a compelling explanation for these divergent findings by delineating two separate processes: (a) a negative contrast effect in which participants compare themselves unfavorably to the thin-ideal image and (b) a positive inspiration effect in which participants identify with and thus experience self-enhancement through the thin-ideal image. We sought to
complement Mills et al.’s findings by inducing an inspiration effect within a reinhibition paradigm.

Study 1

Although myriad studies document the effects of viewing representations of the thin-ideal image, Strauss et al. (1994) report the only investigation in which these images are embedded within a disinhibiting stimulus (a sad movie). Our goal was to replicate and extend their findings. Because the teen years are of crucial significance in eating concerns and because few experimental studies have examined restraint and media exposure among teens (Durkin & Paxton, 2002), we applied Strauss et al.’s paradigm to a high school sample. We predicted that students high in dietary restraint would eat more than students low in restraint and that this effect would be most pronounced after exposure to advertisements emphasizing the thin-ideal image.

Method

Participants. Ninety-one female students from a public high school in the northeastern United States were recruited from 16 academically diverse classes. Most participants (73.6%) were in Grades 11 and 12. Consistent with the school’s racial/ethnic composition, the majority of participants were Caucasian (n = 68 [74.7%]) with fewer Hispanic/Latina (n = 12 [13.2%]), African American (n = 7 [7.7%]), and Asian American (n = 4 [4.4%]) students.

Measures. The Restraint Scale (RS; Herman & Polivy, 1980) comprises 10 items that measure the extent to which participants monitor and control their food consumption yet are prone to lapses in self-regulation. Using a median split, we divided the participants into high (scores ≥ 15; n = 43) and low (scores < 15; n = 48) restraint groups. This score corresponds to the cutoff value recommended by Urbszat, Herman, and Polivy (2002) and Mills et al. (2002) to differentiate individuals high and low in dietary restraint.

The Multiple Affect Adjective Checklist (MAACL; Zuckerman & Lubin, 1965) is a compilation of 132 adjectives pertaining to a variety of moods including general positive affect (e.g., feeling happy, excited, content), and sensation-seeking feelings (e.g., adventurous, reckless). Participants indicated the adjectives that best described how they felt at that moment. The MAACL measured sad mood at two points in the experiment.

Procedure. Following the procedure outlined in Strauss et al. (1994), participants believed they were involved in a pilot study of the effect of mood on taste perceptions at different points in the menstrual cycle.1 In our study, 1–5 students participated at a time, with each participant occupying her own cubicle. Participants could not see each other but shared a view of a video screen. All testing was conducted at the same time in the school day to ensure that a sufficient amount of time had passed since lunch. Upon arrival, participants completed a consent form, the MAACL to establish their baseline mood state, and a background questionnaire designed to reinforce the cover story, assess potential confounding variables, and gather basic demographic information. Each cubicle contained two identical bowls with approximately 300 g each of M&M (Mars, Inc., Hacketstown, NJ) chocolate candies and salted peanuts. Participants were advised that they could eat as little or as much as they wanted, but they had to eat at least three M&Ms and peanuts to ensure the accuracy of the taste test.

After completing the initial surveys, participants watched the same stimuli used by Strauss et al. (1994): a 39-min clip of a sad movie, “Terms of Endearment,” interrupted halfway through with either four neutral commercials (e.g., commercials of linens and windows) or four commercials related to diet and body image (e.g., Weight Watchers [Weight Watchers International, Inc., Woodbury, NY] and Slim Fast [Slim Fast Foods, Corp., West Palm Beach, FL]). The commercial interruption lasted 90–93 s. After the end of the movie clip, participants completed another MAACL and the RS. As is common in restraint studies (cf. Mills et al., 2002), the RS was administered late in the session to minimize participants’ awareness that eating and restraint were central to the study. At the conclusion of the study, researchers debriefed participants, none of whom indicated any suspicion about the cover story.

Results

Mood Manipulation Check. A 2 (restraint: high/low) × 2 (advertisements: body/neutral) × 2 (testing: pretesting/posttesting) analysis of variance (ANOVA) on the MAACL Depression subscale yielded a significant main effect for testing, $F(1, 86) = 48.66, p < .0001$, partial $\eta^2 = .36$, with no other significant effects, indicating that participants felt sadder after the movie ($M = 20.7, SD = 0.5$) than before ($M = 15.1, SD = 0.6$), irrespective of restraint status or advertisement condition.

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1 The specific details of the experimental protocol are available from the corresponding author. The protocol includes information about how the experimenter reinforced the cover story and explained the presence of the advertisements within the movie.
TABLE 1. Means (SD) for total food consumption (in grams) by restraint status, timing, and advertisement condition

<table>
<thead>
<tr>
<th>Restraint</th>
<th>High</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diet ads</td>
<td>113.9 (54.9)</td>
<td>63.6 (43.5)</td>
</tr>
<tr>
<td>Neutral ads</td>
<td>60.1 (48.3)</td>
<td>62.6 (40.7)</td>
</tr>
<tr>
<td>Study 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early ads</td>
<td>83.5 (24.3)</td>
<td>50.0 (33.4)</td>
</tr>
<tr>
<td>Late ads</td>
<td>73.8 (41.3)</td>
<td>74.2 (42.4)</td>
</tr>
</tbody>
</table>

Note: Ads = advertisements.

Food Consumption. Next, we performed a 2 × 2 (Restraint × Advertisements) ANOVA on total grams of food consumed. The main effects for Restraint, F(1, 87) = 5.92, p < .02, partial η2 = .06, and Advertisements, F(1, 87) = 7.78, p < .01, partial η2 = .08, as well as the interaction effect, F(1, 87) = 7.19, p < .01, partial η2 = .08, were significant. Post-hoc tests indicated that the high restraint participants who saw the diet commercials ate significantly more than all other groups (Table 1).

Discussion

As predicted, high school women high in dietary restraint consumed significantly more snack food after exposure to diet commercials than did women low in restraint. Like the Strauss et al. (1994) sample, these women ate nearly twice as much as the women in the other experimental groups. This similarity is striking because of the age difference between the samples and because, unlike the Strauss et al. study, our participants did not consume a milkshake preload before watching the movie. We believe that the increased snacking within this group may reflect a negative contrast effect (Mills et al., 2002). Participants compared themselves unfavorably to the thin-ideal images presented in the diet commercials and their consequent negative self-appraisal fueled disinhibited eating. Interestingly, women high and low in dietary restraint ate equivalent amounts after viewing the sad movie, the inspiration effect would be more evident in decreased consumption in this group.

Because we randomly assigned participants to condition and the conditions only varied by the commercials presented, however, it seems parsimonious to assume the effect is due in large part to the commercials themselves. Second, following common practice, we measured restraint at the conclusion of the study, thus leaving open the possibility that scores were influenced by the study itself. Finally, we were unable to assess age differences in eating consumption because we had an insufficient number of participants in the younger grades.

Despite these limitations, our results encouraged us to continue to work within this experimental paradigm to produce a reinhibition effect by altering the timing of the commercials.

Study 2

In Study 1, we demonstrated that women high in dietary restraint eat more snack food when exposed to commercials emphasizing dieting, fitness, and the thin-ideal image. Although we sought to invoke reinhibition by presenting weight-related commercials, our goal was not achieved. One reason for our inability to elicit reinhibition could involve the timing of the commercials. Participants viewed commercials 21 min into an emotionally intense film. Considerable eating might have transpired before viewing the commercials, possibly triggering negative affect about the eating that had already occurred and precipitating additional eating. We speculated that presenting weight-related advertisements near the beginning of the film might mimic Mills et al.’s (2002) “thinness attainability” condition and thus, in the context of a sad movie, increase the odds of reinhibition among high restraint women.3

Method

Participants. Participants were 102 female undergraduates attending a small college in the midwestern United States who received either course credit (n = 52, mean age = 18.6 years, SD = 0.8) or $10 (n = 50, mean age = 20.2 years, SD = 1.1) for

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2 We analyzed the data for candy, peanuts, and total grams consumed. The patterns were essentially the same for all three variables, although only the peanut and total gram data were consistently, statistically significant. For ease of presentation, we report only the total gram data.

3 We are aware that Mills et al. proposed that high restraint eaters, when engaged in the “thin fantasy,” may eat freely because they feel good about their bodies. We nonetheless predicted that, in the context of a disinhibiting stimulus like a sad movie, the inspiration effect would be more evident in decreased consumption in this group.

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their participation. Of the 78 women who provided information about their race/ethnicity, 69.2% (n = 54) identified themselves as Caucasian, 10.3% (n = 8) as African, African American, or Afro Caribbean, 7.7% (n = 6) as Asian or Asian American, 3.8% (n = 3) as Hispanic, and 9.0% (n = 7) as biracial or multiracial. The median RS score was lower in this sample than in Study 1 (12 vs. 15). Therefore, in keeping with past research (e.g., Mills et al., 2002; Urbaszat et al., 2002) we used the higher score as the cutoff value. As a result, 77 participants were classified as low restraint and 27 were classified as high restraint.

Procedure. Participants believed they were involved in a study exploring the effect of mood on preference for sweet versus salty food. All participants were tested individually. Upon arrival, they completed a consent form, the MAACL to establish a baseline mood state, and a background questionnaire designed to reinforce the cover story, assess potential confounding variables, and gather basic demographic information. One half of the participants then consumed a 6-oz (~180 milliliters) milk-shake preload.

After completion of the measures, we presented all participants with two identical bowls filled with approximately 600 g of M&Ms candy and 380 g of Fritos (Fritos Original Corn Chips, Frito-Lay North America, Inc., Plano, TX) corn chips (the difference in weight is a function of the relative density of the foods and the amount of each needed to fill identical containers). We advised participants that they could eat as little or as much as they wanted during the movie but instructed them to eat at least one piece of candy and one chip.

Next, they viewed a 23-min segment of a sad movie, “Beaches,” interrupted by five commercials totaling 90 s. The commercials emphasized diet and fitness products and featured women who conformed to the thin-ideal image. One half of the participants, selected at random, viewed the commercials after 5 min, whereas the other half saw the advertisements midway through the clip—about 10 min into the video.

When the video was over, participants completed a second MAACL and the RS. At the end of each session, we debriefed the participants and determined whether they believed the cover story.

Results

Mood Manipulation Check. A 2 (restraint: high/low) x 2 (timing: early/late) x 2 (testing: pretest/posttest) ANOVA on the Depression subscale of the MAACL yielded a significant main effect for testing, F(1, 100) = 29.0, p < .0001, partial $\eta^2$ = .22, with no other significant main effects or interactions. Thus, participants felt sadder after the movie ($M = 16.8, SD = 0.4$) than before the movie ($M = 14.2, SD = 0.4$), irrespective of restraint status or timing.

Food Consumption. Next, we performed a 2 (restraint: high/low) x 2 (testing: pretest/posttest) ANOVA on total grams of food consumed. As in Study 1, a significant main effect for restraint emerged, $F(1, 100) = 3.91$, $p < .05$, partial $\eta^2 = .04$. The timing of the advertisements did not produce a significant main effect, but we did find the predicted interaction effect of Timing x Restraint, $F(1, 100) = 4.13$, $p < .05$, partial $\eta^2 = .04$. Contrary to our predictions, however, post-hoc tests indicated that this effect was accounted for by a significant decrease in consumption among the low restraint eaters in the early timing group (Table 1).

Discussion

Study 2 delivers intriguing news about the impact of diet commercials on women’s snack food consumption. Presenting stimuli emphasizing encouraging messages about weight and fitness early in a disinhibiting situation does not appear to affect the eating behaviors of women high in dietary restraint, but it does modify the eating of women low in restraint. Compared with high restraint eaters, low restraint eaters appeared to be, if not more, sensitive to the early diet commercials. These findings remind us that all women may be susceptible to media images and require us to reexamine our assumptions about the regulatory processes used by low restraint eaters. Whereas a few researchers have noted significant changes in the eating patterns of low restraint

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4 Four additional participants were excluded from analyses because they either could not eat the snack foods (e.g., because of diabetes), they discerned the true purpose of the study, or they knew in advance we would be assessing their food intake.

5 Because the cutoff score of 15 yielded unequal cell sizes, we computed all analyses using the median of 12 as well and achieved similar results.

6 Study 2 was actually run as two separate studies. The first study involved consumption of the preload, whereas the second did not. Because none of the analyses involving preload reached significance, we combine the data here for the sake of efficiency.

7 We also performed an ANOVA on the Anxiety subscale of the MAACL for exploratory purposes. As with the Depression subscale, this analysis yielded a main effect for Testing with no other significant main effects or interactions, $F(1, 100) = 5.2, p < .02$, partial $\eta^2 = .05$, showing that participants felt more anxious after the movie than before ($M = 8.3, SD = 2.1$ vs. $M = 7.6, SD = 2.5$), irrespective of restraint status, preload, or timing.

8 We analyzed the data for candy, corn chips, and total grams consumed. In keeping with Study 1, we report only the total gram data, although the patterns were consistent across the food groups. We also conducted a multivariate analysis of covariance (MANCOVA), covarying for self-reported body mass index (BMI) scores. Again, the results remained essentially unchanged although the main effect for restraint became only marginally, statistically significant.
eaters (e.g., Sheppard-Sawyer et al., 2000), the eating behaviors of these women have rarely received direct attention. Future researchers might consider how women low in dietary restraint use media information to modify undesired eating behavior without experiencing the negative contrast effect described by Mills et al. (2002).

Despite differences in stimuli and timing, women high in restraint ate more snack food overall than women low in restraint in both studies, thus supporting considerable research attesting to the disinhibiting effects of a sad movie stimulus (e.g., Sheppard-Sawyer et al., 2000). We note, though, that restraint status did not produce differential effects on eating in the late commercial condition. The decreased time to eat after the commercials (10 min in Study 2 compared with 20 min in Study 1) may have artificially limited snack food consumption in the current study or the commercials in Study 2 may have been less disinhibitory than those in Study 1. These conjectures await future exploration. The absence of a neutral commercial comparison condition and the small sample of participants in the high restraint condition constitute further methodologic limitations that might be redressed in future investigations. Finally, in light of the study by Mills et al. (2002), future researchers might examine self-enhancement processes more directly by assessing changes in self-esteem throughout the experimental session.

**General Discussion**

These two studies provide complementary information about the impact of diet commercials on women’s snack food consumption as a function of dietary restraint. Advertisements emphasizing thinness and fitness exacerbated disinhibition among high school women high in dietary restraint. Even when presented within the first 5 min of a negative mood induction, diet commercials did not confer any benefit to college women high in restraint. Thus, we failed to demonstrate that thin media images, as depicted by diet commercials, can be inspiring for high restraint women.

Surprisingly, these media images exerted a more positive effect on women low in restraint. Low restraint eaters are typically portrayed as relatively impervious to media influences, yet this was clearly not the case with our sample. By studying more systematically the situational determinants of eating consumption in this group, future researchers might discern the strategies that low restraint eaters employ to modify their eating behavior and determine whether these strategies might prove useful for women high in dietary restraint.

These studies sought to use the inspirational content of diet commercials as ballast against the dispiriting effects of disinhibition. Although we were ultimately unsuccessful in this pursuit, we believe the current paradigm offers an efficient approach to assessing the interplay of mood and media in eating behavior. By further adjusting the timing and content of the media images and by examining mediating factors more directly, future researchers may finally be able to activate the elusive process of reinhibition.

**References**


