

Self-Esteem, Restraint, and Eating Behavior

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The mediating influence of self-esteem on disinhibited eating was assessed in restrained and unrestrained subjects. Self-esteem was unrelated to the eating behavior of unrestrained subjects following a preload, but did moderate the disinhibitory effects of a preload on restrained subjects. Specifically, only those restrained subjects with low self-esteem displayed disinhibited eating after a preload. Theoretical and practical implications of this finding were discussed.

The individual difference variable of dietary restraint has been used successfully for some time to predict differential eating behavior in dieters and nondieters (e.g., see Polivy & Herman, 1983, or Ruderman, 1986, for reviews). Using the 10-item Revised Restraint Scale (see Polivy, Herman, & Howard, in press, for a psychometric description), researchers have shown that chronic dieters eat more than do nondieters following a "fattening" preload (e.g., Herman & Mack, 1975), even if the preload is only perceived as high calorie (e.g. Polivy, 1976; Spencer & Fremouw, 1979). Similarly, disinhibitors such as alcohol (Polivy & Herman, 1976b), anxiety (Herman & Polivy, 1975; Herman, Polivy, Lank, & Heatherton, 1987), depression (Polivy & Herman, 1976a), or diffuse dysphoria (Frost, Goolkasian, Ely, & Blanchard, 1982; Ruderman, 1985) increase dieters' eating but generally suppress nondieters' eating. Despite its power to predict consistent group differences between dieters and nondieters, however, restraint status has been considerably less successful at predicting behavior at the individual level. Researchers have commented on the large within-group variability in amount eaten for both restrained and unrestrained subjects (Kirschenbaum & Tomarken, 1982; Silver, Polivy, & Herman, 1978). For instance, although most restrained subjects eat minimally under normal (nondisinhitory) circumstances, often as not there are a few who eat large amounts even in the absence of explicit disinhibitory provocation. By the same token, after a diet-breaking preload most restrained subjects eat a great deal, but there are often a few who eat minimally, in apparent defiance of the preload, stressor, or other disinhibitor.

Silver et al. (1978) attempted to improve behavioral predictability (i.e. reduce within-cell variability) by creating subject groups based not only on restraint scores but also on "commitment to dieting" and "commitment to eating" scores. Unfortunately, this strategy was not particularly successful. It thus remains unclear which individual difference variable(s) other than restraint might increase one's immunity or susceptibility to disinhibitors.

One group that seems to be less variable in their response to standard disinhibitors is bulimia nervosa patients, who tend to overeat consistently in response to stress and dietary infractions. Such patients are highly restrained (Polivy, 1978), but they are also frequently described as having low levels of self-

esteem (Garner, Olmsted, & Polivy, 1983; Orleans & Barnett, 1984; Wolf & Crowther, 1983). Restrained eaters without diagnosed eating disorders have slightly lower mean self-esteem scores than do unrestrained eaters (Heatherton, Polivy, Pliner, & Herman, 1986), although self-esteem varies considerably within both restrained and unrestrained samples. Given that bulimics overeat reliably in disinhibitory situations and also show more reliable deficits in self-esteem, we deduced that perhaps those restrained eaters with low self-esteem—a majority of restrained eaters—will show reliable overeating as well. Individuals with low self-esteem have lower expectations for their performance in evaluative situations than do those with high self-esteem (Coopersmith, 1967), so it seems reasonable to assume that low-self-esteem dieters will extend this attitude to their dieting. That is, because they have low expectations for success at dieting, they may expend less effort in resisting challenges to their diets. In support of this suggestion, Mayo (1978) found that dieters with higher levels of self-esteem prior to weight-loss attempts tended to be more successful than were dieters with lower self-esteem.

A converging line of research also implicates self-esteem as a possible mediator of disinhibitory eating in restrained individuals. Brockner (1983) has demonstrated the "behavioral plasticity" or relative dependence on external cues of individuals with low self-esteem. To the extent that attractive (external) food cues control eating, we may expect more overeating by those dieters who, owing to their low self-esteem, have a greater dependence on such cues. Indeed, it seems possible that some low-self-esteem dieters might overeat in the presence of powerful food cues even without prior disinhibition; certainly, in the presence of a disinhibitory state, it seems that the low self-esteem dieters will be the ones most likely to overindulge.

The present study was thus an attempt to investigate the possible mediating effects of self-esteem on the eating behavior of restrained and unrestrained subjects. It was predicted that restrained individuals with low self-esteem would be more likely to overeat following a fattening preload than would high-self-esteem restrained subjects. Predictions for unrestrained subjects were less clear. The behavioral plasticity formulation suggests that anyone with low self-esteem may be vulnerable to powerful external cues, such as attractive food cues, even in the absence of disinhibition; yet it seems possible that this effect will be domain specific, with behavioral plasticity limited to areas of central importance to the subject (eating, for dieters, but not for nondieters). The formulation based on performance ex-

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expectations would likewise apply particularly to restrained subjects, for whom the maintenance of restraint is a matter of personal concern, but would not apply to unrestrained individuals, who are not even trying to inhibit their intake.

Method

Subjects

Seventy-eight female undergraduates participated in the study as part of an introductory psychology course. Subjects were recruited for what they thought was a taste perception experiment. Subjects came to the laboratory between 11:30 a.m. and 6:30 p.m. and were asked not to eat or drink for 2 h before the study.

Upon arrival, subjects completed a medical screening form to allow us to eliminate any who were allergic to ice cream. None were eliminated. After they had completed the eating phase of the experiment, subjects were given a series of questionnaires, including the Revised Restraint Scale (Polivy et al., in press) and a version of the Janis-Field Self-Esteem Scale modified to include a Physical Attractiveness subscale (Pliner, 1986) so that we might classify them in terms of restraint and self-esteem. After approximately three quarters of the subjects had been run, these data were examined and it was apparent that there was an imbalance in subjects' self-esteem scores such that there were too many low-self-esteem restrained and too few low-self-esteem unrestrained subjects. To correct this, the last 12 subjects were selected from a larger introductory psychology course pool that had already filled out the Restraint and Self-Esteem Scales, so that the unbalanced cells could be filled more equally. Accordingly, the experimenter was aware of the restraint status of these 12 subjects ahead of time, although he did not actually know each subject's self-esteem level.

Procedure

Subjects arrived at the laboratory individually and were given an informed consent form to sign, as well as the medical screening questionnaire. They were then told that the experiment involved the effects of temperature on taste perception, and were randomly assigned to either the control or the cold mouth condition. The "cold mouth" was allegedly achieved by having the subjects all drink an equal amount of a cold liquid, a freshly made 15-oz chocolate milkshake, the preload. Half of the subjects were preloaded and half were in the no-preload (control) condition. Next, all subjects were given three large bowls containing approximately 900 g of ice cream each, mounded and lumped so that it did not seem likely that the experimenter would be able to determine how much a subject had taken. They were also given three rating forms, corresponding to the three flavors of ice cream. The subjects were asked to use serving spoons to place ice cream into their individual cups (one for each flavor), and were asked to taste and rate the three flavors of ice cream (chocolate, vanilla and coffee) according to the following instructions:

Please taste and rate each of these three flavors of ice cream. Take as much as you need to be sure of your rating before going on to the next flavor. Fill out all of the ratings for the first flavor before tasting any of the next flavor. Please do not change a rating for any previous flavor after having tasted any of a subsequent flavor—once you have tasted a new flavor you may not go back and change any ratings of another flavor. Please rate the three flavors in the order in which they are laid out in front of you so that the tastes do not get mixed up. By the way, we will be throwing out any left-over ice cream, so after you finish all your ratings, feel free to go back and help yourself to as much of any flavor as you like. It is important, however, that you don't change any of your ratings. I'll be back in about 10 minutes.

After 10 min, the experimenter returned, removed the bowls of ice cream and rating forms, and gave the subject the postexperimental

Table 1
Means and Standard Deviations for Grams of Ice Cream Eaten

Measure	Low self-esteem		High self-esteem	
	No preload	Preload	No preload	Preload
Unrestrained				
<i>M</i>	91.98	44.79	93.93	55.79
<i>SD</i>	36.18	18.00	41.57	25.75
<i>n</i>	8	8	13	10
Restrained				
<i>M</i>	86.93	148.68	109.66	93.04
<i>SD</i>	62.90	75.28	30.18	58.15
<i>n</i>	11	10	7	11

questionnaires, consisting of the Revised Restraint Scale, the modified Janis Field Self-Esteem inventory, some questions assessing "dieting self-esteem," and a question about reactions to diet violations. All subjects were then weighed and measured, fully debriefed, and sworn to secrecy about the experiment.

Results

Subjects were classified as restrained if they scored 15 or higher on the Restraint Scale, on the basis of previous custom (with 15 or 16 being the previous values used in restraint research; c.f. Herman & Polivy, 1980) and a current median split (which yielded a median of 15). A median split on self-esteem scores (using the entire scale as revised by Pliner, 1986) yielded a median of 93, so subjects scoring 94 and above were deemed to be high on self-esteem, and those scoring 93 and below were deemed to be low.

A three-factor analysis of variance (Restrained vs. Unrestrained \times High vs. Low Self-Esteem \times Preloaded vs. No Preload) was performed on the number of grams of ice cream eaten. There was a significant main effect of restraint, such that restrained subjects ate more than did unrestrained subjects, $F(1, 70) = 11.28, p < .01$. This main effect was qualified by a significant interaction between restraint and condition, $F(1, 70) = 8.33, p < .01$, replicating the usual "counterregulation" effect in which restrained subjects eat more after a preload than if not preloaded, while unrestrained subjects do the reverse. The counterregulation effect, in turn, was qualified by a marginally significant second-order interaction, $F(1, 70) = 3.74, p < .057$, involving all three factors. Examination of Table 1 indicates that self-esteem did not moderate the behavior of unrestrained subjects, who ate less following the preload regardless of self-esteem. Restrained subjects, however, responded to the preload differently depending on self-esteem; Low-self-esteem restrained subjects showed the usual disinhibition effect, whereas high-self-esteem restrained subjects actually ate slightly less after the preload. Analysis of the restrained subjects alone yielded a marginally significant interaction between self-esteem and preload, $F(1, 70) = 3.90, p < .056$. Although high-self-esteem subjects did not eat significantly differently as a function of the preload, low-self-esteem subjects ate significantly more after the milkshake preload than did those who had not been preloaded, $t(70) = 2.88, p < .01$.

Discussion

As predicted, self-esteem was a potent mediator of the eating behavior of restrained subjects. Although the interaction be-

tween self-esteem and preload was not quite significant for the restrained subjects alone, it is clear that the low-self-esteem subjects carried the counterregulation effect. Low-self-esteem restrained subjects were the only ones to show the traditional counterregulatory response, eating more after a preload than after none. Those restrained subjects with high-self-esteem ate about the same amount regardless of whether they had been preloaded or not, exhibiting a nonsignificant decrease in intake following the milkshake. All unrestrained subjects, regardless of self-esteem level, showed normal compensation, eating less when preloaded than when not preloaded.

Despite the marked difference in the behavior of high- and low-self-esteem restrained subjects, the usual significant interaction between restraint and preload was also found. Obviously, the counterregulatory behavior of the low-self-esteem restrained subjects was sufficiently robust to produce the interaction even though a large number of high-self-esteem restrained subjects were not counterregulating. It seems likely that in previous research in the counterregulation paradigm, the effect was caused primarily by low-self-esteem dieters who comprise the majority of the dieting population. (Despite our attempts to equalize cell means toward the end of the study, there were still more low-self-esteem restrained subjects than either low-self-esteem unrestrained subjects or high-self-esteem restrained subjects; self-esteem was significantly lower in the restrained than in unrestrained subjects, $t(76) = 2.49, p < .02$, and $r(76) = -.316, p < .01$. The overrepresentation of low-self-esteem restrained subjects did not distort the analysis of variance because restraint and self-esteem were treated as independent variables.

If high self-esteem in restrained subjects is associated with less disinhibited eating, it is possible that increasing the self-esteem or confidence of dieters might serve to protect them to some extent from the excessive eating induced by stress or other disinhibitors. Conversely, it seems likely that repeated dietary "failures" or episodes of disinhibition will take their toll on the self-esteem of some dieters. Because the present results are essentially correlational evidence of the association between self-esteem and disinhibitory tendency, one cannot comfortably draw causal conclusions. It is possible to speculate about potential causal mechanisms, however. For example, an episode of disinhibited eating might thus lower a dieter's self-esteem, making the dieter more susceptible to disinhibited eating in the future, in a self-perpetuating spiral. Such a spiral may provide at least part of the mechanism by which dieting contributes to bingeing (Polivy & Herman, 1985), and, in some particularly susceptible individuals, to the ultimate development of a true eating disorder, characterized in part by extremely low self-esteem (e.g., Garner, et al., 1983). People with low-self esteem who undertake dieting—often, ironically, in an attempt to raise their self-esteem—may find themselves worse off than if they had not attempted to improve themselves.

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Received July 9, 1987

Revision received February 8, 1988

Accepted February 23, 1988 ■