Dietary Restraint: Some Current Findings and Speculations

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In this paper we review recent findings on the disinhibition of dietary restraint. Disinhibition induced by preloading depends more upon the perception that the diet has been broken than on actual calorie content of the preload. Disinhibition can also result from emotional distress, with ego-threats more likely than physical fear to disinhibit eating. Low self-esteem dieters are more likely to become disinhibited than are high self-esteem dieters in response to both preloading and distress manipulations. Recent theoretical perspectives on disinhibition are examined and the possible role of self-awareness is highlighted.

The construct of dietary restraint has been used to explain a variety of abnormal eating behaviors, especially overeating in obese and normal weight dieters (Herman & Polivy, 1980; Ruder- man, 1986). In many cases, overeating may be a paradoxical consequence of attempts at caloric restriction (Polivy & Herman, 1985, 1987; Ruder- man, 1986). The difficulty of maintaining weight loss over the long-term is well recognized (Heatherton, Polivy, & Herman, in press; Polivy & Herman, 1983; Stunkard & Pennick, 1979; Wilson & Brownell, 1980). Although many factors (including metabolic shifts) contribute to the intransigence of weight, it appears that many dietary failures occur because occasional bouts of disinhibited eating cancel out successes at caloric restriction.

This article examines some of the environmental factors and individual difference variables that trigger disinhibited eating; in addition, we examine what is known about the chain of events involved in disinhibition. The purpose of this paper is to highlight some of the current research on restrained eating and indicate areas where additional research is needed.

Disinhibited Eating

In 1975, Herman and Mack introduced the paradoxical effect called “counterregulation.” In their study, dieters (later called restrained eaters) and nondieters (called unrestrained eaters) were preloaded with 0, 1, or 2 milkshakes and then given ad lib access to test food (ice cream) under the guise they they were participating in a “taste test.” Unrestrained eaters ate a lot of ice cream in the absence of a preload (which makes sense since the ice cream was delicious) and ate the least ice cream after two milkshakes (which makes sense because they were full). Dieters, however, did not display such compensatory eating. Instead, they ate very little when they had not had a milkshake preload but ate considerably more ice cream after consuming two milkshakes (which makes sense because they were full). Dieters, however, did not display such compensatory eating. Instead, they ate very little when they had not had a milkshake preload but ate considerably more ice cream after consuming two milkshakes. Herman and Mack (1975) explained this “what the hell” effect by proposing that dieters abandon

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1 Dietary restraint is measured by the Restraint Scale (Herman & Polivy, 1980). For a discussion on the psychometric properties of the Restraint Scale see Polivy, Herman, and Howard (1988) or Heatherton, Herman, Polivy, King, and McGree (1988).
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their diets as soon as they believe that they have exceeded some magic caloric quota.

The key to disinhibition, apparently, is the perception of whether the diet has been broken or not, since the actual caloric content of the preload is largely irrelevant. If dieters believe that they have violated their diet (whether they have or not), eating becomes disinhibited (Polivy, 1976; Spencer & Fremouw, 1979; Woody, Costanzo, Leifer, & Conger, 1981). For example, Spencer and Fremouw (1979) found that dieters (unlike non-dieters) ate more ice cream following a preload that they had been told was high in calories than after an allegedly low-calorie preload, even though the preloads were actually equal in calories. Knight and Boland (1989) have recently shown that dieters also view different types of foods as more or less threatening to one's diet, regardless of actual caloric density. Dieters were more easily disinhibited by food that they believed to be fattening (such as a milkshake) than by a food that they believed was inherently lower in calories (such as cottage cheese), even if the servings were actually equal in calories.

The Role of Self-Esteem

Although the individual difference variable of restraint has consistently predicted between-group differences in eating behavior, experimental samples of dieters have nevertheless displayed considerable variability in their reactions to disinhibiting triggers. Some dieters are more easily disinhibited than others. This variability prompted us to look for some additional variable that might explain why some restrained eaters are especially susceptible to disinhibitors. Dieters, it turns out, have lower self-esteem than do non-dieters (Polivy, Heatherton, & Herman, 1988; Ruderman & Grace, 1988). Furthermore, we know that low self-esteem subjects have lower overall expectations for their performance (Brockner, 1983; Coopersmith, 1967). Because the maintenance of dietary restraint in the face of disinhibitory pressures probably requires confidence in one's ability to withstand such pressures, we speculated that dieters with high self-esteem (a decided minority of dieters) would be relatively invulnerable to disinhibitors. We therefore conducted a study using the standard milkshake preload paradigm, but in addition to measuring restraint we also measured trait self-esteem (using a modified version of the Janis and Field Feelings of Inadequacy Scale; Pliner, 1986). We found that self-esteem was unrelated to eating for unrestrained eaters, but was quite important in predicting which restrained subjects would show disinhibited eating following a preload. Only those dieters with low self-esteem showed the classic counterregulatory response. High self-esteem dieters ate the same amount whether preloaded or not (Polivy, Heatherton, & Herman, 1988).

Distress-Induced Eating

In addition to the effects of preloading, there has also been considerable interest in eating triggered by emotional distress. Emotional distress has long been viewed as an appetite suppressant (Cannon, 1915; Schachter, Goldman, & Gordon, 1968), allegedly because the autonomic consequences of stress (e.g., increased stomach motility and increased circulating levels of free fatty acids and glucose) are similar to those sensations associated with postprandial satiety. For some individuals, however, emotional upset has the opposite effect on eating, and actually increases consumption relative to the amount eaten when calm. This divergent reaction was originally thought to depend on body weight; normal weight individuals seemed to eat less when stressed, whereas obese individuals appeared to eat more (Bruch, 1961; Kaplan & Kaplan, 1957; Schachter et al., 1968). Herman and Polivy (1980) later argued that dieting (which, of course, is common among the obese) was the critical predictor of one's reaction to distress: dieters (obese or normal weight) eat more when distressed and normal weight non-dieters eat less. Like caloric overindulgence, distress must be counted among the major precursors of disinhibited eating in dieters.

A recent review of the eating and emotionality literature (Herman, Polivy, & Heatherton, 1989) found that in addition to the type of person (dieter/obese vs. nondieter/normal weight), the type of distress is an important determinant of eating behavior, at least in the laboratory. Experimental manipulations of physical fear (such as the threat of electrical shock) have been found to reduce significantly the eating of nondietering normal weight individuals without increasing significantly the eating of obese or dieting individuals. On the other hand, experimental manipulations
that threaten subjects' egos or emotional tranquility (i.e., failure or general dysphoria manipulations) have been found to increase eating significantly by obese or dieting individuals without suppressing normal weight nondieters' eating significantly. Note that the pattern of statistical significance is important here. In each of the studies where eating was significantly reduced for unrestrained subjects (i.e., physical fear studies), there was a nonsignificant change for dieting or obese subjects; in each instance in which dieters or obese subjects ate significantly more following distress (ego-threat studies), nondieters ate nonsignificantly less.

On the basis of this review, we (Herman et al., 1989) proposed that physical fear differs from more general dysphoria in its effects on eating. Physical fear manipulations suppress hunger sensations, probably because of their effects on the autonomic nervous system. Ego-disruptive manipulations, however, lead to increased eating by obese and dieting individuals mainly because of their powerful disinhibiting properties and because dieters are relatively insensitive to internal state (Heatherton, Polivy, & Herman, 1989).

Although this pattern was consistent in the literature, it seemed desirable to demonstrate these effects in one study. Thus, we gave restrained and unrestrained subjects one of three distress manipulations prior to an ad-lib taste task (Heatherton, Herman, & Polivy, in press). Our physical fear threat (which was threat of painful electric shock) significantly decreased the eating of unrestrained subjects while only slightly (nonsignificantly) increasing the eating of restrained subjects. Our ego-threats (either failure at an easy task or having to give a speech in front of an evaluative audience) significantly increased the eating of restrained subjects while not significantly suppressing the eating of unrestrained subjects (Heatherton, Herman, & Polivy, in press).

This pattern appears to implicate the role of self in the disinhibition of eating. Only those experiences that threaten the self produce significant increases in eating for obese or dieting subjects. Although it is hard to imagine how overeating might bolster the battered self-esteem of the dieter, it might be that their overeating is not a compensation for distress but rather the result of a generalized negative expectancy: low self-esteem leaves people unable to cope adequately with actual or expected failure. Brockner and Hulton (1978) showed that low self-esteem subjects are likely to become negatively preoccupied with themselves and their shortcomings following failure. It is therefore probable that low self-esteem dieters are particularly likely to evaluate themselves negatively following failure or emotional upset. This negative view of self may generalize to other abilities, such as the ability to resist tempting and forbidden foods (such as ice cream). Thus, the failure experience might lower restrained individuals' level of expectations for performance, leaving them unable to sustain their diets.

Because we found that self-esteem was important in predicting eating following preloads (Polivy, Heatherton, & Herman, 1988), we thought that self-esteem might be important in predicting eating in response to distress. In the study just described (Heatherton, Herman, & Polivy, in press), we had obtained self-esteem scores in addition to restraint scores. Self-esteem had a dramatic effect on eating for restrained subjects. Low self-esteem restrained subjects were strongly affected by the ego-threats (i.e., they ate more following ego-threats), whereas high self-esteem restrained subjects ate the same amount in all conditions. Note that this pattern of greater susceptibility to disinhibitors by low self-esteem dieters exactly parallels the earlier preload findings.

Considering the results from these behavioral studies together with past findings, it is reasonable to conclude that self-esteem is important in the prediction of disinhibited eating. Low self-esteem dieters (i.e., the majority of dieters) are more likely than high self-esteem dieters to overeat in response to emotional distress and preloading. However, it remains unclear how self-esteem level explains such eating; at present, self-esteem has more descriptive than explanatory value. As with dieting status, self-esteem level simply identifies types of persons who will be most responsive to ego-threatening or preloading manipulations. Although it make sense that ego-threats may be more relevant to the low self-esteem individual (who also may be more attentive to possible threats to self-esteem), it does not necessarily follow that ego-threats should lead to increased eating. Thus, although self-esteem is important for predicting who will experience disinhibited eating, it falls short of providing a full explanation of the phenomenon.
Current Explanations for Disinhibited Eating

Although we have identified some environmental and individual difference factors that predict disinhibition, it is still not clear how such factors (e.g., preloads and distress) disinhibit eating. Herman and Polivy (1975) originally proposed that distress undermines dieters' restraint because there is only so much that they can worry about at any one time—a salient situational threat (e.g., electric shock, task failure) should preempt worrying about weight gain. Physical fear, as we have seen, does not reliably serve to disinhibit eating, however, even though it ought to rank fairly high on any worry hierarchy. And if physical fear does not replace concern about weight, it seems unlikely that ego-threats will. Therefore, it does not appear that ego-threats disinhibit eating through direct competition for attentional resources.

Herman and Polivy (1988) have recently suggested that overeating might serve a masking function for the dieter. That is, the distress (guilt) resulting from overeating per se may occupy the dieter's attention to the exclusion of the more long-term and possible more diffuse ego-threat. Concentrating on the distress that results from overeating may help the dieter avoid focusing on the potentially more damaging implications of the ego-threat. This proposal has yet to be tested explicitly.

Heatherton and Baumeister (1989) have proposed an "escape theory" in which disinhibited eating results from a motivated shift to low levels of self-awareness. Dieters are particularly sensitive to their public image; for example, there is a positive correlation between restraint scores and public self-consciousness (Blanchard & Frost, 1983). When dieters (inevitably) fall short of their high standards and expectations for themselves, their self-awareness becomes acutely aversive. To escape from this unpleasant state, dieters adopt the tactic of narrowing attention to the immediate perceptual environment and avoiding broadly meaningful thought. Such a strategy reduces self-focus and attenuates negative affect (Baumeister, in press). To use Vallacher and Wegner's (1987) terminology, dieters attempt to switch from high to low levels of action identification; that is, they attempt to think in terms of movements and sensations (the mechanics of behavior) rather than in terms of future concerns and meaningful actions (the purpose of behavior).

One consequence of cognitive narrowing is that all inhibitions—including those associated with eating—tend to be abandoned. Inhibitions involve resisting salient and immediate temptations (e.g., tasty food) in the service of delayed and often more abstract objectives (e.g., weight loss). Accordingly, when dieters switch from high to low levels of action identification, their diets are (temporarily) jettisoned, and eating becomes disinhibited.

The escape hypothesis links disinhibited eating to a drop in level of self-awareness. We have recently demonstrated that dieters are normally intensely self-focused (Heatherton, 1990), as indexed by their completing more sentence stems with self-focused statements than did nondieters on the Exner Sentence Completion Task (Exner, 1973). Dieters were also more likely to be negative in these self-statements. Consistent with escape theory predictions, the self-focus of restrained subjects is related more to their public than to their private image since we found that there was a significant relation between restraint scores and a measure of public self-consciousness, but not between restraint scores and private self-consciousness (Heatherton, 1990). It thus appears that dieters are likely to find themselves in a situation where (public) ego-threats will make an escape to mindless, stimulus-bound behavior (including eating) quite attractive.

Does Self-Awareness Affect Eating?

Experimental manipulations that affect self-awareness have indeed been shown to influence eating behavior in a manner consistent with escape theory. One study found that dieters ate three times as much while watching an intensely absorbing film as when engaged in activities that permitted more awareness of self (Wardle & Beales, 1988). Some have argued that alcohol reduces self-focus, and individuals consume more alcohol after failure than success, presumably to avoid self-awareness (Hull & Young, 1983). Polivy and Herman (1976a, 1976b) found that alcohol, when labelled as such, resulted in disinhibited eating by restrained eaters. Thus, reducing
self-awareness either by distraction or by intoxication may lead to disinhibited eating.

Conversely, focused attention on one's eating appears to prevent disinhibition and maintain eating restraints, both among dieters (Herman, Polivy, & Silver, 1979; Polivy, Herman, Hackett, & Kuleshnyk, 1986) and among obese subjects (Pliner & Iuppa, 1974). For example, being observed while eating results in behavior that conforms to societal standards and norms of self-restraint (Herman et al., 1979). Further, forcing subjects to attend to the amount of food they are consuming (either through implied public attention or private attention) apparently prevents disinhibited eating (Polivy et al., 1986). In another recent study examining the role of self-awareness in disinhibited eating (Heatherton, Baumeister, Polivy, & Herman, 1990), restrained and unrestrained eaters performed a problem-solving task and received either failure or neutral performance feedback. This failure manipulation would ordinarily be expected to distress and disinhibit dieters. Failure subjects were then assigned to one of three conditions: one group watched a videoclip of themselves failing on the problem-solving task (high self-awareness); one group watched a fairly interesting videotape on bighorn sheep (low self-awareness); the final group sat quietly for 10 min. Only in those conditions that allowed or promoted escape from self-awareness (the latter two conditions) did restrained subjects show disinhibited eating. In the video condition, which enforced high levels of self-awareness, eating in restrained subjects remained inhibited. It therefore appears that failure sets the stage for binge eating, but that disinhibition will not occur unless the situation allows the dieter to reduce self-awareness.

Thus, the escape hypothesis (Heatherton & Baumeister, 1989) posits that self-awareness acts in a manner similar to self-attention or public attention to inhibit eating (Polivy et al., 1986). Such awareness not only forces dieters to remain cognizant of their long-term projects (including weight loss), but also accentuates feelings of unattractiveness and incompetence, further motivating dieting. This aversive self-awareness is unpleasant and dieters try to avoid thinking about themselves if at all possible. Whether or not such avoidance is possible depends on situational constraints on escape. When conditions favor or at least permit escape, individuals can shift levels of awareness and momentarily feel better. For dieters, such escape will ordinarily mean diet-breaking if attractive food is available. Although the escape theory has yet to be tested directly, it may provide a useful framework for examining the cognitive processes responsible for disinhibition.

Conclusion

Dieters are likely to show disinhibited eating when they are preloaded with food described as high in calories or when they are confronted with threats to their self-esteem or emotional tranquility. Restrained eaters with low self-esteem are especially vulnerable to disinhibitors, although exactly how self-esteem moderates the effects of disinhibitors on eating is as yet unclear (see, also, Polivy et al., 1988). There are also situational constraints on disinhibited eating. For instance, a disinhibitor should be able to disinhibit eating only if eating has not already been disinhibited. Herman, Polivy, Lank, and Heatherton (1987) demonstrated that distress-induced eating will occur only when the dieter has not previously been preloaded (disinhibited), and, conversely, that preload-induced eating will occur only when the dieter is not distressed (disinhibited). Furthermore, our recent examinations of self-focus and eating make it clear that disinhibited eating will occur only when circumstances promote an abandonment of self-awareness. Conditions that promote self-focus inhibit eating in dieters. Thus, we are now confident that self-awareness plays an important role in disinhibited eating.

Our future research will be designed to examine more fully how shifts in levels of thinking or levels of self-awareness are linked to eating in dieters and to examine whether dieters follow the general pattern of escaping from aversive self-awareness by shifting to low levels of action-identification. We are also interested in how dieters might use eating to distract themselves from other concerns. The results of these studies should have implications for the treatment of eating disorders and aid in our understanding of disinhibition as a more general phenomenon, with potential benefits for those who are concerned with disinhibition in other realms, such as smoking cessation or alcohol-abuse treatment.
References


Polivy, J., & Herman, C. P. (1985). Dieting and


