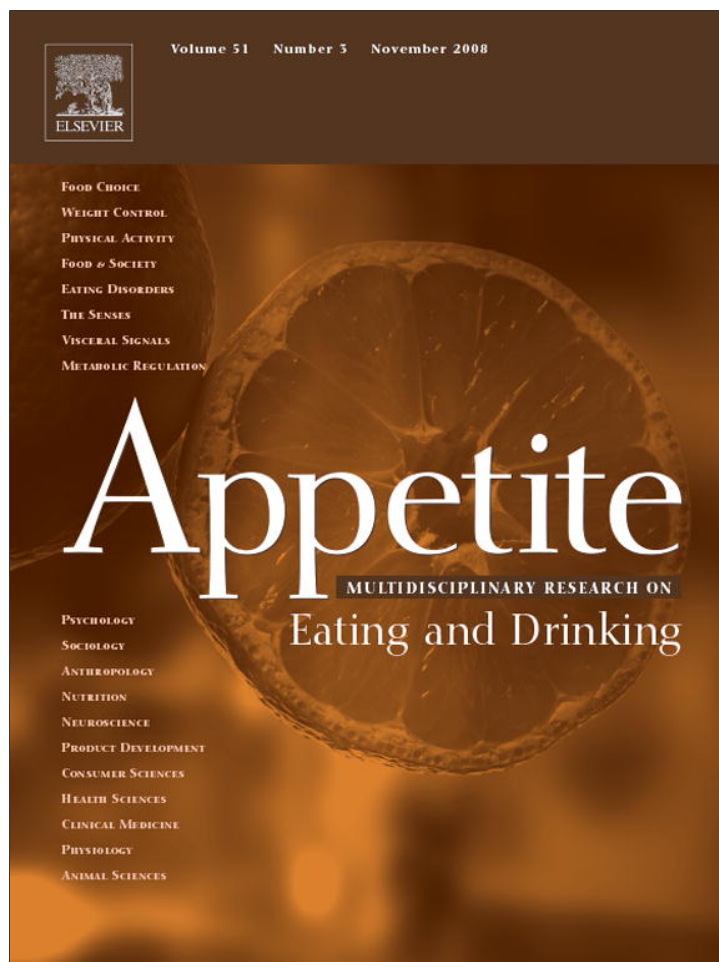


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Short communication

Perceived deprivation, restrained eating and susceptibility to weight gain

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ARTICLE INFO

Article history:

Received 27 March 2008

Accepted 31 March 2008

Keywords:

Perceived deprivation

Restraint

ABSTRACT

Perceived deprivation describes a feeling of not eating what or as much as one would like, despite being in energy balance. This construct was previously found to correlate with the Restraint Scale in obese eaters and current dieters [Timmerman, G. M., & Gregg, E. K. (2003). Dieting, perceived deprivation, and preoccupation with food. *Western Journal of Nursing Research*, 25(4), 405–418]. The current study examined perceived deprivation and restraint in 66 normal weight college females with no history of eating disorders. Perceived deprivation was significantly correlated with restraint generally and with dietary concern in particular; this relationship was due to perceived limits on what, rather than how much, food was eaten. This relationship may have important implications for understanding the motivation underlying restrained eaters' aberrant eating behaviors and the nature of their susceptibility to weight gain.

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Introduction

Restrained eating refers to an effort to restrict energy intake for the purposes of weight loss or maintenance. The first measure of restraint was Herman and Polivy's Restraint Scale (1980), which was used almost exclusively in studies of restrained eating until the mid-1980s. Restrained eaters on the Restraint Scale show counter-regulatory eating in the forced preload paradigm (Herman & Polivy, 1980), eating more following a high-calorie preload than following no preload. Herman and Polivy (1984) explained restrained eaters' counterregulatory eating by suggesting that restrained eaters, who normally impose a "diet boundary" on their eating, become disinhibited when their diet boundary is undermined by the consumption of a diet-prohibited food.

Further research has found, however, that most normal weight restrained eaters are not currently dieting to lose weight (Lowe, Whitlow, & Bellwoar, 1991) and that those who self-identify as current weight loss dieters show eating regulation, rather than counterregulation, after a high-calorie preload (Lowe et al., 1991; Lowe, 1995). In addition, the Restraint Scale and other measures of restrained eating do not reflect hypocaloric dieting in naturalistic settings (Stice, Cooper, Schoeller, Tappe, & Lowe, 2007; Stice, Fisher, & Lowe, 2004) and they prospectively predict weight gain, not weight loss (Drapeau et al., 2003; Klesges, Isbell, & Klesges, 1992; Stice, Cameron, Killen, Hayward, & Taylor, 1999; Van Strien, Frijters, Bergers, & Defares, 1986). This indicates that restrained eaters are

generally not in negative energy balance and, over the long run are eating more than their bodies need to maintain energy balance.

Lowe and Levine (2005) recently suggested a possible way of reconciling these divergent conceptualizations of restrained eating. They proposed that restrained eaters may be eating less than they would like to eat, rather than eating less than they need to eat to maintain energy balance. Lowe and Butryn (2007) have suggested that being chronically tempted by palatable foods in the environment while trying to resist those temptations could create a state of "hedonic hunger" (which Lowe and Levine referred to as "perceived deprivation" or "reward deprivation") despite a state of neutral or even positive energy balance. If this reinterpretation of restraint theory is accurate, then restrained eaters, relative to unrestrained eaters, should more often feel they are not eating as much food as they would like to eat, or feel they are not eating particular types of foods they would like to eat.

Timmerman and Gregg (2003) were the first to examine this concept of hedonic hunger, which they called perceived deprivation. They examined perceived deprivation in binge eaters with no history of purging and current dieters without a history of bingeing. Perceived deprivation was measured daily by two items assessing satisfaction with amount and type of food eaten over 14 days. They found that participants' feelings of deprivation were not correlated with daily caloric intake but that levels of perceived deprivation were correlated with scores on the Restraint Scale. These results are consistent with the idea that restrained eaters (as measured by the Restraint Scale), though typically not on a weight loss diet or in negative energy balance, are prone to feelings of hedonic deprivation because they sometimes avoid eating the amount of food, or the types of food, they would like to eat.

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The current study was aimed at replicating and extending the previous findings by Timmerman and Gregg (2003) in a different population. The construct of perceived deprivation may have implications for those who are normal weight—and for normal weight restrained eaters in particular, given their propensity toward weight gain. We measured perceived deprivation and restraint in normal weight college females with no current or history of eating disorders and hypothesized that perceived deprivation and restraint would be positively correlated in this population.

Methods

Participants

Participants were 66 college females with no current eating disorders or history of eating disorders. Mean BMI was 21.99 (S.D. = 2.08) and the range of BMI was 18.26–27.40 kg/m². Mean age of participants was 18.82 (S.D. = 1.79) and participants were 74.2% Caucasian, 12.1% Asian, 4.5% Hispanic, and 4.5% other ethnicity. All participants were entering their freshman year and were participants in a larger study examining eating disorders and weight gain during the freshman year of college. Participants were recruited the week prior to classes beginning in the fall as well as during the first 2 weeks of classes by passing out flyers with information on the study.

Measures

Restraint Scale (Herman & Polivy, 1980)

The Restraint Scale is a 10 item self-report measure that assesses the presence of dieting and concern about weight. This is the original measure for this construct and has been used extensively for this purpose. The Restraint Scale has two subscales: concern for dieting and weight fluctuation (Lowe, 1993). Previous research has shown that restraint, as measured by the Restraint Scale, is correlated with perceived deprivation (Timmerman & Gregg, 2003). In addition, evidence suggests that restrained eaters do not actually eat less in the natural environment than unrestrained eaters; therefore, if they are “restraining” their eating it is apparently to avoid eating as much as they want rather than to eat less than they need (i.e., to lose weight – Lowe and Levine, 2005; Stice et al., 2004; Stice et al., 2007). The Restraint Scale is a robust predictor of food intake in a variety of laboratory situations (Herman and Polivy, 1980).

Perceived deprivation questionnaire (based on Timmerman & Gregg, 2003)

This measure assesses satisfaction with the amount and types of food eaten. Timmerman and Gregg used a two-item questionnaire which asked participants whether they ate enough food and whether they ate what they wanted. Each question was answered on a 0–100 mm visual analogue scale at the end of every day for 14 days. The items were then summed and averaged. Higher scores indicated higher levels of perceived deprivation. The scale used was internally consistent ($\alpha = .76$). In the current study, participants were asked to complete the perceived deprivation items every evening for 7 days. The items were (1) I feel like I ate enough food today, and (2) I feel like I ate what I wanted today. Rather than using a visual analog scale, participants rated each item on a five point Likert scale (*do not agree at all, agree a little, agree somewhat, agree, strongly agree*). The two questions were highly correlated ($r = 0.68, p < 0.001$).

Procedures

At an in-person assessment appointment, participants were screened for eating disorder symptoms using an abbreviated

version of the eating disorder examination (EDE; Fairburn & Cooper, 1993). Height and weight were measured by the assessor and participants completed the Restraint Scale.

The perceived deprivation questionnaire was sent to participants by email every evening for 1 week. Participants were instructed to make their ratings between the time they ate their last meal of the day and the time they went to sleep. Because data were not received for all 7 days from all participants, we excluded those ($N = 16$) who submitted less than 4 days of data. For those participants who completed more than 4 days, data were used from the first 3 days of data collection, plus the last day (thus 4 days of data were included for each valid participant). These scores were summed and averaged to produce a single perceived deprivation score. Scores on the perceived deprivation measure were coded so that higher scores reflect higher perceived deprivation.

Results

The mean Restraint Scale score for participants in this study was 12.30 (S.D. = 5.83). The mean perceived deprivation questionnaire score for participants in this study was 2.05 (S.D. = 0.64), which reflects an average rating of “agree”. Thus on average participants felt like they had usually eaten as much as food as they wanted and what food they wanted. Perceived deprivation was significantly correlated with restraint ($r = 0.28, p = 0.03$). This correlation was accounted for by the relationship between perceived deprivation and the dietary concern factor of the Restraint Scale ($r = 0.34, p = 0.006$) more than by the relationship between perceived deprivation and the weight fluctuation factor of the Restraint Scale ($r = 0.11, p = 0.38$). In addition, a *t*-test indicated that perceived deprivation scores were significantly higher for participants who scored above the median (11.0) on the Restraint Scale than for those who scored below the median ($t = -2.5, p = 0.01$). The correlation between perceived deprivation and BMI ($r = 0.05$) was not significant.

For exploratory purposes, we also examined whether both items contributed equally to the relationship between perceived deprivation and restraint. The mean score on item 1 and 2 of the PD scale was 1.88 (S.D. = .59) and 2.22 (S.D. = .80), respectively, which approximates ratings of “agree”. The correlations between the first perceived deprivation question (I feel like I ate enough food today) and the two factors of the RS were not significant; for weight fluctuation, $r = 0.02, p = 0.87$; for dietary concern, $r = 0.19, p = 0.12$. The correlations between the second perceived deprivation question (I feel like I ate what I wanted today) and the two factors of the RS were $r = 0.17, p = 0.19$, and $r = 0.40, p = 0.001$. Thus the overall RS/PD correlation was disproportionately due to the significant correlation between dietary concerns and self-perceptions of limiting what foods participants consumed.

Discussion

Timmerman and Gregg (2003) found that, in a group of non-purge binge eaters and current dieters without a history of bingeing, perceived deprivation correlated with the Restraint Scale (Herman & Mack, 1975), but not with self-reported caloric intake. We replicated the finding that perceived deprivation correlates with restraint in a very different population of mostly normal weight college students with no history of an eating disorder. Specifically, the dietary concern factor of the Restraint Scale correlated modestly with perceived deprivation generally and with perceived deprivation of what (as opposed to how much) was eaten in particular. Lowe (Lowe & Kral, 2006; Lowe & Levine, 2005) has theorized that normal weight individuals who score high on

the Restraint Scale are actually prone to weight gain. The participants in this study were college freshman at the beginning of their freshman year. Because nearly all freshmen gain some weight early in their freshman year (Lowe et al., 2006), it strongly suggests that most participants were, if anything, in slight positive energy balance. This provides further support for the suggestion that participants, perceived deprivation was based on hedonic hunger rather than true caloric deprivation.

The relationship between perceived deprivation and restraint (as measured by the Restraint Scale) has important implications for understanding the relationship between dieting and food intake. The full pattern of results suggests that perceived deprivation is related to restraint (more specifically, to dietary concern), but that this relationship is primarily due to the association between restraint and limiting what types of foods are eaten, not how much food is eaten. These findings are consistent with the idea that restrained eaters may be limiting what kinds of foods they let themselves eat, but not how much food they eat. The latter conclusion is consistent with two recent studies by Stice and colleagues (Stice et al., 2004; Stice et al., 2007) showing that restrained eaters do not eat any less than unrestrained eaters on short- or long-term measures of caloric intake in the natural environment. The current results suggest that restrained eaters perceive themselves as restrained because they are trying to resist the temptation to eat certain foods (likely those highest in calories) rather than trying to reduce the amount of food they eat. Individuals who experience perceived deprivation more often may be at heightened risk of future weight gain. In the battle between appetitive drives to consume more palatable food than one needs and the conscious resistance to this drive, appetite often wins (Lowe, 2003). Dieting and restrained eating may delay, but will rarely prevent eventual weight gain in those susceptible to it (Lowe et al., 2006). Future research on the construct of perceived deprivation should explore the extent to which this sense of deprivation is influenced by the food environment, by individual differences in appetitive responsiveness to the food environment, by restrained eating, and by their interactions.

Limitations of the current study include the small sample size, the small range of BMI in our sample, the inclusion of only college-aged women, and the use of only two items to measure perceived deprivation. It is unknown to what extent these results generalize to other populations. In future research on perceived deprivation, inclusion of overweight and obese participants who are seeking treatment for obesity may be beneficial.

Because perceived deprivation is presumably sensitive to certain environmental contexts and events, it ideally would be assessed contemporaneously with such stimuli, for instance by the

use of ecological momentary assessment procedures. Further research is necessary in order to fully understand the concept of perceived deprivation, its relationship to other eating-related variables, and its potential utility for the treatment and prevention of obesity.

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