Journal of Abnormal Psychology
1975, Vol. 84, No. 6, 666–672

Anxiety, Restraint, and Eating Behavior

C. Peter Herman and Janet Polivy
Northwestern University

It was hypothesized that individual differences in eating behavior based on the distinction between obese and normal subjects could be demonstrated within a population of normal subjects classified as to the extent of restraint chronically exercised with respect to eating. Restrained subjects resembled the obese behaviorally, and unrestrained subjects resembled normals. This demonstration was effected in the context of a test of the psychosomatic hypothesis of obesity. The results indicated that although some individuals may eat more when anxious, there is little empirical support for the notion that eating serves to reduce anxiety. An explanation for this apparent inconsistency was offered.

The role of anxiety as a possible causal agent in obesity has recently been subjected to experimental analysis. Schachter, Goldman, and Gordon (1968) hypothesized that although anxiety would decrease eating in normal-weight subjects by inhibiting gastric contractions and releasing sugar into the bloodstream, it would have little if any effect on the obese, who do not eat on the basis of internal physiological state. These predictions were confirmed, with normal-weight subjects eating substantially less (34%) when anxious and the obese eating nonsignificantly more (15%). Schachter et al. (1968) concluded that the psychosomatic hypothesis of obesity —that the obese in effect confuse hunger with negative affect (Bruch, 1961) and thus overeat in response to aversive emotional states (Kaplan & Kaplan, 1957)—had failed to find confirmation. Obese subjects did not eat more when anxious and did not exhibit significant anxiety reduction as a consequence of eating.

McKenna (1972) hypothesized that the psychosomatic hypothesis had some merit, but perhaps only when good-tasting food was available. Schachter et al. had employed crackers as their criterion food; by their own admission, crackers are "a neutral sort of food, neither liked nor disliked by most people (p. 95)." McKenna predicted that the replacement of crackers with "extremely appetizing and tasty" (p. 314) chocolate-chip cookies would elicit significant overeating in the anxious obese. McKenna's results with these cookies indicated that the facilitative effect of anxiety on the obese's eating was almost as strong as its inhibitory effect on normals' eating (33% more and 39% less, respectively), although the former effect fell short of conventional significance levels. Nevertheless, McKenna found no evidence of significant or differential anxiety reduction for the obese. In fact, the group showing the greatest anxiety reduction was composed of noneating, obese control subjects. McKenna argued, however, that the temporal arrangements of his experiment may have prevented accurate measurement of eating-induced anxiety reduction; he suggested that anxiety reduction may be an ephemeral effect which had dissipated by the time he attempted to assess it. The present experiment thus incorporated both a good-tasting food (ice cream) and an immediate assessment of anxiety-reduction effects.

The second focus of the present experiment dealt with the notion that eating behavior differences between obese and normal-weight subjects are perhaps more dependent on the extent of underweight than overweight. Recent theorizing by Nisbett (1972) proposes that many (perhaps most) obese individuals may in fact be relatively deprived or "under-

This research was supported by the Bureau of Health Services Research Grant HS 00049-04, administered by James H. Bryan. The authors wish to thank Andy Davis for his invaluable assistance as an experimenter.

The second author is now at Loyola University in Chicago.

Requests for reprints should be sent to C. Peter Herman, Department of Psychology, Northwestern University, Evanston, Illinois 60201.

weight" with respect to their own biological set–points, an individual difference parameter which varies directly as a function of the number of fat cells in the body. Fat cell number, fixed in the adult, is in turn a function of genetic endowment and early nutritional experience. The obese, according to Nisbett, are overendowed with fat cells, and consequently overeat in an attempt to satisfy the demands imposed by their adipose tissue for repletion. Such demands are expressed indirectly, in this view, through an external orientation to food cues which characterizes food-deprived organisms. Cultural and social pressures, however, tend to inhibit weight gain in most obese individuals; the result is a compromise state of social overweight and biological underweight. Implications of this theory include: (a) The obese ought to resemble food-deprived normals behaviorally because both are in effect hungry (i.e., below set–point), a contention for which Nisbett (1972) provides some suggestive evidence; (b) obese individuals who have repudiated social pressures and attained prodigious weight ought to resemble normal-weight individuals who are also at or near their biological set–points, another contention for which some evidence is accumulating (Nisbett, 1972); (c) normal weight individuals who are constantly dieting and concerned with not gaining weight, and who presumably would gain substantial weight if they were to "let themselves go," ought to resemble the obese behaviorally.

Schachter's original distinction between obese and normal individuals, then, might profitably be mapped onto restrained and unrestrained normal-weight individuals. If it could be demonstrated that restrained normals (presumably well below set–point) behave like Schachter's (or McKenna's) obese, and that unrestrained normals (presumably at or near set-point) behave in a manner corresponding to Schachter's normals, then indirect support will have been provided for Nisbett's relative deprivation model in accounting for obese–normal behavioral differences. Establishing a behavioral parallel between restrained normal-weight eaters and the obese would not specifically undermine the argument offered by Schachter and his coworkers (e.g., Schachter and Rodin, 1974) that "externality" is the characteristic of the obese that accounts for their anomalous eating behavior. The Schachterian position might argue that restrained normals resemble the obese because they are in fact identical with respect to externality, differing only in the extent to which food consumption has been effectively inhibited. Nevertheless, if restraint can be shown to be an effective predictor variable, independent of objective weight, then the notion that externality may be a consequence of dieting (a prominent activity of the obese and other restrained eaters) or forced weight loss, gains cogency. Some support for this notion is provided by the finding (Hibscher, 1974) that restraint, as measured in the present study, correlates significantly, $r(84) = .25$, $p < .02$, with plasma free fatty acid after an overnight fast within both obese and normal-weight subject groups. Free fatty acid level is a well-established index of food deprivation (Walker & Remley, 1970). The present position, then, is in agreement with the notion that externality is a prominent characteristic of the obese; however, it regards externality as an intervening variable that mediates the effect of relative deprivation on behavior.

The present experiment thus incorporated the following critical features: (a) an anxiety manipulation comparable to that employed in the previous research, (b) an assessment of the effects of this manipulation on the consumption of a good-tasting food, (c) an assessment of the effects of eating on anxiety reduction, and (d) the use of restrained and unrestrained normal-weight subjects rather than the obese and normal-weight subjects previously studied. The principal prediction of the study was that restrained normal-weight subjects would behaviorally resemble the obese in their response to anxiety, whereas unrestrained normals would resemble Schachter's and McKenna's normals. It was thought that the most powerful demonstration of the parallelism between the obese and restrained normals would be in a situation in which the behavior of the obese had already been well investigated experimentally. Also,

if overeating is ultimately a consequence of adipose demand rather than aversive psychic states (as Nisbett implies), then one would expect that if and when restrained eaters exhibited excessive eating, such behavior would not necessarily be anxiety reducing.

METHOD

Overview

Female subjects were randomly assigned to high-anxiety or low-anxiety conditions, as in Schachter et al. (1968). The amount of ice cream consumed while anticipating electric shock (or "mild tactile stimulation") was assessed in an ostensible taste-rating context. Anxiety was assessed immediately before and after eating as part of a mood scale. Subjects were retrospectively designated as restrained or unrestrained on the basis of scores on a restraint questionnaire administered at the end of the experiment.

Subjects

Subjects were 42 female students at Northwestern University who received credit toward the experiment requirement of an introductory psychology course. Subjects were run individually from 11:00 A.M. until 6:00 P.M. at hourly intervals. Subjects were asked not to eat for 5 hr preceding the experiment, on the grounds that the experiment involved the sense of taste. Two subjects became intensely distressed at the mention of possible electric shock, despite assignment to the low-anxiety condition; their data were not considered in any analyses.

Procedure

Upon arrival, subjects were seated at a table in a cubicle containing a formidable-looking electrical device. Subjects were informed that the experiment concerned sensory psychology, specifically, the way one sort of sensation affects another. The experiment was further described as an investigation of the influence of tactile stimulation on taste. Subjects were told that they would first taste some food under normal circumstances, then receive some tactile stimulation, and finally taste some more food to determine the effect of the tactile stimulation. In addition to the effects of tactile stimulation, subjects were told the experimenter was also interested in some psychological factors affecting taste. Consequently, subjects were informed they would be asked to fill out "a couple of mood scales and a general personality inventory."

High anxiety. The subject was given a short discourse on influencing taste perception with tactile stimulation, the outcome of which was that it would be necessary to use electrical stimulation amounting to "a fairly painful shock." The subject was assured that there would be no real danger or permanent damage and that the pain she would feel would be brief. She was then asked to remove rings, bracelets, watches, and any other metal objects from her nonpreferred hand, and the experimenter attached electrodes coming from the electrical device, adjusting a knob labeled "shock level" to the second-highest position.

Low anxiety. Subjects were given an introduction similar to that given in the high-anxiety condition, but the focus was shifted so that the subjects could be assured that "only the mildest possible tactile stimulation is required." The experimenter indicated that electrical stimulation would be used, but hesitated to even call it shock because the subjects would feel only a slight tingle or tickling, if anything. Electrodes were attached as above, and the experimenter adjusted the shock level knob to the second-lowest position.

From this point on, all subjects were treated identically. First, the subject was presented with a mood scale ("to assess [her] present mood"), embedded in which were two questions assessing anxiety. Next, three containers of ice cream—one chocolate, one vanilla, and one strawberry—were presented to the subject, allegedly for the initial testing. The subject was told that she would have 10 min to rate the three flavors on three 5-item questionnaires. She was instructed that it was essential that she taste the flavors in a specific order, chocolate, then vanilla, then strawberry, to control for the effect of one taste on another. It was emphasized that she must be certain about all 5 ratings of the chocolate ice cream before proceeding to the vanilla, and so on. She could taste as much of each flavor as she wanted, and after all of the ratings had been made, she could go back and have as much of any flavor as she wanted as long as she didn't change any of the ratings. The subject was then left to taste and rate the ice cream in isolation for 10 min. Each container held approximately 600 g of ice cream, enough to make it appear unlikely that the experimenter could tell how much the subject had eaten. The questionnaires were sufficiently short that the subject could easily complete them in 10 min with ample time to eat more ice cream before the experimenter returned.

Following the 10-min taste period, the experimenter returned and immediately administered the second mood scale which included the two questions assessing anxiety, explaining that it was necessary to "correct for" short-term mood changes. Finally, the subject was given the restraint questionnaire, ostensibly so that individual differences in eating habits could be "correlated out." The restraint scale was adapted from a previous study (Herman & Mack, in press) in which restraint scores successfully predicted differential responses to a preload manipulation. This scale attempts to assess the extent to which individuals exhibit behavioral and attitudinal concern about dieting and keeping their weight down. The 11 items comprising the scale and the corresponding scoring are listed in the Restraint Questionnaire.

RESTRAINT QUESTIONNAIRE

Diet and Weight History

1. How many pounds over your desired weight were you at your maximum weight? (score: 1 point/5 pounds)
2. How often are you dieting?—rarely, sometimes, usually, always. (score: 1–4)
3. Which best describes your behavior after you have eaten a "not allowed" food while on your diet?—return to diet, stop eating for an extended period of time in order to compensate, continue on a splurge, eating other "not allowed" foods. (score: 0–2)
4. What is the maximum amount of weight that you have ever lost within 1 month? (score: 1 point/5 pounds)
5. What is your maximum weight gain within a week? (score: 1 point/3 pounds)
6. In a typical week, how much does your weight fluctuate (maximum–minimum)? (score: 1 point/3 pounds)

Concern with Food and Eating

7. Would a weight fluctuation of 5 pounds affect the way you live your life?—not at all, slightly, moderately, very much. (score: 0–3)
8. Do you eat sensibly before others and make up for it alone?—never, rarely, often, always. (score: 0–3)
9. Do you give too much time and thought to food?—never, rarely, often, always. (score: 0–3)
10. Do you have feelings of guilt after overeating?—never, rarely, often, always. (score: 0–3)
11. How conscious are you of what you're eating?—not at all, slightly, moderately, extremely. (score: 0–3)

While the subject filled out the mood scale, the experimenter removed the ice cream and weighed it in a separate room. Amount eaten was determined by subtracting this weight from the weight of the containers before they were presented to the subject. After the restraint scale was completed by the subject, the experimenter asked her some questions to determine the degree of food deprivation and previous knowledge of the experiment. The subject was completely debriefed, instructed not to discuss the experiment, and weighed and measured.

Because height, weight, and degree of restraint were not determined until the end of the experiment, it was impossible to eliminate obese subjects (5 obese subjects, 15% or more overweight, were run). It was also impossible for the experimenter to know which subjects were restrained or unrestrained eaters, thus effectively blinding the experimenter.

RESULTS

Classification of Subjects

Subjects were divided into restrained and unrestrained groups on the basis of a median split of scores on the restraint scale. Restrained eaters were defined as those scoring 17 or more on the scale; subjects scoring below 17 were classified as unrestrained. The use of a median split, though not in any way dictated theoretically, had effectively discriminated between comparable subjects in a prior study (Herman & Mack, in press). The decision to categorize fully half of the sample as restrained, then, is warranted mainly by the commonsense notion that a substantial proportion of college coeds are, in fact, suppressing their weight owing to societal pressures.

Properties of the Restraint Scale

The 11-item scale used in the present study was an expansion of a 5-item scale which had discriminated successfully between subjects in a previous study (Herman & Mack, in press). The present scale had substantial internal consistency (coefficient $\alpha = .75$). The two subscales, which dealt with diet and weight history, and concern with food and eating, had internal consistency coefficients of .68 and .62, respectively. The correlation between scores on these two subscales was .48 ($p < .01$). Internal reliability, then, was adequate.

The validity of the scale is currently based on its predictive power. However, the significant correlation between restraint and a physiological measure of deprivation, as reported by Hibscher (1974) lends some evidence of construct validity to the scale.

Manipulation Check

The effect of anxiety manipulation was highly significant, $t(38) = 5.66$, $p < .001$. The anticipation of painful electric shock led subjects to report substantially more anxiety and apprehension, as one would expect. On a combined 12-point scale, low-anxiety subjects reported a mean anxiety score of 2.75, whereas high-anxiety subjects' mean score was 7.20.

Because the obese in Schachter et al.'s (1968) study were more distressed by the anticipation of electric shock and were reported to be hyperemotional in general (see Schachter & Rodin, 1974, for a review), one would expect, according to the logic of the present experiment, that restrained subjects

TABLE 1

NUMBER OF GRAMS OF ICE CREAM CONSUMED (INCLUDES ALL SUBJECTS)

Subjects	Low anxiety	High anxiety
Unrestrained (<17)	177.73 (11)	107.60 (10)
Restrained (≥17)	146.88 (8)	162.00 (11)

Note. Numbers in parentheses refer to number of subjects in that cell. The imbalance in numbers of restrained and unrestrained subjects is due to ties at the median.

would be hyperreactive to the anxiety manipulation. In fact, restrained high-anxiety subjects' mean self-report score was 8.47; unrestrained high-anxiety subjects' mean score was 5.80, $t(19) = 2.66$, $p < .05$. If the four obese subjects ($\bar{X} = 6.38$) are eliminated, the mean score for restrained subjects increases to 9.67. Although the difference between obese and normal-weight restrained eaters is not significant, it appears that normal-weight restrained eaters are at least as hyperreactive to stressful stimuli as are the obese. It should be noted that the restrained subjects are not simply more anxious in general than unrestrained subjects; in the low-anxiety condition, restrained subjects reported no more anxiety than did unrestrained subjects. Of the two subjects who were eliminated from the low-anxiety condition for unusual distress, one was restrained and the other was unrestrained.

Effect of Anxiety on Eating

The differential effects of anxiety on restrained and unrestrained subjects may be seen in Table 1. Unrestrained eaters ate significantly less, $t(19) = 2.71$, $p < .05$, when anxious; restrained eaters ate slightly more, although the increase was not significant. Overall, this pattern produced a significant Anxiety × Restraint interaction, $F(1, 36) = 4.55$, $p < .05$, though neither anxiety nor restraint alone affected consumption. These results are in substantial agreement with those of Schachter et al. (1968). It seems fair to conclude that the obese–normal distinction can be well conceptualized as a distinction between restrained and unrestrained eaters.

Included in the restrained group, it should be noted, were five obese subjects. One might argue that (a) a strict test of the restraint notion ought to exclude obese subjects, and (b) increased eating in response to anxiety might occur only in the obese (an implication of the psychosomatic hypothesis). Therefore, a separate analysis was performed on normal-weight subjects only, the results of which appear in Table 2. The exclusion of obese subjects (all of whom were restrained) did not, of course, influence the strong inhibitory effect of anxiety on unrestrained subjects. The effect of anxiety on restrained normals was somewhat stronger than for all restrained subjects but was not significant. Overall, the Anxiety × Restraint interaction was strengthened, $F(1, 31) = 5.67$, $p < .05$, and no main effects emerged. The parallel with Schachter et al.'s results is maintained; restrained normals in this study ate 24% more when anxious, whereas Schachter's most comparable group of obese (those who had not been preloaded) ate 20% more. Unrestrained normals ate 39% less when anxious, and Schachter's nonpreloaded normals ate 44% less. The obese subjects excluded in this analysis actually ate less when anxious, in clear opposition to the psychosomatic hypothesis. Obviously, these five subjects ought not to be taken too seriously, particularly inasmuch as there was only one obese low-anxiety subject, but the accumulating evidence does not seem to support the psychosomatic hypothesis.

Effect of Eating on Anxiety Reduction

Anxiety reduction was assessed by subtracting posteating anxiety scores (on the mood questionnaire) from preeating scores for subjects in the high-anxiety condition. For all subjects, there was a slight decrease (from 7.20 to 6.37) in reported anxiety which was not significant. This decrease, however, was not uniform for all high-anxiety subjects. Unrestrained subjects decreased a trivial amount

TABLE 2

NUMBER OF GRAMS OF ICE CREAM CONSUMED (EXCLUDES OBESE SUBJECTS)

Subjects	Low anxiety	High anxiety
Unrestrained (<17)	177.73 (11)	107.60 (10)
Restrained (≥17)	141.29 (7)	175.86 (7)

Note. Numbers in parentheses refer to number of subjects in that cell. The imbalance in numbers of restrained and unrestrained subjects is due to ties at the median.

(from 5.80 to 5.73), whereas restrained eaters decreased from 8.47 to 6.95, $t(17) = 1.95$, $p < .10$. The failure of eating to reduce anxiety significantly for restrained eaters is compounded by the possibility that the decline in anxiety that did appear may have been due to statistical regression.

The psychosomatic hypothesis, of course, predicts that eating will result in anxiety reduction. It seems logical, however, to refine this hypothesis so as to predict a positive relation between amount eaten and the extent of anxiety reduction. Although unrestrained eaters showed virtually no anxiety reduction as a group, there was nevertheless an extremely strong correlation ($r = .80$; $p < .01$) between amount of ice cream consumed and extent of anxiety reduction. The interpretation of this correlation is necessarily ambiguous; it is quite possible that greater eating produces greater anxiety reduction. The fact that anxiety inhibits eating for unrestrained subjects, however, makes it appear more likely that those subjects who experience the most "spontaneous" anxiety reduction over the course of the experiment (as the initial fear of previously unanticipated shock, or the nonspecific apprehension associated with being a subject dissipates) are most likely to eat the most because they are least anxious. For restrained subjects, the corresponding correlation is not significantly different from 0; there is no relation between extent of anxiety reduction and amount eaten, and the fact that the range of these subjects' scores on both amount eaten and anxiety reduction is greater than the range for unrestrained subjects rules out a truncation artifact. If eating reduces anxiety for restrained eaters (or the obese), it does not appear to do so systematically.

DISCUSSION

Because the present study focused on two separable issues, we will consider them separately and conclude with a suggested integration.

Parallels Between Obese and Restrained Normals

The prediction derived from Nisbett's (1972) relative deprivation interpretation of obesity—that normal-weight individuals who are restraining their intake (and are thus at a weight substantially below biological set-point) ought behaviorally to resemble obese individuals (likewise below set-point)—appears to have been well confirmed. Unrestrained normals ate significantly less when anxious, as did normals in both Schachter et al.'s (1968) and McKenna's (1972) studies. Restrained eaters ate nonsignificantly more, as did both Schachter et al.'s and McKenna's obese. The percentage decrease for unrestrained eaters when anxious (39%) fell within the range of values obtained in McKenna's and Schachter et al.'s studies (39% and 44%, respectively), and the percentage increase for restrained normals (24%) was likewise intermediate (33% and 20%, respectively). Overall, the pattern and significance levels of results in this study accorded well with the comparable previous research categorizing subjects on the basis of degree of overweight. The notion that relative deprivation rather than obesity per se may be the most viable conceptualization underlying individual differences in eating behavior appears to have considerable merit. Furthermore, the restrained–unrestrained distinction becomes more powerful when obese subjects are eliminated from the data.

Secondarily, the relative hyperemotionality of the obese (cf. Pliner, Meyer, & Blankstein [1974], Rodin [1973], and Schachter & Rodin [1974]) is paralleled by the relative hyperemotionality of restrained normals, whose emotional reactivity tends to surpass even that of the obese.

One cannot, of course, dismiss the possibility that restrained eaters are simply external individuals who happen not to be obese; externality may be the critical determinant of their behavior. However, it seems at least as likely that the obese are simply restrained eaters who happen to be obese. Although they no doubt exhibit externality, this characteristic may well be a result of their "biological underweight" rather than a cause of their actuarial overweight. The stimulus-bound portrait that the Schachterian position presents in describing the obese seems, at least in its simplest form, to predict that externality and restraint ought to be mutually exclusive,

which is obviously not the case. Nisbett's position views externality and restraint as virtually synonymous. The critical test of these theories awaits the behavioral assessment of a sample of obese individuals who are clearly not "below set-point."

The Psychosomatic Hypothesis

Technically, the psychosomatic hypothesis is composed of two somewhat independent hypotheses, which merit separate consideration. First, it has been maintained that anxiety augments eating by the obese (or, as we maintain, the relatively deprived). The present study confirms the pattern established by Schachter et al. (1968) and McKenna (1972): a nonsignificant increase in consumption. Even though no single study has demonstrated a substantial effect, the consistency of the results across studies necessitates caution before this aspect of the psychosomatic hypothesis is dismissed. It seems best to consider the phenomenon to be weakly supported; it remains an open question as to whether a more powerful anxiety manipulation (perhaps utilizing an ego-involving threat) might succeed in significantly increasing consumption.

The second component of the psychosomatic hypothesis involves the purported anxiety-reducing effect of eating. Neither Schachter et al. nor McKenna provided any evidence to support this notion, and the present study also failed to produce conclusive evidence. The extent of anxiety reduction for restrained eaters did not qualify as conventionally significant, and the subsidiary notion that amount eaten and extent of anxiety reduction ought to be related received no support at all. McKenna's contention that the anxiety-reduction effect is ephemeral and must be assessed immediately leaves open the possibility of assessment during eating revealing a significant effect. At present, however, this aspect of the psychosomatic hypothesis must be considered even further from confirmation than the "anxiety increases consumption" notion.

If it is true that anxiety does increase consumption for restrained or obese persons, however, it is still unnecessary to invoke an anxiety-reducing effect of eating to account for such increased consumption. The restraint which governs the intake of restrained eaters need not be considered immutable; such restraint can be removed experimentally (cf. Herman & Mack, in press). Anxiety may be regarded as a disrupter of behaviors (including self-control behaviors) and may act to disinhibit the deprivation-motivated (external) eating behavior otherwise held in check by the restrained eater. Increased consumption when anxious may be more a reflection of the individual's chronic hunger (normally suppressed) than an attempt to achieve emotional homeostasis.

REFERENCES

Bruch, H. Transformation of oral impulses in eating disorders: A conceptual approach. *Psychiatric Quarterly*, 1961, *35*, 458–481.

Herman, C. P., & Mack, D. Restrained and unrestrained eating. *Journal of Personality*, in press.

Hibscher, J. A. *The effect of free fatty acid and preload level on the subsequent eating behavior of normal weight and obese subjects.* Unpublished doctoral dissertation, Northwestern University, 1974.

Kaplan, H. I., & Kaplan, H. S. The psychosomatic concept of obesity. *Journal of Nervous and Mental Disease, 1957, 125,* 181–189.

McKenna, R. J. Some effects of anxiety level and food cues on the eating behavior of obese and normal subjects. *Journal of Personality and Social Psychology*, 1972, *22*, 311–319.

Nisbett, R. E. Hunger, obesity, and the ventromedial hypothalamus. *Psychological Review*, 1972, *79*, 433–453.

Pliner, P., Meyer, P., & Blankstein, K. Responsiveness to affective stimuli by obese and normal individuals. *Journal of Abnormal Psychology*, 1974, *83*, 74–80.

Rodin, J. Effects of distraction on performances of obese and normal subjects. *Journal of Comparative and Physiological Psychology*, 1973, *83*, 68–75.

Schachter, S., Goldman, R., & Gordon, A. Effects of fear, food deprivation, and obesity on eating. *Journal of Personality and Social Psychology*, 1968, *10*, 91–97.

Schachter, S., & Rodin, J. *Obese humans and rats.* Washington, D.C.: Erlbaum-Halstead, 1974.

Walker, D., & Remley, N. The relationships among percentage body weight loss, circulating free fatty acids and consummatory behavior in rats. *Physiology and Behavior*, 1970, *5*, 301–309.

(Received December 30, 1974; revision received March 17, 1975)