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TOWARD A CLASSIFICATION AND UNDERSTANDING OF EATING MOTIVATIONS IN COLLEGE STUDENTS

By

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ABSTRACT

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In light of the lack of research and valid instrumentation on "normal eating," this study attempted to identify and classify one or more normal eating styles in a non-clinical population according to conscious motivational patterns, behaviors, and other variables. Participants were 723 male and female college students recruited from undergraduate psychology courses. Participants completed questionnaires measuring various motivational eating styles, and other variables such as exercise motivation, body awareness and responsiveness, emotional interoceptive awareness, self-esteem, body image, physical activity, medical history, dieting history, eating disorder symptoms, and self-reported height and weight. This study tested the hypothesis that there would be more than one type of normal eating style, i.e., that average weight individuals with no current eating disorder symptomotology would endorse a variety of eating styles. The Eating Style Inventory (ESI) resulted in four subscales, including body-responsive eating, healthy eating, constrained eating, and overeating. Participants scored relatively highly on the first two scales, suggesting that body-responsive and healthy eating may reflect "normal" eating in a college population. Weight status was predicted by body-responsive and constrained eating: Below-average weight individuals scored significantly higher on body-

responsive eating and constrained eating, whereas above-average weight participants scored significantly lower on these subscales. Contrary to prediction, eating style was not related to dieting history or to exercise motivation. However, exercise motivation was significantly correlated to body awareness and responsiveness. Implications for obesity treatment, prevention, and health promotion are discussed.

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INTRODUCTION

The study and understanding of human eating behavior has been a complex, multifaceted, and, I argue, not wholly successful, endeavor. Within the field of psychology, clinical researchers have traditionally focused on abnormalities in eating behavior and their consequences (e.g., obesity, eating disorders), attending to normal eating mostly as a comparison or contrast to the abnormal, clinical sample or experimental group in question. The present study attempted to extend previous work by examining eating behavior and some of its correlates in a more "normal," diverse sample of people.

Obesity, which affects an estimated 23 million Americans, is clearly an important problem--not only because of its possible detrimental effects on physical health and psychological well-being, but also because of its notorious resistance to permanent change after treatment (Garner & Wooley, 1991). Current wisdom suggests that traditional weight loss methods, such as behavioral and dietary treatments that promote restrained eating (e.g., dieting or restriction of food intake), are largely ineffective in producing lasting or permanent weight loss. To date, there exists little evidence that clinically significant weight loss can be maintained over the long term by the majority of people who utilize traditional treatments. In fact, such traditional, restrictive

treatments are thought to have a 95% failure rate (Chrisler, 1993; Garner & Wooley, 1991) and may produce negative physical and psychological effects, as is discussed in the Literature Review in Chapter 2.

In light of the debatable effectiveness and potential consequences of standard obesity treatments, researchers recently have begun to question the value of such treatments and their primary goal of weight loss (Brownell, 1993; Garner & Woolley, 1991). However, it may well be that current methods show little evidence of long-term effectiveness, not because of methodological limitations or inherent resistance to weight loss in overweight individuals (as reviewed in Chapter 2), but rather because the PREMISE BEHIND TRADITIONAL WEIGHT LOSS METHODS MAY BE INCORRECT. It would seem logical that treatment of an abnormality, like obesity and/or overeating, would strive to help affected individuals return to the "normal" or healthy state of functioning, assuming that they once functioned normally (at least at birth). However, the goal of traditional weight loss treatments has typically focused on the result of weight loss, instead of on achieving this result via a long-term behavioral objective that might resemble the way a normal person eats.

Although much research has been performed on disordered or abnormal eating behavior and its consequences, the question of What is "normal eating?" has not been adequately addressed in the psychological literature.[1] I refer to "normal eating" in quotations because I assert that we--academics, clinicians,

[1] This paper reviews and addresses deficits in the psychological literature on normal eating behavior in humans. As such, a complete overview of literature from other disciplines, such as biology, nutrition, and food science, is not included.

and most Americans--do not know what "normal eating" is! It should be necessary to study and understand "normality" in order to understand and effectively treat its "abnormal" counterparts. Unfortunately, in the case of obesity and eating behavior, the topic of "normal eating" in humans has been, for, the most part, ignored in the psychological literature. Moreover, when the subject has been addressed, there has been disagreement over the definition of normal eating, as discussed more fully in the Literature Review. Even in the treatment of eating disorders, there is disagreement over what normalizing (and hence, normal) eating should entail. It is no wonder, then, that "normal eating" is not the desired end-goal of most weight loss treatments.

The question of "how people eat," also called "eating style," has been conceptualized and addressed in divergent (and sometimes questionable) ways in the literature. Although there is no one accepted definition of "eating style," it has most commonly included such behaviors as number and rate of mouthfuls, chews, and sips, speed of eating, amount eaten, and types of food eaten. Researchers have attempted to identify a distinct "obese eating style," without much success. In most studies, obese and non-obese participants were not found to differ in their "eating style," as defined above (Keane, Geller, & Scheirer, 1981; Rosenthal & Marks, 1978; Stunkard, Coll, Lundquist, & Myers, 1980).

I argue that it is the motivations, and not the behaviors themselves, that may be particularly meaningful to our understanding of eating behavior and different eating styles. In contrast to predominantly descriptive classifications of

eating, based on observable or self-reported behaviors, some researchers have conceptualized eating with regard to the motivation behind eating or not eating: e.g., internal versus external cues (Schachter, Goldman, & Gordon, 1968; Schachter & Gross, 1968); cognitive restraint (Herman & Polivy, 1975); depletion-induced versus external stimulus control of eating (Weingarten, 1985); emotional and external reasons for eating (van Strien, Frijters, Bergers, & Defares, 1986); spontaneous versus constrained eating (De Castro, 1988); and most recently, internally- versus externally-directed eating (Carrier et al., 1994). Various descriptive and motivational eating styles are discussed more fully in the Literature Review.

I believe that these classifications based on motivation[2] for eating are more conceptually and clinically meaningful than the purely descriptive, behavioral categories. As such, my own definition of eating style is "a consistent, recurrent pattern of motivation, and resulting eating response, which includes specifically what typically motivates or determines when, how much, and what an individual eats."

Despite some recent attention to the motivational aspects of eating behavior, research on assessment of such eating styles has been sadly lacking, with the exception of restrained eating, for which there are several validated

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[2] The psychology of motivation is a broad and loosely defined field. It covers everything from detailed investigations of the physiological mechanisms involved in animal drives to elaborate analyses of the unconscious motives behind abnormal or symptomatic acts in a person to factor analyses of the motives people assign to themselves to explain their behavior (McClelland, 1987). In the context of this study, "motivation" refers to the latter: The motives or reasons individuals consciously assign to themselves to explain their behavior.

measures (Herman & Polivy, 1980; van Strien et al., 1986). Methods and instruments for assessing eating behavior and eating style are reviewed in the Literature Review.

The question posed earlier regarding whether weight loss is a viable or reasonable goal for obesity treatment might be answered in the following way: Determine how "normal" (with no identified weight or eating problem) people eat, and teach overweight individuals how to eat like these normal eaters; and then see if the overweight people lose weight and can maintain a normal weight over time (e.g., at least five years--Brownell's (1982) definition of a "cure from obesity") by eating in a "normalized" way. The first step in this process would be to investigate how normal people eat--hence, this study.

Polivy and Herman (1987) proposed the concept of "physiological normalcy" or "eating that occurs in response to hunger cues and stops in response to satiety cues" (p. 641). This type of eating has also been called "natural eating" (Riebel, 1991) or "depletion-induced" eating in Weingarten's (1985) two-factor theory of hunger. I believe that the preferred or optimal normal eating style is this type of physiologically motivated eating, or the consistent responding to interoceptive cues of hunger and satiety.

In this study, a range of "normal eating"--including an optimal eating style in addition to other less desirable, but still nonpathological, motivational eating styles--was expected. In other words, normal eating may not be one single point on a continuum of eating behaviors, but rather a range that includes different styles with different primary motivations.

Research Design

In light of the relative lack of research and valid instrumentation on normal eating, the purpose of this study was to identify and classify one or more "normal eating styles" in a non-clinical population. This goal was accomplished by developing and testing a measure of "normal eating," which assessed ascribed biological, social, cognitive, and environmental motivations for eating. Other motivational influences on eating, such as cognitive restraint and emotions, were measured with established instruments.

Theoretical framework. This research was based on, and examined, two theoretical models: Herman and Polivy's (1983) theoretical "boundary model" of eating behavior, and Schachter's (1968) theory of internality versus externality. The boundary model suggests that "undisturbed" (normal-eating) humans eat predominantly according to biological pressures (i.e., hunger and satiety) but are also influenced by non-biological, more uniquely human influences. The boundary model involves two separate "boundaries," hunger and satiety, between which is an area the authors call the "zone of biological indifference" (p. 919), where aversive biological pressures to eat (hunger) or stop eating (satiety) are absent. However, it is within this zone that the more human influences on eating--such as social influences, appetitive factors, and cognitive considerations--have the greatest effects.

Schachter's model focuses on the relationship between eating style and body size. He proposes that obese individuals are more responsive to external cues to eating (such as time of day or the passage of time, sight of food, and

taste) and less responsive to internal physiological cues (such as hunger) than are normal-weight individuals.

When Schachter's model is integrated with Herman and Polivy's (1983), one would predict that some people are predominantly motivated to eat by physiological pressures or needs, whereas others eat primarily in response to other factors (social, cognitive, environmental, etc.). There necessarily will be overlap between these (two or more) groups, but they should be distinguishable by a predominant, consistent pattern of motivation and response.

According to Schachter, one would expect the first group to be of normal or average weight, and the other group(s) more likely to be overweight. In contrast, based on my clinical and personal experience, I believe that among the non-physiologically-motivated eaters, there may be several sub-groups of eaters, not all of whom are overweight or "abnormal" in their eating. In other words, normal eating (defined by a lack of physical or behavioral pathology) may be heterogeneous, and there may be more than one normal eating style, as would be possible with the boundary model. Additionally, the research on the negative effects of dieting and restrained eating leads me to expect that individuals who have previously dieted will be less likely to eat predominantly for biological reasons, and more likely to eat according to other motivations, due to a disruption of their normal regulatory processes as a result of dieting.

Current research. This study assessed the proposed multiple motivational influences on normal human eating behavior, as suggested by the boundary model, and possible correlates of different motivational eating styles.

An original measure of "normal eating," along with established questionnaires assessing different types of disordered eating and related variables, were administered to a sample of undergraduate psychology students. The purpose of this study was three-fold: (a) To develop an instrument to measure and classify normal eating according to motivational influences, (b) to determine the distribution of this style or styles within a non-clinical sample, and (c) to determine the correlates of the normal eating style(s). The instrument was designed to assist in the development of new treatment methods and for the evaluation of treatment outcomes. In addition to a three-fold purpose, this study had three distinct parts in which different hypotheses were tested.

Part I

Along with development and refinement of the Eating Style Inventory (ESI), this study examined group differences in motivational eating styles. More specifically, I wanted to explore the potential link between eating style and two sets of predictor variables: Weight and range of disordered eating. The weight factor (below-average, average, or above-average weight,[3] as defined by a weight-to-height index, as described in the Method section) tested Schachter's (1968) predictions about the relationship between body weight and internal versus external eating.

Weight was crossed with range of eating disorder, for a 3 x 4 factorial design. Range of eating disorder represents the concept that "normal" and

[3] In this study, body weight was classified as below-average, average, or above-average, rather than the more traditional "underweight, normal, or overweight," in order to avoid the assumption that the population average is actually "normal" in any way beyond statistical.

disordered eating behaviors fall on a continuum, with normal eating at one end of the continuum and diagnosed eating disorders at the opposite end, with milder or subclinical forms of eating disorders at intermediate points (Kalodner & Scarano, 1992; Polivy & Herman, 1987). Previous research has defined six groups on this continuum (the five non-normal groups being variants of bulimic behavior), but this study examined four groups, based on a combination of history of dieting and eating disorder symptoms: (a) no eating disorder, never dieted ("normal"); (b) no eating disorder, previously dieted; (c) no eating disorder, currently dieting; and (d) clinical eating disorder symptomotology, which included symptoms of anorexia and/or bulimia. The experience of dieting was used as an indicator of intermediate or subclinical eating disorder, based on the research of the long-term negative effects of dieting (e.g., unresponsiveness to internal hunger state and an overreliance on external cognitive cues to eating) and its role in the development of more serious eating disorders (discussed and cited in more detail previously).

Motivational eating style, the criterion variable, included four "normal" and three abnormal eating styles, some of which have been identified in previous research. Expected subtypes of normal eating included body-responsive eating, conventional eating, constrained eating, and healthy eating. Body-responsive eating (the anticipated ideal, or optimal eating style) is my name for Polivy and Herman's (1987) physiologically normal eating; it has also been called internally-directed eating, comparable to Polivy and Herman's conceptualization, with the addition of choosing foods to be eaten according to

the body's cravings (Carrier et al., 1994). There is some evidence for the ability to self-select appropriate foods in animals (see Overmann, 1976) and in infants and young children (Davis, 1928; 1939). However, in their review of food selection, Rozin and Schulkin (1990) conclude that "there has not been definitive demonstration of adaptive food selection under conditions where [*sic*] this might reasonably fail, in need-free [i.e., non-deficient] animals" (p. 312). In the current study, body-responsive eating included responding to the body's messages of hunger, satiety, and food cravings for particular foods.

Conventional, constrained, and healthy eating were also considered "normal" because they were expected to be associated with lack of pathology (obesity and/or eating disorders). Conventional eating is eating according to social convention, such as three meals a day at regular mealtimes, with food choices based on what is commonly eaten at a given meal (e.g., cereal in the morning because it's a breakfast food and it's breakfast-time). Amounts eaten would be socially acceptable (e.g., finishing what is on one's plate). This concept of conventional eating was derived from my clinical work with overweight individuals, and from my personal experience living in our society.

Constrained eating is similar to De Castro's (1988) concept of constrained eating, in which timing of eating is determined by an external schedule. In this study, constrained eating also included external constraints (e.g., money, time) on amount and type of food consumed.

Finally, healthy eating refers to eating according to popular ideas about what is "healthy." This style has a cognitive motivation, based on an

individual's knowledge of current nutritional and health recommendations, and attitudes about food and eating that come from such "knowledge." Healthy eating may be a less severe (or "normalized") form of restrained eating.

The abnormal eating styles assessed included restraint, and types of overeating such as emotional eating and external eating. Restraint refers to the tendency to cognitively restrict or control one's food intake in order to control one's body weight (Herman & Mack, 1975; Herman & Polivy, 1975). Emotional eating is eating in response to negative emotions, and external eating refers to eating in response to food and/or social cues (van Strien et al., 1986).

Hypotheses:

Given Polivy and Herman's (1987) definition of (ideally) normal eating as physiologically motivated, and the relationship between dieting and lack of interoceptive awareness and responsiveness, it was expected that:

1a. Average weight, never dieted participants would score higher on the body-responsive eating scale than the other groups of participants.

1b. Average weight, never dieted participants would score higher on body-responsive eating than on the other eating scales.

Given the relationship between dieting and subsequent eating and weight problems, it was expected that:

2a. There would be significantly fewer participants in the above-average weight, never dieted cell, than in the other groups.

2b. If there are participants in this group, they would score higher on the overeating scales than on the other scales, based on Schachter's theory that

overweight individuals eat more often in response to external and/or emotional cues (as measured by the overeating scales) than in response to internal cues.

Given variability in body weight, such that some people may be naturally thinner than others:

3a. Below-average weight participants would resemble the average weight participants across range of eating disorder categories, with the exceptions of:

3b. Below-average weight, never dieted participants would score lower on body-responsive eating than average weight, never dieted participants. It was assumed that, given equal lack of interference by dieting, below-average weight participants are below-average weight due to lower responsiveness to their hunger and fullness signals than exhibited by average weight individuals. This assumption presupposes that body-responsive eating would result in average body weight in a population.

3c. Below-average weight, eating disordered participants (if any) would score higher on restraint and lower on overeating than the average weight, eating disordered participants. Below-average weight, eating disordered individuals most likely would have anorexia nervosa, or at least serious anorexic symptoms, characterized by high restraint and low (over)eating.

Given the negative long-term effects of dieting on eating behavior:

4. Average weight, previously dieted participants would score higher on one or more of the normal eating scales (healthy, overeating, or constrained, but <u>not</u> body-responsive eating) than on the other scales. Here, the non-

physiological normal eating scales were expected to be higher than the abnormal ones because these individuals are within average weight range.

5. Above-average weight, previously dieted participants would score higher on the overeating scales and lower on body-responsive eating, than on any other scales. This hypothesis tested the negative effects of dieting as well as Schachter's theory that overweight individuals overeat.

6. Average weight, currently dieting participants would score highest on restrained eating, as "currently dieting" means currently restraining, if the individual is dieting "successfully."

7. Above-average weight, currently dieting participants would score highest on the restraint (indicating successful restraint with delayed weight loss) or overeating scales (testing Schachter's theory), and lowest on body-responsive eating. These participants were expected to score lowest on body-responsive eating because (a) they are currently dieting, which is the opposite of responding to the body, and (b) they are above-average weight, signifying that they may not have been eating according to their bodies' needs.

8. Average weight, eating disordered participants would score highest on the restraint, healthy eating, and possibly the overeating scales. These eating styles should characterize bulimia and result in an average weight.

9a. Above-average weight, eating disordered participants would score highest on overeating and restraint, which are likely alternating.

9b. These individuals (above-average weight bulimics) should score higher on overeating and lower on restraint than the average weight, eating

disordered participants, indicating more overeating than restraining behaviors and motivations.

10. Given the continuum idea of eating behavior ranging from normal to disordered, all eating disordered participants (across weight categories) would score lower on body-responsive eating than the dieters or never dieters. Eating disordered individuals fall on the disordered end of the continuum, farthest away from the normal ideal, which may be body-responsive eating.

In summary, it was predicted that there would be significant differences in motivational eating style scores based on a combination of weight and range of eating disorder, and that there would be more than one "normal" eating style, associated with average weight and lack of an eating disorder (as evidenced by the above hypotheses). If an alternative model is more valid--i.e., that there are no motivational differences between normal and overweight individuals, as proposed by the set-point theory (Nisbett, 1972)--the above predictions would not be supported, and any differences in eating style could be attributed only to range of eating disorder or other variables.

Part Ia

As a subset of the first part of the study, average weight participants who were once overweight but lost weight and maintained their loss (if any) were examined. This group was expected to be a subset of the average weight, no eating disorder groups, either currently dieting or having previously dieted. Long-term maintenance of previous weight loss was assessed to determine eating style and other correlates of maintenance of weight loss. Behavioral

weight loss treatments that promote restrained eating suggest that dietary restraint and/or frequent exercise is necessary to lose weight and maintain weight loss over time. Other, non-restrictive treatments (Friedman et al., 1991; Groger, 1983) suggest that overweight individuals can lose weight and keep it off without the traditional dieting, restraint, or exercise. Three different eating styles were expected to be seen in this group of weight loss maintainers.

Hypotheses:

11. Average weight, previously dieted participants would score higher on body-responsive eating (indicating weight loss and maintenance by responding to the body's needs) or on restraint or healthy eating (indicating weight loss and maintenance by ongoing restraint or "healthy eating"), than on any other eating scale.

12. Average weight, currently dieting weight loss maintainers would score highest on restraint, and second highest on healthy eating. "Currently dieting" should result in high restaint, and healthy eating may be a less extreme variant of restrained eating.

If the behavioral/restrained eating model of treatment were true, Hypothesis 11 would not be supported. (However, lack of support for Hypothesis 11 could be due to sample limitations, and would not disprove the non-restrictive theory of weight loss.)

Part II

The second part of this study more closely examined the body-responsive eating style and its correlates. Variables to be examined as

possible predictors or correlates of the body-responsive eating style included: gender, emotional interoceptive awareness, body awareness, body responsiveness, self-esteem, body image, body satisfaction, physical activity, exercise motivation, usual food choices, medical history, and current symptoms.

Gender was examined because eating problems are more common in females than in males (Lundholm & Anderson, 1986; Rolls, Fedoroff, & Guthrie, 1991; Smead & Bloyd, 1987). Separate variables of emotional interoceptive awareness and body awareness were measured to assess awareness of emotional and physical feelings and sensations, because to respond to interoceptive cues, one must perceive them accurately (Polivy & Herman, 1987).

Body responsiveness was measured to assess responsiveness to other non-hunger bodily states such as fatigue, sickness, etc. Self-esteem was measured because low self-esteem is a common attribute of obese individuals (Mahoney & Mahoney, 1976), emotional eaters (van Strien, Fritjers, Roosen, Knuiman-Hijl, & Defares, 1985), and those with other eating disorders (Garner & Bemis, 1982; Katzman & Wolchik, 1984).

Body image was assessed because disturbances in body image have also been associated with obesity (Stunkard & Mendelson, 1967; Wilson, Hogan, & Mintz, 1983), and with other eating disorders (Garner & Bemis, 1982; Katzman & Wolchik, 1984). Satisfaction with body weight was assessed as another indicator of body image.

Physical activity and exercise motivation were measured to determine

the relationship between activity, exercise motivation, and eating style. Exercise motivation, as conceptualized, refers to whether an individual's exercise is internally-directed (i.e., frequency, intensity, and duration of physical activity regulated completely in response to localized and generalized sensations of energy and body fatigue) or externally-directed (exercising to reshape the body, burn calories, or neutralize overeating) (Carrier et al., 1994). Internally- versus externally-directed exercise is important because externally-directed exercise often interacts with dietary restraint to set the stage for individuals to later develop eating disorders (Epling & Pierce, 1988). Negative body image has also been associated with externally-directed exercise (Imm & Pruitt, 1991).

Usual food choices, measured by a food-frequency questionnaire, were examined to determine if different eating styles are associated with particular food choices or types of diets. Finally, medical history data and current symptoms were collected to ascertain if the different eating styles are associated with medical symptoms or conditions.

Hypotheses:

Given that eating problems are more prevalent in females than in males, and given that body-responsive eating represents the ideal or optimal normal eating style:

13. Males would score higher on body-responsive eating than females.

14. High body-responsive eating would be associated with emotional interoceptive awareness, body awareness and responsiveness, self-esteem,

positive body image, internally-directed exercise, and fewer medical symptoms or conditions (suggesting that this style is the most positive or desirable in terms of its consequences).

LITERATURE REVIEW

The Literature Review is organized into a discussion of the following topics: (a) obesity and its treatment, (b) normal eating behavior, (c) eating style, (d) assessment of normal eating, and (e) conclusions.

Obesity and its Treatment

Obesity affects an estimated 23 million Americans and is most commonly treated with weight loss methods whose long-term "effectiveness" yields a 95% failure rate (Garner & Wooley, 1991). The definition of obesity as a problem that needs treatment is likely influenced by cultural messages from the fashion, entertainment, and publishing industries, mostly directed at women, which equate thinness with beauty and worth. Such cultural pressures for slimness have undoubtedly intensified in the past 30 years (Garner, Garfinkel, Schwartz, & Thompson, 1980), such that widespread body-shape dissatisfaction in young women is now considered to be "normative" (Rodin, Silberstein, & Striegel-Moore, 1985). It is not surprising that women in particular feel cultural pressure to lose weight, thereby conforming to society's standards of beauty and acceptablity. Some researchers who question the preported health risks of obesity believe that the "problem" lies not in people's body size, but rather in our society's stigmatization of obesity and the pervasive influence of a lucrative

weight loss industry (Garner & Wooley, 1991).

The weight loss industry in this country is a billion-dollar business, projected to reach over $50 billion by 1995. The most commonly recommended and employed weight loss approaches, behavioral and dietary treatments, are based on the assumption that obesity is caused by overeating behavior that can be controlled or "modified" with treatment, with a result of loss in body weight. Ironically, although it is generally acknowledged that these types of treatments are effective in promoting short-term clinically significant weight losses, they are believed to be ineffective in producing lasting or permanent weight loss (see Garner & Wooley, 1991). To date, there exists no evidence that clinically significant weight loss can be maintained over the long term by the majority of people who seek treatment. In light of this evidence, recently researchers have begun to question the appropriateness of behavioral and dietary treatments of obesity.

In addition, recent research has begun to identify some negative consequences of restrained eating (i.e., dieting) and resulting weight changes. Such research suggests that behavioral or dietary weight loss programs that encourage and teach restraint in the form of calorie counting, dieting, restricting certain foods, etc., may be counterproductive and even harmful, both psychologically and physically. Such physical risks include increased mortality by cardiovascular disease from weight loss and weight cycling. Garner and Wooley (1991) argue that the cardiovascular health risks commonly associated with obesity may be independently attributed to weight cycling or fluctuations in

weight due to dieting and weight regain.

Heatherton, Polivy, and Herman (1989; 1991) found that restrained eating was associated with unresponsiveness to internal hunger state, an overreliance on external cognitive cues to eating, and exaggerated weight fluctuations. Psychological symptoms associated with dieting and resulting weight loss include depression, anxiety, irritability, and mood swings (originally found by Keys, Brozek, Henschel, Mickelson, & Taylor, 1950).

Weight regain or repeated failures in weight loss attempts, understandably, can also be profoundly devastating to an individual's self esteem and acceptance. Dieting to below-optimal weight may cause binge eating or compulsive overeating as a result of the conflict between cultural pressures for thinness and the biological response to suboptimal weight (Garner & Wooley, 1991). Finally, concerns about weight and shape often lead to dieting and stringent weight control efforts that may precipitate anorexia nervosa and bulimia (Garner and Garfinkel, 1980; Smead, 1984).

It has been increasingly recognized that the war against obesity and body fat may have had the grave side effect of leading to an increased incidence of eating disorders. Similarities between dieters and anorexics and bulimics include binge eating, caloric restriction, drive for thinness, body dissatisfaction, and perfectionism (Garner, Olmsted, Polivy, & Garfinkel, 1984; Garner & Wooley, 1991). Moreover, this relationship between dieting and subsequent eating disorders may be exacerbated by using exercise in combination with restrained eating to manage body size. Epling and Pierce

(1988) suggest that as many as 75 percent of the women who develop anorexia do so because they combine a strict diet with exercise. Frequent exercise has also been associated with excessive concern with weight and dieting (Davis, Fox, Cowles, Hastings, & Schwass, 1990) and with a more negative body image (Imm & Pruitt, 1991).

Although it seems clear that the traditional weight loss approaches of behavioral and dietary treatment are ineffective and potentially harmful in the long run, most scientic research has focused on these methods. In his review, Jeffery (1987) reports that among follow-ups beyond one year, recidivism--approximating 75% to 100% regain of initial weight losses--is common. One possible explanation for the poor success rate is in Nisbett's (1972) set-point theory: Perhaps dieters are trying to regulate their weight around a value that is lower than their body's natural set-point weight, hence the inadvertant but inevitable weight gain after treatment (which brings their weight back to the set-point).

Another possible explanation is that treatment samples (reported in the research) may be biased, due to what Schachter (1982) calls "self-selection": Only the most difficult cases seek help, and those who do get included in the research may be less likely to achieve permanent weight loss than those who cure themselves without formal treatment. Most long-term research on weight loss identifies the majority of subjects who have regained all or most of their weight lost during treatment. Such research is limited in that it focuses mainly on one type of treatment method (dieting), thereby oversampling weight loss

failures.

In 1982, Schachter addressed this problem by publishing a study that examined recidivism and self-cure of obesity. He argued that individuals who cure themselves of obesity without therapeutic intervention do not become part of the research data, and therefore the reputation of obesity as uncurable, intractable, or resistent to change may be grossly exaggerated. Schachter's study interviewed 161 people, 46 of whom had a history of obesity, and 40 of those had made an active attempt at some point to lose weight. Schachter found that 62.5% had succeeded in becoming "cured fat" people. These subjects had lost at least 10% of their body weight and were no longer overweight. Schachter explained this discrepency with obesity treatment results partially by his concept of "self-selection." Contradictory to weight loss treatment findings, both Schacter's and a more recent study (Orme & Binik, 1987) identified that some people <u>are</u> able to maintain a significant weight loss over time, although the length of time is not specified. Unfortunately, neither study examined in depth the characteristics of the identified successful weight losers or how they lost the weight and kept it off.

Brownell (1993) agrees that the select nature of clinical samples in university treatment programs is responsible for the observed lack of success in obesity treatment. He recommends examination of the effectiveness of programs or approaches that operate outside of university settings and evaluation of different and innovative treatments. Garner and Wooley's (1991) view is more radical: They argue that there are only minimal health risks of

obesity, but both physical and psychological risks of weight loss treatment. They conclude that obesity should not be treated with weight loss regimens (i.e., with weight loss as the primary goal), but rather with alternative non-dieting approaches aimed at improving individuals' life style, health risk factors, body image, and self esteem, without weight loss.

The question, then, boils down to: "Is weight loss an appropriate and viable goal for obesity treatment?" Those who would answer, "No," believe that obese individuals are biologically and genetically programmed to be obese, and that obesity represents their natural, homeostatically-maintained weight. Therefore, any attempted reduction of weight will be met by "body weight defense" (Garner & Wooley, 1991, p. 742). Those who argue that weight loss is a viable goal of obesity treatment cite findings of formerly-obese individuals as evidence that "some people do manage to lose weight and maintain their new weight" (Brownell, 1993, p. 339; as well as Jeffery & Wing, 1983; Schachter, 1982). The theoretical belief behind this latter argument is that obesity is <u>not</u> the natural, biologically-regulated state, but rather is the result of a failure in normal body weight regulation. Proponents of this view believe that the low effectiveness of current treatments can be explained mostly by faulty research methods (e.g., selection bias). They suggest that further research be conducted with different samples and different treatment methods.

It may well be that current weight loss methods show no evidence or promise of long-term effectiveness, not because of methodological limitations of the research or inherent resistence to weight loss in overweight individuals, but

rather because the PREMISE BEHIND TRADITIONAL WEIGHT LOSS METHODS MAY BE INCORRECT. It would seem logical that treatment of an abnormality, like obesity and/or overeating, would strive to help affected individuals return to the "normal" or healthy state. Unfortunately, the goal of traditional weight loss methods has typically focused on the result of weight loss, per se, instead of a long-term behavioral objective that might resemble the way a normal person eats.

Traditional behaviorists recently stated that the "ultimate goal of treatment should be improved quality of life and permanent weight control" (Robison, Hoerr, Strandmark, & Mavis, 1993, p. 448). Such a focus on the end result of weight reduction has obliterated any concern with the process by which this goal might be achieved. Weight loss has been, historically, the goal of treatment. The desired weight loss and maintenance is usually attempted, not by normalizing eating behavior (as is claimed by traditional programs), but rather by sustained caloric restriction (by counting calories, following lists of allowed and unallowed foods, use of exchanges and portion control), which is virtually impossible to maintain over long periods of time. An apparently less severe method of weight loss is the "increased physical activity and gradual reduction of dietary fat intake" (Robison et al., 1993, p. 448), but even this approach is "externally-directed" (Carrier, Steinhardt, & Bowman, 1994, p. 2) and may not be related to, or compatible with normal eating.

Recommended treatment of clinical eating disorders, such as anorexia nervosa and bulimia, often includes "normalizing" eating behavior (Garner &

Friedman, 1995); and recently, a few promising treatments that were designed to achieve this goal have been studied (Carrier et al., 1994; Friedman, Reyher, & Richmond, 1991; Polivy & Herman, 1992; Roughan, Seddon, & Vernon-Roberts, 1990). However, there is still no clear consensus as to what "normal eating" is.

Normal Eating

Although much research has been done on disordered or abnormal eating behavior and its consequences, the question of What is "normal eating?" has not been adequately addressed in the scholarly literature. When the subject has been discussed, there has been disagreement over the definition of normal eating. It is no wonder, then, that "normal eating" is not the desired end-goal of most weight loss treatments.

This lack of consensus about what normal eating is may be further compounded by differing meanings of "normality" in general. Normality may be defined simply as the "absence of abnormality" (Rosenhan & Seligman, 1989), but then, there are also several conceptualizations of abnormality. A definition of abnormal eating would likely include suffering and maladaptiveness, and may also include the elements of incomprehensibility/irrationality, unpredictability or loss of control, vividness, observer discomfort, and possibly, violation of moral and ideal standards (Rosenhan & Seligman, 1989). In this vein, normal eating may represent the absence of an overt abnormality or manifestation of pathology (Polivy & Herman, 1987). Two observable pathological consequences of eating behavior are body weight and eating disorder

symptoms.

Normality or normalcy may also be conceived in a statistical or normative sense. In 1987, Polivy and Herman published a conceptual article paradoxically titled, "Diagnosis and Treatment of Normal Eating," addressing the normative meaning of normal eating. They argue that "the meaning of a phrase such as *normal eating* is no longer obvious," because terms "such as *normal, acceptable,* and *overweight* can be understood only in the context of societal realities and ideals" (Polivy & Herman, 1987, p. 635). The authors state that, for North American women, "normal eating" is now characterized by dieting, motivated by concern about one's weight. Hence their title about diagnosis and treatment of "normal" (normative, though unhealthy) eating.

Finally, normality can be defined in terms of an ideal or optimal state or behavior, or what might be considered "beyond normality" (Rosenhan & Seligman, 1989). In the case of eating, although "normal" may be defined by normal body weight, absence of an eating disorder, or what is most common in our society, there may in fact be an ideal or optimal way of eating that is associated with more positive physical and psychological outcomes.

In addition to the problem in defining normal eating, there is similar confusion and misunderstanding about eating behavior in general. In 1981, Spitzer and Rodin published a critical review of studies of human eating behavior in the journal, Appetite. The authors identified many problems with research on eating behavior, and they concluded that "thus far, many of the research questions in this area have not been posed in theoretically meaningful

ways," and that "many of the methodologies used were not adequate to test the research questions that were posed" (Spitzer & Rodin, 1981, p. 293). Disappointingly, research on human eating behavior has not shown much improvement in the 16 years since this article was published.

Eating Style

Within the many varied areas that constitute "eating behavior," my particular interest (for the purpose of this study) is in the area of "eating styles," which have been defined in differing ways in previous research. My definition of "eating style" is a consistent, recurrent pattern of motivation and the resulting eating response, which includes specifically what typically motivates or determines when, how much, and what an individual eats.

The following list is a brief chronological summary of how the concept of eating style or eating pattern has been conceptualized differently in the literature:

1. Responsiveness to internal versus external cues (Schachter et al., 1968; 1968). Schachter proposed that obese individuals are more resposive to external cues to eating (like time of day or the passage of time, sight of food, and taste) and less responsive to internal physiological cues (such as hunger) than are normal-weight individuals. This perspective distinguishes between internal and external motivations for eating.

2. Restrained versus unrestrained eating (Herman & Mack, 1975; Herman & Polivy, 1975). Herman et al. conceptualized restraint as a tendency to cognitively restrict or control one's food intake in order to control one's body

weight, which may result in a below-set-point body weight. Unrestrained eaters do not employ such cognitive restraint or display weight concerns, and hence, are likely "at or near their set-points, and therefore eat in the internally controlled manner by which Schachter originally characterized all normal weight eaters" (Herman & Mack, 1975, p. 648). Restraint originally was measured by the Restraint Scale, a self-report questionnaire. However, unrestraint has been characterized only by low restraint scores, and not by any positive measure of internal responsiveness. This perspective also addresses motivational factors in eating.

3. Obese eating style (Stunkard, Coll, Lundquist, & Myers, 1980). Stunkard et al. attempted to distinguish an "obese eating style," which includes such factors as calories and amount eaten, meal duration, number and rate of mouthfuls, chews, and sips, and speed of eating. These variables, and others in similar studies, were observed, and therefore, do not address the question of motivation. An "obese eating style," consisting of the above named variables, has not been consistently found in the research.

4. Three factors of eating: Dietary restraint, disinhibition, and hunger (Stunkard & Messick, 1985). Stunkard and Messick expanded on Herman et al.'s (1975) conceptualization of restraint by adding disinhibition, or the relinquishing of control over eating, and "hunger," which refers to self-reported frequent "hunger" and subsequent eating. These factors or eating styles, as measured in a self-report questionnaire, address motivation to a degree, with the restraint items showing the strongest motivational component.

5. Two-factor theory of hunger and meal initiation (Weingarten, 1985). Weingarten suggests the existence of two controls of feeding in humans and animals: one involving internal physiological events signifying depletion, and a second, incorporating a classical learning process that leads to the acquisition of an association between external stimuli and food. Weingarten argues that both of these systems result in physiological responses that promote ingestion; therefore, both can be regarded as being associated with a "hunger" state. He decribes these two states as "depletion-induced hunger" and "incentive- (or expectation-) induced hunger" (p. 394). Weingarten suggests that newborns may be the only true depletion-driven eaters. He believes that after the neonatal period, with increased experience with food, feeding, and rituals associated with eating, an incentive-based hunger system becomes established, which, for the remainder of the lifespan, interacts with the depletion signals to control both "hunger" and eating.

6. Restrained, emotional, and external eating (van Strien, Fritjers, Bergers, & De Fares, 1986). van Strien et al. developed a different questionnaire to measure restraint, emotional eating (eating in response to negative emotions), and external eating (eating in response to food and/or social cues). All three factors or styles reflect different motivations for eating, particularly with regard to the initiation of eating.

7. Spontaneous versus constrained eating (De Castro, 1988). De Castro posed and attempted to identify two other motivational distinctions: "Spontaneous" eating (motivated by hunger or the desire to eat) and

"constrained" eating (timing determined by an external schedule). (However, De Castro noted that his subjects had a very difficult time comprehending the distinction between spontaneous and constrained eating, even after considerable instruction.)

8. Six types of eating patterns (Kristeller & Rodin, 1989). Based on empirical research (using cluster analysis), Kristeller and Rodin identified six different clusters of eating patterns in normal subjects. These patterns, or types of eaters, included Uninhibited eaters, Uninterested eaters, Bingers, Guilty Dieters, High Self-Monitors, and Low Self-Monitors. These clusters were determined by scores on nine questionnaire scales which assessed eating habits (behaviors such as "uninhibited eating," "oversnacking," binging, and dieting), use of satiation cues, weight and dieting history and practices, and attitudes towards causes of weight problems. The three satiation scales address motivation for terminating eating, but the other scales are predominantly descriptive of behavior and attitudes.

9. Eating and dieting styles (Smead, 1991). Smead developed measures to assess "eating style" (one's "typical style of eating," how one normally eats) and "dieting style" (how one eats while on a serious diet, in order to lose weight). These scales assessed self-reported restrained eating behaviors, including motivations and consequences, and also unrestrained eating behaviors.

10. Three proposed patterns of disordered (over)eating: Deprivation-sensitive, affect-triggered, and dissociative eating (Plaisted, 1993). Most

recently, Plaisted and her colleagues developed a questionnaire to distinguish three different and distinct types of overeating styles. "Deprivation-sensitive" or "restrictive-reactive" overeating is eating in response, or as a result of, prior restriction or dieting. "Affect-triggered" overeating is similar to van Strien et al.'s (1986) emotional eating. "Dissociative" or "non-attentive" overeating refers to acting without awareness of either emotions, behavioral triggers, or the experience of eating. This third style is also often labeled as "compulsive" overeating.

In 1973, Leon and Chamberlain published a study in which participants who were attempting to lose weight (members of a weight-reduction club) were compared with a control group of normal weight individuals who were not trying to lose weight and had reported no previous weight problems. The overweight participants (primarily women) were further divided into those who had maintained a weight loss for a one-year period, and those who had regained the weight that they had lost. The three groups were compared by means of questionnaires, interviews, and tests. Statistically significant differences among the three groups were obtained on several questionnaire items that assessed when and why subjects usually eat (motivational items). The regainers indicated eating in response to a variety of states of positive and negative emotional arousal. The maintainers reported that eating was more specific to loneliness and boredom; in contrast, the control ("normal?") group reported that their food consumption was primarily in response to hunger. However, there was a relatively high frequency of subjects in all three groups who indicated

that they ate when lonely or bored. Nonetheless, the predominant response of the control group was that they ate when hungry, rather than when emotionally aroused.

Despite conducting an enlightening study, the authors unfortunately failed to relate their findings to any clinical implications for weight loss treatment and maintenance. When asked about follow-up to this study, G. R. Leon reported that she had since gotten away from this topic and more into the area of clinical eating disorders (personal communication, October 5, 1993). Not surprisingly, the control group in the above study was included for the sole purpose of comparison with the clinical population of concern. The authors apparently had no true interest in examining "normal eaters" in their own right, or to inform recommendations for improved weight loss treatment.

Fortunately, a few other scientists have recognized the importance of understanding "normal eating" and its relation to other, more disordered eating styles. In 1983, Herman and Polivy proposed a theoretical "boundary model" for the regulation of eating behavior, which suggests that normal-eating humans eat predominantly according to biological pressures (i.e., hunger and satiety). The boundary model involves two separate boundaries, hunger and satiety, between which is what the authors call the "zone of biological indifference" (p. 919), in which aversive biological pressures to eat or stop eating are absent. However, it is within this zone that the more uniquely human influences on eating, such as social influences, appetitive factors, and cognitive considerations, have stronger effects. Herman and Polivy (1983) suggest

individual differences in "boundary placement," of the hunger, satiety, and "diet" boundaries, to explain different eating responses in different types of individuals. The boundary model, with individual boundaries or responsiveness to the boundaries, can be applied to explain the mechanisms of normal eating, dieting, eating disorders, and obesity.

In another conceptual article, Herman and Polivy (1987) discuss the relationship between culturally accepted dieting behavior and the clinical eating disorders, expanding on a "continuum hypothesis" first proposed by Nylander (1971), in which "eating disorders fall at the endpoint of a continuum of disordered eating, with chronic and intermittent dieters falling at intermediate points along the continuum. . .and normalcy (at the other pole of the continuum) represent[ing] the absence of the characteristics of pathology" (Polivy and Herman, 1987, p. 637). The authors further discuss their own boundary model of eating and argue that the eating behavior of eating-disordered individuals may reflect a different mode of regulation rather than the absence of regulation or control. The authors conclude with recommendations for the treatment of "normal dieting" behavior: "Eating must be returned to physiological normalcy, and attitudes regarding weight and appearance must be modified" (p. 640). Polivy and Herman define "normal eating" simply as "eating that occurs in response to hunger cues and stops in response to satiety cues" (p. 641). Weingarten (1985), however, would argue that normal eating behavior includes both responses to physiological depletion (hunger) and to external stimuli or incentives (present in Herman and Polivy's "zone of biological indifference").

Whether physiological, depletion-induced hunger is one part or all of "normal eating", to be able to respond to such cues, one must perceive them accurately. However, dieting (or our society's "normal eating") may seriously interfere with the perception of normal hunger and satiety signals. As such, "normal (normative) eating" may preclude truly normal eating!

Assessment of Normal Eating

As discussed previously, there has been little research to date on the concept of normal eating, except when considered as a comparison to disordered or abnormal eating. Likewise, although eating has been assessed in specific populations (such as obese, dieting, and eating disordered individuals), little research has been done on the measurement or identification of normal eating.

Several methods are commonly used to gather data on people's eaitng behavior, including the following:

1. 24-hour food recalls (Rush & Kristal, 1982)
2. Diet histories (Block, 1982; Underwood, 1986)
3. Food frequency questionnaires (Sampson, 1985)
4. Questionnaires that ask individuals to rate eating behaviors such as binge eating (Hawkins & Clemens, 1980) or weight regulation (Schlundt & Zimering, 1988; Stunkard & Messick, 1985)
5. Eating diaries (Block, 1982; Schlundt, 1989; Underwood, 1986)
6. Behavioral observation and subjective reports during laboratory manipulations (Chiodo & Latimer, 1986; De Castro, 1988; Harris & Wardle,

1987; Hill, Magson, & Blundell, 1984; Rolls, 1992, 1993; Wardle, 1987)

Laboratory studies. In experimental, controlled studies, investigators have attempted to measure subjective feelings of hunger and satiety in humans via self-report questionnaires or visual analog scales, usually administered before and/or after some laboratory manipulation of mood or physical state (e.g., Chiodo & Latimer, 1986; De Castro, 1988; Harris & Wardle, 1987; Hill, Magson, & Blundell, 1984; Rolls, 1992, 1993; Wardle, 1987). However, motivation is not an observable behavior, per se, so the identification of the state called "hunger" is far from clear. When an individual declares a feeling of hunger, he/she may be referring to local physical sensations in the body (including in the stomach, throat, or mouth), the passage of time since the last meal, the presence of salient food or eating cues, and/or an attribution made in order to justify the imminent act of eating (Hill et al., 1984). As stated earlier, De Castro noted that ("normal") participants could not easily distinguish when they ate in response to hunger as opposed to in response to more external pressures. Furthermore, with a few exceptions, most of the studies have been concerned with measuring hunger at a specific moment, and not the pattern of eating over time.

Researchers have not been immune to the confusion surrounding hunger, in their disagreement over the conditions in which one can reasonably expect to elicit reports of physical hunger. Some experimenters expect hunger even when no manipulation of food deprivation is employed (e.g., Harris & Wardle, 1987), whereas others require as little as a two-hour food deprivation

period (often self-reported) to ensure that subjects will be able to assess their "hunger" (e.g., Heatherton, Polivy, & Herman, 1989). In all cases, even if hunger is manipulated appropriately and participants actually are hungry, if they cannot accurately identify their hunger, how meaningful can the results of such a study be?

Behavioral diaries. Self-monitoring has been used for many years as a behavioral assessment strategy. Typically, self-monitoring is used to collect information of the base rate of problem behaviors and to evaluate the impact of treatment on the behavior problem (see Lindsley, 1968). The individual keeps a record of one or more target behaviors, such as eating, as they occur. According to Haynes (1984), self-monitoring is one of the most cost-efficient and clinically useful behavioral assessment techniques.

However, there are three major problems with self-monitoring that may be particularly relevant when assessing eating behavior:

1. It is difficult to verify the accuracy of self-monitored data, and people notoriously under-report their food consumption, often by as much as 50% (Lowe, Kopyt, & Buchwald, 1996).

2. Some individuals will not comply with self-monitoring procedures.

3. The act of self-monitoring may affect the behavior being monitored. For this very reason, self-monitoring often is used as a treatment intervention to promote behavior change in obese and eating-disordered individuals.

Typically, food diaries have been used with clinical populations for clinical purposes.

Self-report questionnaires. Questionnaires, although still relying on self-report data, are an alternative to self-monitoring methods as a way to assess specific eating behaviors. Several instruments have been developed to assess various aspects of dieting behavior in dieters, including the Dieter's Inventory of Eating Temptations (DIET) (Schlundt & Zimering, 1988), the Situation-Based Dieting Self-Efficacy Scale (SDS) (Stotland, Zuroff & Roy, 1991), the Situational Appetite Measure (SAM) (Stanton, Garcia, & Green, 1990), and the Eating Self-Efficacy Scale (ESES) (Glynn & Ruderman, 1986).

Other instruments have been developed for use with more general populations, such as college students. The Supplemental Eating Characteristics Questionnaire (SECQ) (Mehrabian, 1987) was developed to measure patterns or styles of eating, in order to better characterize the range and variability in the eating patterns of normal people. The SECQ consists of 196 items that describe various eating behaviors, such as "I hardly ever eat out of cans, cartons, or food containers," and "I like to try new flavors." The scale was administered to college students and factor-analyzed twice, resulting in eight dimensions of eating that reflect behaviors and food preferences: Mechanical joyless eating; Predisposition to obesity; Aesthetic approach to eating; Reduced eating when overstimulated or feeling submissive; Preference for regularly scheduled meals in unarousing settings; Some eating and drinking ancillary to other routines, work; Frequent snacks and desserts relieve boredom, provide extra stimulation; and Prefers protein to starches. Scores on some of the SECQ scales were correlated with gender, triceps skinfolds (a

measure of overweight), and temperament.

Kristeller and Rodin (1989) developed the Yale Eating Pattern Questionnaire, to assess the eating behaviors, attitudes, and motivation for termination of eating in normal individuals (college students). The authors found behavioral and attitudinal differences between "normal" participants, who were classified into six groups, based on scores on nine scales from the questionnaire. Of these nine scales, four reflected behaviors and attitudes (Uninhibited eating, Oversnacking, Binging, and Dieting), three reflected different motivations for the termination of eating (fullness, nausea, and guilt), and two reflected attributions about weight problems (physical or emotional causes). Kristeller and Rodin (1989) argue for the complexity of "normal" eating and state that "it is likely that the definitions of normal eating must extend beyond the narrower definition of eating in response to hunger and satiation signals" (p. 639). Although their questionnaire did assess different "satiation cues," it did not address hunger at all.

As stated earlier, it may be the motivations, and not the behaviors themselves, that are more meaningful to our understanding of eating behavior and different eating styles. For example, the item, "I have late night snacks" (from Kristeller and Rodin's Uninhibited scale), describes a behavior, but this behavior could have different meanings, e.g., "I have late night snacks when I am hungry" is entirely different from "I have late night snacks when I am home alone and feel lonely." Perhaps two different types of people would endorse this item similarly, but have different meanings in mind, signifying two different

eating styles instead of one.

Leon and Rosenthal (1984) developed an Eating Patterns Questionnaire that assessed motivations for the initiation of eating that included situational and emotional motivations, with (only) one item on hunger ("How often do you eat when hungry?"). In a previous study, Leon and Chamberlain (1973) found that control (normal?) participants reported that food consumption was primarily in response to hunger, whereas weight regainers and weight loss maintainers reported eating in response to emotional states. Unfortunately, the instruments used to measure these motivations for eating were rather unsophisticated and were not further developed or tested.

Often, "normal eating" has been inferred by low restraint scores on a restraint scale. In a study of an "Undieting" program encouraging "natural eating," Polivy and Herman (1992) interestingly measured restraint and eating pathology, but did not assess the "natural eating" that was the goal of treatment! Although decreased eating pathology and restraint may be indicative of non-dieting behavior, we do not know whether such behavior resembles normal eating because (a) we do not truly know what normal eating consists of, and (b) we have no demonstrably valid way, as of yet, to measure it.

Another line of research has focused on interoceptive (internal) awareness, or awareness of internal emotional and physical states. The self-report Eating Disorders Inventory (EDI) (Garner, 1991; Garner, Olmsted, & Polivy, 1984) includes an Interoceptive Awareness subscale that is intended to reflect "one's lack of confidence in recognizing and accurately identifying

emotions and sensations of hunger and satiety." However, upon examination of the actual questionnaire items, only two (out of 10 items) have anything to do with eating, and only one addresses the issue of hunger ("I get confused as to whether or not I am hungry."). Research using the EDI has found that individuals with, or at risk for, eating disorders score significantly lower on Interoceptive Awareness than do normals (Bourke, Taylor, & Crisp, 1985; Leon, Fulkerson, Perry, & Cudeck, 1993). Other investigators have tried to identify interoceptive awareness, both in terms of general emotions, such as anxiety (Norvell & Kallman, 1988), and hunger and satiety (Heatherton et al., 1989).

Finally, and most recently, Carrier et al. (1994) tested the effects of a another non-dieting program called "Eat for L.I.F.E.," in which the authors measured the adoption of a non-restrained, "internally-directed" eating style in participants during and after treatment. Mastery of the internally-directed eating style was assessed by an Eating and Activity Survey developed by the authors. This questionnaire asked, in one item each, how often participants were able to identify (a) emotions associated with eating, (b) stomach (physiological) hunger, (c) mouth (emotional) hunger, and (d) a specific food which matched their specific hunger. Although this instrument addresses (albeit briefly) awareness of hunger and food cravings, it does not measure responsiveness to such bodily signals, nor motivation for terminating eating (e.g., satiety). Furthermore, this questionnaire was developed for the purpose of this one study, and although it may be on the right track conceptually, so to speak, it has not been validated and may not be appropriate for use with a sample that has not

participated in the Eat for L.I.F.E. program (due to the specific terminology and jargon employed).

Conclusions

Past research on normal and disordered eating behavior, as highlighted above, raises several unanswered questions. The truth is, we do not know for certain what causes obesity, we do not know whether obesity is really treatable and "curable," and if it is, we do not know how. (Some may claim to know these answers, based on personal and/or clinical experience, but the answers have not been demonstrated consistently and reliably in the research up to now.) Furthermore, (and equally important?), we do not know what constitutes "normal eating" in our present society, or what proportion of the population falls into this category. We have no positive way to measure or classify "normal eating," except as the absence of disordered eating.

This current study--in response to a number of these issues--attempted to answer, or at least address, the following questions:

1. What characterizes people who have never had a weight/eating problem, and how do they differ from those with current or previous weight or eating problems?

2. What proportion of the population has never had an eating or weight problem? What proportion eats in what Polivy and Herman (1987) would call a "normal eating" style?

3. Is "normal eating" (the absence of pathology or abnormality) a homogenous construct, or might there be different styles or types of "normal

eating," and, if so, what is the distribution of these normal eating styles?

Secondary questions included:

4. If, as some research suggests, some people are able to lose weight and keep it off, what distinguishes these weight loss successes, and how did/do they do it?

5. How do successful weight losers compare to those who fail, and to others?

RESTATEMENT OF THE HYPOTHESES

As described more fully in the Introduction, this study tested the following hypotheses:

Part I

Given Polivy and Herman's (1987) definition of (ideally) normal eating as physiologically motivated, and the relationship between dieting and lack of interoceptive awareness and responsiveness, it was expected that:

1a. Average weight, never dieted participants would score higher on the body-responsive eating scale than the other groups of participants.

1b. Average weight, never dieted participants would score higher on body-responsive eating than on the other eating scales.

Given the relationship between dieting and subsequent eating and weight problems, it was expected that:

2a. There would be significantly fewer participants in the above-average weight, never dieted cell, than in the other groups.

2b. If there are participants in this group, they would score higher on the overeating scales than on the other scales, based on Schachter's theory that overweight individuals eat more often in response to external and/or emotional cues (as measured by the overeating scales) than in response to internal cues.

Given variability in body weight, such that some people may be naturally thinner than others:

3a. Below-average weight participants would resemble the average weight participants across range of eating disorder categories, with the exceptions of:

3b. Below-average weight, never dieted participants would score lower on body-responsive eating than average weight, never dieted participants. It was assumed that, given equal lack of interference by dieting, below-average weight participants are below-average weight due to lower responsiveness to their hunger and fullness signals than exhibited by average weight individuals.

3c. Below-average weight, eating disordered participants (if any) would score higher on restraint and lower on overeating than the average weight, eating disordered participants. Below-average weight, eating disordered individuals most likely would have anorexia nervosa, or at least serious anorexic symptoms, characterized by high restraint and low (over)eating.

Given the negative long-term effects of dieting on eating behavior:

4. Average weight, previously dieted participants would score higher on one or more of the normal eating scales (healthy, overeating, or constrained, but <u>not</u> body-responsive eating) than on the other scales. Here, the non-physiological normal eating scales were expected to be higher than the abnormal ones because these individuals are within average weight range.

5. Above-average weight, previously dieted participants would score higher on the overeating scales and lower on body-responsive eating, than on

any other scales. This hypothesis tested the negative effects of dieting as well as Schachter's theory that overweight individuals overeat.

6. Average weight, currently dieting participants would score highest on restrained eating, as "currently dieting" means currently restraining, if the individual is dieting "successfully."

7. Above-average weight, currently dieting participants would score highest on the restraint (indicating successful restraint with delayed weight loss) or overeating scales (testing Schachter's theory), and lowest on body-responsive eating. These participants were expected to score lowest on body-responsive eating because (a) they are currently dieting, which is the opposite of responding to the body, and (b) they are above-average weight, signifying that they may not have been eating according to their bodies' needs.

8. Average weight, eating disordered participants would score highest on the restraint, healthy eating, and possibly the overeating scales. These eating styles should characterize bulimia and result in an average weight.

9a. Above-average weight, eating disordered participants would score highest on overeating and restraint, which are likely alternating.

9b. These individuals (above-average weight bulimics) should score higher on overeating and lower on restraint than the average weight, eating disordered participants, indicating more overeating than restraining behaviors and motivations.

10. Given the continuum idea of eating behavior ranging from normal to disordered, all eating disordered participants (across weight categories) would

score lower on body-responsive eating than the dieters or never dieters. Eating disordered individuals fall on the disordered end of the continuum, farthest away from the normal ideal, which may be body-responsive eating.

Part Ia

11. Average weight, previously dieted participants would score higher on body-responsive eating (indicating weight loss and maintenance by responding to the body's needs) or on restraint or healthy eating (indicating weight loss and maintenance by ongoing restraint or "healthy eating"), than on any other eating scale.

12. Average weight, currently dieting weight loss maintainers would score highest on restraint, and second highest on healthy eating. "Currently dieting" should result in high restaint, and healthy eating may be a less extreme variant of restrained eating.

If the behavioral/restrained eating model of treatment were true, Hypothesis 11 would not be supported. (However, lack of support for Hypothesis 11 could be due to sample limitations, and would not disprove the non-restrictive theory of weight loss.)

Part II

Given that eating problems are more prevalent in females than in males, and given that body-responsive eating represents the ideal or optimal normal eating style:

13. Males would score higher on body-responsive eating than females.

14. High body-responsive eating would be associated with emotional

interoceptive awareness, body awareness and responsiveness, self-esteem, positive body image, internally-directed exercise (as measured by intrinsic rewards and body-dependent exercise), and fewer medical symptoms or conditions (suggesting that this style is the most positive or desirable in terms of its consequences).

METHOD

Participants

Participants were recruited from undergraduate psychology courses at Michigan State University during the spring and summer semesters of 1994. Students in Introductory Psychology could sign up to participate in the study through the Psychology Department "subject pool." With course instructors' permission, announcements were made in other psychology classes not participating in the subject pool, and students in these courses earned extra credit for their participation.

Over 700 students participated in this study; however, data from three participants were completely excluded from analysis: One male appeared to be sharing his scantron sheets with a friend; one male completed his questionnaires in less than an hour and his responses clearly reflected a response set (e.g., endorsing all 3s, etc.). One female was unable to complete the questionnaire packet in over two hours, due to a probable reading disorder. (A referral was made to the student learning center for assessment.)

Data (partial or complete) from 723 students were included in analyses. These participants were 243 (34%) male and 480 (66%) female college students enrolled in undergraduate psychology courses during the spring and

summer semesters of 1994. Ages ranged from 18 to over 26, with 708 students (98%) between the ages of 18 and 25. Of those under 26, the mean age was 19.9 years, with a standard deviation of 1.4 years. Thirty-one percent were freshmen, 26% sophmores, 25% juniors, and 18% were seniors. One participant was a graduate student and one was a Lifelong Education student. The majority (94.9%) were unmarried and white (84.3%); 7.2% of the participants were black and 5.1% Asian. Approximately half were employed part-time, with 43% unemployed and 7% employed full-time.

Self-reported body weights ranged from 89 to 330 pounds, with a mean of 147.6 and a standard deviation of 31.5 pounds. Body mass index (BMI) ranged from 16 to 45, with a mean of 23 and a standard deviation of 3.8. According to the NHANESI classification based on BMI percentiles (Must, Dallal, & Dietz, 1991), 108 participants (14.9%) were above-average weight, 539 (74.2%) were average weight, and 74 (10.2%) were classified as below-average weight. Although not assessed on the questionnaire, two women were obviously pregnant, and their self-reported pre-pregnancy weights were used instead of actual current weight.

Two hundred and fifty-four (35.3%) participants reported that they had never dieted to lose weight; the rest reported dieting at least once, with 76 (10.6%) participants reporting 16 or more dieting attempts. Three hundred and four (42.6%) reported currently dieting to lose weight, whereas 410 (57.4%) were not currently dieting at the time of data collection. Eighty-five participants (11.7%) scored within the clinical range on eating disorder symptomotology.

In compliance with university and APA guidelines, participants read a statement of informed consent before participating in the study, which stated "You indicate your voluntary agreement to participate in this study by completing and returning your questionnaire answer-sheets" (see Appendix A).

Measures

Data were collected via a combination of established and original self-report measures, administered in one sitting. The complete questionnaire packet is presented in Appendix B; questionnaire items separated by scale are presented in Appendix C. The questionnaire packet contained eight different questionnaires, which were randomly ordered in each packet, with the exception of the Personal Information questionnaire, which was always presented last. There were 10 different random orders of the questionnaires, determined by a random-number table. The Personal Information questionnaire was always presented last so that items about dieting and weight history would not influence responses to the other questionnaires. The eight questionnaires assessed the following areas:

Demographic and weight history. Background data were collected on age, gender, marital status, year in college, ethnic background, employment status, and living arrangements, to assess relationships with the eating style variables, via correlations. Occupation, a question commonly included in demographics, was not ascertained in this study because all of the participants were students, which was assumed to be their primary "occupation."

Dieting and weight history were assessed as possible predictors of

eating style scores. Questions included current height and weight, perception of being overweight, dieting history and current status, weight history, maintenance of a previous weight loss, medical conditions, and special medical diets. Weight was classified by the body mass index (BMI), which is a formula for weight in kilograms divided by height in meters squared. The body mass index is an estimate of body fatness relative to height. The 15th and 85th percentile BMIs were used to classify males and females into weight categories, according to their age (Must et al., 1991): For males aged 18, a score of 25.92 or above was considered above-average weight, 18.89 to 25.91 was considered average, and below 18.89 was considered below-average weight. For 19-year-old males, a score of 26.36 or above was considered above-average weight, 19.20 to 26.35 was considered average, and below 19.20 was considered below-average weight. For males aged 20 and older[4], a score of 26.87 or above was considered above-average weight, 20.21 to 26.86 was considered average, and below 20.21 was considered below-average weight. For 18-year-old females, a BMI of 25.56 or above was considered above-average weight, 17.99 to 25.55 was classified as average weight, and under 17.99 was considered below-average weight. For females aged 19, a BMI of 25.85 or above was considered above-average weight, 18.20 to 25.84 was classified as average weight, and under 18.20 was considered below-average weight. Finally, for females aged 20 or older, a BMI of 26.14 or above was considered

[4] For participants aged 20 and older, BMIs reflect the reference BMIs for the 20-24-year-old age category.

above-average weight, 18.64 to 26.13 was classified as average weight, and under 18.64 was considered below-average weight.

Eating Measures

Several measures were used to assess conscious motivational influences and behavior of both abnormal and normal eating styles.

Abnormal eating. Abnormal eating styles were be assessed via the Dutch Eating Behavior Questionnaire (DEBQ) (van Strien et al., 1986), which measures restrained, external, and emotional eating. The restraint factor reflects the concept of using cognitive control to refrain from eating (i.e., cognitive factors determining when, how much, and what to eat, with the goal of controlling body size). Although not the original Restraint Scale (Polivy, Herman, & Walsh, 1978), the DEBQ restraint scale is thought to offer a purer measure of restraint (restricting food intake on the grounds of weight), rather than assessing the supposed consequences of retraint (e.g., preoccupation with food, guilt after overeating) as in the original Restraint Scale by Polivy et al. (1978). Furthermore, the DEBQ offers a measure of restraint that is apparently unconfounded with weight variability, unlike the original Restraint Scale (Wardle, 1986). Items from the emotional and external eating factors specifically tap the desire to eat in response to a variety of emotional situations and external cues.

All items in this instrument were reproduced on the questionnaire, although they were reworded from questions to statements; also, they were modified to tap actual eating behavior under various circumstances, instead of the desire to eat, which may or may not be fulfilled. Some items were revised

slightly to make the language more contemporary.

van Strien et al. (1986) report Cronbach's alpha coefficients for a mixed population of obese and non-obese men and women of .95 for the 10-item restrained eating scale, .94 for the 13-item emotional eating scale, and .80 for the 10-item external eating scale. In this study, reliabilities were .93 for restrained eating, .95 for emotional eating, and .86 for the external eating scale.

Most variables (eating, exercise, and body awareness and responsiveness) that were measured on a Likert-type scale utilized a five-point scale, in which participants rated whether each item applied to them "always" (scored as 5), "frequently" (4), "sometimes" (3), "rarely" (2), or "never" (1). Item scores contributed to only one subscale score.

Eating disorder symptomotology. Symptoms of clinical eating disorders were measured by the Eating Attitudes Test (EAT-26) (Garner, Olmsted, Bohr, & Garfinkel, 1982). This 26-item scale is presented in a six-point, forced-choice format, which is easy to score. Although the other eating scales were measured on a five-point Likert scale, the original six-point scale and anchors was maintained for the EAT-26 so that the validity of the scoring and cut-off scores could be preserved.

The EAT-26 measures attitudinal and behavioral aspects of its three factors: Dieting, Bulimia and food preoccupation, and Oral control. Scores on all three factors combined have been used to distinguish individuals with eating disorders, with a score of 20 or above indicating the presence of an eating disorder. Reliablity coefficients for the full scale are .90 for anorexic subjects

(N=160) and .83 for a female comparison group (N=140) (Garner, Olmsted, Bohr, & Garfinkel, 1982). In this sample of male and female participants, the full-scale reliability coefficient was .86.

According to the scoring instructions, responses to each item from the EAT-26 were weighted from zero to three, with a score of 3 indicating the greatest symptomotology ("always" or "never," depending on whether the item is keyed in the positive or negative direction), a score of 2 for the immediately adjacent response, a score of 1 for the next adjacent response, and a 0 score assigned to the three responses farthest in the nonsymptomatic direction. Thus, positively scored items were weighted as follows: Always=3, Usually=2, Often=1, Sometimes=0, Rarely=0, and Never=0. The reversed scored item was weighted in the opposite manner (i.e., Never=3, Rarely=2, Sometimes=1, Often=0, Usually=0, and Always=0). This adjusted scoring method is recommended to prevent the addition of non-symptomatic responses to the total score, which would elevate the total score (Garner & Garfinkel, 1979).

Normal eating. "Normal" (non-disordered) eating was assessed by a measure developed for this study. The Eating Style Inventory (ESI) assesses motivational determinants of the initiation and termination of eating, and the selection of food. Scales of 15 to 34 items each were developed to measure the following motivational constructs: body responsiveness (appropriately responding to interoceptive messages), conventional eating (eating according to social convention, such as normal mealtimes, meals, etc.), constrained eating (eating determined by environmental or time constraints, similar to De Castro's

concept, 1988), and healthy eating (eating according to popular standards of "good health"). Each scale included an approximately equal number of items to assess motivation for the initiation and termination of eating, and for the selection of particular foods, with both positive and negatively-scored items.

Other Measures

Interoceptive awareness. Eight items of the 10-item Interoceptive Awareness subscale of the Eating Disorders Inventory (EDI) (Garner, Olmsted, & Polivy, 1983) were used as a predictor of eating style and to cross-validate my original measure of body awareness. This established scale measures lack of interoceptive awareness, namely, confusion and apprehension in recognizing and responding to emotional states. It also taps (in only two items) uncertainty in the identification of certain visceral sensations related to hunger and satiety. These two items were not included. Reliability coefficients of .85 for female anorexic subjects (N=113) and .66 for the female comparison group (N=577) are reported (Garner et al., 1983). The eight items assessing emotional awareness were used, with a reliability of .87 for this sample. These items were intermixed with the DEBQ items, in a questionnaire called Eating Habits.

Body awareness/responsiveness. An original measure was developed to measure awareness of bodily, not emotional, feelings and sensations, such as hunger, satiety, tiredness, etc., and also responsiveness to physical states other than hunger, such as fatigue, illness, sexual feelings, and stress. Scores on this scale were expected to be related to body responsiveness in eating and to emotional interoceptive awareness. These items were intermixed with exercise

motivation items on the BRS (Body Responsiveness Scale).

Self-esteem. Self-esteem was measured by the Rosenberg (1965) Self-Esteem Scale. The complete 10-item scale was used. A Guttman scale reproducibility coefficient of .92 was obtained by Robinson and Shaver (1978). Silber and Tippett (1965) found a test-retest correlation over two weeks of .85 (N=28), and correlations ranging between .56 and .83 with several similar measures and clinical assessment (N=44). The Rosenberg scale scored for Guttman scalability also correlated .59 with Coopersmith's Self-Esteem Inventory (Robinson & Shaver, 1978). In this sample, the alpha coefficient for the 10 items was .90.

Body image. The Body Cathexis Scale (Secord & Jourard, 1953) was used to measure body image. The scale consists of a list of 40 physical characteristics, and respondents rate their satisfaction with each, on a five-point Likert scale. The reported corrected split-half reliability for the body esteem score was .78 for males and .83 for females. No test-retest data are provided. Physical self-esteem and general self-esteem correlated .58 for males and .66 for females (Secord & Jourard, 1953). In this mixed sample of males and females, the internal consistency was found to be .94.

Physical activity. Physical activity was measured by an adaptation of the Leisure Time Exercise Questionnaire (Godin & Shephard, 1985). Concurrent validity was established by a strong correlation between VO_2 max (percentile) and reported strenuous exercise (r=.35). Two week test-rest reliability coefficients were respectively .94, .46, .48, and .80 for self-reports of vigorous,

moderate, light, and sweat-inducing exercise. Reliability coefficients for the optimum discriminant functions classifying VO_2 max percentile and body fat percentile were .83 and .85 respectively (Godin & Shephard, 1985). Participants in the current study were classified based on the frequency and duration of physical activity, as measured by METs.

Exercise motivation. Two original scales were developed to assess exercise motivation, one measuring internally-directed exercise (exercising according to the body's needs and for pleasure), and one measuring externally-directed exercise (exercising because of external directives, to change or maintain body shape, prevent weight gain, or to counteract overeating) (Carrier et al., 1994). These exercise motivation items were included in the BRS.

Food frequency. Block's (Block et al., 1986) Food Frequency Questionnaire was modified to include only the medium portion size for 79 different food items commonly eaten by college students. Items from six different food categories were included: milk and cheese, bread and cereal, fruit and vegetable, meat and poultry, calorie-dense snacks, and high-fat foods. High-calorie foods included foods such as chocolate, cookies, non-diet soda, etc., whereas high-fat foods included butter/margarine, chips, bacon, whole milk, etc. Respondents indicated how many times per week they eat the portion size specified of each food, ranging from 0 to 17 or more times per week.[5]

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[5] Unfortunately, preliminary analyses suggested that the food-frequency data were not valid. Weekly and daily kilocalories were calculated, and these results were unrelated to body mass index. The reported mean daily caloric intake, based on the food frequency data, was 6038

Medical history. Finally, participants completed a medical history checklist, similar to those used by physicians. Individuals indicated the medical conditions that they had previously, and/or currently have. Current use of vitamins and various medications were also assessed, in addition to current physical symptoms. In this sample, 24 medical history items had an internal consistency of .88. The 12-item medication scale (excluding an item on vitamin supplements) had a reliability of of .90. The 28-item scale assessing current physical symptoms had an alpha of .89.

Procedure

Instrument development. Questionnaire items were constructed by the principal investigator based on previous empirical research and theoretical discussions (especially Carrier et al., 1994; De Castro, 1988; Herman & Polivy, 1983; Schachter, 1968) as well as the investigator's clinical experience. More items than desired for each scale were generated to maintain scale length when "bad items" were eliminated. After the initial questionnaire was constructed, items were blind-coded by three independent raters to ensure face validity. Raters included another graduate student in clinical psychology, a professional social worker, and a woman with a recent undergraduate degree in psychology. Items that did not produce inter-rater agreement were reworded to achieve rater agreement, or were eliminated. The next (reduced) draft of the instrument was informally piloted with 6 female dormitory residents and 2 RAs

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kcals, which indicates an erro in reporting and/or calculation. It seems that in modifying this questionnaire to accomodate scantron responses, its validity was compromised. Therefore, food-frequency data are not reported in the Results section.

(residence hall assistants) to assure readability and clarity of items, instructions, and format, and to determine how long the administration would take.

Data collection. The final set of self-report measures, along with a statement of informed consent and computer answer-sheets, were administered to students in several large undergraduate psychology classes. To counteract possible order-effects, the questionnaire scales were presented in random order, with the exception of Personal Information (including demographics, the EAT-26, and dieting and weight history), which was always presented last. Ten random scale orders were derived from a random number table (Musser & Burger, 1991).

The total questionnaire packet included the following measures: (a) ESI (all original items in random order), (b) BRS (exercise motivation, body awareness, and body responsiveness), (c) Eating Habits (all other eating style items, except the EAT-26, and emotional interoceptive awareness, in random order), (d) Perceptions of Your Body (body image), (e) Health History (including physical activity, perceptions of general health, current medications, medical history, and physical symptoms), (f) Self Perceptions (self-esteem), (g) Food Frequency, and finally (h) Personal Information (including demographics, the EAT-26, and dieting and weight history).

Normal eating style, the criterion variable, was measured before other eating scales so that scores would not be affected by exposure to the other scales. BRS (Body Responsiveness Scale) followed the ESI, which was followed by Eating Habits. As such, eating and exercise style were randomized

as a module, with the ESI presented first. As noted above, demographics and weight history were deliberately collected last so that the reporting of weight would not sensitize participants to this issue such that other scores would be altered.

Students signed up to participate in this study and attend a group administration of the questionnaires. All students received required or extra class credit for their participation. Administration sessions lasted one to two hours, with one or more research assistants always present to distribute pencils, collect questionnaires, and "quality control" the data. Session size ranged from approximately 20 to 170 students. The investigator introduced herself and the study at the beginning of each session. Instructions (see Appendix D) were displayed on an overhead projector and reviewed verbally by the investigator. Participants were instructed to respond truthfully to all items, explaining that there was no right or wrong answer to any of the surveys. Questionnaires were completed anonymously, with informed consent explained both in the questionnaire cover-sheet and by the investigator at the beginning of the session. Participants signed out after completing the questionnaire packet to ensure that they received proper credit for their participation.

All data for each participant were collected in one sitting (with a few exceptions, described below). Although a two-step instrument validation procedure may have been preferable, due to time constraints, a single step procedure was employed in which the same group of participants was used for both the development and validation of the new instrument (the ESI), and for

exploring substantive results and implications. Six students were allowed to complete the packet at home and return to the investigator the following day, due to time constraints at the administration session. (In addition, approximately 16 students, enrolled in the investigator's summer course, completed the packet at home for extra credit.)

Despite data quality control and an overhead slide requesting that students check their scantron sheets before turning them in, if it were later noticed that data were incomplete or otherwise questionnable, participants were called by the principal investigator within a day or two of administration, in an attempt to collect missing data or rectify the problem. Students who had signed up for this study but failed to attend the session were telephoned and invited to attend another session. At the completion of the study, interested individuals (as indicated on a separate sheet of paper) were sent a brief, written summary of the study and its results (see Appendix E).

Data Processing and Management

Data were quality controlled at the administration sessions by research assistants, and again after the session by the investigator. Scantron sheets that were incomplete or invalid due to missing data were excluded before processing. The Personal Information questionnaire (large blue scantron) contained instructions to skip items that did not apply to the student. Although participants were reminded to read this questionnaire carefully, many still made errors in skipping and filling in the appropriate bubbles. Of the initial 546 particpants, 60 made errors in skipping that could be corrected by the

investigator. Four students made errors that could not be rectified, and these data were therefore excluded. Data from 46 other scantron sheets were excluded due to errors in completion (e.g., responding to 9 or 11 self-esteem items instead of 10). The approach to data cleaning and quality control was conservative: Data were eliminated if there was any question about validity or accuracy.

After data collection, questionnaire data were processed (in two sets) through the Computer Center at Michigan State for statistical analyses. In other words, the scantron sheets (eight per participant) were scanned at the Computer Center and copied onto disks for use with SPSS for Windows. Scantron sheets with 10 response choices were recoded by the Computer Center from 1 to 10 into 0 to 9. Data from a given participant's eight scantron sheets were identified as a set according to the student's 9-digit student ID number.

Before analysis, data were "cleaned" with the help of a research assistant (an undergraduate student). Data were checked to ensure that the length of each participant's records were as they should be. Except for the body image questionnaire (in which all items were unidirectional and the composite score was a mean of all items), individual records that were incomplete or too long were deleted, while retaining data from the participant's other questionnaires. In this manner, the maximum amount of data was preserved, while eliminating data that appeared flawed and unfixable. Once fully cleaned, the data were then analyzed.

Data Analysis

A principal components exploratory factor analysis with a Varimax rotation, assuming orthogonal factors, was conducted on the normal eating scales and other original scales. Scale reliabilities of the established measures were also determined for this sample. After the determination of distinct, reliable, and meaningful scales, analyses of variance (ANOVA) were conducted on eating style scores, in a 3 x 4 factorial design with two factors (body weight and range of eating disorder). In Part Ia, the subgroup of average weight weight loss maintainers were specifically examined with an ANOVA of eating style and correlations with other variables.

In the second part of the study, several variables were correlated to body-responsive eating scores. These variables included gender, self-esteem, body image, emotional interoceptive awareness, body awareness/ responsiveness, exercise motivation, medical history, and current symptoms.

Composite subscale scores on eating style, exercise motivation, emotional interoceptive awareness, body awareness and responsiveness, self-esteem, and body image were also correlated with each other, and with other variables, such as weight, dieting history, maintenance of weight loss, physical activity, and medical history and symptoms. Pearson's correlation coefficient were used for these analyses.

RESULTS

The results of the current research are reported in five sections: (a) instrument development, (b) tests of the hypotheses, (c) overall effects, (d) descriptive analyses of the sample, and (e) correlational analyses. All statistical tables are presented in Appendix F.

Instrument Development

As noted above, all original instruments were analyzed using a principle component factor analysis, giving consideration to the factor scree plot, amount of variance accounted for, unidimensionality and distinctness of factors, and conceptual relevance of items to a factor.

Normal eating scales. A principle component factor analysis (Dunteman, 1989) of the 117 normal eating style items was conducted to group items into subscales. This procedure extracts linear components computed on the basis of sample items in such a way that those components maximize the joint variance of the items (Kim & Mueller, 1978). The criterion used for a component's extraction was that it had to account for at least 5% of the variance among items.

On the basis of the "5%" rule, four principle components were extracted. Further examination of the scree plot confirmed that components following the

four accounted for minimal variation. After extraction, an orthogonol rotation was applied, assuming that the scores on the normal eating scales would be independent of each other and not necessarily correlated. Selection of individual items was based on the following criteria applied to the loadings in the rotated factor matrix: (a) an item had a loading of at least .49 on its main component; (b) the second highest loading was at least .2 lower than the highest loading (to ensure unidimensionality of subscales); (c) items that loaded negatively on their primary factor were deleted. In addition, items were analyzed semantically to establish whether the factors could be conceptually defended.

Following these procedures, 50 of the intitial 117 items were retained and then rerun with the four components (or subscales) identified as (a) healthy eating, (b) overeating, (c) body-responsive eating, and (d) constrained eating. These factors accounted for 48.8% of the total variance among the 50 remaining eating variables. The final factor loadings for these items are presented in Table 1.

The 17-item healthy eating subscale measures the extent to which an individual's food choices and amounts eaten are determined or influenced by the desire to be "healthy." Overeating, measured by an 11-item subscale, assesses the extent to which an individual eats more than his/her body needs and eats for other (e.g., social) reasons besides hunger. The 14-item body-responsive eating subscale measures eating in response to hunger, regardless of other influences, eating foods that the body seems to want, and pleasure in

eating. The final subscale, constrained eating, consists of 8 items and measures eating that is constrained or limited by financial or time constraints.

All items forming each subscale load within .30 points of one another, which suggests a homogeneity among indicators of the same subscale. The interscale correlations (see Table 2), on the other hand, show that the subscales, although correlated, represent relatively independent dimensions of eating style.

The internal consistency of the subscales was calculated using Chronbach's alpha (Nunnally, 1978). As shown in Table 1, the scales displayed a high degree of reliability, ranging from .79 on constrained eating to .96 on the healthy eating subscale.

Exercise motivation. Forty-three exercise motivation items were factor-analyzed using the same methods as described for the normal eating scales. Although exercise items were written to tap "internal versus external" exercise motivation, the factor analysis produced four distinct factors, and not two. Twenty-nine items were retained and rerun with a 4-factor solution such that each item had a factor loading of at least .56 on its main component and accounted for at least 4.6% of the variance. These four factors (subscales) were identified as (a) intrinsic rewards, (b) weight control, (c) body unresponsive, and (d) body-dependent exercise. Factor analysis and scale reliabilities are presented in Table 3.

The 10-item intrinsic rewards subscale (alpha=.94) measures intrinsic (internal) motivation to exercise, such as enjoyment, relaxation, and increased

energy. The weight control subscale also consists of 10 items (alpha=.94), assesses the desire to lose weight or prevent weight gain as motivations to exercise. The third subscale, body unresponsive exercise, consists of 4 items (alpha=.82), and assesses the tendency to exercise in spite of feeling ill, fatigued, or in pain. Finally, body-dependent exercise (5 items with an alpha=.71) measures an exercise style in which the frequency, duration, and intensity of exercise is dependent on how the body feels.

Interscale correlations are presented in Table 4 and suggest that the four subscales measure relatively independent dimensions of exercise motivation. Interestingly, the highest correlation was between intrinsic rewards subscale and body unresponsive exercise (r=.43).

Body awareness/responsiveness. The final original instrument developed for this study measured a combination of body awareness (i.e., physical interoceptive awareness) and responsiveness to the body's needs and messages. An initial total of 42 body awareness and responsiveness items were factor-analyzed together, resulting in five distinct factors. Twenty-eight items were retained and rerun with the five components identified as (a) hunger/fullness awareness, (b) symptom awareness, (c) self-care, (d) sexual awareness/responsiveness, and (e) food craving awareness. Factor loadings and subscale reliabilities are presented in Table 5. The full-scale Body Awareness/Responsiveness reliability was .86, with individual subscale alphas ranging from .70 to .84. Subscale intercorrelations are presented in Table 6 and suggest related yet relatively distinct subscales.

Tests of the Hypotheses

A probability level of .05 was used as the criteria for significance for each of the hypotheses tested. All statistics were calculated using SPSS for Windows. The results reported are based on the data for those participants who turned in a complete and valid scantron sheet for the variables in question.

Because 73 participants reported taking weight- or appetite-altering medications, preliminary analyses were conducted to determine if these medications were related to weight (BMI) or to eating style scores. Analyses of variance for BMI and the seven eating style scores by medications (yes/no) were non-significant; therefore, all participants were included in data analyses, regardless of medications.

Part I: Hypothesis one. The first hypothesis stated that (a) average weight, never dieted participants would score higher on the body-responsive eating scale than the other groups of participants, and (b) average weight, never dieted participants would score higher on body-responsive eating than on the other eating scales. Contrary to prediction, inspection of the means found that average weight, never dieted participants did not score higher than all the other groups on body-responsive eating (see Table 7). However, the planned contrast for the repeated measures of eating scores found that average weight, never dieted participants did score higher on body-responsive eating than on the other eating scales (t (1, 146)=15.29, $p<.001$). These means and standard deviations are presented in Table 8.

Hypothesis two. Hypothesis two stated that (a) there would be significantly fewer participants in the above-average weight, never dieted group, than in the other groups, and (b) these participants would score higher on the overeating scales than on the other scales. Table 9 presents frequencies of participants classified into weight and dieting status groups. Examination of these frequencies indicated that hypothesis 2a was not supported. Also contrary to prediction, means of the overeating and emotional eating scales were not higher than the other eating scores in above-average weight, never dieted individuals. The mean of external eating was not significantly different from the others combined (t (1, 23)=.97, p=.34). These means and standard deviations are presented in Table 10.

Hypothesis three. The third hypothesis stated that (a) below-average weight participants would resemble the average weight participants across range of eating disorder categories, with the exceptions of: (b) below-average weight, never dieted participants would score lower on body-responsive eating than average weight, never dieted participants, and (c) below-average weight, eating disordered participants would score higher on restraint and lower on overeating than the average weight, eating disordered participants. Planned contrasts between below-average weight versus average weight participants, performed within the framework of one-way ANOVA found no significant differences in the normal or abnormal eating scores between these two weight groups (supporting hypothesis 3a), with the exception of body-responsive eating: Below-average weight participants scored higher on body-responsive

eating than did average weight participants (t (1, 693)= -2.20 ($p<.05$). Means and standard deviations are presented in Table 11.

Contrary to the prediction (hypothesis 3b), an examination of the means found that below-average weight, never dieted participants did not score lower on body-responsive eating than the average weight, never dieted group (see Table 12). Also contrary to prediction, below-average weight eating disordered participants did not score higher on restraint or lower on overeating than their average weight counterparts. There was no significant difference between these two groups on scores on either emotional (t (1, 642)=3.93, $p=.70$) or external eating (t (1, 642)=-.16, $p=.87$). These means and standard deviations are presented in Table 13.

Hypothesis four. The fourth hypothesis stated that average weight, previously dieted participants would score higher on one or more of the "normal" eating scales (healthy, overeating, or constrained, but not body-responsive eating) than on the other scales. Planned contrasts for the repeated measures of eating scores found that scores on healthy and constrained eating were significantly higher than on the "abnormal" eating scales (restrained, emotional, and external eating), as hypothesized ($t_{healthy}$ (1, 115)=5.10, $p<.001$; $t_{constrained}$ (1, 115)=2.80, $p<.01$). However, contrary to prediction, scores on overeating were lower than on the other scales. Means and standard deviations are presented in Table 14.

Hypothesis five. Hypothesis five stated that above-average weight, previously dieted participants would score higher on the overeating scales and

lower on body-responsive eating than on any other scales. Contrary to prediction, this participant group scored lower on the overeating scale than on the others. Planned contrasts with repeated measures for eating scores found no significant differences between scores on emotional or external eating and the other scales ($t_{emotional}$ (1, 20)=1.20, p=.25; $t_{external}$ (1, 20)=.17, p=.87). Also contrary to the prediction, above-average weight, previously dieted individuals did not score lower on body-responsive eating than on the other eating scales. Means and standard deviations are presented in Table 15.

Hypothesis six. The sixth hypothesis stated that average weight, currently dieting participants would score highest on restrained eating than on the other scales. An examination of the means found that this hypothesis was not supported (see Table 16).

Hypothesis seven. The seventh hypothesis stated that above-average weight, currently dieting participants would score highest on the restraint or overeating scales, and lowest on body-responsive eating. An examination of the means revealed that, contrary to prediction, this participant group did not score highest on restrained eating or on the three overeating scales. In fact, contrary to the prediction, these participants scored highest (not lowest) on body-responsive eating than on the other scales. Means and standard deviations are presented in Table 17.

Hypothesis eight. Hypothesis eight stated that average weight, eating disordered participants would score highest on the restraint, healthy eating, and possibly the overeating scales. A planned contrast with the repeated measures

of eating scores found no significant difference between restraint and scores on the other eating scales combined (t (1, 59)=1.76, p=.08). These participants did score second highest and significantly higher on healthy eating than on the other scales (t (1, 59)=4.91, p<.001). However, scores on the overeating scales (overeating, emotional, and external eating) were lower than most of the scores on the other scales. Means and standard deviations are presented in Table 18.

Hypothesis nine. The ninth hypothesis stated that (a) above-average weight, eating disordered participants would score highest on overeating and restraint, and (b) these individuals (above-average weight bulimics) should score higher on overeating and lower on restraint than the average weight, eating disordered participants. Examination of the means found that contrary to prediction, these participants scored lowest on restraint, overeating, and emotional eating than on the other scales (see Table 19). They did, however, score second highest (though not significantly so) on external eating (t (1, 10)=2.18, p=.06). Contrary to predictions, planned contrasts between above-average weight and average weight participants with eating disorder symptomotology were nonsignificant for overeating, emotional, external, and restrained eating. Means and t-tests are presented in Tables 20 and 21.

Hypothesis 10. The tenth hypothesis stated that eating disordered participants (across weight categories) would score lower on body-responsive eating than the dieters or never dieters. A planned contrast between eating disordered participants versus the other three groups (never, previously, or

currently dieting), performed within the framework of one-way ANOVA, was nonsignificant for body-responsive eating (t (1, 645)=.23, p=.82). Means and standard deviations are presented in Table 22.

Part Ia: Hypothesis 11. Hypothesis 11 stated that average weight, previously dieted participants would score higher on body-responsive eating or on restraint or healthy eating, than on any other eating scale. Planned contrasts with repeated measures for eating scores found that average weight, previously dieted individuals scored higher on both body-responsive and healthy eating than on the other scales ($t_{body\text{-}resp}$ (1, 111)=15.52, p<.001; $t_{healthy}$ (1, 111)=5.67, p<.001). As expected, given elevated scores on healthy eating, there were no significant differences between restraint scores and scores on the other scales (t (1, 111)=1.10, p=.27). Means and standard deviations are presented in Table 23.

Hypothesis 12. Hypothesis 12 stated that average weight, currently dieting weight loss maintainers would score highest on restraint, and second highest on healthy eating. Contrary to prediction, these participants did not score highest on restraint and second highest on healthy eating. Means and standard deviations are presented in Table 24.

Part II: Hypothesis 13. Hypothesis 13 stated that males would score higher on body-responsive eating than females. Contrary to prediction, an examination of the means found that males scored slightly lower on body-responsive eating than did females. Means and standard deviations are presented in Table 25.

Hypothesis 14. Hypothesis 14 stated that high body-responsive eating would be associated with emotional interoceptive awareness, body awareness and responsiveness, self-esteem, positive body image, internally-directed exercise (as measured by intrinsic rewards and body-dependent exercise), and fewer medical symptoms or conditions. Contrary to prediction, Pearson correlation coefficients between body-responsive eating and these other variables all were nonsignificant (see Table 26).

Overall Effects

Multivariate analyses of variance (MANOVAs) of eating style, exercise style, and body-responsiveness were conducted with three between-groups factors: gender, dieting status (Eatgroup) (never dieted, previously dieted, currently dieting, and current eating disorder symptoms), and weight status (Wtgroup) (above-average weight, average weight, and below-average weight). To ensure conservative interpretation of the results, multivariate tests of significance were examined first, followed by an examination of univariate tests if the multivariate effect was significant. Finally, post-hoc comparisons and analyses of simple effects were conducted when appropriate. ANOVAs of physical activity, eating disorder symptomotology, self-esteem, body image, and emotional interoceptive awareness were also conducted.

Eating style. Gender was included as a factor in preliminary analyses but produced no significant main or interaction effects, so it was omitted from the final analyses reported below. Multivariate tests of the four normal eating scores were significant for the main effect of weight status ($F(8, 1220)=2.43$,

p<.05). Univariate tests with 2 and 612 degrees of freedom were significant only for body-responsive eating (F=4.09, p<.05) and constrained eating (F=3.47, p<.05). Post-hoc comparisons found that below-average weight participants scored significantly higher on body-responsive eating than did their above-average weight counterparts (F (2, 695)=3.73, p<.05). This finding can also be stated that above-average weight participants scored significantly lower on body-responsive eating than did below-average weight individuals. On constrained eating, above-average weight individuals scored significantly lower than both below-average weight and average weight participants (F (2, 695)=4.67, p<.01). Means and standard deviations are presented in Tables 27 and 28.

Multivariate tests of the three abnormal eating scores (restraint, emotional eating, and external eating) were non-significant for gender, weight status, and dieting status. In addition, multivariate tests of all seven eating scores were non-significant for maintenance of weight loss.

Exercise style. MANOVAs of the four exercise style scores were conducted with the three between-groups factors of gender, dieting status, and weight status. Multivariate tests were significant for the main effect of gender (F (4, 592)=3.77, p<.01). Of the four exercise scales, only the univariate test for weight control exercise was significant (*t* (1, 595)=2.99, p<.01), with females scoring significantly higher on weight control than males.

Physical activity. An ANOVA of physical activity, calculated as the total weekly METs acquired, was performed with gender, weight status, and dieting

status as between-groups factors. The main effect of gender was significant (t (1, 631)=3.79, p<.001), with males reporting higher levels of physical activity (METs) than females.

Eating disorder symptomotology. An ANOVA of scores on the Eating Attitudes Test (EAT-26) was performed with gender and weight status as factors. Only the main effect of gender was significant (t (1, 710)=6.63, p<.001), with females scoring significantly higher on eating disorder symptomotology than males. Means and standard deviations for weight control exercise, physical activity, and eating disorder symptoms by gender are presented in Table 29.

Body awareness/responsiveness. MANOVAs of the body responsiveness scores were conducted with weight status and dieting status as factors. Gender was omitted due to preliminary analyses being non-significant. Multivariate tests of the full score and five subscales were significant for the main effect of dieting status (F (18, 1806)=1.71, p<.05). For this effect of dieting status, univariate tests were significant only for the sexual awareness and responsiveness scale (F (3, 605)=3.00, p<.05). Post-hoc analyses found that sexual awareness/responsiveness was significantly lower in eating disordered participants than in the never-dieted (t (1, 606)=2.60, p<.01) and currently dieting categories (t (1, 606)=2.88, p<.01). Means and standard deviations are presented in Table 30.

Self-esteem. An analysis of variance of self-esteem with weight status and dieting status as factors was significant only for the interaction between

Wtgroup by Eatgroup (F (6, 647)=2.31, p<.05). (Again, gender was omitted because preliminary analyses proved non-significant.) Analyses of simple effects found that dieting status (Eatgroup) was significant only at level 2 of Wtgroup (average weight participants) (F (3, 655)=2.89, p<.05). However, post-hoc analyses of the average weight group found no two dieting status groups to be significantly different on self-esteem at the .05 level. Means and standard deviations are presented in Table 31.

Descriptive Analyses

Means and standard deviations of the eating style, exercise motivation, and body awareness/responsiveness scales are presented in Table 32. Of the seven eating style scales, participants scored highest on body-responsive eating, second highest on healthy eating, and lowest on overeating and emotional eating. Of the four exercise scales, individuals scored highest on body-dependent exercise and intrinsic rewards, and lowest on body unresponsive exercise. Participants scored relatively highly (mean≥3.34) on all of the body awareness/responsiveness scales, reporting the highest scores on symptom awareness and the lowest on self-care.

In addition to the main effects of gender discussed above, a Chi-Square analysis of dieting status by sex was significant (X^2(1, 3)=137.97, p<.001), with proportionally more men than women never having dieted, and proportionally more women than men currently dieting or reporting eating disorder symptomotology (see Table 33). Females were more likely to be taking weight- or appetitie-affecting medications than were males (X^2(1, 1)=18.82, p<.001).

Females were also more likely to report extended dieting and other attempts to lose weight.

Correlational Analyses

Although not part of the hypotheses, correlational analyses were performed on non-ordinal background and demographic data, and eating, exercise, and body responsiveness scores. Correlations between composite scale scores found body awareness/responsiveness to be significantly correlated with the four exercise style scales: Body responsiveness was positively correlated with intrinsic rewards ($r=.22$; $p<.001$) and with body-dependent exercise ($r=.35$; $p<.001$), and negatively correlated with weight control ($r=-.08$; $p<.05$) and body unresponsive exercise ($r=-.30$; $p<.001$). Not surprisingly, body image was negatively associated with weight control exercise ($r=-.09$; $p<.05$). Exercise motivation was not significantly correlated with physical activity level, body mass index, eating behavior, or self-esteem.

The number of weight loss diets a participant had tried was significantly correlated with body mass index ($r=.09$, $p<.05$), length of dieting ($r=.59$, $p<.001$), and scores on the Eating Attitudes Test (EAT-26) ($r=.47$, $p<.001$). However, dieting history was not significantly associated with scores on the eating style scales.

DISCUSSION

Despite hypthotheses that were carefully formulated based on theoretical models of eating behavior, the majority of the predictions were not supported by the data. To summarize, only a few hypthotheses were corroborated: Average weight, never dieted participants (the expected prototypical "normal" group) did score higher on body-responsive eating than on the other eating scales. However, the majority of participants in this sample scored highest on body-responsive eating, suggesting that this eating style may indeed be the norm among college students, regardless of their weight or dieting history.

As hypothesized, below-average weight individuals resembled average weight participants across all eating scales, with the exception that below-average weight participants scored higher (not lower) on body-responsive eating. The significant relationship between body-responsive eating and weight suggests that this type of eating style may result in lower (than average) body weight.

Also as hypothesized, average weight, previously dieted participants scored higher on healthy and constrained eating (both "normal" subscales) than on the "abnormal" eating scales. However, this group of individuals scored lower on overeating than on the other scales, suggesting that overeating,

although derived from "normal eating" items, may reflect a less normal or normative eating style in a college population.

As expected, average weight, previously dieted participants also scored higher on body-responsive and healthy eating than on the other scales. Again, however, this pattern of scores reflects that of the entire sample.

Contrary to predictions, dieting history did not seem to affect eating style scores. In other words, the experience of dieting did not appear to negatively affect eating behavior, as reported by this sample. In fact, restrained eating (as measured by the Dutch Eating Behavior Questionnaire) was not related to reports of current or past dieting, which may be the result of imprecise assessment of "dieting." Conversely, the absence of dieting did not seem to protect against less desirable eating styles (e.g., the "abnormal" eating styles and overeating). Neither was dieting history related to weight status. Number of dieting attempts was, however, significantly associated with eating disorder symptomotology.

Weight classification as above-average weight, average, or below-average weight, was significantly related to body-responsive and constrained eating, but <u>not</u> to scores on the overeating subscale. As stated previously, below-average weight participants scored significantly higher on body-responsive eating than did their above-average weight counterparts. Similarly, above-average weight individuals scored significantly lower on constrained eating than did average and below-average weight participants. In other words, obesity was related to relatively lower body-responsive eating and lower

constrained eating. In addition, maintenance of weight loss was associated with body-responsive and healthy eating: Average-weight weight loss maintainers scored significantly higher on healthy eating, and significantly highest on body-responsive eating. This finding contradicts recent research that suggests that the majority (90%) of successful weight losers report high levels of restrained eating (Klem, Wing, McGuire, Hill, & Seagle, 1996).

Instrument Development

One purpose of this study was to develop and preliminarily test original measures to assess normal eating style, exercise motivation, and body awareness and responsiveness. In the factor analysis of the original eating variables, the "conventional" eating items (three meals a day; conventional food choices) were eliminated due to low factor loadings. Also of interest, items that were written to be the reverse of body-responsive eating loaded, unexpectedly, on their own factor as Overeating. Given the sample's relatively high scores on body-responsive eating and healthy eating, and the relatively low scores on constrained and overeating, it may not be appropriate (or useful) to classify all four of these scales as "normal" eating. Body-responsive and healthy eating are clearly more normative (i.e., highly endorsed) than are the constrained and overeating styles. The body-responsive and healthy eating styles are also more normative than are restrained, emotional, and external eating in the population studied. As such, the body-responsive and healthy eating scales may provide an important contribution to the measurement of eating behavior in normal individuals.

These results support a recent study that identified "watching what one eats" and "eating healthy" as distinct from, and perhaps more prevalent than dieting behavior in a sample of normal adolescent females (Nichter, Ritenbaugh, Nichter, Vuckovic, & Aickin, 1995). This study, like the current one, sought to capture a range of healthful or normative eating patterns in a normal population. The authors agree with my observation that past research has "assumed a pathogenic rather than a salutogenic stance; that is, attention has been directed more toward factors that lead to sickness and less toward describing successful coping or adaptive behaviors" (Nichter et al., 1995, p. 161). Based on ethnographic interviews, "watching" behavior or "eating healthy" was described by the participants as "avoiding candy, chips, soda, and fatty foods, and eating more fruits and vegetables" (p. 157), which sounds comparable to the construct of healthy eating in the present study. In an original self-report instrument, Nichter and colleagues also assessed motivations behind eating behavior. They identified that "watching" behavior was motivated predominantly by the desire to be healthy in girls classified as "watchers," and by the desire to lose weight in girls classified as "watcher/dieters" or "dieters." As I have argued, these authors emphasize the importance of investigating healthy eating behaviors and including questions and responses that would substantiate their commonality in survey questionnaires.

The assessment of healthy or normal eating would also be beneficial in studying successful maintenance of weight loss. Recent research has

examined the self-reported eating behavior of 600 successful weight losers who had lost at least 30 pounds and maintained this loss for one year or longer (Klem et al., 1996). However, this study assessed eating behavior with the Three Factor Eating Questionnaire (Stunkard & Messick, 1985), an instrument commonly used to assess disordered eating such as restraint, disinhibition, and (excessive) "hunger." With this instrument, the investigators found that successful weight losers reported high levels of restraint and low levels of disinhibition and hunger. The authors suggest that low levels of disinhibition and hunger, coupled with high levels of restraint, may allow these individuals to be successful at long-term weight loss. I believe that the inclusion of an instrument, such as the Eating Style Inventory, that measures more normal eating behaviors, would prove enlightening to our understanding of the long-term maintentance of weight loss.

Of the exercise scales, body-dependent exercise was the most highly endorsed exercise motivation in this sample, closely followed by intrinsic rewards. Weight control was moderately endorsed, with body unresponsive exercise receiving the least support. Interestingly, the construct of exercise motivation was not two-dimensional as had been expected based on previous research, but rather, it was four-dimensional, as suggested by the factor analysis. Two of the scales, intrinsic rewards and weight control, describe motivations for exercising, whereas the body unresponsive and body-dependent exercise factors seem to describe two approaches to exercise. The results of this study do not suggest much relation between exercise motivation and eating

style or actual level of activity.

Body awareness and responsiveness items were combined to form a body awareness/responsiveness scale with five subscales. Participants with eating disorder symptomotology scored significantly lower on the sexual awareness/responsiveness subscale of the Body Responsiveness scale than did never dieted or currently dieting individuals. This finding is not surprising given the association between eating disorders, sexual abuse, and subsequent sexual dysfunction (Palmer, 1995). Interestingly, body awareness was not correlated with emotional interoceptive awareness, as had been expected. However, body awareness/responsiveness seems to be an important correlate of exercise motivation, which deserves further attention.

Methodological Limitations or "Lessons from the Lab"

During and after data collection, I realized several possible flaws in methodology that I would correct or do differently if repeating this or a similar study. In developing the original measures, it would have been helpful to gather information and ideas from more people. Although I used my own psychology students to identify common eating motivations, a larger pre-sample might have resulted in a more comprehensive instrument. For example, none of the students in my classes was an athlete; therefore, I did not consider that there might be an "athletic" or performance-based eating style. Moreover, I did not assess whether participants were university athletes, which might very well affect their eating behavior, weight, and activity level. This oversight came to my attention during data collection, when several participants informed me that

they were wrestlers, and they noted how this activity affected their eating behavior and weight. This omission might have been prevented by better piloting of the questionnaire. Although my full sample consisted of both males and females, my pilot sample consisted of only females, hence omitting the male perspective.

In addition, I forgot to inquire about current pregnancy on the questionnaire. This came to my attention when several women informed me that they were pregnant!

With regard to the original items assessing eating and exercise style, although they were intended to measure conscious motivation for behavior, some items instead measured actual behavior, rather than the identified motivation. Therefore, despite attempts to create an instrument to assess purely motivational aspects of eating and exercise behavior, the resulting scales measure a mixture of both motivation and behavior. In fact, when looking back at the original conventional eating items, only three out of 18 items explicitly stated a motivation behind the behavior described. This fact may account for the low factor loadings and subsequent elimination of the conventional items. Thus, the Eating Style Inventory (ESI) and other original measures could likely be revised and improved upon to better reflect and measure conscious motivations or attributions of behavioral motivation.

Although the scantron sheets saved much time in data coding and entry, they also were the cause of many errors in completion. I was (later) told never to use scantron sheets that are separate from the questions on the instrument,

because participants can easily lose their place in marking bubbles, resulting in erroneous or invalid data. Despite my reminders to be careful and check their scantrons, many students made mistakes in completing their scantron sheets. In addition, items that instruct the respondent to "Skip to item 23" are likely to confuse participants and result in avoidable errors. Finally, although "essay boxes" on the scantron sheets were used to record height and weight, age was assessed by a multiple-choice item. Age would have been more precisely assessed with an open-ended item completed in an essay box.

In addition, although I had one or two research assistants helping at each data collection session, I actually needed 10 or more assistants to "quality control" (check) the data as they were turned in. As it happened, participants tended to complete the questionnaire packet at approximately the same time, resulting in a line to turn in questionnaires and scantron sheets. My research assistants were rushed in checking the sheets, thereby missing many incompletions and errors.

Height and weight (as with all the variables) were self-reported, and therefore may be less than accurate. Several individuals had no idea how much they currently weighed. To avoid underreporting of body weight and overreporting of height, it would have been better if I had weighed and measured each participant myself. This option was not implemented due to time constraints and not wanting a weigh-in to produce participant reactivity. Heights and weights were intentionally not adjusted for self-report error because this study examined the relationship of weight/height^2 (BMI) to other variables.

In this study, there were no purely objective variables; all variables were measured via self-report, in questionnaire form. Kagan (1988) has reviewed the poor relationship between self-reported scores and behavioral observations or observer ratings of the same variable. He argues that the theoretical meaning of a term applied to self-report data is likely to change when the same term is applied to behavioral or physiological referents. In addition, he argues that each person only has a limited awareness of his or her moods, motives, and bases for behavior, and it is not obvious that only conscious intentions and moods make up the main basis for variation in behavior. In the current study, participants' attribution of their own eating motivation may be inaccurate or may reflect social desirability influences. The perception of hunger and other physiological drives may be interpreted (or misinterpreted) differentially by individuals.

Hogan and Nicholson (1988) discuss additional problems with self-report measures--the primary problem being inadequate construct validation of a measure or an item. They also address the problems of social desirability, lack of stable covariations between personality measures and measures of corresponding physiological processes, and lack of correspondence to actual behavior. Hogan and Nicholson recommend more thorough construct validation of self-report measures.

In the present study, the definition and classification of dieting behavior may have been less than valid. Dieting was assessed by the questions, "About how many times have you gone on a diet or changed your eating habits in

order to lose weight?" and "Are you currently dieting or trying to lose weight?" However, dieting status (Eatgroup) as classified by these items did not differentiate scores on the restraint subscale, which is intended to measure dieting behavior. In contrast, mean scores on the restraint subscale appear comparable to means reported by van Strien et al. (1986) of a mixed sample of obese and non-obese men and women.

Nichter et al. (1995) report a similar discrepancy in their study of dieting and "watching" behavior in adolescent girls: Although 44% of the sample reported trying to lose weight on the day they completed the survey, only 8.6% of the food records were designated as actual dieting days. Self-report responses about dieting in a cohort of adolescents or college students may index key cultural concerns about weight rather than reflect actual sustained weight loss behavior. Many adolescent girls (and likely young adults) experience cultural pressure to say that they feel fat and/or are trying to lose weight, even when they are not actively engaged in such behavior (Nichter & Vuckovic, 1994). In addition, "dieting" may be interpreted by some as attempting, trying, or intending to change eating behavior, rather than actual success at making objective behavioral changes. Therefore, the current study, and others in the past, may overstate the prevalence of dieting behavior. Better assessment of the dieting construct would be useful, especially when participants are subsequently categorized according to their responses on such items.

Kagan (1988) suggests the use of behavioral and physiological evidence,

in combination with self-report data, to cross-validate the results. Unfortunately, it was not feasible in this study, given the size of the sample, to use behavioral observations or observer reports. It would have been interesting to collect food diaries from participants, as did Nichter and colleagues (1995), to determine if eating style scores were related to caloric or macronutrient intake. (The food frequency questionnaire was included for this purpose, but such measures tend to be less valid than food records.) Further validation and testing of the original measures are necessary before conclusive deductions about the results can be made. Data from repeated administrations of the questionnaire should be analyzed to establish test-retest reliability.

Finally, this research was limited by a relatively homogeneous sample of college students of similar age, ethnicity, socioeconomic status, and education. I had mistakenly hoped that an investigation of eating behavior in normal college students would be generalizable to the population at large. However, given the homogeneous nature of the sample and the relatively low variability of scores on the eating scales, such generalizability based on the current study would be premature.

Despite the above methodological limitations, the data set of over 700 participants is likely large enough to produce reasonably valid and robust findings.

Clinical Implications

One purpose of this study was to investigate the range of eating styles in a normal population. Based on the results of this study, it seems reasonable to

conclude that "normal eating" in a college population is characterized predominantly by body-responsive and healthy eating. Constrained and overeating appear less normative, along with restrained, emotional, and external eating.

The identification of body-responsive (or physiologically-motivated) eating in a normal sample is important in our understanding of eating behavior and treatment goals. According to this study, individuals (at least college students) can and do eat in response to their body's needs and messages. Interestingly, however, body-responsive eating was not associated with any of the body responsiveness scales. Therefore, teaching individuals to increase their overall body awareness and responsiveness may not improve body-responsive eating. Body-responsive eating would, however, seem to be a viable goal of obesity treatment, and may reflect a more normal and healthy eating style than restraint or dieting. Obesity interventions should assess body-responsive eating pre- and post-treatment, with the goal of increasing such internally-directed eating behaviors. Healthy eating, or "watching" what one eats, should also be encouraged rather than strict dieting (Nichter et al., 1995).

The relationship between higher body-responsive eating and lower body mass index (BMI) is interesting and may have positive implications for obesity treatment, caloric restriction, and longevity. In a recent article on the Nurses' Health Study, Manson et al. (1995) reported lowest relative risk (1.0) for mortality in women with BMIs of less than 19.0 (comparable to my "below-average" weight category). The investigators found that body weight and

mortality from all causes were directly related among the middle-aged nurses studied. Lean women did not have excess mortality. In fact, the lowest mortality rate was observed among women who weighed at least 15% less than the U.S. average for women of similar age and among those whose weight had been stable since early adulthood. These results, and the relation between below-average weight and body-responsive eating in the current study, suggest that "below-average" may actually be more optimal or "normal" than average weight.

In addition, since the 1930s, animal research has found caloric restriction to be the only intervention shown convincingly to slow aging and increase the lifespan of rodents and other organisms (Weindruch, 1996). Caloric restriction, or eating behavior that leads to lower-than-average body weight, may benefit human longevity by retarding the aging process and decreasing mortality due to disease. Weindruch proposes deliberate "caloric restriction" that enables humans to weigh 10 to 25% less than their personal "set point" (1996, p. 52). He defines set point as the weight the body is "programmed" to maintain, if one does not eat in response to external cues. Weindruch suggests caloric restriction beyond body-responsive eating to produce lower-than-average body weight. However, the results of my study suggest that body-responsive (internally-motivated) eating behavior may in itself lead to lower body weight, without conscious caloric restriction. This possible implication is promising in that caloric restriction (dieting, restraint) is difficult to maintain over time, as evidenced by the lack of long-term maintenance of weight loss after traditional

obestiy treatment that entails caloric restriction (Garner & Wooley, 1991). Body-responsive eating may be easier than restriction to maintain over the long run, if individuals can be taught to respond to physiological cues of hunger, cravings, and satiety.

In light of the significant negative relationship between self-esteem and exercising for weight control, future weight loss or health promotion programs may benefit from incorporating body awareness/responsiveness training and internally-directed exercise into their treatment approach. Although general body responsiveness may not affect eating style, it may facilitate internal exercise motivation and increased activity. The four-factor conceptualization of exercise motivation might also have implications for the teaching of physical education to children and adolescents in school. For example, how can children be taught the "intrinsic rewards" of body-dependent exercise? Additional research is needed to better understand the antecedents and consequences of different exercise motivations, and to evaluate the long- and short-term effectiveness of promoting an internal bodily focus in weight loss, exercise, and health education programs.

Directions for Future Research

The current study represents a reasonable starting point for research on normal eating behavior and eating motivations. Future research would benefit from investigating more diverse samples of individuals of varying ages, ethnicities, health status, educational levels, and socioeconomic backgrounds. Results from a middle-aged, heterogeneous sample might look quite different

than the results from a college population.

In addition, a longitudinal study of eating style and motivation would be necessary to identify changes and trends in eating style over time, and to assess the possible health correlates and consequences of the various styles. Cross-sectional research comparing groups of differing ages and health states (e.g., medical patients versus controls) might similarly elucidate correlates of eating style.

Third, further exploration of patterns and configuations of eating motivations would be useful in determining discrete and consistent eating styles. The current study only identifies various eating motivations in a normal population without identifying concrete or conceptual styles of recurrent and consistent motivations and behaviors. Finally, to better understand ascribed and actual motivations behind eating behavior, a more comprehensive view of motivation might be studied, including biological drives and possible unconscious processes affecting eating behavior.

Conclusions

Despite the limitations mentioned above, this study was the first of its kind to classify and measure "normal eating" in normal adults by assessing motivational influences instead of mere descriptions of behavior. Despite a lack of corroboration for the hypotheses, the results are enlightening. The conceptualization of normal eating (body-responsive and healthy eating) might be a more appropriate end-goal of innovative weight loss and eating disorder treatments. In addition, the original questionnaires could be useful both as a

pre-treatment assessment and as an outcome evaluation in future research.

Finally, identification of a preferred or optimal normal eating style would be beneficial to inform and enhance efforts in the prevention of eating problems, disorders, and obesity, including (but not limited to) parenting, education, and cultural change. Further research is needed to investigate the eating motivations identified in this study, and the relationship between these motivational eating styles and their psychological and health-related consequences.

APPENDIX A

Informed Consent Form

(Cover Letter to the Questionnaire Packet)

GENERAL LIFESTYLE STUDY OF COLLEGE STUDENTS

Thank you for participating in this study on general lifestyle issues and daily habits of college students, conducted by Laurie Friedman, M.A., under the supervision of Dr. Lawrence Messe.

You have in front of you a series of questionnaires on various topics and **EIGHT (8) scantron answer sheets--4 large ones and 4 small ones in various colors. Please take a few moments NOW to fill in your Student ID Number on ALL 8 scantron sheets, in the box labeled PID. Please write in your 8-digit numerical student number and then fill in the corresponding bubbles for each digit, including the "A." DO NOT PUT YOUR NAME ON ANY SCANTRON SHEET, so your participation can remain anonymous. Please check that your student number is correct on all answer sheets. Thank you!**

Each questionnaire has specific instructions and a corresponding scantron sheet on which to write your responses. **PLEASE DO NOT WRITE ON THE QUESTIONNAIRES AS THEY WILL BE USED AGAIN!** All of your responses will be made directly on the scantron sheets. Mark only **ONE (1) response for each item** in the corresponding row on the scantron sheet. The first page of each questionnaire tells you which scantron sheet (size and color) to use for that questionnaire. Please read the instructions and the response categories carefully, and ask the moderator of the session if you have any questions. Please complete all items except those few that you may be instructed to skip. (If you are instructed to skip an item, be sure you mark your next response in the correct row on the answer sheet!)

Please answer all items honestly, based on what is true for you. Remember, there are no right or wrong answers! **Some items may seem repetitive, but this is necessary to the research process.** Please bear with this redundancy and give each item your serious consideration. Your participation and assistance in this project are GREATLY APPRECIATED!

Please read and remember the following points regarding your participation in this study:

1. Full disclosure of the complete study design will not take place until after all data are collected. You will be debriefed about the study, upon request, when the results are available.

2. You are expected to complete all questionnaires truthfully and completely. The questionnaires will take approximately 90 minutes to complete, and completion of the questionnaires will mark the end of your obligation to this study.

3. You are free to discontinue your participation in this study at any time without penalty. However, if you decide not to continue your participation and complete the questionnaires, you will not receive extra credit for your Psychology course.

4. The results of this study will be strictly confidential and anonymous; your name will not be associated with your questionnaire, unless you agree to participate in follow-up research. Only group results will be reported; no individuals will be identified.

5. Your participation in this study does not promise any beneficial results to you.

6. YOU INDICATE YOUR VOLUNTARY AGREEMENT TO PARTICIPATE IN THIS STUDY BY COMPLETING AND RETURNING YOUR QUESTIONNAIRE ANSWER-SHEETS.

Thank you again for your participation in this study! Please see the session moderator with any questions or concerns about the study.

APPENDIX B

Questionnaire Packet

ESI

Please answer the following items on the LARGE RED scantron sheet. For each item, decide if the statement is true about you NEVER (1), RARELY (2), SOMETIMES (3), FREQUENTLY (4), or ALWAYS (5). On the LARGE RED scantron sheet, blacken the number for each item that corresponds to your response. Remember to use the following scale:

1	2	3	4	5
NEVER	RARELY	SOMETIMES	FREQUENTLY	ALWAYS

1. I eat when I am hungry.

2. When I eat is constrained or determined by my school or work schedule.

3. I try to match the food(s) I eat to what my body happens to be craving at the moment.

4. I consciously choose foods that are considered healthy.

5. I stop eating even though I'm still hungry.

6. I try to eat well-balanced meals to ensure that I'm getting enough nutrients.

7. If I have a craving for a particular food, I will go out of my way to obtain that food.

8. I eat breakfast or lunch when I can, so I won't get hungry later at a time when I can't eat.

9. I avoid foods with high fat content because they're unhealthy for me.

10. I eat when I'm hungry, regardless of the time of day.

11. I eat while driving a car.

12. I eat beyond the point of satiety or physical comfort.

13. What I eat is constrained by my living situation (e.g., family meals, dormitory, etc.).

14. I eat when I'm hungry, regardless of the amount of time that has elapsed since I last ate.

15. I eat while watching TV.

16. I eat foods that look good to me.

17. I eat at regular mealtimes.

18. I eat what my body seems to be wanting, regardless of the time of day.

19. I allow myself to eat certain snacks between meals.

20. I am afraid to allow myself to feel hungry.

21. I eat breakfast everyday because it's said to be the most important meal of the day.

22. When I realize I am hungry, I try to eat right away.

23. My eating is constrained by religious beliefs and/or holidays.

24. I consider myself a healthy eater.

25. How much I eat is limited by how much time I have in which to eat.

26. I eat while reading a newspaper, book, or magazine.

27. I am aware of the health value or risks of different foods while I am eating them.

28. I eat at the same time each day.

29. I eat when I'm tense or uptight.

30. I eat lunch and snacks during allotted break times at work or school.

31. I eat food that is appropriate or common for the time of day (e.g., "breakfast food" in the morning, etc.).

32. I have second helpings if I'm still hungry.

33. I overeat at meals or between meals.

34. My eating is motivated by a feeling that, if I don't eat it now, the food will be eaten by someone else (e.g., my roommate, family member, etc.).

35. I skip meals.

36. I keep food available where I live so I can eat when I get hungry.

37. I make an effort to relax my mind and body before eating.

38. I eat because others are eating also.

39. I choose foods that are healthy for me.

40. Money constraints keep me from eating the foods I really want.

41. I limit my intake of foods that are not high in nutritional value.

42. I eat on-the-run because I don't have time to sit down to a meal.

43. I eat until I feel that I would be sick if I ate any more.

44. I eat because it's time to eat, even if I'm not really hungry.

45. When someone else has prepared the food, I eat what is served to me even if I don't really like or want it.

46. I feel uncomfortable when I'm the only person in a group eating, even if I'm hungry.

47. I eat what my body is craving even if other people think it's strange.

48. I pay attention to my eating, while I'm eating.

49. I like to talk to people while I'm eating my food.

50. I knowingly eat more than my body needs at meals or between meals.

51. I carry food with me so I can eat when I get hungry.

52. I avoid foods that are unhealthy.

53. I pay attention to how my body is feeling while I'm eating.

54. How much I eat is limited by how much food is available.

55. I intentionally eat moderate amounts of food in order to be healthy.

56. I tend to choose the same types of foods that we ate in my family when I was a child.

57. I stop eating because others around me have finished also.

58. I eat more than my body needs.

59. I typically eat balanced meals (e.g., protein, vegetable, carbohydrate, etc.).

60. What I eat is limited by how much time I have to prepare a meal.

61. I leave food on my plate if I've had enough to eat.

62. I try to eat healthy foods so I will be in good shape.

63. I overeat at meals or between meals because I don't realize I'm full until it's too late.

64. I eat what my body wants to eat.

65. I stop eating when no more food is available.

66. When at a social, school, or work function where food is served, I eat even if I'm not hungry.

67. I stop eating when my body has had enough food.

68. Work or school interferes with being able to eat when I would like to.

69. I don't have time to eat.

70. If I eat unhealthy foods, I only eat them in small amounts.

71. I keep eating until I'm comfortably full.

72. I eat normal-sized portions.

73. When I realize I am hungry, I eat soon thereafter.

74. I eat until I feel uncomfortably full.

75. I avoid sugar because it's bad for me.

76. I eat what my body wants even if others think it is unhealthy.

77. I eat because it's time to eat.

78. I decide what to eat based on how the food tastes to me.

79. I feel uncomfortably full after eating.

80. I eat foods I love.

81. When I shop for groceries, the first thing I do is look at the labels to determine if a food is good for me or not.

82. What I can eat is limited by my religious beliefs.

83. I keep food accessible throughout the day so I can eat when I get hungry.

84. The portions of food that I eat are appropriate or common for that food.

85. I eat when others are eating, even if I'm not really hungry.

86. I choose what to eat based on how I imagine my body will feel after eating a particular food.

87. I like to eat on a regular schedule.

88. How much I eat is determined by what I can afford.

89. I am concerned about how healthy my diet is.

90. I eat foods I don't particularly like because they're good for me.

91. I like to eat and do other activities or tasks at the same time (e.g., talk on the phone, study, watch TV, etc.).

92. I intentionally eat foods high in nutritional value.

93. I eat three meals a day.

94. TV is distracting to me while I eat.

95. I eat foods I don't particularly like.

96. I try to limit my caffeine intake (coffee, tea, soda, chocolate) for health purposes.

97. My living situation (e.g., dorm, fraternity, family) restricts me from eating any time I want to.

98. I eat before I actually get hungry.

99. I try to limit my intake of sugar because it's not good for me.

100. I eat less than my body needs.

101. I habitually eat three meals a day.

102. I try to eat foods that are rich in fiber (whole grain breads, cereals, fruits, vegetables, dried beans) because they're good for me.

103. It is important for me to be comfortable and relaxed when I eat.

104. What I eat is limited by what I can afford.

105. I eat while standing up.

106. When I eat, I like to just eat, and not engage in any other activity but eating.

107. When I eat is determined by my living situation (e.g., dorm, fraternity, family, etc.).

108. I eat when I'm hungry, even if others around me aren't eating.

109. I limit my intake of fat/cholesterol by eating fish, poultry without skin, lean meats, and lowfat milk/cheeses.

110. Talking to people distracts me while I'm eating.

111. I like to eat and study at the same time.

112. I keep food available at work or school so I can eat when I get hungry.

113. I eat healthy foods because I want to be healthy.

114. I enjoy eating.

115. I eat while sitting down.

116. I finish what is on my plate.

117. When I'm very busy or engaged in an activity, I forget to eat.

BRS

Please answer the following items on the LARGE GREEN scantron sheet. For each item, decide if the statement is true about you NEVER (1), RARELY (2), SOMETIMES (3), FREQUENTLY (4), or ALWAYS (5). **On the LARGE GREEN scantron sheet, blacken the number for each item that corresponds to your response. Remember to use the following scale:**

1	2	3	4	5
NEVER	RARELY	SOMETIMES	FREQUENTLY	ALWAYS

1. I exercise to look better.

2. I stay home and rest when I am sick.

3. I am aware of physical symptoms if I don't take care of myself.

4. How often I exercise depends on how I'm feeling.

5. I am aware of physical symptoms or sensations when I eat something that doesn't agree with me.

6. I exercise because I enjoy it.

7. I can distinguish hunger from emotions or feelings.

8. I exercise to lose weight for special upcoming occasions.

9. I put other commitments (e.g., school, work, friends) before my health.

10. I exercise to prevent gaining weight.

11. I go to the doctor when I am sick and do not seem to be getting better after several days.

12. When exercising, I will slow my pace or stop if my body feels very tired.

13. I am unaffected by extreme temperatures inside or outdoors.

14. I exercise because I feel fat.

15. I can tell when my body has had enough food.

16. I exercise more when I have eaten more.

17. When I hurt myself physically, I feel pain.

18. Exercise is fun for me.

19. When my body feels sick or hurts, I try to ignore it.

20. I exercise to take care of myself.

21. I exercise when I feel like it.

22. I exercise to keep from getting fat.

23. I am aware of sexual feelings in my body.

24. I exercise to stay in shape.

25. I rest when I feel tired.

26. My body feels good while I'm exercising.

27. I seem to be numb to sensations of pain.

28. When my body feels tired, I push myself by exercising anyway.

29. I exercise to look good for my boyfriend/girlfriend.

30. I know when to stop eating so I won't feel too full.

31. The intensity with which I exercise is dependent on how my body is feeling.

32. I exercise to burn calories.

33. I know when I'm getting sick.

34. I make myself exercise even if I'm really tired.

35. I am aware of sensations in my body.

36. At night, I go to sleep when I am tired.

37. I exercise because I'm supposed to.

38. The length of time I spend exercising is dependent on how fatigued my body is feeling.

39. My body tells me what it wants to eat.

40. I exercise to lose weight.

41. I can tell how much food my body needs to eat.

42. I force myself to exercise regularly.

43. I continue with my daily activities even when I am sick and feel awful.

44. I exercise because it makes my body feel good.

45. I feel very uncomfortable when I've eaten too much.

46. I exercise when my body is rested and well.

47. My body sends me messages about what it wants or needs to eat.

48. I exercise to maintain my weight.

49. I push myself to the point of exhaustion.

50. When exercising, I will slow my pace or stop if my body begins to hurt.

51. I try to take care of myself physically.

52. My body hurts while I'm exercising, but I make myself do it anyway.

53. I know when I am sick.

54. I exercise when my body feels like moving.

55. I know when my body needs sexual stimulation or release.

56. I exercise regularly regardless of how my body feels.

57. I ignore my sexual feelings and desires.

58. I exercise even if I'm feeling sick.

59. I get confused as to whether or not I am hungry.

60. Exercise is painful for me.

61. I dress to be comfortably warm or cool, depending on the weather.

62. I only exercise if I feel like it.

63. I know when I'm hungry.

64. I feel guilty when I don't exercise regularly.

65. I get specific food cravings.

66. Exercise relaxes me.

67. I exercise when I've eaten too much, to prevent gaining weight.

68. I can distinguish hunger from other bodily sensations.

69. I exercise even though I don't really like it.

70. I take time out for myself when I feel under stress.

71. I enjoy exercising while I'm doing it.

72. I know when my body needs fluids.

73. I exercise because it makes my body feel good.

74. When I am under stress, my body feels very tense.

75. I exercise when I have an abundance of energy.

76. I try to tune out my body.

77. I exercise because it makes me feel good.

78. I can tell when I'm coming down with a cold or other illness.

79. I wear clothing and/or shoes that are uncomfortable.

80. I have sexual contact or masturbate when I am feeling sexually aroused.

81. I exercise because it gives me more energy.

82. I know when I need more or less sleep than I've been getting.

83. I get sick because I don't take good care of myself.

84. I exercise to counteract overeating.

85. I know when I've had enough to eat.

EATING HABITS

Please respond to the following items on the SMALL BLUE scantron sheet. For each one, decide if the statement is true about you NEVER (1), RARELY (2), SOMETIMES (3), FREQENTLY (4), or ALWAYS (5). On the SMALL BLUE scantron sheet, please blacken the number for each item that corresponds to your response. Remember to use the following scale:

1	2	3	4	5
NEVER	RARELY	SOMETIMES	FREQUENTLY	ALWAYS

1. When I have put on weight, I eat less than I usually do.
2. I eat when I am irritated.
3. If food tastes good, I eat more than usual.
4. I get frightened when my feelings are too strong.
5. If food smells and looks good, I eat more than usual.
6. I eat when I have nothing to do.
7. I try to eat less at mealtimes than I would like to eat.
8. I eat when I am depressed or discouraged.
9. If I see or smell something delicious, I find it difficult to keep from eating, even if I have just finished a meal.
10. I get confused about what emotion I am feeling.
11. I eat when I am feeling lonely.
12. If I have something delicious to eat, I eat it right away.
13. I can clearly identify what emotion I am feeling.
14. If I walk past a bakery, I have a desire to buy something delicious.
15. I eat when somebody lets me down.
16. I refuse food or drink offered to me because I am concerned about my weight.

17. I eat when I am angry.

18. If I see others eating, I also have the desire to eat.

19. I don't know what's going on inside me.

20. I can't resist eating delicious foods.

21. I eat when I am expecting something unpleasant to happen.

22. I watch exactly what I eat.

23. I eat when I am anxious, worried, or tense.

24. I eat more than usual when I see others eating.

25. I worry that my feelings will get out of control.

26. I deliberately eat foods that are low-calorie.

27. I eat when things are going against me or when things have gone wrong.

28. When preparing a meal, I am inclined to eat something.

29. When I am upset, I don't know if I am sad, frightened, or angry.

30. If I walk past a snack-bar or cafe, I find it difficult to keep from buying and eating something.

31. When I have eaten too much, I deliberately eat less than usual the following day.

32. I eat when I am disappointed.

33. I have feelings I can't quite identify.

34. I deliberately eat less in order not to become heavier.

35. I eat when I am emotionally upset.

36. I take my weight into account with what I eat.

37. I try not to eat between meals because I am watching my weight.

38. I eat when I am bored or restless.

39. In the evenings, I try not to eat because I am watching my weight.

40. When I am upset, I worry that I will start eating.

41. I eat when I am frightened.

SELF PERCEPTIONS

The following are a series of statements. Please respond to these 10 items on the SMALL GREEN scantron sheet. Read each statement carefully and indicate how much you agree or disagree with each one, using the categories given below:

1	2	3	4	5
STRONGLY DISAGREE	DISAGREE	NEITHER AGREE NOR DISAGREE	AGREE	STRONGLY AGREE

1. I feel that I'm a person of worth, at least on an equal basis with others.
2. I feel that I have a number of good qualities.
3. All in all, I am inclined to feel that I am a failure.
4. I am able to do things as well as most people.
5. I feel I do not have much to be proud of.
6. I take a positive attitude toward myself.
7. On the whole, I am satisfied with myself.
8. I wish I could have more respect for myself.
9. I certainly feel useless at times.
10. At times I think I am no good at all.

PERCEPTIONS OF YOUR BODY

The following items are a number of characteristics about yourself. Please respond to these 40 items on the SMALL RED scantron sheet. Blacken the number on your scantron sheet that best represents your feelings about the appearance and/or functioning of each item according to the following scale:

1 = Have strong negative feelings
2 = Have moderate negative feelings
3 = Have no feeling one way or the other
4 = Have moderate positive feelings
5 = Have strong positive feelings

1	2	3	4	5
STRONG NEGATIVE	MODERATE NEGATIVE	NEUTRAL	MODERATE POSITIVE	STRONG POSITIVE

1. Hair
2. Facial complexion
3. Appetite
4. Hands
5. Distribution of hair (over body)
6. Nose
7. Physical stamina
8. Elimination (i.e., urination/defecation)
9. Muscular strength
10. Waist
11. Energy level
12. Back
13. Ears
14. Age

15. Chin
16. Body build
17. Profile
18. Height
19. Keenness of senses
20. Tolerance for pain
21. Width of shoulders
22. Arms
23. Chest/breasts
24. Appearance of eyes
25. Digestion
26. Hips
27. Resistance to illness
28. Legs
29. Appearance of teeth
30. Sex drive
31. Feet
32. Sleep
33. Voice
34. Health
35. Sexual activities
36. Knees
37. Posture

38. **Face**

39. **Weight**

40. **Sex organs**

HEALTH HISTORY

Please respond to the following sets of items on the SMALL BROWN scantron sheet.

GENERAL HEALTH

1. Do you smoke cigarettes?

   1. No

   If YES, indicate approximately how many per day:

   2. Less than 1/2 a pack per day
   3. 1/2 to 1 pack per day
   4. 1+ to 2 packs per day
   5. More than 2 packs per day

2. How many hours do you usually sleep within a 24-hour period? (include sleep at night and naps)

   1. 5 hours or less
   2. 6 hours
   3. 7 hours
   4. 8 hours
   5. 9 hours or more

4. Do you get as much sleep as you'd like?

   1. No
   2. Yes

5. How often do you feel under stress which makes you tense or worried, or causes physical problems such as stomach or back trouble or headaches?

   1. Rarely or never
   2. Several times a year
   3. Several times a month
   4. Several times a week
   5. Everyday

6. Which of the following best describes your sexual activity with a partner over the past 6 months?

   1. No intercourse or any sexual contact with a partner
   2. Intercourse or sexual contact with a partner less than once a week
   3. Intercourse or sexual contact with a partner at least once a week

7. In general, how would you rate your health?

   1. Poor
   2. Fair
   3. Good
   4. Very good
   5. Excellent

CURRENT MEDICATIONS

Please answer NO (1) or YES (2) to the following items:

Are you currently taking:

8. **Vitamin supplements**
9. **Laxatives**
10. **Hormones (including birth control pills)**
11. **Heart medicine**
12. **Stomach medicine**
13. **Pain medicine**
14. **Antidepressant medication (including Prozac and others)**
15. **Antianxiety medication (Valium or tranquilizers)**
16. **Cold medicine**
17. **Thyroid medicine**
18. **Insulin**
19. **Cortisone (cream, ointment, or injections)**
20. **Barbituates**
21. **Sleeping pills**
22. **Diet pills**
23. **Amphetamines**

MEDICAL HISTORY (Respond on the **SMALL BROWN** scantron sheet.)

Please answer NO (1) or YES (2) to the following items:

Have you ever had:

24. **Anemia**
25. **Bleeding problems (e.g., hemophilia)**
26. **Blood clots**
27. **Diabetes**
28. **Hypoglycemia (low blood sugar)**
29. **Depression**
30. **Fainting spells**
31. **Cancer**
32. **Arthritis**
33. **Tuberculosis**
34. **Thyroid problems**
35. **Heart problems**
36. **Stroke**
37. **Asthma**
38. **High blood pressure**
39. **High cholesterol**
40. **Hepatitis/liver problems**
41. **Kidney problems**
42. **Blood transfusions**

NO = 1, YES = 2

43. **Stomach ulcers**

44. **Intestinal problems**

45. **Epilepsy**

46. **Psychological problems requiring hospitalization**

47. **Psychological problems requiring therapy or medications**

48. **Multiple sclerosis or related condition**

49. **Physical disability**

50. **Back problems**

51. **Allergies**

52. **Sinus problems**

53. **History of sexual assault or abuse**

54. **Severe headaches**

55. **Sexually transmitted disease**

PHYSICAL SYMPTOMS

For the following items, please mark the number for each statement that best describes how much that problem has bothered or distressed you during the past four (4) weeks, including today. At one extreme, 1 means that you have not been bothered by the problem (i.e., you have not experienced the problem in the past four weeks). At the other end, 5 means that the problem has been an extreme bother. Please use the following scale:

1	2	3	4	5
HAS NOT BOTHERED ME AT ALL		HAS BOTHERED ME MODERATELY		HAS BOTHERED ME EXTREMELY

56. Sleep problems (can't fall asleep, wake up in the middle of the night or early in the morning)

57. Weight change (gain or loss of 5 pounds or more)

58. Back pain

59. Constipation

60. Diarrhea

61. Faintness

62. Constant fatigue

63. Headache

64. Migraine headache

65. Nausea and/or vomiting

66. "Acid stomach" or indigestion

67. Stomach pain or cramps

68. Hot or cold spells

69. Hands trembling

70. Heart pounding or racing

71. Cold or cough

72. Shortness of breath when not exercising or exerting yourself

73. Numbness or tingling in parts of your body

74. Feeling weak all over

75. Pains in heart or chest

76. Feeling low in energy

77. Stuffy head or nose

78. Blurred vision

79. Muscle tension or soreness

80. Severe aches and pains

81. Acne

82. Bruises

83. Nosebleed

84. Pulled or strained muscles

85. Pulled or strained ligaments

FOOD FREQUENCY

The following section is about your usual eating habits. Please answer these items on the **LARGE BROWN** scantron sheet. Think back over the past year. For each of the foods listed, think about how often you usually eat the specified portion size of that food (in parentheses). Then, **select the number of times per week you usually eat that amount of food.** If a food is seasonal, respond for when that food is in season. Please do not skip foods, and be careful to record your answers in the corresponding row on your scantron sheet. Please use the following scale:

1 = 0 times per week
2 = 1-2 " "
3 = 3-4 " "
4 = 5-6 " "
5 = 7-8 " "
6 = 9-10 " "
7 = 11-12 " "
8 = 13-14 " "
9 = 15-16 " "
10 = 17 or more times per week

FRUITS AND VEGETABLES

1. Orange juice or grapefruit juice (6 oz.)
2. Oranges (1 medium)
3. Grapefruit (1/2)
4. Tomatoes (1) or tomato juice (6 oz.)
5. Cantaloupe (1/4) or watermelon (1" wedge)
6. Broccoli or cauliflower (1/2 cup)
7. Greens, spinach (1/2 cup)
8. Carrots or mixed vegetables with carrots (1/2 cup)
9. Vegetable or tomato soup (1 medium bowl)
10. Sweet potatoes, yams (1/2 cup)

1 = 0 times per week
2 = 1-2 " "
3 = 3-4 " "
4 = 5-6 " "
5 = 7-8 " "
6 = 9-10 " "
7 = 11-12 " "
8 = 13-14 " "
9 = 15-16 " "
10 = 17 or more times per week

11. French fries, fried potatoes (3/4 cup)

12. Other potatoes, including boiled, baked (1), mashed, potato salad (1/2 cup)

13. Corn, green beans, or peas (1/2 cup)

14. Tossed green salad (1 medium bowl)

15. Coleslaw, cabbage, sauerkraut (1/2 cup)

16. Applesauce (1/2 cup), peaches, or pears (1)

17. Apples (1 medium)

18. Bananas (1 medium)

19. Grapes (30)

20. Lemonade, Koolaide, Tang (6 oz.)

21. Other fruit juice or fortified fruit drink (6 oz.)

22. Other fruit (1 medium)

23. Other vegetables (1/2 cup)

MEAT, POULTRY, FISH, BEANS

24. Peanut butter (2 Tbsp.)

25. Cheeseburgers, hamburgers, meatloaf (1 medium)

1 = 0 times per week
2 = 1-2 " "
3 = 3-4 " "
4 = 5-6 " "
5 = 7-8 " "
6 = 9-10 " "
7 = 11-12 " "
8 = 13-14 " "
9 = 15-16 " "
10 = 17 or more times per week

26. Other beef: steak, stew, roasts (4 oz.)

27. Spaghetti with meat sauce or meat balls (1 cup)

28. Pork chops (2 chops), pork roast (4 oz.)

29. Ham (4 oz.)

30. Fried chicken (2 small pieces or 1 large piece)

31. Chicken or turkey, roasted, stewed, or broiled (2 small pieces or 1 large piece)

32. Fried fish (4 oz.) or fish sandwich (1)

33. Other fish, broiled, baked (4 oz.)

34. Hot dogs (2), lunch meat (2 slices)

35. Bacon, sausage (2 pieces)

36. Eggs (2)

37. Refried beans, bean dip (3/4 cup)

<u>BREADS AND CEREALS</u>

38. Spaghetti, pasta, macaroni, noodles (1/2 cup)

39. White bread (incl. Italian bread and sandwiches) (2 slices)

40. Dark bread (incl. whole wheat, rye, pumpernickel) (2 slices)

1 = 0 times per week
2 = 1-2 " "
3 = 3-4 " "
4 = 5-6 " "
5 = 7-8 " "
6 = 9-10 " "
7 = 11-12 " "
8 = 13-14 " "
9 = 15-16 " "
10 = 17 or more times per week

41. Hamburger or hotdog bun (2 halves)

42. Bagels (2 halves), pita bread (1 pocket)

43. Crackers (6, 2" square crackers)

44. Pretzels (1 small bag), unbuttered popcorn (1 box)

45. Rice (1/2 cup)

46. Biscuits, muffins, corn bread (1 medium)

47. Tortilla (1)

48. Cold or hot cereal (1 medium bowl)

MILK AND CHEESE

49. Milkshake or malt (8 oz.)

50. Whole milk (8 oz.)

51. Lowfat (2%) milk (8 oz.)

52. Skim (1%) milk (8 oz.)

53. Ice cream (1 scoop or 1/2 cup)

54. Lowfat/nonfat yogurt (frozen or non-frozen) (8 oz.)

55. Cheese (2 slices), cheese spreads, cream cheese (2 oz.)

56. Pizza (2 slices)

1 = 0 times per week
2 = 1-2 " "
3 = 3-4 " "
4 = 5-6 " "
5 = 7-8 " "
6 = 9-10 " "
7 = 11-12 " "
8 = 13-14 " "
9 = 15-16 " "
10 = 17 or more times per week

57. Macaroni and cheese (1 cup)

58. Lasagne (1 cup)

OTHER FOODS

59. Low-calorie frozen dinners (1)

60. Regular TV dinners (1)

61. Diet soft drinks (12 oz.)

62. Regular carbonated soft drinks (not diet) (12 oz.)

63. Hard candy (2 pieces)

64. Chocolate candy (2 pieces), chocolate bar (1)

65. Chips (1 small bag), buttered popcorn (1 box)

66. Doughnut, pastry, croissant (1)

67. Pie, cake (1 piece)

68. Cookies (3, 2" size)

69. Margarine or butter (2 pats)

70. Salad dressing, mayonnaise (incl. on sandwiches) (2 Tbsp.)

71. Lowfat/no-fat salad dressing (2 Tbsp.)

1 = 0 times per week
2 = 1-2 " "
3 = 3-4 " "
4 = 5-6 " "
5 = 7-8 " "
6 = 9-10 " "
7 = 11-12 " "
8 = 13-14 " "
9 = 15-16 " "
10 = 17 or more times per week

72. Beer (12 oz. can or bottle)

73. Wine (1 medium glass)

74. Liquor (1 shot)

75. Coffee or tea, not decaffeinated (1 medium cup)

76. Decaffeinated coffee or tea (1 medium cup)

77. Milk or cream in coffee or tea (1 Tbsp.)

78. Sugar in coffee or tea, or on cereal (2 Tsp.)

79. Water or sparkling water (unsweetened), not including in coffee or tea (8 oz.)

PERSONAL INFORMATION

Please respond to the following items on the LARGE BLUE scantron sheet. Please blacken the number that corresponds to your response for each item.

DEMOGRAPHICS

1. How old are you?

1.	17	6.	22
2.	18	7.	23
3.	19	8.	24
4.	20	9.	25
5.	21	10.	26 or older

2. Sex:

1. Male
2. Female

3. Current marital status:

1. Never married
2. Married
3. Divorced or separated
4. Widowed
5. Living with partner

4. Year in college:

1. Freshman
2. Sophmore
3. Junior
4. Senior
5. Graduate student
6. Lifelong education (non-degree) student

5. Ethnic background:

   1. White
   2. Black (Non-Hispanic)
   3. Hispanic
   4. American Indian or Native Alaskan
   5. Asian or Pacific Islander
   6. Other

6. Which of the following describes your current work status?

   1. Employed full-time (30 hours or more a week)
   2. Employed part-time (less than 30 hours a week)
   3. Not employed

7. Do you currently work at a restaurant, cafeteria, or other establishment that serves food?

   1. No
   2. Yes

8. Where do you live?

   1. Residence hall
   2. Fraternity/sorority
   3. Coop
   4. University apartments
   5. Off campus

9. With whom do you live?

   1. Alone
   2. With roommate(s) or friend(s)
   3. With boyfriend/girlfriend
   4. With parent(s) or family
   5. Other

10. Who prepares the majority of your meals?

    1. I do
    2. Residence hall cafeteria
    3. Fraternity or sorority
    4. Coop
    5. Roommate or friend
    6. Parents
    7. I usually eat at restaurants

11. Approximately how often do you eat a "meal" (as opposed to a snack)?

    1. Less than once a day
    2. Once a day
    3. Twice a day
    4. 3 times a day
    5. 4 or more times a day

12. Approximately how often do you eat at fast-food restaurants (e.g., McDonald's, Taco Bell, Kentucky Fried Chicken, pizza places, etc.)?

    1. Never, or less than once a year
    2. 1-4 times a year
    3. 5-10 times a year
    4. 1-3 times a month
    5. Once a week
    6. 2-4 times a week
    7. Almost everyday
    8. Everyday

PHYSICAL ACTIVITY (Respond on the **LARGE BLUE** scantron sheet.)

During a typical 7-day period (a week), how many times on the average do you do the following kinds of physical activity for more than 15 minutes at a time? Consider both leisure and work-related activities. You will then be asked to indicate the usual duration you engage in these activities.

13. **VIGOROUS ACTIVITY** (heart beats rapidly)
(e.g., running, jogging, hockey, football, soccer, squash, basketball, cross-country skiing, racquetball, judo, roller or ice skating, vigorous swimming, vigorous long-distance bicycling, aerobics or aerobic dancing, chopping wood, digging in the garden, other hard physical labor)

1. 0 times per week (Skip to question #15)
2. Once a week
3. Twice a week
4. 3 times a week
5. 4 times a week
6. 5 times a week
7. 6 times a week
8. 7 times a week
9. 8 times a week
10. 9 or mores times a week

14. When you do the above vigorous activities, approximately how long do you typically engage in one of these activities at a given time?

1. 15+ minutes
2. 30 minutes
3. 45 minutes
4. 1 hour
5. 1.25 hours
6. 1.50 hours
7. 1.75 hours
8. 2 hours
9. 2.25 hours
10. 2.50 hours or more

15. **MODERATE ACTIVITY** (not exhausting)
(e.g., brisk walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, downhill skiing, popular and folk dancing, calisthenics, yard work, heavy housecleaning, other moderate physical labor)

1. 0 times per week (Skip to question #17)
2. Once a week
3. Twice a week
4. 3 times a week
5. 4 times a week
6. 5 times a week
7. 6 times a week
8. 7 times a week
9. 8 times a week
10. 9 or mores times a week

16. When you do the above moderate activities, approximately how long do you typically engage in one of these activities at a given time?

1. 15+ minutes
2. 30 minutes
3. 45 minutes
4. 1 hour
5. 1.25 hours
6. 1.50 hours
7. 1.75 hours
8. 2 hours
9. 2.25 hours
10. 2.50 hours or more

17. **LIGHT ACTIVITY** (minimal effort)
(e.g., yoga, archery, fishing from a river bank, bowling, horseshoes, golf, easy walking, light housework)

1. 0 times per week (Skip to question #19)
2. Once a week
3. Twice a week
4. 3 times a week
5. 4 times a week
6. 5 times a week
7. 6 times a week
8. 7 times a week
9. 8 times a week
10. 9 or mores times a week

18. When you do the above light activities, approximately how long do you typically engage in one of these activities at a given time?

    1. 15+ minutes
    2. 30 minutes
    3. 45 minutes
    4. 1 hour
    5. 1.25 hours
    6. 1.50 hours
    7. 1.75 hours
    8. 2 hours
    9. 2.25 hours
    10. 2.50 hours or more

19. During a typical 7-day period (a week), considering both your leisure time and while at work, how often do you engage in any regular activity long enough to work up a sweat (heart beats rapidly)?

    1. Never/rarely
    2. Sometimes
    3. Often

EATING ATTITUDES

For each of the following items (20 through 45), decide if the statement is true about you NEVER (1), RARELY (2), SOMETIMES (3), OFTEN (4), USUALLY (5), or ALWAYS (6). On the scantron sheet, please blacken the number for each item that corresponds to your response. Note that this scale has 6 points, and not 5 points like the other scales in this questionnaire packet. Remember to use the following 6-point scale:

1	2	3	4	5	6
NEVER	RARELY	SOMETIMES	OFTEN	USUALLY	ALWAYS

20. I am terrified about being overweight.

21. I avoid eating when I am hungry.

22. I find myself preoccupied with food.

23. I have gone on eating binges where I feel that I may not be able to stop.

24. I cut my food into small pieces.

1	2	3	4	5	6
NEVER	RARELY	SOMETIMES	OFTEN	USUALLY	ALWAYS

25. I am aware of the calorie content of foods that I eat.

26. I particularly avoid foods with a high carbohydrate content (e.g., bread, rice, potatoes, etc.).

27. I feel that others would prefer if I ate more.

28. I vomit after I have eaten.

29. I feel extremely guilty after eating.

30. I am preoccupied with a desire to be thinner.

31. I think about burning up calories when I exercise.

32. Other people think that I am too thin.

33. I am preoccupied with the thought of having fat on my body.

34. I take longer than others to eat my meals.

35. I avoid foods with sugar in them.

36. I eat diet foods.

37. I feel that food controls my life.

38. I display self-control around food.

39. I feel that others pressure me to eat.

40. I give too much time and thought to food.

41. I feel uncomfortable after eating sweets.

42. I engage in dieting behavior.

43. I like my stomach to be empty.

44. I enjoy trying new rich foods.

45. I have the impulse to vomit after meals.

EATING AND WEIGHT HISTORY

46. How satisfied are you with your current weight?

1. Very unsatisfied
2. Unsatisfied
3. Indifferent
4. Satisfied
5. Very satisfied

47. How would you classify yourself with regard to your body weight?

1. Underweight
2. Slightly underweight
3. Normal or average weight
4. Slightly overweight
5. Overweight

48. How much would you like to weigh?

1. 16 or more pounds more than what I weigh now
2. 11-15 pounds more than what I weigh now
3. 6-10 pounds more than what I weigh now
4. 1-5 pounds more than what I weigh now
5. I am satisfied with my current weight
6. 1-5 pounds less than what I weigh now
7. 6-10 pounds less than what I weigh now
8. 11-15 pounds less than what I weigh now
9. 16-20 pounds less than what I weigh now
10. 21 or more pounds less than what I weigh now

49. How often do you weigh yourself?

1. Never
2. Rarely
3. Once a month
4. Several times a month
5. Once a week
6. Several times per week
7. Daily
8. More than once a day

50. In a typical week, how much does your weight fluctuate, excluding menstrual weight gain?

1. 0-2 pounds
2. 3-5 pounds
3. 6-8 pounds
4. 9-11 pounds
5. 12-14 pounds
6. More than 14 pounds
7. Don't know

51. Do you currently take any medications that affect your weight or appetite?

1. No
2. Yes

52. Are you currently on a special diet?

1. No

If YES, indicate type of diet:

2. Weight loss
3. For diabetes
4. For hypoglycemia (low blood sugar)
5. For other medical condition
6. Vegetarian
7. Low salt
8. Low cholesterol/low fat
9. Weight gain

53. About how many times have you gone on a diet or changed your eating habits in order to lose weight?

1. Never (Skip to question #55)
2. Once
3. 2-3 times
4. 4-5 times
5. 6-7 times
6. 8-9 times
7. 10-11 times
8. 12-13 times
9. 14-15 times
10. 16 or more times

54. How long, in total, have you spent dieting or restricting your food intake in order to lose weight?

1. Less than 1 month
2. 1 to 3 months
3. 4 to 6 months
4. 7 to 11 months
5. 1 to 2 years
6. 2+ to 3 years
7. 3+ to 4 years
8. 4+ to 5 years
9. 5+ to 6 years
10. longer than 6 years

55. At what age did you first diet or change your eating patterns in order to lose weight?

1. Never
2. Age 5-9
3. Age 10-11
4. Age 12-13
5. Age 14-15
6. Age 16-17
7. Age 18-19
8. Age 20-21
9. Age 22-23
10. Age 24 or older

56. At what age did any weight and/or eating problems begin?

1. No history of weight or eating problems
2. Age 5-9
3. Age 10-11
4. Age 12-13
5. Age 14-15
6. Age 16-17
7. Age 18-19
8. Age 20-21
9. Age 22-23
10. Age 24 or older

57. Have you ever changed your exercise patterns (i.e., exercised more frequently or intensely) in order to lose weight?

1. No
2. Yes

58. Are you currently dieting or trying to lose weight?

1. No
2. Yes

59. What is the most weight that you've ever lost, from dieting or lifestyle changes, but not due to illness, stress, or poverty?

1. 0 pounds (Skip to question #61)
2. 1-5 pounds
3. 6-10 pounds
4. 11-15 pounds
5. 16-20 pounds
6. 21-25 pounds
7. 26-35 pounds
8. 36-45 pounds
9. 46-55 pounds
10. more than 56 pounds

60. Have you maintained the majority of this weight loss?

1. No
2. Yes

61. Have you ever weighed more than you currently weigh?

1. No (Skip to question #63)

If YES, please indicate how much more you used to weigh at your highest weight, than you weigh currently:

2. 1-5 pounds more
3. 6-10 pounds more
4. 11-15 pounds more
5. 16-20 pounds more
6. 21-25 pounds more
7. 26-35 pounds more
8. 36-45 pounds more
9. 46-55 pounds more
10. 56 pounds or more

62. How long ago were you at your highest past weight? (If you weighed this amount at different times in your life, how long ago since the most recent time you were at your highest weight?)

1. Less than 1 month ago
2. 1 to 3 months ago
3. 4 to 6 months ago
4. 7 to 11 months ago
5. 1 to 1-1/2 years ago
6. 1-1/2+ to 2 years ago
7. 2+ to 3 years ago
8. 3+ to 4 years ago
9. 4+ to 5 years ago
10. more than 5 years ago

63. How long have you been at your current weight (within 5 pounds)?

1. Less than 1 month
2. 1 to 3 months
3. 4 to 6 months
4. 7 to 11 months
5. 1 to 1-1/2 years
6. 1-1/2+ to 2 years
7. 2+ to 3 years
8. 3+ to 4 years
9. 4+ to 5 years
10. longer than 5 years

64. Have you ever had an eating disorder such as anorexia or bulimia?

1. No, never (Skip to question #68)
2. Yes, anorexia nervosa
3. Yes, bulimia
4. Yes, both anorexia and bulimia

65. For how long did you experience eating disorder symptoms (behaviors, thoughts, and feelings)? Include current symptoms in your response. If you have had more than one episode of an eating disorder, indicate the total time you experienced symptoms.

1. Less than 6 months
2. 6 months to 1 year
3. 1+ to 2 years
4. 2+ to 3 years
5. 3+ to 4 years
6. 4+ to 5 years
7. 5+ to 6 years
8. 6+ to 7 years
9. 7+ to 8 years
10. longer than 8 years

66. Do you currently have an eating disorder?

1. No
2. Yes, anorexia nervosa
3. Yes, bulimia

67. Do you consider yourself to be fully recovered from your eating disorder?

1. No
2. Yes

68. Have you ever, not by your choice, consistently experienced hunger that was not able to be adequately satisfied, for a period of two months or longer?

1. No
2. Yes

69. As a child, in your home, were you allowed to eat whatever, whenever, and as much (or as little) as you wanted?

1. No
2. Yes

70. Are you hungry right now?

1. No
2. Yes
3. Don't know

71. What time is it now?

1. 9:00 to 9:59 AM
2. 10:00 to 10:59 AM
3. 11:00 to 11:59 AM
4. 12:00 to 12:59 PM
5. 1:00 to 1:59 PM
6. 2:00 to 2:59 PM
7. 3:00 to 3:59 PM
8. 4:00 to 4:59 PM
9. 5:00 to 5:59 PM
10. 6:00 PM or later

72. When, approximately, did you eat last?

1. 1 hour ago
2. 2 hours ago
3. 3 hours ago
4. 4 hours ago
5. 5 hours ago
6. 6 hours ago
7. 7 hours ago
8. 8 hours ago
9. 9 hours ago
10. 10 or more hours ago

Before you turn in your questionnaires and answer-sheets, please double-check again that your student ID number is correct and complete on ALL EIGHT (8) scantron sheets. This is very important to keep all your data together! Please also check that you completed all questionnaires and all items in their correct rows on the scantron sheets. THANK YOU AGAIN FOR YOUR CONSCIENTIOUS PARTICIPATION!

WEIGHT HISTORY

Please write directly on this page and turn it in to the moderator.

1. Student ID Number (8 digits): A _____

2. What was your highest past weight, excluding pregnancy?

   _____ pounds

3. What was your lowest past weight as an adult (age 18 or older?)

   _____ pounds

4. What is your current weight?

   _____ pounds

5. What is your height without shoes?

   _____ feet _____ inches

THANK YOU AGAIN FOR YOUR PARTICIPATION!

(Office use: Large red scantron essay boxes)

RESULTS

If you wish to receive additional information about the purpose and results of this study, please print your name and CAMPUS (or permanent) address on the lines below, and a brief summary will be mailed to you when the results are available.

Name: _____

Campus Address (residence or work) for **1994-95** school year:

_____

OR

Permanent Address (include zip code):

_____

FOLLOW-UP PARTICIPATION

If you would be willing to participate in follow-up research at a later date, which may include an interview or other methods, please complete the following information below. Please include <u>both</u> a local and a permanent address and phone! (Expressing interest at this time does **NOT** obligate you to participate in the future.)

Name: _____

Student ID Number (8 digits): A _____

Local Address (include zip code):

_____

Local Phone Number: _____

Permanent Address (include zip code):

_____

Permanent Phone Number (include area code): _____

_____

APPENDIX C

Questionnaire Items

Questionnaire Items

Demographics:

1. Age
2. Gender
3. Current marital status
4. Education
5. Ethnic background
6. Under a physician's care for high blood pressure, diabetes, or hypoglycemia?
7. On a special medically-prescribed diet or eating plan for a medical condition?
8. Currently being treated for an eating disorder, such as anorexia nervosa or bulimia?
9. Ever had an eating disorder such as anorexia or bulimia?
10. Currently smoke cigarettes?
11. Currently taking any medications that affect your weight?
12. Height
13. Current weight
14. How long have you been at your current weight?
15. Highest past weight excluding pregnancy
16. Lowest weight as an adult
17. Have you ever dieted before to lose weight?
18. How many times have you dieted?

19. Total time spent dieting
20. Have you ever changed your eating or exercise patterns in order to lose weight?
21. Are you currently dieting to lose weight?
22. Are you currently trying to lose weight?
23. What is the most weight you've ever lost?
24. Did you lose this weight intentionally?
25. If you were once overweight, have you been able to maintain a weight loss?
26. Are you currently maintaining a weight loss (lower weight)?
27. How much did you lose?
28. How long have you maintained this loss?
29. Age at which weight or eating problems began (if any)
30. Do you consider yourself to be overweight?
31. How much would you like to weigh?

Restrained Eating:

1. When I have put on weight, I eat less than I usually do.
2. I try to eat less at mealtimes than I would like to eat.
3. I refuse food or drink offered because I am concerned about my weight.
4. I watch exactly what I eat.
5. I deliberately eat foods that are slimming.
6. When I have eaten too much, I deliberately eat less than usual the following day.

7. I deliberately eat less in order not to become heavier.

8. I try not to eat between meals because I am watching my weight.

9. In the evenings, I try not to eat because I am watching my weight.

10. I take into account my weight with what I eat.

Emotional Eating:

1. I eat when I am irritated.

2. I eat when I have nothing to do.

3. I eat when I am depressed or discouraged.

4. I eat when I am feeling lonely.

5. I eat when somebody lets me down.

6. I eat when I am angry

7. I eat when I am expecting something unpleasant to happen.

8. I eat when I am anxious, worried, or tense.

9. I eat when things are going against me or when things have gone wrong.

10. I eat when I am frightened.

11. I eat when I am disappointed.

12. I eat when I am emotionally upset.

13. I eat when I am bored or restless.

External Eating:

1. If food tastes good, I eat more than usual.

2. If food smells and looks good, I eat more than usual.

3. If I see or smell something delicious, I find it difficult to keep from eating, even if I have just finished a meal.
4. If I have something delicious to eat, I eat it right away.
5. If I walk past a bakery, I have a desire to buy something delicious.
6. If I see others eating, I also have the desire to eat.
7. I can't resist eating delicious foods.
8. I eat more than usual when I see others eating.
9. When preparing a meal, I am inclined to eat something.
10. If I walk past a snack-bar or cafe, I find it difficult to keep from buying and eating something.

Eating Attitudes Test (EAT-26):

1. I am terrified about being overweight.
2. I avoid eating when I am hungry.
3. I find myself preoccupied with food.
4. I have gone on eating binges where I feel that I may not be able to stop.
5. I cut my food into small pieces.
6. I am aware of the calorie content of foods that I eat.
7. I particularly avoid foods with a high carbohydrate content (e.g., bread, rice, potatoes, etc.).
8. I feel that others would prefer if I ate more.
9. I vomit after I have eaten.
10. I feel extremely guilty after eating.

11. I am preoccupied with a desire to be thinner.

12. I think about burning up calories when I exercise.

13. Other people think that I am too thin.

14. I am preoccupied with the thought of having fat on my body.

15. I take longer than others to eat my meals.

16. I avoid foods with sugar in them.

17. I eat diet foods.

18. I feel that food controls my life.

19. I display self-control around food.

20. I feel that others pressure me to eat.

21. I give too much time and thought to food.

22. I feel uncomfortable after eating sweets.

23. I engage in dieting behavior.

24. I like my stomach to be empty.

25. I enjoy trying new rich foods.

26. I have the impulse to vomit after meals.

Body-Responsive Eating:

1. I eat when I am hungry.

2. I eat when I'm hungry, regardless of the time of day.

3. I eat when I'm hungry, regardless of the amount of time that has elapsed since I last ate.

4. When I realize I am hungry, I try to eat right away.

5. When I realize I am hungry, I eat soon thereafter.

6. I eat when I'm hungry, even if others around me aren't eating.

7. I keep food available where I live so I can eat when I get hungry.

8. I keep food available at work or school so I can eat when I get hungry.

9. I don't mind being the only person in a group eating, if I'm hungry.

10. I carry food with me so I can eat when I get hungry.

11. I stop eating when my body has had enough food.

12. I have second helpings if I'm still hungry.

13. I leave food on my plate if I've had enough to eat.

14. I eat what my body wants to eat.

15. I eat what my body is craving even if other people think it's strange.

16. I eat what my body wants even if others think it is unhealthy.

17. I eat foods I love.

18. I eat foods I don't particularly like.

19. I keep eating until I'm comfortably full.

20. I stop eating even though I'm still hungry.

21. I eat what my body seems to be wanting, regardless of the time of day.

22. I can tell when my body has had enough food.

23. When at a social, school, or work function where food is served, I eat only if I'm really hungry.

24. I don't feel hungry because I eat <u>before</u> I get hungry.

25. I eat beyond the point of satiety or physical comfort.

26. I feel uncomfortably full after eating.

27. I eat more than my body needs.

28. I eat less than my body needs.

29. I overeat at meals or between meals.

30. I keep food accessible throughout the day so I can eat when I get hungry.

31. If I have a craving for a particular food, I will go out of my way to obtain that food.

32. I eat until I feel that I would be sick if I ate any more.

33. I eat until I feel uncomfortably full.

34. I eat foods that look good to me.

Conventional Eating:

1. I eat three meals a day.

2. I eat at regular mealtimes.

3. I eat normal-sized portions.

4. I eat food that is appropriate or common for the time of day (e.g., "breakfast food" in the morning, etc.).

5. I eat balanced meals (e.g., protein, vegetable, carbohydrate, etc.).

6. I eat because it's time to eat.

7. I eat because it's time to eat, even if I'm not really hungry.

8. I eat when others are eating.

9. I eat when others are eating, even if I'm not really hungry.

10. I eat because others are eating also.

11. I allow myself to eat certain between-meal snacks at scheduled times.

12. I eat at the same time each day.

13. The portions of food that I eat are appropriate or common for that food.
14. I try to eat well-balanced meals.
15. I eat breakfast everyday because it's said to be the most important meal of the day.
16. I skip meals.
17. I finish what is on my plate.
18. I like to eat on a regular schedule.

Constrained Eating:

1. I eat lunch and snacks during allotted break times at work or school.
2. When I eat is constrained by my school or work schedule.
3. When I eat is determined by my living situation (e.g., dorm, fraternity, family, etc.).
4. I eat breakfast or lunch when I can so I won't get hungry later at a time when I can't eat.
5. What I eat is constrained by my living situation (e.g., family meals, dormitory, etc.).
6. My eating is constrained by religious beliefs and/or holidays.
7. My eating is motivated by a feeling that, if I don't eat it now, the food will be eaten by someone else (e.g., my roommate, family member, etc.).
8. What I eat is limited by what I can afford.
9. How much I eat is limited by how much food is available.
10. How much I eat is determined by what I can afford.

11. What I eat is limited by how much time I have to prepare a meal.

12. How much I eat is limited by how much time I have in which to eat.

13. I don't have time to eat.

14. Money contraints keep me from eating the foods I really want.

15. Work or school interferes with being able to eat when I would like to.

16. My living situation (e.g., dorm, fraternity, family) restricts me from eating any time I want to.

Healthy Eating:

1. I choose foods that are healthy for me.

2. I choose foods that are considered healthy.

3. I avoid foods that are unhealthy.

4. I eat moderate amounts of food in order to be healthy.

5. I avoid foods with high fat content because they're unhealthy for me.

6. If I eat unhealthy foods, I only eat them in small amounts.

7. I avoid sugar because it's bad for me.

8. I consider myself a healthy eater.

9. I am concerned about how healthy my diet is.

10. I am aware of the health value or risks of different foods.

11. I try to eat healthy foods so I will be in good shape.

12. I intentionally eat foods high in nutritional value.

13. I limit my intake of foods that are not high in nutritional value.

14. I eat healthy foods because I want to be healthy.

15. When I grocery shop, the first thing I do is look at the labels to determine if a food is good for me or not.

Emotional Interoceptive Awareness:

1. I get frightened when my feelings are too strong.
2. I get confused about what emotion I am feeling.
3. I can clearly identify what emotion I am feeling.
4. I don't know what's going on inside me.
5. I worry that my feelings will get out of control.
6. When I am upset, I don't know if I am sad, frightened, or angry.
7. I have feelings I can't quite identify.
8. When I am upset, I worry that I will start eating.

Body Awareness:

1. I get confused as to whether or not I am hungry.
2. I know when I'm hungry.
3. I know when I've had enough to eat.
4. My body tells me what it wants to eat.
5. I know when I'm getting sick.
6. I know when I am sick.
7. I am aware of physical symptoms if I don't take care of myself.
8. I know when my body needs fluids.
9. I know when I need more or less sleep than I've been getting.
10. I can distinguish hunger from other bodily sensations.
11. I can distinguish hunger from emotions or feelings.

12. I am aware of sexual feelings in my body.

13. I know when my body needs sexual stimulation or release.

14. I get specific food cravings.

15. I can tell how much food my body needs to eat.

16. I know when to stop eating so I won't feel too full.

17. I am aware of physical symptoms or sensations when I eat something that doesn't agree with me.

18. When I hurt myself physically, I feel pain.

19. I seem to be numb to sensations of pain.

20. I am unaffected by extreme temperatures inside or outdoors.

21. My body sends me messages about what it wants or needs to eat.

22. I am unaware of sensations in my body.

23. I am afraid to allow myself to feel hungry.

24. I feel very uncomfortable when I've eaten too much.

25. I can tell when I'm coming down with a cold or other illness.

26. When I am under stress, my body feels very tense.

<u>Body Responsiveness</u>:

1. At night, I go to sleep when I am tired.

2. I take time out for myself when I feel under stress.

3. I stay home and rest when I am sick.

4. I go to the doctor when I am sick and do not seem to be getting better after several days.

5. I have sexual contact or masturbate when I am feeling sexually aroused.
6. I dress to be comfortably warm or cool, depending on the weather.
7. I rest when I feel tired.
8. I push myself to the point of exhaustion.
9. I get sick often because I don't take good care of myself.
10. I continue with my daily activities even when I am sick and feel awful.
11. I ignore my sexual feelings and desires.
12. I put other commitments (e.g., school, work, friends) before my health.
13. I try to take care of myself physically.
14. I try to tune out my body.
15. When my body feels sick or hurts, I try to ignore it.

Self-Esteem:

1. I feel that I'm a person of worth, at least on an equal basis with others.
2. I feel that I have a number of good qualities.
3. All in all, I am inclined to feel that I am a failure.
4. I am able to do things as well as most people.
5. I feel I do not have much to be proud of.
6. I take a positive attitude toward myself.
7. On the whole, I am satisfied with myself.
8. I wish I could have more respect for myself.
9. I certainly feel useless at times.
10. At times I think I am no good at all.

Internal Exercise Motivation:

1. I exercise because I enjoy it.
2. I exercise when I feel like it.
3. I exercise when my body is rested and well.
4. I exercise when my body feels like moving.
5. I only exercise if I feel like it.
6. Exercise is fun for me.
7. Exercise relaxes me.
8. I exercise because it makes my body feel good.
9. I exercise when I have an abundance of energy.
10. Exercise is a way for me to take care of myself.
11. I enjoy exercising while I'm doing it.
12. My body feels good while I'm exercising.
13. I exercise because it makes me feel good.
14. I exercise because it gives me more energy.
15. The length of time I spend exercising is dependent on how fatigued my body is feeling.
16. The intensity with which I exercise is dependent on how my body is feeling.
17. How often I exercise depends on how I'm feeling.
18. When my body feels tired, I do not push myself by trying to exercise.
19. I exercise because it makes my body feel good.
20. When exercising, I will slow my pace or stop if my body feels very tired.

21. When exercising, I will slow my pace or stop if my body begins to hurt.

External Exercise Motivation:

1. I exercise to stay in shape.
2. I exercise to look better.
3. I exercise to lose weight.
4. I force myself to exercise regularly.
5. I exercise to maintain my weight.
6. I exercise to prevent gaining weight.
7. I exercise because I'm supposed to.
8. I exercise even if I'm really tired.
9. I exercise even if I'm feeling sick.
10. I exercise regularly regardless of how my body feels.
11. I exercise when I've eaten too much to prevent weight gain.
12. I exercise even though I don't really like it.
13. I feel guilty when I don't exercise regularly.
14. My body hurts while I'm exercising, but I make myself do it anyway.
15. Exercise is painful for me.
16. I exercise because I feel fat.
17. I exercise to look good for my boyfriend/girlfriend.
18. I exercise to lose weight for an upcoming occasion.
19. I exercise to burn calories.
20. I exercise to counteract overeating.
21. I exercise to keep from getting fat.

22. I exercise more when I have eaten more.

Medical History:

1. Do you use tobacco, and how much per day?

2. Have you ever had:

   anemia, bleeding problems, blood clots, diatetes, hypoglycemia, glaucoma, cataracts, cancer, arthritis, tuberculosis, thyroid problems, heart problems, heart attack, stroke, asthma, pacemaker, high blood pressure, high cholesterol, hepatitis, liver problems/jaundice, kidney problems, blood transfusions, stomach ulcers, intestinal disorder, epilepsy, nervous breakdown, back problems, allergies, sinus trouble, fainting spells

3. Are you currently taking:

   vitamins, laxatives, hormones, heart medicine, stomach medicine, pain medicine, antidepressant, antianxiety drug, cold medicine, thyroid, cortisone, barbituates, sleeping pills, diet pills

APPENDIX D

Overhead Instructions

COLLEGE LIFESTYLE STUDY

#146

- X-out #3 on small brown scantron. There is no question #3.

- Please sit every other seat.

- Use pencil and please fill in bubbles darkly and completely.

- Pencils available for LOAN, and pencil sharpener at front of room.

- Write you Student Number on all 8 scantron sheets--NO NAMES.

- Please keep the content of this study CONFIDENTIAL.

- If you make a mistake, erase completely or ask for another scantron sheet.

- Feel free to take breaks if needed.

-You must initial or sign your name on the sign-up sheet before leaving.

QUESTIONS: PLEASE CALL LAURIE FRIEDMAN, M.A. 332-0256

PLEASE CHECK YOUR SCANTRONS!

small green:	**10 items**
small red:	**40 items**
small blue:	**41 items**
small brown:	**85 items (no #3)**
large brown:	**79 items**
large green	**85 items**
large red	**117 items**

Last Questionnaire:

large blue	**72 items**

You may be asked to skip some questions. Please read CAREFULLY! Thank you!

APPENDIX E

Summary of Results

COLLEGE LIFESTYLE STUDY RESULTS

Thank you for your participation and/or interest in the "College Lifestyle Study," sponsored by the Psychology Department at Michigan State University in the Spring and Summer of 1994. The real title of this project was "Toward a Classification and Understanding of 'Normal' Eating Styles." As you requested, the following is a summary of the study and its results. If you have any further questions or comments, please feel free to call me. Thanks again for your participation in my dissertation research!

Laurie L. Friedman, Ph.D.
716-885-8268 (Buffalo, NY)

TOWARD A CLASSIFICATION AND UNDERSTANDING OF "NORMAL" EATING STYLES

In light of the lack of research and valid instrumentation on "normal eating," this study attempted to identify and classify one or more normal eating styles in a non-clinical population according to conscious motivational patterns, behaviors, and other variables. Participants were 723 male and female college students recruited from undergraduate psychology courses. Participants completed questionnaires measuring various motivational eating styles, and other variables such as exercise motivation, body awareness and responsiveness, emotional interoceptive awareness, self-esteem, body image, physical activity, medical history, dieting history, eating disorder symptoms, and self-reported height and weight. This study tested the hypothesis that there would be more than one type of normal eating style, i.e., that normal-weight individuals with no current eating disorder symptomotology would endorse a variety of eating styles. The Eating Style Inventory (ESI) resulted in four subscales, including body-responsive eating, healthy eating, constrained eating, and overeating. Participants scored relatively highly on the first two scales, suggesting that body-responsive and healthy eating may reflect "normal" eating in a college population. Weight status was predicted by body-responsive and constrained eating: Underweight individuals scored significantly higher on body-responsive eating and constrained eating, whereas overweight participants scored significantly lower on these subscales. Contrary to prediction, eating style was not related to dieting history or to exercise motivation. However, exercise motivation was significantly correlated to body awareness and responsiveness. Implications for obesity treatment, prevention, and health promotion are discussed.

APPENDIX F

Statistical Tables

Table 1

Exploratory Factor Analysis of Normal Eating Items

Items	1	2	3	4
Healthy eating (Factor 1)				
1. 113: I eat healthy foods because I want to be healthy.	.864	-.067	-.077	-.080
2. 39: I choose foods that are healthy for me.	.861	-.099	-.021	-.053
3. 62: I try to eat healthy foods so I will be in good shape.	.848	-.113	-.081	-.040
4. 92: I intentionally eat foods high in nutritional value.	.842	-.113	-.082	-.016
5. 4: I consciously choose foods that are considered healthy	.828	-.053	-.073	-.035
6. 52: I avoid foods that are unhealthy.	.827	-.076	-.195	-.089
7. 24: I consider myself a healthy eater.	.763	-.155	.038	-.032
8. 41: I limit my intake of foods that are not high in nutrition.	.741	-.050	-.157	.002
9. 9: I avoid foods with high fat content because they're un-	.739	-.002	-.248	-.029
10. 102: I try to eat foods that are rich in fiber because they	.736	-.036	-.068	-.036
11. 81: When I shop for groceries, the first thing I do is look	.732	.074	-.206	-.056
12. 109: I limit my intake of fat/cholesterol by eating fish	.730	-.027	-.156	-.015
13. 6: I try to eat well-balanced meals to ensure that I'm	.728	-.146	.097	-.042
14. 59: I typically eat balanced meals (e.g., protein,	.713	-.125	.116	-.041
15. 89: I am concerned about how healthy my diet is.	.669	.028	-.068	-.044
16. 70: If I eat unhealthy foods, I only eat them in small	.662	-.183	-.147	-.042
17. 55: I intentionally eat moderate amounts of food in order	.611	-.144	-.239	-.025
Overeating (Factor 2)				
1. 33: I overeat at meals or between meals.	-.157	.774	.107	.074
2. 58: I eat more than my body needs.	-.127	.764	.129	.022
3. 50: I knowingly eat more than my body needs at meals or	-.080	.761	.140	-.007
4. 63: I overeat at meals or between meals because I don't	-.057	.753	.117	.045
5. 12: I eat beyond the point of satiety or physical comfort.	-.114	.720	.086	.066
6. 79: I feel uncomfortably full after eating.	-.112	.709	.000	-.021
7. 43: I eat until I feel that I would be sick if I ate anymore.	-.166	.682	.097	.150
8. 67: I stop eating when my body has had enough food (R)	-.093	.646	-.186	-.050
9. 74: I eat until I feel uncomfortably full.	-.004	.555	.167	-.063
10. 98: I eat before I actually get hungry.	.002	.513	.092	.037
11. 85: I eat when others are eating, even if I'm not really	-.021	.505	.155	.105

Table 1 (cont'd)

Body-responsive eating (Factor 3)				
1. 14: I eat when I am hungry, regardless of the amount of	-.200	.149	.691	.138
2. 18: I eat what my body seems to be wanting, regardless	-.241	.154	.667	.107
3. 10: I eat when I'm hungry, regardless of the time of day.	-.157	.193	.661	.082
4. 64: I eat what my body wants to eat.	-.208	.014	.650	-.047
5. 47: I eat what my body is craving even if other people	-.105	-.003	.572	.032
6. 80: I eat foods I love.	-.169	-.028	.563	-.003
7. 108: I eat when I'm hungry, even if others around me	-.036	-.113	.559	-.024
8. 32: I have second helpings if I'm still hungry.	-.145	.157	.550	.040
9. 22: When I realize I'm hungry, I try to eat right away.	.031	.127	.549	.054
10. 73: When I realize I'm hungry, I eat soon thereafter.	.041	.039	.546	-.110
11. 19: I allow myself to eat certain snacks between meals.	-.097	.111	.530	.084
12. 16: I eat foods that look good to me.	-.181	.042	.501	.093
13. 1: I eat when I am hungry.	.085	.092	.496	-.081
14. 114: I enjoy eating.	.129	.173	.491	-.100
Constrained eating (Factor 4)				
1. 104: What I eat is limited by what I can afford.	-.144	.043	.039	.772
2. 88: How much I eat is determined by what I can afford.	-.098	-.005	.089	.725
3. 40: Money constraints keep me from eating the foods I	-.122	.037	-.003	.709
4. 69: I don't have time to eat.	-.065	.008	-.174	.611
5. 60: What I eat is limited by how much time I have to	.100	.023	.010	.568
6. 42: I eat on-the-run because I don't have time to sit down	-.019	.088	.066	.561
7. 25: How much I eat is limited by how much time I have in	.008	.022	.021	.558
8. 68: Work or school interferes with being able to eat when	-.053	.028	.035	.520
Eigenvalue	11.923	5.289	3.975	3.232
Percent of variance	23.8	10.6	8.0	6.5
Alpha coefficient	.96	.89	.86	.79

Table 2

Eating Style Interscale Correlation Matrix

	Overeating	Healthy	Body-responsive
Healthy	-.026		
Body-responsive	.024	-.265*	
Constrained	-.023	-.138*	.073

* p (2-tailed) <.001

Table 3

Exploratory Factor Analysis of Exercise Motivation Items

Items	1	2	3	4
Intrinsic rewards (Factor 1)				
1. 73: I exercise because it makes my body feel good.	.870	.122	.093	.158
2. 77: I exercise because it makes me feel good.	.858	.135	.138	.130
3. 71: I enjoy exercising while I'm doing it.	.822	.018	.026	.094
4. 18: Exercise is fun for me.	.819	.006	.195	-.003
5. 44: I exercise because it makes my body feel good.	.811	.177	.171	.126
6. 6: I exercise because I enjoy it.	.789	.026	.229	.039
7. 81: I exercise because it gives me more energy.	.736	.161	.139	.093
8. 66: Exercise relaxes me.	.724	.129	.007	.055
9. 20: I exercise to take care of myself.	.718	.128	.224	.160
10. 26: My body feels good while I'm exercising.	.717	.104	.064	.172
Wt. control (Factor 2)				
1. 40: I exercise to lose weight.	.046	.907	-.001	.059
2. 22: I exercise to keep from getting fat.	.127	.894	.022	.069
3. 14: I exercise because I feel fat.	-.089	.844	.100	.022
4. 10: I exercise to prevent gaining weight.	.240	.840	.100	.022
5. 67: I exercise when I've eaten too much, to prevent	.128	.819	.128	.004
6. 32: I exercise to burn calories.	.209	.787	.049	.111
7. 8: I exercise to lose weight for special upcoming	.005	.785	.060	.045
8. 84: I exercise to counteract overeating.	.011	.729	.156	-.009
9. 16: I exercise when I have eaten more.	.138	.678	.208	.130
10. 48: I exercise to maintain my weight.	.248	.672	.105	.121
Body unresponsive exercise (Factor 3)				
1. 28: When my body feels tired, I push myself by	.309	.138	.772	-.071
2. 52: My body hurts while I'm exercising, but I make myself	.048	.162	.768	.052
3. 34: I make myself exercise even if I'm really tired.	.317	.182	.738	-.175
4. 58: I exercise even if I'm feeling sick.	.233	.079	.712	-.182

Table 3 (cont'd)

Body-dependent exercise (Factor 4)				
1. 38: The length of time I spend exercising is dependent	.065	.055	-.125	.725
2. 31: The intensity with which I exercise is dependent on	.230	.105	.002	.681
3. 21: I exercise when I feel like it.	.190	.003	.026	.655
4. 4: How often I exercise depends on how I'm feeling.	-.083	.146	-.139	.653
5. 54: I exercise when my body feels like moving.	.253	.073	-.029	.560
Eigenvalue	9.449	5.031	2.765	1.323
Percent of variance	32.6	17.3	9.5	4.6
Alpha coefficient	.94	.94	.82	.71

Table 4

Exercise Motivation Interscale Correlation Matrix

	Intrinsic	Wt. control	Body unresponsive
Wt. control	.275*		
Body unresponsive	.429*	.287*	
Body-dependent	.306*	.213*	-.102*

* p (2-tailed) $\leq$.008

Table 5

Exploratory Factor Analysis of Body Awareness/Responsiveness Items

Items	1	2	3	4	5
Hunger/comfort (Factor 1)					
1. 85: I know when I've had enough to eat.	.767	.131	-.086	.023	.044
2. 30: I know when to stop eating so I won't feel too	.714	.039	-.026	-.022	.069
3. 15: I can tell when my body has had enough food	.695	.155	.087	.108	.100
4. 63: I know when I'm hungry.	.651	.203	.136	.145	.056
5. 68: I can distinguish hunger from other bodily	.642	.264	.021	.085	-.058
6. 41: I can tell how much food my body needs to	.622	.017	.049	.018	.334
7. 7: I can distinguish hunger from emotions or	.582	.221	.045	.090	-.192
8. 59: I get confused as to whether I'm hungry (R)	.575	.048	.126	.186	-.162
Symptoms (Factor 2)					
1. 78: I can tell when I'm coming down with a cold	.144	.785	.096	.089	.082
2. 33: I know when I'm getting sick.	.145	.767	.133	.024	.068
3. 53: I know when I am sick.	.225	.757	.224	.090	.064
4. 3: I am aware of physical symptoms if I don't	.026	.642	.173	.091	.085
5. 82: I know when I need more or less sleep than	.223	.565	-.006	.146	.066
6. 5: I am aware of physical symptoms or	.204	.504	.098	.128	.213
Self-care (Factor 3)					
1. 43: I continue with my daily activities even (R)	-.058	-.042	.699	.058	.018
2. 19: When my body feels sick or hurts, I try to (R)	.002	.070	.670	-.001	-.074
3. 2: I stay home and rest when I'm sick.	-.008	.267	.627	-.012	.099
4. 49: I push myself to the point of exhaustion (R).	.062	-.024	.573	-.063	-.142
5. 36: At night, I go to sleep when I am tired.	.196	.140	.522	.024	.090
6. 25: I rest when I feel tired.	.171	.164	.498	.102	.070
7. 70: I take time out for myself when I feel under	.083	.174	.458	.155	.162
Sexual awareness (Factor 4)					
1. 57: I ignore my sexual feelings and desires (R).	.047	.023	.122	.766	-.020
2. 80: I have sexual contact or masturbate when I	.030	.069	.015	.753	.093
3. 55: I know when my body needs sexual	.188	.199	.013	.721	.194
4. 23: I am aware of sexual feelings in my body.	.227	.225	.023	.655	.131

Table 5 (cont'd)

Cravings (Factor 5)					
1. 39: My body tells me what it wants to eat.	.116	.147	.036	.080	.820
2. 47: My body sends me messages about what it	.097	.143	.060	.084	.803
3. 65: I get specific food cravings.	-.151	.114	.007	.153	.603
Eigenvalue	6.328	2.452	2.215	1.687	1.503
Percent variance	22.6	8.8	7.5	6.0	5.4
Alpha coefficient	.84	.81	.70	.75	.71

Table 6

Body Awareness/Responsiveness Interscale Correlation Matrix

	Full scale	Hunger	Symptoms	Self-care	Sexual
Hunger	.732l				
Symptoms	.769*	.441*			
Self-care	.618*	.218*	.348*		
Sexual	.588*	.284*	.338*	.162*	
Cravings	.430*	.120*	.306*	.108	.258*

* p (2-tailed) ≤.002

Table 7

Means and Standard Deviations of Body-Responsive Eating by Weight/Dieting Group

Group	n	Mean	SD
Above-average weight			
Never dieted	24	3.42	.54
Previously dieted	23	3.56	.53
Currently dieting	36	3.46	.39
Eating disordered	11	3.35	.34
Average weight			
Never dieted	155	3.52	.47
Previously dieted	117	3.56	.47
Currently dieting	146	3.52	.49
Eating disordered	61	3.51	.51
Below-average weight			
Never dieted	26	3.73	.52
Previously dieted	16	3.65	.59
Currently dieting	21	3.45	.38
Eating disordered	8	3.82	.56
Total	644	3.53	.48

Table 8

Means and Standard Deviations of Eating Scales for Average Weight, Never Dieted Participants*

Subscale	Mean	SD
Body-responsive	3.51	.47
Healthy eating	3.23	.74
External eating	3.05	.52
Restrained eating	2.81	.85
Constrained eating	2.81	.59
Emotional eating	2.44	.64
Overeating	2.40	.66

* n=147

Table 9

Frequencies of Participants Classified into Weight and Dieting Status Groups

Group	n
Above-average weight	
Never dieted	26
Previously dieted	24
Currently dieting	38
Eating disordered	11
Average weight	
Never dieted	158
Previously dieted	123
Currently dieting	147
Eating disordered	66
Below-average weight	
Never dieted	26
Previously dieted	17
Currently dieting	21
Eating disordered	8
Total	665

Table 10

Means and Standard Deviations of Eating Scales for Above-Average Weight, Never Dieted Participants*

Subscale	Mean	SD
Body-responsive	3.44	.55
Healthy eating	3.02	.52
External eating	2.81	.49
Constrained eating	2.70	.63
Restrained eating	2.49	.98
Emotional eating	2.33	.87
Overeating	2.27	.49

* n=23

Table 11

Means and Standard Deviations of Eating Scales in Average Weight and Below-Average Weight Participants

Subscale	Average Weight (n=520)		Below-Average (n=72)	
	Mean	SD	Mean	SD
Body-responsive	3.52*	.49	3.65*	.52
Healthy eating	3.24	.77	3.12	.81
External eating	3.00	.56	3.02	.53
Constrained eating	2.83	.60	2.89	.64
Restrained eating	2.76	.84	2.82	.70
Emotional eating	2.42	.72	2.40	.77
Overeating	2.41	.60	2.48	.70

* Significantly different at $p<.05$

Table 12

Means and Standard Deviations of Body-Responsive Eating

Group	n	Mean	SD
Average weight, never dieted	155	3.52	.47
Below-average weight, never dieted	26	3.73	.52

Table 13

Means and Standard Deviations of Restraint and Overeating Scales in Average Weight and Below-Average Weight Eating Disordered Participants

Subscale	Average Weight (n=66)		Below-Average (n=8)	
	Mean	SD	Mean	SD
External eating	2.93	.57	2.96	.51
Restrained eating	2.70	.74	2.65	.73
Emotional eating	2.45	.79	2.32	.91
Overeating	2.43	.62	2.74	.44

Table 14

Means and Standard Deviations of Eating Scales for Average Weight, Previously Dieted Participants*

Subscale	Mean	SD
Body-responsive	3.56	.47
Healthy eating	3.15	.81
External eating	2.95	.59
Constrained eating	2.87	.58
Restrained eating	2.73	.87
Overeating	2.40	.56
Emotional eating	2.33	.79

* n=112

Table 15

Means and Standard Deviations of Eating Scales for Above-Average Weight, Previously Dieted Participants*

Subscale	Mean	SD
Body-responsive	3.57	.54
Healthy eating	3.35	.84
External eating	2.81	.54
Emotional eating	2.58	.84
Restrained eating	2.55	.73
Constrained eating	2.47	.56
Overeating	2.39	.56

* n=21

Table 16

Means and Standard Deviations of Eating Scales for Average Weight, Currently Dieting Participants*

Subscale	Mean	SD
Body-responsive	3.50	.48
Healthy eating	3.27	.75
External eating	2.99	.60
Constrained eating	2.86	.67
Emotional eating	2.46	.70
Restrained eating	2.81	.88
Overeating	2.40	.57

* n=137

Table 17

Means and Standard Deviations of Eating Scales for Above-Average Weight, Currently Dieting Participants*

Subscale	Mean	SD
Body-responsive	3.47	.40
Healthy eating	3.13	.68
Restrained eating	2.81	.69
External eating	2.80	.42
Constrained eating	2.63	.51
Overeating	2.39	.56
Emotional eating	2.37	.64

* n=35

Table 18

Means and Standard Deviations of Eating Scales for Average Weight, Eating Disordered Participants*

Subscale	Mean	SD
Body-responsive	3.52	.51
Healthy eating	3.37	.79
External eating	2.96	.57
Restrained eating	2.73	.73
Constrained eating	2.70	.56
Emotional eating	2.46	.82
Overeating	2.44	.63

* n=60

Table 19

Means and Standard Deviations of Eating Scales for Above-Average Weight, Eating Disordered Participants*

Subscale	Mean	SD
Body-responsive	3.35	.34
External eating	3.26	.76
Healthy eating	3.12	.53
Constrained eating	2.80	.47
Overeating	2.66	.81
Restrained eating	2.51	.76
Emotional eating	2.41	.57

* n=11

Table 20

Means and Standard Deviations of Restraint and Overeating Scales in Above-Average and Average Weight Eating Disordered Participants

Subscale	Above Average (n=65)		Average Weight (n=11)	
	Mean	SD	Mean	SD
External eating	3.26	.76	2.93	.57
Overeating	2.66	.81	2.43	.62
Restrained eating	2.51	.76	2.70	.74
Emotional eating	2.41	.57	2.45	.79

Table 21

Planned Contrasts between Above-Average versus Average Weight Eating Disordered Participants on Restraint and Overeating Scales

Subscale	Value	df	S. Error	*t* Value
External eating	.33	642	.18	1.85
Overeating	.23	632	.20	1.15
Restrained eating	-.20	642	.27	-.73
Emotional eating	-.04	642	.24	-.16

Table 22

Means and Standard Deviations of Body-Responsive Eating by Dieting Status Group

Group	n	Mean	SD
Never dieted	206	3.54	.49
Previously dieted	158	3.56	.50
Currently dieting	205	3.50	.47
Eating disorder symptoms	80	3.52	.51
Total	649	3.53	.49

Table 23

Means and Standard Deviations of Eating Scales for Average Weight, Previously Dieted Participants*

Subscale	Mean	SD
Body-responsive	3.56	.47
Healthy eating	3.15	.81
External eating	2.95	.59
Constrained eating	2.87	.58
Restrained eating	2.73	.87
Overeating	2.40	.56
Emotional eating	2.33	.77

* n=112

Table 24

Means and Standard Deviations of Eating Scales for Average Weight, Currently Dieting Weight Loss Maintainers*

Subscale	Mean	SD
Body-responsive	3.60	.51
Healthy eating	3.26	.80
Restrained eating	2.94	.77
Constrained eating	2.89	.64
External eating	2.78	.52
Overeating	2.49	.54
Emotional eating	2.20	.65

* n=34

Table 25

Means and Standard Deviations of Body-Responsive Eating by Sex

Group	n	Mean	SD
Males	239	3.51	.50
Females	459	3.53	.48
Total	698	3.52	.49

Table 26

Scale Correlations with Body-Responsive Eating

Scale	r	n
Emotional interoceptive awareness	.028	686
Body awareness/responsiveness	.013	646
Self-esteem	-.044	691
Body image	-.007	699
Intrinsic rewards exercise	-.005	646
Body-dependent exercise	.024	646
Medical symptoms	-.031	697
Medical conditions (history)	-.045	697

Table 27

Means and Standard Deviations of Body-Responsive Eating by Weight Status

Group	n	Mean	SD
Above-average weight	103	3.45	.45
Average weight	520	3.52	.52
Below-average weight	73	3.65	.52
Total	696	3.52	.49

Table 28

Means and Standard Deviations of Constrained Eating by Weight Status

Group	n	Mean	SD
Above-average weight	103	2.65	.53
Average weight	520	2.83	.60
Below-average weight	73	2.89	.64
Total	696	2.81	.60

Table 29

Means and Standard Deviations of Weight Control Exercise, Physical Activity, and Eating Disorder Symptomotology by Sex

Subscale	Males		Females	
	Mean	SD	Mean	SD
Weight control exercise	2.91[1]	.94	3.05[2]	.95
Physical activity (METs)	70.06[3]	49.93	43.98[4]	34.20
Eating Attitudes Test	5.15[5]	5.31	11.04[6]	9.33

[1] n=228, [2] n=442

[3] n=239, [4] n=471

[5] n=243, [5] n=478

Table 30

Means and Standard Deviations of Sexual Awareness/Responsiveness by Dieting Status Group

Group	n	Mean*	SD
Never dieted	200	3.75	.70
Previously dieted	151	3.78	.67
Currently dieting	193	3.79	.70
Eating disorder symptoms	79	3.68	.67
Total	623	3.76	.69

*weighted

Table 31

Means and Standard Deviations of Self-Esteem by Dieting Status Group in Average Weight Participants

Group	n	Mean	SD
Never dieted	156	4.07	.63
Previously dieted	122	4.01	.69
Currently dieting	147	3.88	.74
Eating disorder symptoms	66	4.13	.62
Total	491	4.01	.68

Table 32

Means and Standard Deviations of Eating Style, Exercise Motivation, and Body Awareness/Responsiveness in the Entire Sample

Subscale	n	Mean	SD
Body-responsive eating	701	3.52	.49
Healthy eating	701	3.22	.76
External eating	711	2.98	.55
Constrained eating	701	2.80	.60
Restrained eating	711	2.74	.82
Overeating	701	2.42	.60
Emotional eating	711	2.42	.72
Body-dependent exercise	671	3.55	.57
Intrinsic rewards exercise	671	3.53	.76
Weight control exercise	671	3.00	.95
Body unresponsive exercise	671	2.51	.71
Symptom awareness	671	3.88	.56
Hunger/fullness awareness	671	3.78	.55
Sexual awareness/responsiveness	671	3.76	.68
Food craving awareness	670	3.37	.62
Self-care	671	3.34	.53
Body responsiveness full scale	671	3.65	.38

Table 33

Frequencies of Males and Females Classified into Dieting Status Groups

Group	Males	Females
Never dieted	134	77
Previously dieted	42	123
Currently dieting	39	169
Eating disordered	6	79
Total	221	448

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