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Reducing Maladaptive Weight Management Practices: Developing a Psychoeducational Intervention Program

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Reducing Maladaptive Weight Management Practices: Developing a Psychoeducational Intervention Program

BY

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of

DOCTOR OF PHILOSOPHY

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Abstract

Although the total number of persons who develop anorexia and bulimia nervosa (DSM-IV diagnosable eating disorders) is small, the number of individuals with sub-clinical levels of eating pathology is considerably larger. Among specific populations, such as women attending university, levels of maladaptive weight control behaviors are extremely high, and represent a significant public health issue. Extant research has addressed the issues of behavior change and eating disorder prevention among adolescents and young women, both by targeting persons considered "at risk" for developing an eating disorder based on various predetermined criteria, and also by focusing on more general populations. Unfortunately, methodological flaws including a lack of randomized controlled trials and poor, even unrelated, outcome measures, have reduced the clarity and utility of a large proportion of the research in this area. The current study was designed to evaluate: (a) whether an 8-week, purely psychoeducational (didactic) intervention can reduce maladaptive weight-management practices in university women with sub-clinical levels of eating pathology; and (b) whether participation in the intervention reduces the risk of developing more severe eating pathology across time, measured at 3 and 6-month follow-up. Dependent measures included both self-monitoring data (daily meal records; daily exercise records), as well as various psychometric measures. Participants were 24 females attending a Canadian university, randomly assigned to an experimental (EX) group, which received the psychoeducational intervention (n = 13) or a wait-list control (WLC) group (n = 11). Pre-post intervention data were analyzed using a doubly-multivariate repeated measures analysis of variance. Statistically significant changes in eating pathology, as measured by psychometric

instruments (EAT-26; BULIT-R; Forbidden Food Survey) were observed, as were changes in body image (measured using the Body Shape Questionnaire); additional significant between-group differences in eating behavior, as measured by daily meal records, were observed. In each of these cases, participants in the EX group evidenced improvements in scores which were significantly different from those observed in the WLC group. Attrition limited the utility of follow up data, and therefore, between-groups analysis of these data was not deemed appropriate. However, the results of intent-to-treat analyses suggest that treatment gains were generally maintained at follow up.

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Reducing Maladaptive Weight Management Practices: Developing a Psychoeducational Intervention Program

Eating disorders, particularly anorexia nervosa, bulimia nervosa, and binge-eating disorder, are highly publicized and serious psychological disturbances. While eating disorders do occur in males, their prevalence is unequally dispersed across genders, with considerably higher rates occurring in women; current estimates suggest a 10:1 female-to-male gender ratio for eating disorder development (Woodside et al., 2001). Among the general population, the actual percentage of women who develop clinically diagnosable eating disorders is quite small (0.5%-1% for anorexia nervosa, 1%-3% for bulimia nervosa, Diagnostic and Statistical Manual of Mental Disorders 4th Edition [DSM-IV] 1994; 3% for binge eating disorder, van Hoeken, Lucas, & Hoek, 1998). However, the number of women presenting with sub-clinical levels of eating pathology is considerably higher (e.g., Schwitzer, Bergholz, Dore, & Salimi, 1998). Garfinkel (1995) estimates that 10% of the population could be described as experiencing "sub-clinical" levels of eating disorders, while other prominent researchers have gone so far as to state that it is now normative for persons in our society to experience weight concerns, and to make sporadic attempts to change their weight (Polivy & Herman, 1987; Rodin, Silberstein, & Striegel-Moore, 1984).

Eating Pathology in College and University

While eating disordered behaviors and cognitions affect individuals from many walks of life, they appear to be particularly prevalent within sub-categories of individuals, such as women in general, and more specifically, among female university students. Among the latter, diagnosable eating-disorder prevalence rates fall within an estimated

range of 5% (Hart & Ollendick, 1985) to 15% (Grey & Ford, 1985). These percentages, translated into actual numerical values, may represent quite a small number of individual women. However, as indicated in the previous section, sub-clinical levels of eating pathology are much higher among the general population, and also among college and university women. Some researchers have noted that a *minority* of college women actually exhibit "normal" eating habits (e.g., Mintz & Betz, 1988). For example, in a study of first-year women at the University of Michigan, 3% exhibited symptoms of clinically diagnosable bulimia nervosa, 10% were classified as "dieters at risk", and 31% were classified as "intensive dieters" (Drewnowski, Yee, Kurth, & Krahn, 1994). Overall, 44% of the women examined reported significantly disturbed eating behavior. It is particularly important to note that 4% of the "intensive dieters" and 15% of the "dieters at risk" went on to develop clinically diagnosable bulimia nervosa by the following semester (Drewnowski et al., 1994), supporting the continuum model of pathological eating, and emphasizing the need for early intervention.

The university environment may itself be conducive to the development of eating disorders, due to its often unhealthy norms about food and eating, achievement pressure, high competitiveness, dating pressure, and due to eating and weight changes which may occur during that particular time of life/developmental stage. Additionally, having other students model disturbed eating behavior may exert a disinhibiting effect on other vulnerable individuals. In one study, female college students gained more weight during their first year than did an age-matched non-college comparison group (Hovell, Mewborn, Randle, & Fowler-Johnson, 1985). This is a more ominous finding when interpreted within in the context of models positing that weight gain is a risk factor for the

development of chronic dieting, binge-eating and the eating disorders (Smolak & Levine, 1994). In another study, 30 of 34 women with bulimia indicated that their bulimic behavior began in association with a traumatic event, the most common being loss or separation from a person significant in their life (Pyle, Mitchell, & Eckert, 1981). For the purposes of the current study, this is important to note, as a move to university frequently necessitates a separation from significant persons in ones' life, in addition to other developmental and dietary changes.

Traditional Interventions for Pathological Eating Behaviors

The costs of eating disordered and sub-clinical levels of pathological eating behavior, both to society and to the affected individuals, are high. Unfortunately, effective, empirically validated treatments are expensive to implement, not available to all, and not studied or utilized by all professionals. Treatments for both obesity and anorexia nervosa have had discouraging and mixed results, despite extensive research (Battle & Brownell, 1996). For example, a longitudinal study following 76 severely anorexic patients treated in an intense, inpatient program found that after 10 years, 24% were described as "fully recovered", 64% had begun binge-eating, 41% were diagnosed with bulimia nervosa, weight relapse occurred in 42% during the first year of treatment, and the mortality rate over the 10 year period was 7% (Eckert, Halmi, Marchi, & Grove, 1995). Thus, even this intense and expensive program produced results which were less than ideal for over 75% of those treated. Interventions for bulimia have met with greater success, but remain expensive, and are available to or utilized by only a small number of persons with the disorder (Battle and Brownell, 1996). Finally, behavioral treatment programs for obesity have been well researched, and there is some evidence that initial weight loss will occur

during these programs in mildly to moderately obese patients. However, 5-year follow up data does not instill optimism, as relapse to the earlier weight often occurs (Battle & Brownell, 1996).

The less than encouraging results for many eating disorder and obesity-related interventions, and the poor cost effectiveness inherent in the current allocation of resources, has prompted some researchers to call for a paradigm shift, in which some of the resources devoted to treatment are reallocated to focus on preventative efforts and policy change (e.g., Battle & Brownell, 1996). In general, past and present research efforts related to eating disorders have focused on etiology or treatment, with considerably less focus on early intervention or prevention. Furthermore, methodological flaws have hampered much of the research that has addressed early intervention and prevention. Battle and Brownell (1996) propose that persons treating eating disorders and obesity must begin to emphasize these issues as public health concerns. This model requires a cognitive and behavioral shift, from the more medical focus on treatment, towards an emphasis on prevention and public policy changes. The public health burden and public finance burden of eating disorders and obesity is great, in terms of morbidity, mortality, lost productivity, and psychological and social consequences to the person with the problem and to those interacting with them (Battle & Brownell, 1996).

One may conclude that the status quo, while having some success, is less than ideal, expensive, and available to relatively few (Battle & Brownell, 1996). Therefore, the development and validation of early intervention programs is apropos, and if effective, will address some of the public health and cost-effectiveness concerns associated with the current "treatment focused" approach.

Methodological Concerns in Extant Prevention-Oriented Research

Although many researchers have attempted to develop eating disorder prevention programs, overall, results have been discouraging. There are several possible explanations for the lack of convincing positive outcomes following many prevention efforts: (a) use of a model which assumes that increasing knowledge and changing attitudes translates to behavior change; (b) unintentionally "teaching" the negative behavior that is meant to be reduced or prevented; (c) lack of operationalized behavioral outcome measures; and (d) directing the intervention indiscriminately.

Use of the Knowledge-Attitude-Practice Model and Possible Iatrogenic Effects

Many recent eating disorder prevention programs utilize a rational-didactic approach known as the KAP (Knowledge-Attitude-Practice) model, which infers that once people are apprised of the consequences of harmful behaviors, they will no longer engage in them (Rosenvinge & Börresen, 1999). Unfortunately, this approach has not been empirically validated, and in fact, an undesired consequence of this approach may be to teach people the very behaviors which one is trying to prevent (Rosenvinge & Börresen, 1999). In the case of eating disorder prevention, this effect could occur if the behaviors of those with eating disorders (e.g., use of laxatives, specific methods of purging, types of foods consumed and avoided) are described ("taught") to individuals without eating disorders. This problem was noted by Mann et al., (1997), who provided a presentation/intervention to first year college women, led by two women with histories of anorexia nervosa and bulimia nervosa. The presentation provided information about the symptoms and effects of eating disorders, and was intended to be a preventative intervention. Unfortunately, the authors noted that students who attended the presentation

actually reported greater levels of eating disorder symptomatology subsequent to the intervention than did women who did not attend (Mann et al., 1997)! One possible way of conceptualizing this problem, in terms of external contingencies on behavior, is that the immediate reinforcement value for maladaptive eating behaviors (and eating disorders) may be initially and immediately positive, such as quick weight loss, whereas the negative outcomes, such as poor health and rebound weight gain, occur later. Discussing the problems associated with an eating disorder such as anorexia nervosa will also, by default, require discussing some of its "positive" or "glamorous" attributes, such as extreme thinness and control, both of which tend to be characteristics valued in our society. This sentiment is echoed by Garner and Wooley (1991), who state, "even anorexia nervosa itself has developed a not altogether unfavorable connotation in our culture" (p. 732). Thus, the available data suggest that discussing the symptoms and consequences of eating disorders is not helpful in reducing their incidence, and may actually have the opposite effect. Due to this unfortunate consequence, a Roundtable on the Prevention of Eating Disorders, conducted at the National Institute of Mental Health in 2000, recommended designing prevention approaches intended to both minimize and assess the potential for iatrogenic effects of interventions (Pearson, Goldklang, & Striegel-Moore, 2001).

Lack of Operationalized Behavioral Outcome Measures

Many extant eating disorder prevention programs lack adequate assessment of outcome. Although they purport to utilize a KAP model, they only assess knowledge and attitude subsequent to the intervention, failing to assess or even adequately operationalize behavioral outcomes ("practice"). In addition, the programs themselves tend to lack a

focus on actual behaviors during the prevention program, forgetting or omitting this very important third component of the model. It may be that altering knowledge and attitude are necessary, but not sufficient, for behavior change. It is likely that focusing on altering actual behaviors, and providing contingencies on these behaviors, is an integral component of the prevention program itself.

Universal Versus Targeted Approaches to Modification of Eating

Prior to implementing eating-disorder prevention efforts, or attempting to modify pre-eating-disordered behaviors, it is important to identify risk factors implicated in the development of eating disorders. Since specific risk factors for eating disorders are posited, but not unequivocally specified, many published prevention efforts have adopted a "general population model", and directed their efforts towards large groups of persons. Many of these programs are directed towards girls or women, but lack any greater specificity in their target population. However, directing prevention programs to large groups of females using a "shotgun" approach, and then assessing improvement based on scores on pre-and post-intervention measures, has thus far provided discouraging results. Directing a behavior-change program to a large group, many of whom will not demonstrate dysfunctional attitudes towards food, dieting, eating, or exercise, is likely to mask the effect of the intervention, in that we would not expect the behavior of persons without dysfunctional attitudes and/or behaviors to change. Therefore, by averaging data across these divergent persons, we are reducing the strength of our effect, and possibly not noticing changes occurring in persons with pre-intervention maladaptive behaviors.

Thus, it is important to establish greater specificity in one's target population prior to developing and implementing a prevention effort, both by identifying specific "target

behaviors" for intervention, and by focusing the intervention on individuals who display problems in these areas. Additionally, by addressing specific target behaviors, the intervention can focus on changing sub-clinical levels of eating pathology, allowing the expected changes to be operationalized. As previously described, sub-clinical levels of eating pathology are common among women in university, underscoring the alteration of this pathology as an important goal of psychological interventions.

Risk Factors For Eating Pathology: Identifying Target Behaviors for Intervention

As previously noted, specific risk factors for the development of eating disorders remain somewhat speculative. Problems in identifying risk factors for eating disorders include a lack of epidemiological data, a lack of information regarding the prevalence of eating disorders among minority groups and among those with socioeconomic challenges, the low base rate of eating disorders, the extremely complex and multifactorially determined nature of eating disorders, a paucity of data acknowledging the public health significance of eating disorders (Pearson et al., 2001), and high levels of psychiatric comorbidity among those with eating disorders (e.g., O'Brien & Vincent, 2003). However, a considerable body of research provides strong support implicating certain factors as related to the development of pathological eating. These proposed etiological factors are generally divided into four groups: physiological, psychological, familial, and sociocultural (Austin, 2001). Given the focus of the current study, which addresses chronic dieting behaviors in university women, the psychological (behavioral) risk factor of chronic dieting will be comprehensively reviewed; as the other factors are not directly targeted in the current study, their discussion is beyond the scope of this paper.

Dieting

A quantity of research evidence strongly implicates dieting as a major contributing factor in the etiology of binge eating in bulimia nervosa (e.g., Howard & Porzelius, 1999; Patton, Johnson-Sabine, Wood, Mann, & Wakeling, 1990). While the etiology of binge eating disorder is not yet well understood or researched, a central role for dieting in its development is also suggested based on research derived from the study of bulimia nervosa (Howard & Porzelius, 1999).

Although many persons engage in restrictive dieting and experience concerns with body weight and shape, only a few go on to develop full-blown eating disorders. It appears that the development of an eating disorder within the context of chronic dieting occurs only in vulnerable individuals, such as those with concurrent low self-esteem, social skills deficits, biological predispositions, and/or a vulnerability to dietary disinhibition (Wilfley, Grilo, & Rodin, 1997).

When most researchers use the term "dieting" to refer to a suspected etiological factor in the development of pathological eating, they are referring to the construct of "dietary restraint", which may be conceptualized as a chronic course of self-imposed caloric deprivation in an attempt to suppress weight (Heatherton, Polivy, Herman, & Baumeister, 1993). Many people classified as restrained eaters based on the Restraint Scale (Herman & Polivy, 1980), a psychometric tool for identifying restrained eaters, are unsuccessful in consistently maintaining this deprivation, and their restraint tends to break down when they are, for example, led to break their diet. In this case, *counterregulation* can occur, whereby the "dieter" will eat more than a non-dieter would in the same situation (Herman & Mack, 1975). Research using the Restraint Scale reveals

a strong positive correlation between the severity of binge-eating behavior and the degree of dietary restraint (e.g., Porzelius, Houston, Smith, Arfken, & Fisher, 1995).

According to an early paper by Polivy and Herman (1985), there is considerable evidence that dieting and bingeing co-occur. Rather than hypothesize that binge eating leads to dieting, these researchers propose that dieting causes binge eating. Although they acknowledge that the relationship may be a circular one, whereby binge eating also leads to compensatory dieting attempts, they propose that "causal primacy" should remain with dieting. Clinical evidence for this proposal is provided by an early description of 34 bulimic patients, in which 30 of the 34 patients studied reported that the onset of their bulimic behavior began while they were voluntarily dieting (Pyle et al., 1981).

Additionally, Herman and Polivy (1984) have proposed the existence of a "diet boundary", whereby the restrained eater creates rigid cognitive "rules" about what is and is not acceptable to eat. In general, these rules are set a level below the person's actual physiological satiety level. Thus, the cognitive rule is overriding physiological cues. When the boundary is crossed (e.g., he or she eats a small amount of a "forbidden" food), the person's dietary restraint is broken, and a feeling of failure results. Instead of discontinuing the eating process right there, the individual may eat until he or she is overly full (Herman & Polivy, 1984). In this way, restraint theory can be used to explain a possible pathway to the development of binge eating and bulimia nervosa (Howard & Porzelius, 1999).

A similar model implicating dieting as a precursor to eating disorders is the "spiral model", proposed by Heatherton and Polivy (1992). The spiral model explores the relationship between dieting, binge eating, and full-blown eating disorders. Heatherton

and Polivy (1992) indicate that body dissatisfaction, as opposed to actual body weight, is an important factor predicting a girl or woman's decision to diet. Research suggests that repeated unsuccessful weight loss attempts heighten psychological distress symptoms, such as depression (e.g., Farchaus Stein & Hedger, 1997) and anxiety (e.g., McFarlane, Polivy, & McCabe, 1999), which may lead to increased and more stringent attempts to diet, and a chronic pattern of dietary restraint. A pattern of chronic dietary restraint leaves the individual more vulnerable to a host of problems which actually increase the likelihood of weight gain, including compromised metabolism (Fernstrom, Weltzin, & Kaye, 1992), increased susceptibility to external cues to eat (Heatherton & Baumeister, 1991), disinhibited eating or binge-eating (Polivy & Herman, 1993), and cognitive rather than physiological control over eating (Polivy & Herman, 1985). In this manner, the dieter enters the "diet spiral", at which time the individual is at increased risk for extreme dieting attempts. This could, in turn, lead to the development of an eating disorder such as anorexia nervosa, bulimia nervosa, or binge-eating disorder (Heatherton & Polivy, 1992).

Finally, Lowe (1993) differentiates between the person with a history of past cyclical dieting and overeating (as a fairly stable style of eating behavior), and a second type involved in "current dieting", which refers to a current effort to reduce/restrict food intake. Current dieters tend to maintain some level of restriction under circumstances in which restrained eaters will evidence counterregulation (overeating) (Lowe, Whitlow, and Belwoar, 1991). This allows for an explanation of eating behavior in terms of: (a) the longitudinal effects of cyclical dieting and overeating; (b) current dieting behavior; (c) the combination of these (Howard & Porzelius, 1999). It appears that it is the longer term effects of attempted caloric reduction and overeating that can lead to binge-eating under

certain conditions, and which may be a risk factor for the development of eating disorders (Lowe, 1993).

Some researchers (e.g., Kalodner & Scarano, 1992; Drewnowski et al., 1994) have posited a continuum of eating disordered behavior, ranging from "normal" eating at one end, to full-blown eating disorders at the other. More mild, or sub-clinical levels of disordered eating fall at various points along this continuum. However, whether this continuum represents a true "stages of change" model of eating disorders is unclear. How does one formulate a theoretically based and empirically testable continuum between dieting and clinically diagnosable eating disorders, and also explain the fact that most "normal dieters" do not go on to develop clinical symptoms? Models of disordered eating need to explain why levels of self-reported dieting are very high in comparison with levels of serious eating disturbance and eating disorders, as well as non-dieting (Levine & Smolak, 1990). It is possible that the starting point on the "continuum" of disordered eating is the same for all dieting related behaviors, disordered or not (Levine & Smolak, 1990). The continuum begins when increased body salience and body dissatisfaction are triggered by both weight gain (maturational, or triggered by the onset of health conditions such as hypothyroidism which can cause weight gain) and changes in social relationships, where physical attractiveness becomes an important factor; each of these is a risk factor for the development of problematic eating, particularly dieting (Levine & Smolak, 1990). If the dieter has a well-defined goal for slenderness which will be very difficult for her to obtain, possibly because she has a biological tendency to be heavier than her goal weight, the woman may proceed along the continuum from nonpathological dieting towards sub-clinical eating disturbance. At this point, Levine and Smolak (1990) hypothesize that

intense dietary restraint occurs, which in turn increases the likelihood of disregulated eating in the form of binge-eating, which may instigate the onset of compensatory vomiting and/or laxative use. These authors (Levine & Smolak, 1990) theorize that the development of an eating disorder, over and above pathological dieting, requires two additional variables: a threat to achievement status, which means the dieter feels out of control, distressed, and ineffective (due to her inability to achieve her slenderness goal); and the "superwoman complex", whereby the woman builds her identity around achieving in a variety of areas including school or work, social life, fitness, attractiveness, and slenderness. In sum, dieting is viewed as a precursor to eating disorders in certain individuals with additional psychological characteristics, which make them particularly vulnerable. It is important to note that sub-clinical levels of eating pathology, while not technically "diagnosable" according to DSM-IV criteria, cause significant distress, and compromise physical and psychological health. Thus, the sequelae of chronic dieting may be causing harm for a large number of individuals, not only those with full-blown eating disorders.

It is very likely that dieting is a risk factor for eating pathology. Dieting, as a risk factor, increases considerably in potency when combined with psychological characteristics such as a sense of ineffectiveness, distorted self-awareness, body dissatisfaction, and interpersonal distrust, characteristics observed in persons with eating disorders (Kalodner & Scarano, 1992; Polivy & Herman, 1987). Additionally, dieting can increase in power when the dieter experiences perfectionism and distress related to her slenderness goal (Levine & Smolak, 1990).

Empirical support for the role of dieting in eating pathology. Retrospective studies attempting to determine how binge eating and dieting are temporally related are severely limited, as an individuals' memory is often inaccurate and biased by his or her current situation (Howard & Porzelius, 1999). Therefore, prospective data provides a clearer examination of the relationship between dieting and binge eating. In one such study, 26 obese individuals were randomly assigned to one of three conditions: (a) diet; (b) exercise; or (c) control (Wardle & Beales, 1988). After four weeks in their respective conditions, individuals did a "taste-test", in which they drank a milkshake then tasted different types of ice cream. Participants in the "diet" group ate twice as much ice cream subsequent to the milkshake "preload" than did the exercise or control group. These results provide some support for the notion that restrictive dieting can lead to overeating when the "diet boundary" (Herman & Polivy, 1984) is crossed.

Compelling data from non-clinical populations also supports the idea that restrictive dieting can lead to binge eating (e.g., Keys, Brozek, Henschel, Mickelsen, & Taylor, 1950). This research also emphasizes that it is dieting, *whether successful or unsuccessful* (and it is the latter which comprises the higher number of individuals), which leads to binge eating (e.g., Polivy and Herman, 1986). During the much cited "Minnesota experiment", 34 male conscientious objectors underwent caloric deprivation and were carefully observed and studied throughout the process (Keys et al., 1950). Once free access to food was reinstated, the men demonstrated a tendency to binge-eat, despite reporting no binge eating prior to the experiment. While dieting, the men became preoccupied with food, with food and associated subject matter becoming their most usual topic of conversation (Keys et al., 1950). At the halfway point of the starvation

experiment, 13 of the 34 men mentioned cooking as among their career plans subsequent to the experiment (Keys et al., 1950). It is noteworthy that this research is described as a study on " semi-starvation", yet the number of calories the men in the study were permitted to eat was approximately the level of caloric deficit recommended by some conservative obesity treatments (Stunkard, 1987). This suggests that many of today's restrictive dieters could reasonably be expected to experience similar cognitive and behavioral sequelae (to dieting) as did the men in the Keys (1950) experiment. The male participants had no eating disturbances or overt psychiatric disturbance prior to the beginning of the study. After eating was returned to "voluntary" levels, meaning the men could chose when and what to eat, their caloric intake rose to a mean of almost 8000 calories per day, and the men tended to eat such large quantities of food that they experienced nausea, vomiting, and gastrointestinal distress (Keys et al., 1950). Some participants reported that they still felt hungry after eating a very large meal, and that they found it hard to stop eating; for example, one "stuffs himself until he is bursting at the seams, to the point of being nearly sick" (Keys et al., 1950. p. 847). This study provides convincing empirical support for the idea that it is dieting that leads to binge eating, and not the reverse, as none of these men self-reported binge eating prior to the study. However, it is important to note that there are likely differences between "normal weight" restrictive dieters and obese dieters, both in terms of their emotional reactions to dieting and in terms of their likelihood to binge eat as a result of dieting; it is suggested that the "normal weight" dieter is more likely to experience psychopathology as a result of restrictive dieting (Wilson, 2002). In contrast, moderate degrees of calorie reduction do not appear to lead to binge eating in obese individuals (Wilson, 2002).

In a recent very large-scale study of 16,114 boys and girls between 9 and 14 years of age, the prevalence of binge-eating behavior was noted to increase in a linear fashion with age among girls, and was strongly associated with purging for both genders (Field et al., 1999). Additionally, the misperception of overweight, trying to lose weight, and frequency of dieting increased linearly with age for girls. Overall, the prevalence of binge eating on a monthly basis was 0.4% for 9-year-old girls, increasing to 3.6% in 14-year-old girls. Purging at least monthly increased from 0.9% in 9-year-old girls to 2.9% in 14-year-old girls. In boys, binge eating remained constant at 0.8%. Although these data are correlational and cross-sectional, they suggest an association between binge eating and the misperception of overweight / dieting behaviors, which concurs with models presented earlier (e.g., Heatherton & Polivy, 1992).

Another study investigated the relationship between food restriction and binge eating in men who were prisoners of war (POWs) during World War II (Polivy, Zeitlin, Herman, & Beal, 1994). These researchers hypothesized that POWs (who had experienced starvation) would be more likely to have engaged in binge eating than soldiers who were not POWs (and were not starved), and that the amount of weight they had lost during imprisonment would be positively correlated with the degree of binge eating they experienced (Polivy et al., 1994). POWs did report significantly more post-war bingeing than did a comparison group of war veterans who did not experience severe food restriction; additionally, correlational analysis indicated that degree of binge-eating was correlated with level of weight change during the war, in that the larger the amount of weight lost in the war, the higher the level of binge-eating reported (Polivy et al., 1994).

Again, this bolsters the evidence that it is food restriction that leads to binge eating, rather than the reverse.

Stice and Agras (1998) identified an increase in perceived social pressure to be thin, thin-ideal internalization, body dissatisfaction, increased dieting, and negative affect as factors predictive of the onset of binge-eating, while greater perceived social pressure to be thin, body dissatisfaction, dieting, and negative affect also predicted the onset of compensatory behaviors. Elevated BMI scores were not predictive of either binge-eating or compensatory behaviors (Stice & Agras, 1998). Results of further analysis suggested that body dissatisfaction, dieting, and negative affect contribute most to the onset of eating disordered behaviors, while the strongest predictor of the onset of binge eating and compensatory behavior was dieting (Stice & Agras, 1998).

One prospective study, which investigated possible risk factors for the development of eating disorders, found that dieters were 8 times more likely to develop an eating disorder than were non-dieters (Patton et al., 1990). In another well-designed study, nine young unrestrained eaters were assigned to an intermittent dieting schedule, whereby they had to reduce their caloric intake to below 600 kcal. per day on four days of the week, while eating normally on other days of the week (Laessle, Platte, Schweiger, & Pirke, 1996). Participants did not lose significant amounts of weight during the four-week period, and their caloric intake on days of unrestricted food intake significantly increased over the 4-week period. Participants reported food preoccupation, mood deterioration, irritability, and fatigue, as well as a desire to eat more than allowed; the fear of loss of control increased during episodes of dieting (Laessle et al., 1996).

In keeping with models of dieting induced pathological eating, and with the empirical support for them, one may propose that the development of disordered eating depends upon the development of chronic dieting, and that unsuccessful dieting leads to self-loathing and preoccupation with body weight and shape. In the vulnerable individual, this may lead to binge eating, as a result of dietary restriction, which may also lead to compensatory behaviors such as self-induced vomiting. Therefore, one may posit that an intervention aimed at reducing dieting efforts and sub-clinical levels of eating pathology may be successful in reducing body dissatisfaction, and possibly in preventing binge-eating and compensatory behaviors which are consistent with diagnosable eating disorders.

Physiological sequelae of chronic dieting. Although dieting is effective in producing weight loss over the short term, as assessed by one-year follow-up research, dieting on its own is not effective in producing long-term weight loss for a majority of those who attempt it (Garner & Wooley, 1991). In fact, it appears that weight regain following treatment by dieting is equally as reliable an outcome as is initial weight loss (Garner & Wooley, 1991).

The type of disinhibited, uncontrolled eating that is actually feared by the dieter actually appears to arise from the act of dieting (Polivy & Herman, 1987) and a dieter will sometimes actually lose weight after ending a diet (Polivy & Herman, 1983). One possible reason for this is that dieting disrupts the body's natural perceptions of hunger and satiety (Polivy & Herman, 1987). Dieting disinhibits eating by creating a state where an individual becomes less sensitive to internal body cues, and over responsive to external cues (Kaplan & Ciliska, 1999). Additionally, low calorie diets are associated

with a reduction in basal metabolic rate, which may lead to weight gain over time (Kaplan & Ciliska, 1999).

Weight fluctuation also appears to be associated with dietary restraint. Heatherton, Polivy, and Herman (1991) examined the hypothesis that overweight chronic dieters (or restrained eaters) evidence larger fluctuations in weight than overweight unrestrained eaters. Restrained participants did have larger fluctuations in weight than unrestrained participants, and restrained participants did not tend to lose weight over time (Heatherton et al., 1991). Level of dietary restraint appears to be a better predictor of the amount of weight fluctuation than actual weight itself; that is, it is level of restraint rather than overweight which predicts weight fluctuation, supporting the idea that weight fluctuation is a function of attempted dieting (Heatherton et al., 1991). In addition, this research supports the notion that chronic dieting is not a successful determinant of weight loss, as participants in this research did not lose any weight over a 6-month period (Heatherton et al., 1991).

Cognitive sequelae of chronic dieting. Dieting is associated with an increase in cognitive distortions, cognitive impairments, and increased preoccupation with food and eating (McFarlane, Polivy, & McCabe, 1999). Polivy and Herman (1986) advocate a strong role for cognition in triggering binge eating, over and above purely physiological instigators. Additionally, research indicates that restrained eaters report greater anxiety and depression than do unrestrained eaters, sometimes during baseline conditions and more notably after a threatening or anxiety-provoking manipulation (McFarlane, Polivy, & McCabe, 1999). The extant literature on dieting suggests that it impacts negatively on psychological well-being (McFarlane, Polivy, & McCabe (1999). For example, during the

Keys et al. (1950) study, participants experienced preoccupation with thoughts of food, and many of the men experienced depression (Keys et al., 1950). Similarly, Hart and Chiovari (1998) found that current dieters were significantly more obsessed with thoughts of food and eating than were non-dieters. This preoccupation with food and eating is counterproductive to reducing calorie intake, the task the restrained eater is attempting to accomplish.

An important concept in the discussion of restrained eating is *counterregulation*, a process hypothesized to be at least partially under cognitive control (e.g., Polivy & Herman, 1985). Counterregulation refers to a phenomenon whereby dieters will eat little or no food after not eating or a very small amount of eating, but then eat a lot after consuming a large high calorie (or perceived high-calorie) preload, which "disinhibits" their usual level of dietary restraint (Herman & Mack, 1975). In a classic experiment, participants who scored highly on a measure of dietary restraint ate more ice-cream after a "preload" of milkshake than they did after they were given no "preload", while participants who scored lower on the restraint measure consumed less ice cream after the milkshake preloads (Herman & Mack, 1975). According to Herman and Polivy (1980), the preload temporarily "ruins" the dieters' dieting behavior, removing inhibitions on eating normally found in the dieter. This process may be cognitively mediated, in that the violation of a diet leads to thinking one is "out of control" and no longer capable of controlling food intake (Polivy and Herman, 1985), and therefore can abandon all restraint for the time being. This compensatory eating behavior may be one explanation as to why attempts to lose weight through restriction can sometimes lead to weight gain. Some researchers have developed treatment programs for binge eating which target this

type of eating (i.e., in response to maladaptive cognitions) and attempt to train eating in response to internally mediated cues (Craighead & Allen, 1995).

"Being a dieter does not 'cause' one to develop an eating disorder such as anorexia nervosa, but being a dieter seems to be a major part of the constellation of personal and situational factors that put one at risk for the disorder" (Polivy & Herman, 1986, p. 328). Although dieting has been demonstrated to produce maladaptive eating behavior (e.g., binge-eating), it is important to establish whether or not there is a "link" between this chaotic behavior and that of a full-blown eating disorder. For the purposes of the current study, it is important to investigate whether an early intervention aimed at reducing levels of sub-clinical eating pathology, focusing on chronic dieting behaviors, can reduce chronic dieting and, over the long term, reduce the likelihood of the development of a diagnosable eating disorder.

Psychoeducationally Based Eating Disorder Prevention

Psychoeducationally-based interventions can be a cost-effective and efficient method of catalyzing change in groups of individuals. Psychoeducation refers to "the process of disseminating information about the nature of the disorder for the purpose of fostering attitudinal and behavioral change in the recipient" (Davis, Olmsted, & Rockert, 1990, p.882). From a more philosophical standpoint, psychoeducational models of intervention contrast with the paternalistic and old-fashioned idea that the clinician is in charge of decisions related to patient care; instead, psychoeducation acknowledges that the patient, him or herself, is in charge of making decisions related to behavior change (Olmsted & Kaplan, 1995).

An alphabetized summary of extant psychoeducational research is presented in Table 1, while a brief discussion of this research follows in text.

Table 1

Summary of Relevant Previous Research

Researcher (s)	Population	Focus	Methodology	Outcome
Andrewes et al. (1996)	54 females with diagnosed eating disorders; 2 sessions over 2 weeks	Computerized program delivery; Focus on dangers and myths of dieting, tells story of an anorexic girl	Random assignment to groups; placebo control condition; no data on drop-out; no follow-up data	Increase in knowledge about eating disorders; "improved attitudes towards their disorder"; No behavioral measures
Baranowski & Heatherington, 2001)	30 female students ages 11-12; 5-week program, 1.5 hours each meeting.	Experimental: causes and consequences of dieting; appraisal of weight and shape; self-body esteem; eating disorders. Control: fruit and vegetable awareness program	Non-randomized placebo-control group; 6-month follow-up.	Decreases in psychometric scores on a measure of dietary restraint.
Ciliska (1990)	Chronically obese adult females;12 week program; 6-21 per group	Etiology of obesity, regulation of weight/set point theory, negative consequences of restrained eating	Randomization to groups; 6 and 12-month follow ups.	Increased self-esteem, decreased RS score, decreased body dissatisfaction
Davis, Olmsted, & Rockert (1990)	Females with bulimia nervosa 5, 90-minute sessions about 9 per group	Highly structured sessions, didactic information focusing on normalizing eating and self-care strategies	Wait list control condition; unsure regarding random assignment; no discussion of dropouts; follow up.	Decreased binge-eating, decreased vomiting; improvements maintained at 3-5 month follow up

Researcher (s)	Population	Focus	Methodology	Outcome
Franko (1998)	"at risk" college females (women who self-identified as having body image/eating concerns); 10 in treatment group; 8, 90-min sessions	Societal thinness ideals; nutrition education; dysfunctional beliefs/attitudes; coping skills	Non-randomized control group; no follow-up.	Significantly improved scores on body image concerns (questionnaire); no behavioral measures
Higgins and Gray (1998)	Female, self-reported dieters 6, 2 hour sessions and review meeting; 19-21 per group	Enhance self-acceptance and replace dieting with "natural eating"	Random assignment to experimental and control groups; 6 and 12-month follow-up.	Decreased restrained eating; increased self-esteem; decreased concern about body image; inadequate assessment of "natural eating"
Kaminski & McNamara (1996)	25 college females "at risk" for bulimia nervosa; 8 sessions of 90 minutes; 15 per group	Information about realistic weight, healthy eating habits, problems with dieting; cognitive strategies; body image; societal pressures	Random assignment to groups; did not utilize intent-to treat analysis; has 5 week follow up.	Decreased body dissatisfaction; increased self-esteem; less use of compensatory methods, and meal-skipping at post-test & 5-week follow up
Killen et al.(1993) Killen (1996)	Female adolescents 18 sessions, 50 minutes each; delivered during school	Did not discuss eating disorders themselves; focus on nutrition, dangers of dieting; focus on proximal, salient outcomes	Non-randomized (used school classes).	Effects seen for "high risk" girls only; Reduced purging, lowered score on weight concerns scale of EDI, lowered RS score
Moriarty, Shore, & Maxim (1990)	Boys and girls grades 7-12; group size/program length unclear; delivered in classroom setting	Increase knowledge & change attitudes regarding eating disorders	Non-randomized control group; no follow up; no attention to behavior change	Significant increase in knowledge about eating disorders; Increase in "positive attitudes" towards eating disorders (may be problematic)

Researcher (s)	Population	Focus	Methodology	Outcome
Nicolino, Martz, & Curtin (2001)	85 university females, mean age of 18.9 years; no pre-screening; intervention delivered in groups of 7-10.	CBT treatment for negative body image delivered as a brief group preventive intervention; didactic and discussion components; one two-hour session.	Randomization to groups; no follow-up; no attrition reported.	No change over time on psychometric measures of body image, fear of fat, calorie-restrictive dieting, anxiety regarding physical appearance.
Polivy and Herman (1992)	18 females with elevated scores on EDI subscales, high RS scores, and low self-esteem; mean age 41.3 years; 10, 2 hour sessions; 7, 5, or 6 per group	Information about the costs and side-effects of dieting/provide information about alternatives to these major weight loss attempts	No control group; 6-month follow-up; did not use intent-to-treat analysis.	Improvement on psychometric instruments addressing self-esteem, depression, lower dietary restraint and eating pathology
Santonastaso, Zanetti, Terrara, Olivotto, Magnavita, & Favaro (1999)	Female adolescents; 4, 2hr sessions; groups of 12-17;	Pubertal changes, body image, coping with adolescence, interpersonal relationships, eating disorders, dieting	One year follow-up.	Reduced scores on EDI body dissatisfaction subscale for "low risk" persons in intervention group at one-year follow up
Shisslak, Crago, & Neal (1990)	50 high-school students 8 sessions over nine weeks delivered during health education class	Symptoms, prevalence, risk factors, and treatment of eating disorders	Non-randomization to groups; no follow up; no control group.	Increase in knowledge about eating disorders No behavioral measures
Stewart, Carter, Drinkwater, Hainsworth, & Fairburn, 2001	474 female school students, ages 13-14 years; no pre-screening for risk status	6 weekly 45-minute sessions, delivered during school classes. Cultural influences on body image, body weight regulation, self-esteem, etc.	Non-randomized control group; 6 month follow-up; did not use intent-to-treat analysis.	Significant effects on some EDE-Q measures and dietary restraint for intervention group immediately post-intervention; gains not fully maintained at follow-up.
Stice, Trost, and Chase (2003)	148 females, ages 13-20, self-reported body image concerns, groups of 4-12 participants	"Dissonance intervention" to encourage participants to question societal "thin-ideal"	Randomized to groups; did not use intent-to-treat analysis.	Improvement in negative mood states and bulimic symptoms

Researcher (s)	Population	Focus	Methodology	Outcome
Varnado-Sullivan, Zucker, Williamson, Reas, Thaw, & Netemeyer (2001)	157 female & 130 male 6th and 7th grade students, private schools.	Three-session psychoed. presentation to students, focus on body image, variety of body shapes, impact of puberty, homework assignments, basic nutritional information. Attempt to include parents of "at-risk" youth.	Non-randomized control group. Did not use intent-to-treat analysis. 10.5-week follow-up.	Only female student data reported. Reduction in psychometric data addressing avoidance of forbidden foods and fear of fatness for one of the schools.
Withers, Twigg, Wertheim, & Paxton (2002)	218 female Grade 7 students at 3 private schools, mean age approx. 13 years old	Presented a 22-min videotape focusing on variation in female body shape, normal changes during puberty, negative effects of dieting and eating disorders, healthy eating habits	Non-randomized control group. Did not use intent to treat analysis. Use of 1-month follow-up.	Intervention participants' scores on drive for thinness and intention to diet decreased relative to control group. At one-month follow up these changes were not maintained.
Zabinski, Pung, Wilfley, Eppstein, Winzelberg, Celio, & Taylor (2001)	56 college women, "at-risk" based on pre-study psychometric scores.	8-week Internet-based psychoeducational intervention; encouraged to utilize on-line bulletin board for discussion.	Randomization to groups; did not use intent-to-treat analysis; 10-week follow-up.	No significant difference between experimental and control groups on psychometric measures of eating pathology; significant effect for time for both groups.
Zabinski, Wilfley, Pung, Winzelberg, Eldredge, & Taylor, 2001 (pilot of the previous study)	4 female university students; high BSQ scores.	On-line educational program for women with body image concerns, conducted over a "chat room".	Pilot study. No control group. No intent-to-treat analysis; 10-week follow-up.	Calculated effect size estimates. Improvements noted on many eating-disorder measures across time.

Published Studies: Inconclusive Results

Much of the published psychoeducational eating disorder prevention research has focused on attempting to alter participant's knowledge base regarding eating disorders, (e.g., Shisslak, Crago, & Neal, 1990), attitudes towards dieting and body-shape (Huon, Roncolato, Ritchie, & Braganza, 1997), and behavioral "intention" to diet (Moreno & Thelen, 1993). In general, outcomes have been poor or inconsistent, and have presented little or no support for the effectiveness of didactic programs in reducing levels of disturbed eating, weight loss behaviors, or body dissatisfaction (e.g., Paxton, 1993). Significant methodological flaws, some of which are discussed below, hamper many studies.

Programs with a non-eating disturbed target population. Paxton (1993) found no effects for a psychoeducationally-based intervention on reducing disturbed eating, maladaptive weight loss behaviors, or body dissatisfaction, nor did Nicolino, Martz, & Curtin (2001), in their study using a one-session "shotgun approach" cognitive-behaviorally based intervention, focusing on body image, for university women.

The KAP model was utilized in a Canadian study, which developed "A Preventive Curriculum for Anorexia Nervosa and Bulimia", a program described as having the goal of increasing *knowledge* and changing *attitudes* related to eating disorders (Moriarty, Shore, & Maxim, 1990). This program was developed for use within the school system as part of classroom instruction, and targeted boys and girls in grades 7 through 12. The size of the intervention groups and length of the intervention is unclear. Assessment of knowledge and attitudes was conducted following implementation of the curriculum, and assessment of eating behavior and habits was done psychometrically using the Eating

Disorder Inventory (EDI; Garner & Olmsted, 1983). The researchers reported an increase in knowledge about dieting and eating disorders, but not about sociocultural influences contributing to eating disorders. In addition, there was an increase in "positive attitudes towards eating disorders"(Moriarty et al., 1990). It is unfortunate that the authors do not discuss the meaning of this result; however, it is possible that it parallels that of Mann et al. (1997), who found increased eating pathology following the dissemination of information related to the eating disorders themselves. Moriarty et al. (1990) do not report results for the EDI scales. However, the utility of giving students a measure related to pathological eating behavior, without any direct intervention related to this behavior, appears questionable.

Shisslak et al. (1990) developed a program for prevention of eating disorders in adolescents, with the stated goal of educating students, faculty, and staff in the school system about eating disorders (Shisslak et al., 1990). The study was directed toward 50 high-school students, and provided eight presentations on eating disorders during a nine-week period. The program focused exclusively on eating disorders themselves, including symptoms, prevalence, associated psychological characteristics, complications thereof, risk factors, and treatment. On average, students who attended the presentations answered 69% of questions on a questionnaire about eating disorders correctly, whereas those who did not attend answered 50% of the questions correctly. These authors did not assess either attitudes or behaviors subsequent to their intervention, nor did they include a follow up to determine prevalence rates for the group which received the intervention compared to that which did not. Thus, it is unclear whether this educational program had

any effect on decreasing the incidence of maladaptive eating behaviors or eating disorders among adolescents, or whether this type of intervention is effective as a preventive agent.

Programs targeting "at risk" individuals. A number of psychoeducational programs have used "at risk" (for eating disorder development) target populations, but report less than promising results. One problem within this body of research is that many studies refer to participant dietary *behavior* (e.g., pathological eating behavior) as an intended focus of change, while few studies actually implement any direct intervention targeting participants' dietary behavior. For example, Franko (1998) developed an eating disorder prevention program for "at risk" college women, defined as women who self-identified as having body image or eating habit concerns. Her aim was to develop and implement a prevention program, and evaluate the efficacy of this program using measures of eating behaviors and body-image concerns. The prevention program, consisting of eight, 90-minute sessions, focused on four areas: (a) exploration of cultural ideals of thinness in society; (b) education about nutrition, weight management, and the development of healthy eating behaviors; (c) identification and examination of dysfunctional beliefs and attitudes about shape and weight and the importance of appearance; and (d) discussion of personal values, self-worth, identity development, effective expression, and coping skills to deal with negative feelings (Franko, 1998). Results indicated that the ten participants in the treatment group, compared to the 9 participants in the control group, made positive changes in the area of body image concerns as measured by questionnaire. Unfortunately, this study did not include a behaviorally based evaluation of the women's eating habits. Although the intent of the intervention was, purportedly, to reduce maladaptive eating behaviors, the lack of measurement in this area obfuscates the results of the intervention.

It is possible that a change in body image is not followed by an actual improvement in maladaptive eating habits; conversely, it may be that the two are highly correlated. In addition, no long-term follow up was done to determine if there was a reduced incidence of eating disorders in the experimental group, which also limits the utility of this study.

In another prevention study, Sesan (1989) also targeted an "at risk" group of females, defined as college athletes. Sesan (1989) developed a three-level intervention program intended to address risk factors for the development of eating disorders. Components of the program included education of coaches, identification and assessment of 28 "at risk" athletes, and group "outreach" programs. Unfortunately, Sesan (1989) does not provide any outcome data regarding the intervention effects, severely limiting the utility of this study.

Computer-based psychoeducational programs. An emerging body of research focuses on computer/Internet based interventions, although some of these studies suffer from the same methodological concerns as the non-computer based programs. One group of researchers used a computer-based psychoeducational package as a tertiary intervention for DSM-III-R diagnosed eating disordered patients (Andrewes et al., 1996). Again, this program adhered stringently to the idea that changes in knowledge and attitude could lead to actual behavioral change, while not specifically addressing behavior itself. The computerized program, entitled "DIET", was developed to increase knowledge of, and communicate dangers and myths about, dieting. The experimental group of 27 patients used the DIET program, whereas the comparison group of 27 patients utilized the "CARL" program, a computer program named after Carl Rogers and intended to reflect back clients' responses in a non-directive fashion. Participants completing the DIET

program demonstrated a greater increase in knowledge and greater attitude change than the comparison group (Andrewes et al., 1996). Unfortunately, this study had no behavioral measures.

Zabinski et al. (2001) conducted an 8-week psychoeducational program over the Internet, targeting a group of university women deemed "at-risk" for the development of an eating disorder based on elevated psychometric test scores. This program used computer software known as "Student Bodies", which was based on a self-help program targeting body dissatisfaction, weight concerns, and excessive dieting. It also included an on-line "bulletin board", where participants could post messages and reply to the messages of others. In terms of outcome, there was no significant group by time interaction, with all participants (including those in the control group) evidencing "improvements" on psychometrically-based measures of eating pathology.

Moving Towards Empirical Validation of the Model: Programs With Some Success

School-based programs. Santonastaso et al. (1999) presented a psychoeducational eating disorder prevention intervention to groups of 16-year-old girls. This school-based program included information related to normal physiological changes in puberty, information about anorexia and bulimia, discussion of body dissatisfaction, difficulties in coping, interpersonal relationships, and attitudes towards food (Santonastaso et al., 1999). Body Mass Index, EAT (Eating Attitudes Test; Garner & Garfinkel, 1979), and EDI (Eating Disorder Inventory; Garner, Olmsted, & Polivy, 1983) data were analyzed on a within-group and between-groups basis (with control group data). Program participants had lower EDI body dissatisfaction scores at the one-year follow up than at baseline, and also compared to control group data. However, perhaps due to this program's lack of

attention to behavior, no significant change was noted on "eating behavior scores" (measured by the EAT and EDI) at follow up (Santonastaso et al., 1999). Somewhat more promisingly, Stewart, Carter, Drinkwater, Hainsworth, and Fairburn (2001) developed a school-based prevention program based on a cognitive-behavioral and developmental framework. The authors stated that the main intention of the program was to decrease dietary restraint and weight/shape concern. This program included information about the early warning signs of an eating disorder, and in addition to a psychoeducational/didactic component, made use of group discussion and other more interactive techniques. Individuals who participated in the intervention demonstrated a significant reduction in dietary restraint, and reductions on subscales of the EDE-Q, immediately following the intervention. However, these gains were not maintained at six- month follow-up. Withers, Twigg, Wertheim, and Paxton (2002) presented a 22-minute psychoeducational videotape (focusing on the hazards of dieting and improving body image) to Grade 7 females, and found that this brief intervention effected short-term change on the EDI-drive for thinness and body dissatisfaction subscales relative to a control group. However, these changes were not maintained at one-month follow-up.

One very promising prevention effort is based on Bandura's (1986) social-cognitive model, which states that behavior develops and is maintained through a complex interaction of personal, behavioral, and environmental factors. Killen (1996) described a comprehensive intervention, based on this model, to prevent eating disorder symptoms in adolescent females. The intent of the program was to provide the adolescents with incentives to manage their weight through exercise and healthy diet, to teach self-regulation skills to aid them in making lifestyle changes, and to provide specific practice

in these new skills. A major goal of this program was to increase the girls' motivation to adopt and practice healthy weight regulation skills, based on the fact that there is a high "incentive value" for thinness in our culture (Killen, 1996). The social cognitive model indicates that an intervention has to emphasize proximal outcomes that are important to the target audience (Bandura, 1986). Thus, it may be important to emphasize the immediate consequences of health-behavior changes, and in the case of girls or young women, the most powerful immediate proximal outcome is the attainment of a slim body. Killen (1996) notes that adolescents are more interested in health issues as they pertain to personal appearance, and less as they relate to physical conditioning. Therefore, it is important to emphasize the way in which healthy weight regulation practices have a direct effect on weight and shape (Killen, 1996), as opposed to outlining the deleterious effects of maladaptive weight management practices. An emphasis on immediate consequences was considered of primary importance: thus, the program was implemented through the planning of proximal goals leading to long-term behavior change; the specification of self-incentives; completion of a contract; the identification of potential barriers to achievement; and by using problem-solving as a method of overcoming barriers (Killen, 1996). The intervention had a beneficial impact on physical fitness, nutrition practices, and weight regulation (Killen, 1996). Additionally, Killen et al. (1993) conducted a separate study on prevention of eating disorder symptoms, consisting of 18 classroom sessions of 50 minutes each. Components included emphasizing that weight gain is normal and necessary in pubertal growth, excessive caloric restriction is not an effective long-term weight control strategy, caloric restriction can actually increase weight gain and problems in weight regulation, adolescents can lean to resist cultural thinness and dieting

pressure, and adolescents can be trained to adopt more healthful nutrition practices and physical activity regimens (Killen et al., 1993). Outcome measures included a weight concerns scale, measure of purging behaviors, dietary restraint (RS), EDI, and Body Mass Index. Within the full participant sample, there was little effect on weight concerns and disordered eating behaviors; however, outcome measures indicated some impact for "high risk" girls (Killen et al., 1993). Within this context, "high-risk" girls were those who scored above a cutoff on the weight-concerns subscale of the Eating Disorders Inventory (EDI). This result emphasizes the need for programs directed at "high risk" individuals, so that the impact of a program is not obscured statistically by the inclusion of data points not expected to change between pre and post-intervention measurement (i.e., those provided by individuals without eating related concerns).

A number of other researchers have conducted large-scale school-based interventions, which have been more globally directed as opposed to specifically targeted at "high-risk" students (e.g., Varnado-Sullivan et al., 2001; Baranowski & Heatherington, 2001). These studies are variable in outcome, but have enjoyed some success when subjected to empirical scrutiny.

Non school-based interventions. Stice and colleagues describe another successful intervention in several published studies (Stice, Chase, Stormer, & Appel, 2001; Stice & Ragan, 2002; Stice, Trost, & Chase, 2003). These researchers used a "dissonance based" intervention, applied to women recruited based on self-reported body image concerns (unfortunately, there were no pre-study measures to determine level of body image concern or operationalization of body image concern). Each of these studies included randomization to either an intervention condition or a wait-list control, and one of the

three studies (Stice, Trost, & Chase, 2003) also included a placebo-control condition, consisting of a "healthy weight" intervention. All of the studies evaluating the dissonance based program (in which participants were asked to write about and discuss the costs associated with pursuing the "thin-ideal" and engage in an at-home "body acceptance" exercise where they observed their reflection in a full length mirror and wrote down positive statements about themselves) reported a reduction in bulimic symptoms among the female participants. Interestingly, participants in the "healthy weight" placebo-control intervention (which disseminated healthy eating tips, differentiated between "healthy" and "unhealthy" dieting, and reviewed the risks of dangerous weight loss attempts and eating disorders) also evidenced improvements on psychometric measures including the EDE-Q (Fairburn & Beglin, 1994), and in negative affect, as measured by the Positive Affect and Negative Affect Scale-Revised (PANAS-X; Watson & Clark, 1992), relative to the wait-list control group.

Ciliska (1990) developed the "Beyond Dieting" program for use with chronically obese women. The program consists of a 12-week intervention, including an "educational' component which includes a discussion of the concept of restrained eating (Ciliska, 1990). A more intense intervention was also run concurrently, as a comparison to the educational program. It provided the same information, but also included assertiveness training, practice at changing faulty cognitions, body image exercises, and a supportive group environment (a psychotherapeutic component). Ciliska (1990) hypothesized that both groups would experience: (a) increased self-esteem; (b) decreased body dissatisfaction; and (c) decreased restrained eating. Additional hypotheses were that the more experiential group would have better results than the purely educational group,

and that these gains would be maintained at a six-month follow up (Ciliska, 1990). Secondary outcomes measured included depression scores, bulimia, drive for thinness, and social adjustment, as well as weight, blood pressure, glucose, and lipids (Ciliska, 1990). The Restraint Scale was used as a measure of change in dieting behavior, as it is useful in studying behavior that characterizes dieters independent of weight loss (Ciliska, 1990). The "education alone" group did not demonstrate any significant differences overall, compared to the control group, while the more experiential group was significantly better than the educational and control groups (Ciliska, 1990). Univariate changes between the experiential and control group were noted in the areas of self-esteem, restrained eating, and body dissatisfaction, while all of these except the body dissatisfaction measure were significantly better than the education only group (Ciliska, 1990). No significant changes in weight occurred in any group. Many improvements were maintained at 6-month and 1-year follow-ups, for both experimental groups (Ciliska, 1990). Some weaknesses of this study, as discussed by the author, are the high drop-out rate at the time of the six-month follow up, a lack of control group for follow up, and lack of clinical screening for eating disorders (Ciliska, 1990).

In a later evaluation of the "Beyond Dieting" program, Kaplan and Ciliska (1999) used the psychoeducational/group support/problem solving program with the stated goals of "normalize(ing) eating, stabilize(ing) weight, and increase(ing) self-esteem". Participants' scores on the EDI drive for thinness and bulimia subscales were significantly lower subsequent to the intervention, as were participants' Beck Depression Inventory (BDI) scores (Kaplan & Ciliska, 1999). Unfortunately, this study lacks a comparison control group; in addition, it does not have any measures of behavior (eating,

attempts at dieting), which would assess whether the intervention had any effect on normalizing eating. Finally, these researchers state that a goal of the program was to stabilize weight, but fail to report weight data at post-testing and/or follow-up.

In another very promising study, 41 women meeting DSM-III-R criteria for bulimia nervosa participated in five, 90-minute sessions of a psychoeducational program over a four-week period (Davis, Olmsted, & Rockert, 1990). Each meeting was described as "highly structured", and included didactic information intended to assist participants in normalizing their eating (Davis et al., 1990). Compared to a control group, there was a reduction in binge eating in the treatment sample, as well as a decline in self-induced vomiting. In fact, 21% of the treatment sample reported being free of eating disordered behaviors during the month subsequent to treatment, and during a three to five-month follow up period, reductions in binge eating and purging were generally maintained (Davis et al., 1990). The most notable result of this study, in a general sense, is that it instituted clinically significant change in actual behavior with a minimal, entirely psychoeducationally based intervention.

Kaminski and McNamara (1996) describe an evaluation of a cognitively-oriented psychoeducational program for women determined to be "at risk" for the development of bulimia nervosa, as compared with a waiting-list control group. Participants were considered "at risk" on the basis of scores obtained on various self-report instruments. The program consisted of an eight-week structured group program, each session lasting approximately 90 minutes. Homework was assigned at the end of each session, and it was reviewed the following week (Kaminski & McNamara, 1996). Sessions focused on providing information about realistic weight, healthy eating habits, problems with dieting,

cognitive strategies, the relationship between perfectionism, depression, and self-esteem, assertiveness, societal pressures and messages, and improving body image. The overall MANCOVA revealed a significant effect for the treatment group. More specifically, treatment group participants were noted to have lower body dissatisfaction, improved body esteem, were less likely to endorse cultural stereotypes regarding thinness, and were less likely to fear negative evaluation by others (Kaminski & McNamara, 1996). Further, participants described a reduction in their use of diet pills, laxatives, vomiting, and skipping meals at both posttest and five-week follow up (as measured by a self-report measure) (Kaminski & McNamara, 1996). The authors indicate that a more objective behavioral measure of change, such as food diaries, would improve this study, as would a longer-term follow up (Kaminski & McNamara, 1996).

Polivy and Herman (1992) developed an "undieting" program, intended to provide information to women about the costs and side effects associated with dieting, and provide information about alternatives to these major weight loss attempts. These researchers hypothesized that women who gave up dieting would evidence higher self-esteem and self-efficacy, and demonstrate less disordered eating (Polivy & Herman, 1992). Prior to the intervention, participants in the study had elevated scores on several EDI subscales, BDI scores in the moderate range, elevated restrained eating scores (RS), and low scores on a measure of self-esteem (Polivy & Herman, 1992). Ten two-hour sessions, involving provision of educational information, at least one experiential exercise, and a group discussion component, were implemented. Three separate groups of seven, five, and six participants received the intervention. Following the program, all test scores were improved, save for the EDI Body Dissatisfaction subscale, and most of these

gains were maintained at six-month follow up (Polivy & Herman, 1992). An interesting addition to this study would have been the addition of a comparison between the intervention group and a control group on measures of eating disordered symptoms at six-month and one-year follow-up, as this would provide information as to how a reduction in dieting behaviors potentially affects eating disordered symptomatology.

Higgins and Gray (1998) designed a program intended to reduce body image concern and normalize the eating of women who were chronic dieters, called the "Freedom from Dieting" program. Participants were 82 adult female volunteers (40 participants in the experimental group, 42 in the control group) who self-reported as "sometimes, usually, or always dieting". The program was designed to enhance self-acceptance and replace dieting with "natural eating", defined as eating in response to biological hunger cues as opposed to in response to emotional states or due to cognitive factors (Higgins & Gray, 1998). The program facilitators challenged the utility of dieting, and provided training in the "natural eating" alternative (Higgins & Gray, 1998). The actual intervention consisted of six, two-hour sessions, followed by a review meeting, and formal review sessions at bi-monthly intervals; two newsletters were also distributed (Higgins & Gray, 1998). Each session followed a written outline, and combined a didactic presentation with small group activity and discussion. Study hypotheses were that participation in the program would: (a) reduce restrained eating, increase self-esteem, and reduce concern about body image; (b) enable participants to replace dieting with natural eating; (c) allow positive outcomes of the program to be durable over time; (d) create a positive relationship between the extent of natural eating and the likelihood of weight stability or weight loss (Higgins & Gray, 1998). Hypothesis one was empirically supported, as was hypothesis two. However,

the evaluation of hypothesis two was inadequate, as it consisted of asking participants only two questions: "I feel I am a natural eater" and "I feel out of control when I eat"; additionally, the researchers did not provide pre-intervention data for these questions. In terms of the third hypothesis, an improvement was noted between pre and post-test scores on restrained eating, emotional eating, external eating, body shape concern, and trait self-esteem, and for all variables except body shape concern between post-test and the 6 and 12 month follow-up period (Higgins & Gray, 1998). Finally, the extent to which a person self-reported natural eating was correlated with a greater likelihood of weight loss or weight stability (Higgins & Gray, 1998). Although the results of this study are promising, it is hindered by the use of "one-shot" measures which fail to provide a continuous record of participant's eating habits, and which rely very heavily on the accuracy of memory and global self-report (as opposed to a more continuous measure such as a daily food record). Also, it is unclear what the participant's level of "natural" eating was prior to the intervention, or their level of feeling "out of control", so it is difficult to make conclusive statements about the "success" of the fourth hypothesis test. However, this study provides optimistic support for the idea that women's ideas about dieting, and possibly eating behavior, can be altered through a fairly brief intervention, and results can be maintained over time. It also provides evidence that "natural eating" (not attempting to restrict caloric intake, eating in response to physiological signals) is compatible with weight maintenance or loss.

In sum, the programs with the best success provide instruction in new behaviors and emphasize salient proximal goals to aid in the motivation to adopt these behaviors (e.g., Killen et al., 1993; Killen, 1996). Additionally, they are directed towards a specific

population with pre-existing pathology, as opposed to utilizing a more general approach. Successful programs whose target population does not include persons with diagnosed eating disorders do not (and should not) discuss the eating disorders themselves during didactic presentations. However, several include a focus on the perils of dieting, and instruction in altering this behavior (e.g., Ciliska, 1990; Kaminski & McNamara, 1996; Polivy & Herman, 1992; and Higgins & Gray, 1998). Among successful interventions, group sizes and length of the intervention have varied. Davis et al. (1990) report positive results for eating disordered individuals participating in five, 90-minute sessions over four weeks, while Killen's (1996) intervention spanned 18 weeks and was delivered in 50 minute sessions. This disparity makes it difficult, at this stage, to determine a "gold standard" in terms of the ideal length of intervention. Finally, specific measures of eating related behavior are an essential component for the successful evaluation of interventions intended to alter or prevent dysfunctional eating habits.

The Current Study

The current study focuses on altering sub-clinical levels of maladaptive eating behaviors in university women, and assesses the effects of this intervention on eating disordered pathology over a follow-up period. It uses psychoeducation as the primary vehicle for delivering the intervention. In contrast to much of the previously reviewed research, direct, observable behaviors posited as risk factors for the development of eating disorders were chosen as the primary target behaviors for this study. Much of the psychoeducational intervention focuses on "strict dieting" and associated behaviors, because dieting has been identified as a risk factor/precursor for eating disorders by many researchers (e.g., Patton et al., 1983; Wertheim and Weiss, 1989), and it is associated

with other problems, such as overweight (Stice, 1998) and onset of binge-eating (Stice & Agras, 1998). While dieting, on its own, does not cause eating disorders, it does appear to be a significant risk factor for their development, particularly in young women, "normal weight" dieters, and in those with dietary restraint characterized by chaotic eating patterns (Wilson, 2002). In contrast to the existing prevention research, this intervention goes a step beyond education. Current programs tend to provide information without providing alternatives to the maladaptive behaviors they purport to alter, with the exception of Killen (1996). In contrast, the interventions utilized in this study:

- provide information which may deter participants from engaging in maladaptive behavior
- review the results from relevant empirical studies, and summarize them for participants
- provide direct instruction in how to engage in alternative, more adaptive behaviors
- provide a rationale as to why these behaviors are more conducive to effective weight management than chronic dieting
- provide feedback and reinforcement contingent on behavior change

While extant research on eating disorder prevention has tended to focus on knowledge and attitude changes as a result of the intervention program, in general it fails to directly address and assess behavior change as a result of the intervention. In contrast, operationalized behavioral outcome measures were utilized in the current study. Although there is no compelling data suggesting that this type of intervention should span a particular time frame in order to be maximally effective, eight, 60-90 minute sessions

spanning a period of eight-weeks was determined appropriate for the current study, based on the results of previously reviewed research.

The Categories of Intervention: A Justification

During the current study, three specific categories of overt dieting behaviors, as well as exercise behavior, were discussed and targeted in an effort to reduce maladaptive, sub-clinical levels of pathological eating and, over the long term, reduce the risk for the development of even more disturbed eating. In addition, a brief (one of the eight sessions) body-image component was included, based on review of the previous literature, and due to the implication of body dissatisfaction as a factor in women's decision to diet (e.g., Heatherton & Polivy, 1992).

A behaviorally-based program is readily operationalizable, and allows for the use of dependent measures which provide data directly related to topics addressed and targeted by the program. In contrast, previous programs have focused on more amorphous and difficult to operationalize concepts, making accurate evaluation of psychoeducational programs in this area difficult. A brief review of, and justification for, the major target areas covered in the current intervention is presented below. As "dieting" has been devoted the most research emphasis, this construct has received the most extensive review here. "Food avoidance" and "meal skipping" are offshoots of strict dieting, while encouraging "physical activity" and addressing "negative body image" were deemed important additions to the program.

Physical activity intervention. "The strongest and most consistent predictor of long-term weight loss and maintenance has been physical activity" (Jeffery, Wing, Thorson, & Burton, 1998, p. 777). Research reveals that the effects of exercise on body weight are

small but significant (Miller, 1999a); over the long-term, the effects of exercise may be most potent. Some data reveal that exercise is critical in the long-term maintenance of weight loss (Miller, 1999a). Blix and Blix (1995) review weight-loss studies, and conclude that exercise alone, as a weight-loss method, leads to modest weight loss. However, weight loss is more significant in long-duration studies (e.g., greater than one-year), and a multitude of studies indicate that the factor most strongly associated with weight maintenance, over the long term, is participation in an exercise program (Blix and Blix, 1995). Although exercise may not lead to immediate weight loss, the cumulative effects over time add to significant weight loss and consistent weight maintenance (Blix & Blix, 1995). Brownell and Stunkard (1980) suggest that making physical activity a part of daily life may be the best way to maintain weight change. Additionally, exercise may aid in weight maintenance, and the maintenance of reasonable eating habits, in the absence of weight change.

While the goal of the current study is not to initiate weight loss, the addition of an exercise component to the current intervention both acknowledges and facilitates the participants' desires for a slim figure and for prevention of weight gain. As discussed by Killen (1996), a focus on the immediate consequences of healthful behavior, in terms of appearance rather than health, is an important area of emphasis when directing interventions toward young females. In relation to the current study, it is possible that these appearance related consequences are the most salient points for the university-aged female as well.

When attempting to involve individuals in exercise, one must address (perceived) barriers to engaging in physical activity, as well as its benefits. One potential "perceived

barrier" to exercise is that people may believe that they will be hungrier after they exercise than they were when not exercising (Wilfley & Brownell, 1994). Thus, it is important to address this issue when advising exercise. Exercising at a low or moderate intensity tends to decrease food intake and body weight, while vigorous exercise has been shown to increase food intake but allow for the maintenance of body weight (Wilfley & Brownell, 1994). Pinto, Marcus, and Clark (1996) outline various perceived barriers to physical activity in women, describing environmental barriers such as lack of time, psychosocial barriers such as peer norms, health barriers, and psychological barriers such as low self-efficacy. Addressing each of these "barriers" is an important component of the current program, as is providing challenges to the barriers (based on the cognitive model).

Physical exercise has also been shown to have psychological benefits. For example, it can reduce depression and anxiety (Kaplan and Ciliska, 1999), potential risk factors for maladaptive eating behavior. Further, exercise can enhance feelings of well being in women, an effect that is particularly noticeable when exercise is of moderate as opposed to high intensity (Pinto, Marcus, & Clark, 1996). Further support for encouraging moderate as opposed to high intensity exercise comes from data suggesting that attrition rates from vigorous exercise may be as high as 50%, whereas dropout rates for more moderate exercise may be lower, around 30% (Sallis et al., 1986). Therefore, the current study emphasizes setting realistic goals, and the maintenance of those goals. For example, it is preferable to exercise for 15 minutes every day, than go to a few one-hour-long aerobics classes, hate it, and never return.

Meal skipping intervention. Meal skipping can represent one manifestation of strict weight-loss dieting. One study of 14-16 year-old adolescent girls found that 46% reported

skipping meals for weight control (Grigg, Bowman, & Redman, 1996). Additionally, skipping meals such as breakfast on a regular basis can lead to reduced daily intake levels of recommended daily nutrients, particularly among women (Morgan, Zabik, & Stampley, 1986). One study showed that the highest percentage of daily caloric intake from fat occurred in a group of women who skipped breakfast, as compared to women who ate breakfast (Morgan et al., 1986). The current program emphasizes the importance of eating regular meals and snacks, both for ensuring adequate daily nutrient intake, and for reducing the tendency to overeat or binge-eat.

"Dieting" intervention. As early as the 1960's, Crisp (1965) theorized that abstinence from food, whether forced or determined by the individual, could "release" binge-eating behavior. He later hypothesized that regular eating could "mute" the tendency to binge-eat (Crisp, 1988). Crisp (1988) noted that the minimization of binge eating could have important ramifications for the prevention of obesity, bulimia nervosa, and anorexia nervosa, and suggested that providing information, such as public information about the effects of food restriction on the tendency to binge, could be a helpful preventative effort.

Similarly, McFarlane, Polivy, and McCabe (1999) state that "the most effective protection health professionals may offer their dieting patients is to expose this fantasy {that diets will lead to weight loss} by accurately describing the data about dieting, weight, and health." Similarly, according to Garner and Wooley (1991), a fundamental component of "normalizing" eating behavior involves "the genuine recognition that dieting is self-defeating and that virtually every type of food may be consumed in moderation" (p. 764). The effectiveness of dieting alone, as a weight loss method, must

certainly be questioned given the plethora of discouraging data, particularly in the domain of maintenance. For example, the success of both Very Low Calorie Diets (VCLD) and more moderate diets tends to be initially positive, but is followed by a gradual regain to pre-diet weights (Miller, 1999a). Similarly, behavior modification programs or nutrition education may be effective in facilitating short-term weight loss, but studies either do not report long-term data, or reveal a tendency towards relapse within 2 years (Miller, 1999a). According to Miller (1999a), "no commercial program, clinical program, or research model has been able to demonstrate significant long-term weight loss for more than a small fraction of the participants. Given the potential dangers of weight cycling and repeated failure, it is unscientific and unethical to support the continued use of dieting as an intervention for obesity" (p. 1131). This is not to say that choosing foods wisely, over one's lifetime, could not be beneficial to weight and health, only that short term, restrictive, or drastic dieting tends to be more harmful than helpful.

The long-term weight-reducing effects of exercise appear more promising. In the short term, exercise is less effective in producing weight loss than caloric reduction, but over the longer term, exercise produces a significant loss and this loss appears more maintainable (Miller, 1999b). Even without its (possible) weight reduction benefits, there is a significant body of data which suggests that exercise can lower the risk of a variety of diseases, including heart disease, hypertension, and diabetes (Miller, 1999b). Thus, the psychoeducational vehicle employed in the current study emphasizes the importance of balanced eating, not dieting, and including exercise as an important component of healthy weight maintenance.

Food avoidance intervention. Another specific manifestation of strict dietary restriction involves "food avoidance". This concept refers to the tendency to avoid a specific food or food category, and for the purposes of the current study, the food must be avoided in an effort to lose weight. One study notes that many adolescents avoid various foods; among girls aged 14-16, 16% avoided dairy, 18% avoided meats, and 13% avoided starchy foods (Grigg et al., 1996). The idea that all foods can fit within one's life, in moderation, was emphasized in the current study. Participants were encouraged to gradually introduce previously avoided foods into their diets, by eating a small amount of the avoided food on a regular basis.

Body image intervention. Because body dissatisfaction has been implicated as a risk factor for the development of dieting (e.g., Heatherton & Polivy, 1992) and eating pathology (e.g., Stice & Agras, 1998), it is important that this topic be addressed as part of the intervention. Body image refers to specific feelings, ideas, appraisals, and schemas about one's actual body, as well as internalized standards related to physical shape and appearance (Cash & Grant, 1996). Given the behavior-oriented nature of this psychoeducational intervention, cognitions associated with negative feelings about the body were elicited from participants during the program, and ways in which dysfunctional thoughts can negatively influence behavior (e.g., by leading to binge-eating) were emphasized.

Hypotheses

The current study was designed to answer two primary research questions: (a) "Can a psychoeducational program reduce maladaptive dietary and exercise habits in women with sub-clinical levels of eating pathology?"; and (b) "Does altering maladaptive dietary

and exercise habits reduce the risk of the development of more severe eating pathology over the long-term?" Hypotheses used to test these research questions were as follows.

1) Immediately following the intervention, participants in the psychoeducational group will demonstrate significantly greater pre-post test change on the Forbidden Food Survey (FFS) (Ruggerio, Williamson, Davis, Schlundt, & Carey, 1988), as compared to participants in the wait-list control (WLC) group.
2) Immediately following the intervention, participants in the (EX) group will have significantly greater pre-post test change on the RS, as compared to participants in the WLC group.
3) Participants in the EX group will demonstrate a significantly greater pre to post-test change in Meal skipping, as recorded on their Daily Meal Record, compared to participants in the WLC group.
4) Immediately following the intervention, participants in the EX group will demonstrate significantly greater pre-post test change on scores on the Beck Depression Inventory-II (Beck, Steer, & Brown, 1996), as compared to participants in the WLC group.
5) Immediately following the intervention, participants in the EX group will demonstrate significantly greater pre-post intervention change on the Body Shape Questionnaire (BSQ; Cooper, Taylor, Cooper, & Fairburn, 1987) as compared to participants in the WLC group.
6) Participants in the EX group will demonstrate a significantly greater decline in self-reported binge eating episodes over time, as recorded on their Daily Meal Record, compared to participants in the WLC group.

7) Participants in the EX group will demonstrate a significant decline in self-reported food avoidance over time, as measured by their Daily Meal Record, compared to participants in the WLC group.
8) At three-month follow-up, participants in the EX group will have significantly lower scores on the BULIT-R (Thelen, Farmer, Wonderlich, & Smith, 1991) than participants in the WLC group.
9) At three-month follow-up, participants in the EX group will have significantly lower scores on the EAT-26 (Garner, Olmsted, Bohr, & Garfinkel, 1982) than participants in the WLC group.
10) At six-month follow-up, EX group participants will have significantly lower scores on the BULIT-R than participants in the WLC group.
11) At six-month follow-up, participants in the EX group will have significantly lower scores on the EAT-26 than participants in the WLC group.

Method

Recruitment

Prospective participants (female university students in their first or second year of study) were recruited from a mid-sized Canadian University (Simon Fraser University). This population was chosen for 2 reasons: a) the high incidence of maladaptive eating patterns reported among this population (e.g., Delene & Bragowitcz, 1990); and b) accessibility.

Three recruitment modalities were used. First, posters advertising the research project were placed in highly visible locations around the university campus, including in the women's washroom areas. Approval for the posters was obtained from the Simon

Fraser University Ethics Review Committee. A sample poster is included in Appendix A. Second, advertisements were placed in the University's student newspaper; and third, brief classroom presentations describing the research were given to three first-year classes. An informal evaluation of how individuals came to hear about the study and decided to call for more information strongly suggests that the posters, particularly those placed in the women's washrooms, were more effective than the other recruitment methods.

Pre-Screening of Prospective Participants

Once a prospective participant indicated an interest in the study (by telephoning the experimenter), she was scheduled for a pre-study screening interview. The screening interview was conducted in order to determine prospective participants' eligibility for the study, based on the following inclusion and exclusion criteria:

Inclusion criteria.

1) Chronic attempted caloric restriction (dietary restraint); participants must obtain a score of 16 or greater on the Revised Restraint Scale (Herman & Polivy, 1980).
2) Irregular eating patterns, as defined by "skipping" two or more meals per week, assessed during the clinical interview. The selection of two meals was arbitrary, as the literature does not indicate a specific "cutoff" at which meal skipping becomes pathological.
3) Avoidance of certain foods due to their "fattening" nature (note: this does not include avoidance for religious or ethical reasons, e.g., kosher, vegetarian, macrobiotic diets, and the like). Food avoidance was assessed at clinical interview using the questions: "Are there any foods that you avoid eating? If so, why do you avoid these foods?

What are the foods you avoid?" In order to qualify for the study, participants had to self-report avoiding three or more foods, and these foods had to be avoided based on weight or body shape concerns. The selection of three avoided foods was arbitrary, as the literature is non-specific as to a pathological quantity of "food avoidance".

4) Exercise frequency was assessed by clinical interview and an author devised exercise questionnaire (Appendix B). Level of exercise was categorized in two ways: sedentary lifestyle (See Appendix C), as assessed by clinical interview; compensatory exercise, as assessed by the author-devised questionnaire and defined by both of the following criteria: exercise conducted solely for weight related reasons; and which is excessive, as defined by vigorous exercise for two or more hours duration on six or more days per week.

   A participant who fell into one of the two categories (sedentary or compensatory) was considered for the study.

5) A score of 10 or greater on the "Drive for Thinness" subscale of the EDI was used to aid in the identification of women experiencing subclinical levels of eating pathology. That is, participants scoring above ten were considered for the study, provided that they fulfilled the other inclusion/exclusion criteria.

Exclusion criteria.

1) Presence of a clinically diagnosable eating disorder, as assessed by the Eating Disorder Examination 12th Edition (EDE; Fairburn & Cooper, 1993) and defined by using DSM-IV criteria for anorexia nervosa, bulimia nervosa, or binge-eating disorder (proposed criteria).

2) Current suicidality (assessed at interview, and using the BDI-II; Beck, Steer, & Brown, 1996).
3) Current substance abuse (defined conservatively as the consumption of 10 or more alcoholic beverages/week, or any recreational drug use).
4) Current treatment by a therapist, psychologist, or psychiatrist.
5) Inability to exercise due to a health problem (assessed by participant's self-report at interview).
6) Pregnancy.
7) Age under 18.

Screening Measures

To assist in determining participants' eligibility for the study, a structured clinical interview and several psychometric instruments were administered.

Demographic Information Sheet. (Appendix D). This consists of a series of experimenter-administered questions, including those regarding demographic information, meal skipping, and nature of food avoidance.

Eating Disorder Inventory. The Eating Disorder Inventory (EDI; Garner, Olmsted, & Polivy, 1983)) is a 91-item self-report instrument designed to assess symptoms associated with anorexia and bulimia nervosa. It is divisible into 11 subscales. One of the subscales, Drive for Thinness, was used as a screening tool to assist in identifying individuals with sub-clinical levels of eating pathology during the intake process. Items on this subscale are intended to assess concerns with dieting, weight preoccupation, and fear of weight gain (Garner & Olmsted, 1983). An EDI-Drive for Thinness score is obtained by summing the item scores for this subscale. Other researchers have used this scale to

identify "weight preoccupied" individuals for research purposes (e.g., Garner et al., 1984). The cutoff score of 10 was used to aid in identifying individuals with sub-clinical levels of eating pathology, because 10 is the lower boundary of the 95% confidence interval on this subscale for women with eating disorders (Garner, & Olmsted, 1983). This cutoff was set at a relatively low level to aid in ensuring that individuals who were chronic dieters with weight preoccupation, but without diagnosable levels of eating disorder, were chosen for the study.

Eating Disorder Examination (12th Edition). The Eating Disorder Examination (EDE; Fairburn & Cooper, 1993) was used to screen for clinically diagnosable eating disorders. The EDE is a semi-structured clinical interview designed to assess and describe the specific psychopathology of eating disorders (Fairburn & Cooper, 1993). Interrater reliability and convergent and discriminant validity of the interview have been reported (e.g., Fairburn & Cooper, 1993). For the purposes of this study, the EDE was used to assist in determining whether participants met DSM-IV criteria for anorexia nervosa, bulimia nervosa, or binge-eating disorder (proposed criteria) at the time of the initial screening. Participant responses to critical items on the EDE were compared to DSM-IV criteria in order to make or rule out an eating disorder diagnosis. The use of the EDE is advantageous in that it allows the clear operational definition of various symptoms of pathological eating behavior, and compares these symptoms with those required for DSM-based diagnosis (Fairburn & Cooper, 1993). The use of this interview assisted in ensuring that the individuals chosen for this study were, indeed, "subclinical" in their levels of eating pathology, and was a powerful adjunct to the self-report questionnaire data.

Revised Restraint Scale. The Revised Restraint Scale (RS) (Herman & Polivy, 1980) was used as a measure of a) expressed concern with body weight and shape, and b) the extent to which participants chronically diet to control their weight (Heatherton et al., 1988). Within the context of this study, the use of the Restraint Scale was intended to assess a combination of restriction and disinhibition (Polivy and Herman, 1989), or "unsuccessful dieting". Thus, it is important to note that RS scores appear to be unrelated to actual dietary intake or physical activity levels in women (French, Jeffery, & Wing, 1994) (i.e., it does not appear to identify successful caloric restrictors).

Scores on the RS range from 10 to 50, with higher scores being indicative of greater dietary restraint; a cutoff score of 16 is generally used to discriminate restrained from unrestrained individuals. Adequate internal consistency (.78-.86), test re-test reliability (.95), and construct validity of the Revised Restraint Scale are reported (Allison, Kalinsky, & Gorma, 1992; Laessle, Tuschl, Kotthaus, & Pirke, 1989; Ruderman, 1983). At the time of the initial screening, participants scoring at or above a score of 16 were considered for participation in the study.

In total, 43 women completed the clinical interview and psychometric measures. Of these, 15 did not qualify for participation in the study based on the inclusion/exclusion criteria outlined previously. Only one individual was excluded due to meeting DSM-IV criteria for an eating disorder (bulimia nervosa), while the remaining 14 were excluded due to not meeting the predetermined cutoff-scores on psychometric measures. None of the interviewees was excluded due to substance abuse, suicidality, or current treatment by a psychologist, psychiatrist, or therapist. Following the screening interviews, a total of 28 participants agreed to participate in the study. Four of these participants withdrew prior to

beginning the study (and prior to completing any pre-study measures), and no data from these individuals is included in the results section.

Participants

A total of 24 individuals (13 = experimental group, 11= control group) completed the initial component of the study (i.e., pre-testing), and 21 of these participants completed the study, from pre to post-test. The remaining 3 (2 experimental group, 1 control group) participants withdrew for unknown reasons during the eight-week study period.

The ethnic composition of the total sample of 24 participants was 54.2% Caucasian, 37.5% Asian, and 8.3% other ethnicities. Forty-one percent of the sample resided at home with their parents, 20.8% were living in on-campus residence, and 37.5% resided off-campus, in their own rented or owned accommodation. Forty-one percent of the sample was in their first year of university, while 58.3% were in their second year. The mean age of the sample was 22.2.

Procedures

Participants were randomly assigned to groups by rolling a dice, and categorizing individuals based on the following: a roll of one-three = EX group assignment; and a roll of four-six = WLC group assignment.

Dependent Measures

Outcome measures were considered, on an a priori basis, to be of either primary or secondary importance. Primary outcome measures are those which address the main research hypotheses. Two other outcome measures addressed constructs not directly targeted by the intervention, but which were considered important in their own right.

These include a measure of depression (Beck Depression Inventory II; Beck, Steer, & Brown, 1996) and participant body weight, in pounds.

Primary Outcome Measures

Daily Meal Record (Appendix E). Daily self-monitoring forms were used to record meals and snacks eaten during the course of the study. Participants were not asked to record the actual food items they consumed, only whether they ate a meal or snack (subjectively defined by each individual participant) and the time of day at which they ate it. Additionally, participants recorded whether they consumed a "forbidden food", operationally defined as a food that they were attempting to avoid eating for weight or shape-related reasons, on a particular day. This provided an estimate of the frequency of consumption of "forbidden foods" on a weekly basis. Finally, participants were asked to indicate whether a meal or snack was a binge, defined for them at pre-study (See Appendix B for definition of "binge"). A separate Daily Meal Record form was used for each day of the week.

Scoring. The number of self-reported binge-eating episodes was scored by summing the number of self-reported binges per participant, per week. The number of meals eaten per week was determined by summing the number of meals recorded on the self-monitoring form over the course of the week. Each day on which a participant reported consuming a "forbidden food" was scored a "1", regardless of how many forbidden foods they reported consuming on that particular day, and summed for the week (max. score = seven per week).

Daily Exercise Record (Appendix F). A second daily self-monitoring form was used to record the number of minutes of daily exercise, the type of exercise, and the

participants' reasons for exercising on that day. For the purposes of this study, the term "exercise" included only "structured" exercise, meaning we did not consider activities such as housework, gardening, or home renovation, but did include activities such as walking, running, aerobics, swimming, and team sport. Participants were told to record only activities done for a minimum of 10 consecutive minutes, and a separate form was used for each day.

Scoring. Exercise was scored by summing the number of minutes exercised over the period of each week. Non-aerobic exercise (e.g., weight training) was not included in the total score.

Forbidden Food Survey. The Forbidden Food Survey (FFS; Ruggiero et al., 1988) was used to measure participants' self-reported feelings associated with the consumption of various foods. The FFS is not a measure of frequency of consumption of forbidden foods; rather, it evaluates the individuals' emotional response to consuming various foods. The FFS consists of a list of 45 food items, sampled from five food groups and beverages, and three caloric levels (low, medium, and high). The individual rates how she would feel about herself following the consumption of each food, based on five response choices ranging from "I would feel very good about myself after eating this food" to "I would feel very badly about myself after eating this food" (Ruggiero et al., 1988). Adequate reliability and validity of the FFS has been reported (Schlundt & Johnson, 1990). Cronbach's alpha for the 8 scales ranges from .52 for the beverage scale to .85 for the high-calorie grain and meat scales (Ruggiero et al., 1988). This scale is described as valid for discriminating varying levels of eating disturbances within non-clinical populations (Schlundt, 1995). For the purposes of this study, only FFS total scores were

used in analyses, as opposed to t-scores. This method was used in order to facilitate the inclusion of this variable in the multivariate analysis. Use of the scale in this manner was approved by the scale's corresponding author (D. A. Williamson, personal communication, 2003).

Bulimia Test-Revised. The Bulimia Test-Revised (BULIT-R; Thelen, Farmer, Wonderlich, & Smith, 1991) is a 28-item self-report, multiple-choice scale, with possible scores ranging from 28 to 140. A score of 104 or greater is suggestive of bulimia nervosa (Thelen, Farmer, Wonderlich, & Smith, 1991), but should not be used in isolation for diagnostic purposes. In a study that compared BULIT-R scores and the self-monitored frequency of binge-eating and purging among a group of college women, this scale demonstrated adequate construct validity ($r = .83$, $p < .05$; Brelsford, Hummel, & Barrios, 1992). Additionally, the BULIT-R demonstrates adequate concurrent validity ($r = .90$) with the Bulimia Investigatory Test Edinburgh, another measure of bulimic symptomatology (Welch, Thompson, & Hall, 1993).

Body Shape Questionnaire. The Body Shape Questionnaire (BSQ; Cooper, Taylor, Cooper, & Fairburn, 1987) was used as a psychometric measure of body image. The BSQ is a 34-item self-report questionnaire which measures concerns about body shape, especially regarding "feeling fat" (Cooper et al., 1987). It is scored by summing individual's ratings for each question (rated from 1-6), and provides a total score.

Concurrent validity with the EAT (Garner & Garfinkel, 1979) ($r = .35$, $p < .05$) and the EDI-Body Dissatisfaction Scale (Garner & Olmsted, 1983) ($r = .66$, $p < .05$) has been established, as has adequate discriminant validity for differentiating individuals with symptoms of bulimia nervosa from those without symptoms (Cooper et al., 1987).

Eating Attitudes Test-26. The Eating Attitudes Test-26 (EAT-26; Garner, Olmsted, Bohr, & Garfinkel, 1982) is a 26-item self-report measure of abnormal eating attitudes and behaviors, and is based on items determined based on a factor analysis of the original 40-item EAT. According to the test authors, this factor analysis indicated that the 14 items eliminated from the original EAT are "redundant and do not increase the instrument's predictive capability" (Garner et al., 1982, p. 874). Scores may range from 0-78, with a score of 20 or greater considered indicative of potential eating disturbance, particularly symptoms common to anorexia nervosa (Garner et al., 1982). Concurrent validity of the EAT-26 is established with a measure of body image ($r = .43$, $p < .001$) and with the number of self-reported diets in the past year ($r = .47$, $p < .001$) in a non-clinical population (Koslowsky et al., 1992). A total score on the EAT-26 is obtained by summing the score (range = 0-3) for each test item.

Secondary Outcome Measures

Beck Depression Inventory-II. The BDI-II (Beck, Steer, & Brown, 1996) is a 21-item self-report questionnaire intended to assess the symptoms of depression as defined by DSM-IV criteria. Adequate reliability and validity have been established in both outpatient clinical and non-clinical (college student) populations (Beck, Steer, & Brown, 1996). Scores on the BDI-II are obtained by summing the total for each item, and range from 0-63, with a greater score indicating greater endorsement of depressive symptoms.

Weight. A digital scale was used to weigh participants immediately prior to and immediately following the intervention. Additionally, participants were weighed at three and six-month follow-up meetings. Participants wore regular street clothes, without shoes, for weighing, and were not told or allowed to see their weight. Body Mass Index

(BMI) was calculated using the formula, weight (kg) ÷ height (in meters squared). Participant height was determined via self-report.

Conditions

Experimental Condition (EX)

The experimental group intervention consisted of eight experimenter-led psychoeducational sessions, of approximately 60 to 90 minutes each. Three separate intervention groups were held over a 1-year period, with each group attended by 3 to 8 participants.

Wait-List Control Condition (WLC)

Participants in the wait-list control condition completed all pre-study psychometric measures and engaged in daily self-monitoring of eating and exercise habits using the daily self-monitoring forms. Their only face-to-face contacts with the experimenter or research assistant occurred: at pre-study; after the first week of self-monitoring to ensure correct usage of the daily self-monitoring forms; immediately post-study; and at the two follow-up periods. Wait list control participants were also given the experimenter's telephone number and e-mail address in case they had a question regarding the study, or if they needed to change an appointment time.

The Psychoeducational Intervention Program

The framework of the psychoeducational program (i.e., communication intended to facilitate behavior change) followed a sequence of steps, as suggested and outlined by Maccoby, Farquhar, and Fortmann (1985). These steps are: (a) become aware (increase attention toward the problem, and provide knowledge that solutions to the problem exist); (b) increase knowledge (present information about the problem, in a manner meaningful

to the presentees); (c) increase motivation (provide incentives for behavior change, such that the presentees understand the personal benefits of behavior change); (d) learn skills (teach specific new skills involved in behavior change by providing step-by-step instructions; (e) maintenance (provide support and maintenance strategies for the new behaviors) (adapted from Maccoby, Farquhar, and Fortmann., 1985). For a comprehensive description of the psychoeducational intervention, as well as a copy of the slides used during participant presentations, refer to Appendices G and H.

Data Collection

Experimental Group

Each EX group participant met individually with the experimenter immediately before or following the group meeting. During these brief individual meetings, weekly self-monitoring logs were returned, and the experimenter read the weekly logs and determined rates at which participants had engaged in the self-monitored dependent measures for that week (e.g., number of meals skipped, number of minutes exercised).

Contingencies on performance. In order to enhance the effects of the psychoeducational intervention, contingencies were placed on participants' performance. When EX group participants turned in their weekly data, verbal reinforcement was provided to participants who attained improvements in behavior, whereas no verbal reinforcement was given to participants who did not evidence improvements. All participant behaviors which would be addressed over the course of the psychoeducational intervention (e.g., all dieting/exercise related target behaviors) were reinforced if the participant exhibited change in the desired direction, whether or not that behavior had been discussed yet. This method was used due to the highly correlated nature of the

interventions; that is, it was posited that changes in one behavior, for example, reduction in dietary restraint, would also lead to alterations in other areas, such as meal skipping. In sum, any change in behavior (in the desired direction) was reinforced by the experimenter.

Wait-List Control Group

This group completed all pre-study measures, kept daily self-monitoring logs during the 8-week intervention period (although they received no intervention), completed post-test measures, and participated in three and six-month follow-up data collection. To limit contact with the experimenter, participants returned all of their self-monitoring data to the Psychology General Office, and these data were periodically retrieved. No reinforcement was given to WLC participants for behavior change. However, participants who were late handing in data were given e-mail reminders, and if necessary, telephone reminders. In sum, this group was intended to control for the possible effects associated with daily self-monitoring of eating and exercise behavior, as well as the repeated administration of psychometric measures, in the relative absence of experimenter contact or psychoeducational intervention. At the completion of the study (including the last six-month follow up period), WLC participants were given the option of participating in a one-day seminar where they would be given the same psychoeducational material as was provided during the intervention. Due to the very low response rate and interest rate (related to the one-day seminar), the WLC participants were sent a package containing the psychoeducational information presented during the study in lieu of being given a seminar.

Specifics of Pre-intervention Data Collection

The study began with a pre-intervention phase, during which all participants initiated self-monitoring of the following dependent measures: (1) number of meals and snacks eaten each day; (2) binge-eating; (3) amount of exercise/day; (4) "forbidden food" consumption. Participants used their self-monitoring forms to record these data. Each participant kept pre-intervention data for eight days, and all participants brought self-monitoring data to the experimenter at the end of this time period. At that time, records were checked to determine whether participants were using the self-monitoring forms accurately. Additionally, psychometric dependent measures were administered at this meeting. These measures are the: (5) RS; (6) FFS; (7) BSQ; (8), BULIT-R; (9) EAT-26; and (10) BDI-II. Data on (11) weight were also collected at this time. In order to reduce the likelihood of negative affect arising from the weighing procedure, participants were not told their weight.

Self-monitoring of measures one through four continued throughout the eight-week intervention period, while the remaining measures were completed again immediately post-intervention. In sum, the more behaviorally-oriented measures were recorded on a continuous (daily) basis throughout the intervention period, while the psychometric measures were given on a more intermittent basis (at the pre-and post-intervention periods only).

Follow-Up Assessments

At three months and six months following the completion of the first part of the study, participants completed an additional two weeks of self-monitoring, and also completed all previously administered psychometric measures. Additionally, participants were weighed at both follow-up periods. These follow-up measures were intended to

provide information regarding: (a) the degree of maintenance of any changes in cognitions, behavior, and weight; (b) whether these changes were diminished or amplified over time; (c) whether there were differences, over time, between the treatment group and wait-list control conditions. A research assistant was hired to collect follow-up data for the second and third of the three study periods, as the primary researcher had left the province to complete internship training.

Compliance Intervention

Prior to the initiation of pre-study data collection, all participants underwent a "compliance intervention" to increase adherence to the daily self-monitoring procedure, as daily self-monitoring can be quite arduous and time consuming. The "compliance intervention" was administered to each participant individually. First, each participant was given training in self-monitoring by the experimenter. Specifically, the self-monitoring forms were reviewed with each individual in detail, and the importance of accuracy in daily recording was emphasized. Barriers to correct recording were elicited from participants, and problem-solving was done. Second, each participant was told that there would be a "lottery" at the end of the study, whereby participants who handed in all data and attended all necessary meetings would be eligible to win $100. This lottery procedure was conducted both following the initial portion of the study, and again at the three and six-month follow-up periods. Finally, participants who were delinquent in returning their records received telephone or electronic-mail reminders from the experimenter.

Confidentiality

At the initial psychoeducational group meeting, the issue of confidentiality regarding other members in the group was discussed. Participants were encouraged to avoid discussing specifics of group involvement with others, and to plan what they would do if they met one another while on campus.

Treatment Integrity

Two aspects of treatment integrity, as defined by Vermilya, Barlow, and O'Brien (1983), were addressed in this study. The first of these is procedural reliability, which refers to whether the treatment was delivered as intended. In order to ensure procedural reliability, a "script" was used to deliver the experimental group intervention. This was done in order to ensure completeness of the information provided, and to allow for accurate replication of the study. This script followed exactly from the outline of the program found in Appendix G.

The second aspect of treatment integrity, which may be conceptualized as "was the treatment received as intended" (Vermilya et al., 1983) was assessed by evaluating participants' knowledge regarding information presented in the experimenter-led presentations. This was done by giving participants review questions which covered material presented in the weekly seminar sessions. Each set of review questions was administered immediately following the weekly presentation. A copy of the weekly review questions is presented in Appendix IV of Appendix G. Participants scoring below 70% correct were to be provided with a written synopsis of the previous week's information at the following week's session. However, none of the participants obtained a score below 70% on any of the review questionnaires. Participants' mean scores ranged

from 84% to 100% correct, with the lowest score on any given week being 7/10 for any individual.

Adherence to the program was also measured by tracking attendance at each of the 8 sessions. Overall, attendance at sessions was excellent. Of the 11 experimental-group individuals classified as "treatment completers" (i.e., they did not drop out of the program before completing all pre and post-study measures), seven attended all eight of the sessions. Three individuals missed one session, while one individual missed two of eight sessions. Participants who missed a session were given a printed copy of the information from the previous week's session when they attended the following week.

Consumer Satisfaction

Due to the applied nature of this research, a measure of consumer satisfaction was deemed important. Following the intervention, experimental group participants were asked to fill out a form addressing consumer satisfaction (CSQ; Larsen, Attkisson, Hargreaves, & Nguyen, 1979; see Appendix H). Participants were told that this was completely anonymous. The form was delivered to participants via e-mail, and they were asked to complete the form and print it, then drop it off (without adding their name) at the Psychology General Office. Unfortunately, although participants were given several e-mail reminders asking them to return these forms, only 2 participants actually returned them. Participant feedback (from these 2 individuals) was overwhelmingly positive (Appendix I).

Statistical Analyses

Pre to Post-Intervention Outcomes

To answer the primary research question, "Can a psychoeducational program reduce maladaptive dietary and exercise habits in women with sub-clinical levels of eating pathology?", psychometric data were analyzed using a repeated-measures multivariate analysis of variance with a 2 (Group) x 2 (Time) design. The between-subjects independent variable was group membership (experimental vs. wait-list control), while the within-subjects independent variable, treated multivariately, was the "time" effect for each of the five psychometric measures (measured prior to and following the psychoeducational intervention). The G x T interaction was examined, as it was the main outcome of interest, and a significant interaction effect was followed by appropriate univariate analyses.

Similarly, all non-psychometric data (data from daily self-monitoring records, consisting of minutes exercised, number of meals eaten, number of subjective binge-eating episodes, and number of days on which a "forbidden food" was consumed) were analyzed using a doubly-multivariate analysis of variance with a 2 (Group) x 2 (Time) design. The group by time interaction was examined, and, once again, a significant interaction effect was followed by appropriate univariate analyses.

Finally, secondary variables of interest (depression and weight scores) were analyzed using a 2 (Group) x 2 (Time) design. The group by time interaction was examined, and a significant interaction effect was followed by appropriate univariate analyses.

Attrition

During the course of the eight-week intervention period, attrition was minimal. Two EX participants did not complete the psychoeducational intervention, (for unknown reasons) and one WLC participant left the study prior to the completion of post-test

measures (for unknown reasons). Greater attrition occurred at the two follow-up periods: three EX (one due to an illness in the family, one due to her own health problems, one returned to her country of origin) and six WLC participants (one due to lack of time, the rest for unknown reasons) failed to complete three-month follow up; six EX and six WLC participants failed to complete the six-month follow up.

Intention-to-Treat Analyses

Data lost due to participant drop-out were managed using the intention-to-treat principle (e.g., Begg et al., 1996). That is, the data missing due to participant attrition were estimated by bringing forward the last valid observation available on each measure for each participant. The use of this procedure is intended to reduce the potential bias created by including only treatment completers in the data analysis. All individuals who dropped-out of the study following the administration of pre-study measures are included in the intention-to-treat analysis, whether they left during the intervention period or were lost to follow-up.

Results

Baseline Characteristics

Non-categorical demographic and pre-study psychometric data for the 24 participants are presented in Table 2. As reflected in the table, EX and WLC participants did not significantly differ on any of the pre-study psychometric or non-psychometric measures, or in age, Body Mass, or score on the Beck Depression Inventory-II, suggesting that the randomization procedure was successful. Although there were no mean differences between groups, two significant outliers on the variable "age" are found in the control

group: one of the women was 53, and one 37. Age, as a variable, was not included in any of the statistical analyses.

Table 2

Pre-Study Scores for Experimental (EX) and Wait-List Control (WLC) Participants

Measure	Group	*n*	*M*	*SD*	*SE*	*t*	*p*
BMI	EX	13	25.27	6.64	1.84	-0.46	0.65
	WLC	11	26.34	4.27	1.29		
BDI-II	EX	13	20.00	8.37	2.32	1.13	0.27
	WLC	11	16.36	7.12	2.15		
BULIT-R	EX	13	90.85	15.98	4.43	1.36	0.19
	WLC	11	82.00	15.65	4.72		
EAT-26	EX	13	25.31	12.64	3.51	1.36	0.19
	WLC	11	19.55	6.59	1.99		
RS	EX	13	21.46	2.67	0.74	0.93	0.36
	WLC	11	20.36	3.14	0.95		
FFS	EX	13	143.69	18.67	5.18	0.49	0.63
	WLC	11	140.27	14.93	4.50		
MEALS	EX	13	15.85	4.06	1.13	-1.52	0.14
	WLC	11	18.09	2.98	0.90		
EXERCISE	EX	13	222.92	208.42	57.81	1.33	0.20
	WLC	11	131.36	98.62	29.73		
BSQ	EX	13	138.54	26.17	7.26	0.90	0.38
	WLC	11	130.27	16.92	5.10		
BINGE	EX	13	3.46	3.41	0.94	0.79	0.44
	WLC	11	2.36	3.38	1.02		
FOOD AVOID	EX	13	5.23	1.69	0.47	1.94	0.06
	WLC	11	3.73	2.10	0.63		

Note. BMI = Body Mass Index; BDI-II = Beck Depression Inventory-II; BULIT-R = Bulimia Test-Revised; EAT-26 = Eating Attitudes Test-26; RS = Restraint Scale; FFS = Forbidden Food Survey; MEALS = Number of self-reported meals eaten per week; EXERCISE = Self-reported minutes of exercise per week; BSQ = Body Shape Questionnaire; BINGE = Number of self-reported binge episodes per week; FOOD AVOID = Number of days on which participants consumed a "forbidden food" (food they were trying to avoid for weight/shape related reasons).

Clinically, all participants' pre-study scores fell within the "restrained" range on the RS (this was required for participation in the study). On the EAT-26, scores of 20 and above are considered clinically significant; 10 EX and 7 WLC participants obtained pre-study EAT-26 scores exceeding 20. Additionally, three EX participants obtained pre-study BULIT-R scores exceeding 104, the cutoff suggestive of bulimic symptomatology, with scores of 125, 105, and 106. On the BDI-II, 25% of the sample scored in the minimally depressed range at pre-study, 29% scored in the mild-symptoms range, 38% obtained scores falling within the moderately depressed range, and 8% obtained scores falling within the severely depressed range. Finally, three EX and four WLC participants were categorized as obese at pre-study, using a BMI cutoff score of over 27 as indicative of obesity (Pi-Sunyer, 1991).

Evaluation of Assumptions: Pre-Post Analyses

Missing Data: Treatment Completers

Following the completion of data entry, three of the "treatment completers" files were identified as containing missing data. Of note, this does not refer to individuals who dropped out of the study prior to completion of all pre-post measures, only to those who completed at least the initial (pre-post) component of the study. Among these "completers", three individuals failed to provide a complete data set for the self-monitoring variables. Within the "number of self-reported binge episodes" section, there were eight missing data points out of a possible 189, for a total missing of 4.2%. Within the "number of meals eaten per week" component, a total of 10 of a possible 189 data points were missing, for a total of 5.3%. Within the "minutes of exercise per week" component, a total of six of a possible 189 data points were missing, for a total of 3.2%.

Finally, for the food avoidance section, a total of eight of a possible 189 data points were missing, for a total of 4.2%.

Given the fairly small sample size, we did not wish to lose these individuals to analysis. Since the relative quantity of missing data was very small, we decided to replace the data using estimates of the data points. Data points were estimated using a regression equation that was created based on both the previous data points for that individual, and for the entire dataset. This is a commonly used method of estimating missing data points.

Multivariate Normality and Linearity

Group sizes were small but approximately equal. Given the fairly small sample size, each dependent variable was analyzed both visually (based on graphical data) and statistically to ensure acceptability of skewness and kurtosis values. The following formulae were used to calculate significance of skewness and kurtosis values (from Tabachnick & Fidell, 2001):

Skewness. $s_s = (6/N)^{-½}$, where N is the number of cases and s_s is the standard error for skewness. This value is compared with zero by using the z distribution, where $z = S\text{-}0/\, s_s$ and S is the reported value for skewness.

Kurtosis. $s_k = (24/N)^{-½}$, where N is the number of cases and s_k is the standard error for kurtosis. Once again, this value is compared with zero using the z distribution, where $z = K\text{-}0/\, s_k$, and K is the value reported for kurtosis.

Data were analyzed for skewness and kurtosis on a by-group basis. Using the conventional but conservative cutoff of $p < .001$ (as per Tabachnick & Fidell, 2001), most of the major dependent variables demonstrate small skewness and kurtosis values which are of little threat to linearity (Table 3). As reflected in the tabular data, three of the post-

test experimental-group variables have statistically significant kurtosis values. We decided that transformation of these variables was not necessary, as the analysis is robust to a small violation of this nature, and since the degree of kurtosis is not such that we observe significant outliers in the data.

Table 3

Skewness and Kurtosis Values

	Skewness (*SE*)	Kurtosis (*SE*)	Skewness (*SE*)	Kurtosis (*SE*)
	Experimental (n = 13)		Wait-List Control (n = 11)	
Pre-Weight	1.853 (0.616)	4.022 (1.191)	-0.92 (0.661)	1.159 (1.279)
Post-Weight	2.008 (0.616)	4.871 (1.191)*	-0.885 (0.661)	0.7 (1.279)
Pre-BDI-II	0.196 (0.616)	-0.491 (1.191)	-0.324 (0.661)	0.119 (1.279)
Post-BDI-II	1.078 (0.616)	0.629 (1.191)	-0.141 (0.661)	-0.465 (1.279)
Pre-BULIT-R	0.479 (0.616)	0.297 (1.191)	-0.352 (0.661)	-0.483 (1.279)
Post-BULIT-R	0.683 (0.616)	0.863 (1.191)	-0.485 (0.661)	-1.18 (1.279)
Pre-EAT-26	0.005 (0.616)	-0.28 (1.191)	-0.537 (0.661)	-0.958 (1.279)
Post-EAT-26	0.504 (0.616)	-1.228 (1.191)	-0.084 (0.661)	-1.139 (1.279)
Pre-RS	-0.09 (0.616)	-1.537 (1.191)	0.395 (0.661)	-0.776 (1.279)
Post-RS	-0.031 (0.616)	-1.16 (1.191)	0.296 (0.661)	-1.381 (1.279)
Pre-FFS	-1.307 (0.616)	3.396 (1.191)	0.374 (0.661)	-0.219 (1.279)
Post-FFS	-0.721 (0.616)	0.241 (1.191)	-0.097 (0.661)	-1.1 (1.279)
Pre-Meal	-0.646 (0.616)	0.192 (1.191)	-0.743 (0.661)	0.09 (1.279)
Post-Meal	-0.857 (0.616)	-0.346 (1.191)	-0.271 (0.661)	-1.72 (1.279)
Pre-Exercise	0.773 (0.616)	-0.711 (1.191)	0.105 (0.661)	-1.225 (1.279)
Post-Exercise	0.752 (0.616)	-0.924 (1.191)	0.039 (0.661)	-1.632 (1.279)
Pre-BSQ	0.273 (0.616)	-0.117 (1.191)	1.389 (0.661)	2.576 (1.279)
Post-BSQ	1.91 (0.616)	4.86 (1.191)*	0.492 (0.661)	0.755 (1.279)
Pre-Binge	1.385 (0.616)	2.137 (1.191)	1.319 (0.661)	0.249 (1.279)
Post-Binge	1.989 (0.616)	4.556 (1.191)*	1.922 (0.661)	2.809 (1.279)
Pre-Forbidden	-0.548 (0.616)	-0.877 (1.191)	-0.193 (0.661)	-0.699 (1.279)
Post-Forbidden	-0.221 (0.616)	-1.28 (1.191)	-0.271 (0.661)	-0.993 (1.279)

Note: * denotes $p < .001$. BDI-II = Beck Depression Inventory-II. EAT-26 = Eating Attitudes Test –26; RS = Restraint Scale; FFS = Forbidden Food Survey; Meal = Number of self-reported meals consumed per week; Exercise = Number of minutes of self-reported exercise per week; BSQ = Body Shape Questionnaire; Binge = Number of self-reported binge-episodes per week; Forbidden = Days on which a "forbidden food" was consumed.

Outliers

Univariate. Assessment of univariate outliers was conducted by converting dependent variables to standardized scores and, on a by-group basis, looking for data points with a z-score greater than $|3.29|$; a data point exceeding this z score was considered an outlier, $\alpha < .001$ (as per Tabachnick & Fidell, 2001). No univariate outliers were identified using this method.

Multivariate. Multivariate outliers were sought on a by-group basis, by using assessment of Mahalanobis distance computed using SPSS regression. Data for each group were separated into psychometric data, non-psychometric data, and a third separate analysis for the two other secondary variables of interest (weight and BDI-II), as they are included in subsequent multivariate analyses. Using a conservative estimate of the probability of a case being an outlier, $p < .01$, no cases were identified as multivariate outliers.

Homogeneity of Variance-Covariance Matrices

For both major sets of pre-post analyses (psychometric data and daily self-monitoring data), Box's test of equality of covariance matrices was non-significant, indicating homogeneity of variance. Similarly, Box's test of equality of covariance matrices was non-significant when applied to the secondary variables of interest (BDI-II and weight).

Pre-Post Intervention: Change Over Time

For each of the two main analyses (daily self monitoring data, and psychometric data of primary interest), a 2 x 2 repeated-measures multivariate analysis of variance was conducted, with group assignment treated as the between-subjects factor and time regarded as a repeated measure. In each case, the group by time interaction is the main

statistical contrast of interest, although the main effects of group or time are also reported if relevant. A significant multivariate effect was followed by univariate analysis at the level of each dependent variable. We control for Type I error using the approach of Dar, Serlin, and Omer (1994) who suggest controlling for error at the level of "families". In this case, our data are divided into three families: psychometric data, self-monitoring data, and secondary variables of interest. An alpha level of .05 is used for each of these analyses.

Psychometric Data

The 2 x 2 MANOVA involving the psychometric measures revealed a significant main effect for time, multivariate F (5, 18) = 4.138, p = .011, partial η^2 = .54. Most importantly, the G x T interaction, which is the main statistical contrast of interest, was statistically significant, multivariate F (5, 18) = 3.001, p = .038, partial η^2 = .46.

As the multivariate tests of T and the G x T interaction were significant, they were followed by univariate tests on each of the dependent measures. The T effect was statistically significant for each of the psychometric variables. For the BULIT-R, F (1, 22) = 10.50, p = .004, partial η^2 = .32; for the EAT-26, F (1, 22) = 7.85, p = .020, partial η^2 = .26; for the FFS, F (1, 22) = 6.281, p = .020, partial η^2 = .22; for the BSQ, F (1, 22) = 20.79, p = .000, partial η^2 = .49; and for the RS, F (1, 22) = 13.754, p = .001, partial η^2 = .39. The G x T interaction was statistically significant for the BULIT-R, F (1, 22) = 5.093, p = .034, partial η^2 = .19; the EAT-26, F (1, 22) = 4.627, p = .043, partial η^2 = .18; the FFS, F (1, 22) = 5.943, p = .023, partial η^2 = .21; and the BSQ, F (1, 22) = 11.931, p = .002, partial η^2 = .35. There was no significant G x T interaction on level of dietary restraint (RS). Post hoc testing using Tukey's HSD test found two pairwise comparisons

to be statistically significant. EX participants had significantly lower BULIT-R scores at post-test than at pre-test, $p = .011$, pre-test $M = 90.85$, $SD = 15.98$, post-test $M = 69.00$, $SD = 17.28$; and EX participants had significantly lower BSQ scores at post-test than at pre-test, $p = .002$, pre-test $M = 25.31$, $SD = 26.17$. Examination of the marginal means, displayed graphically, confirms that there was a significant effect over time for both groups, in that both groups' scores on psychometric measures tended to become lower over time. However, participants in the psychoeducational group evidenced a significantly greater reduction than the control group, as reflected by the significant interaction effect (Figures 1-5). These figures are profile plots based on estimated marginal means.

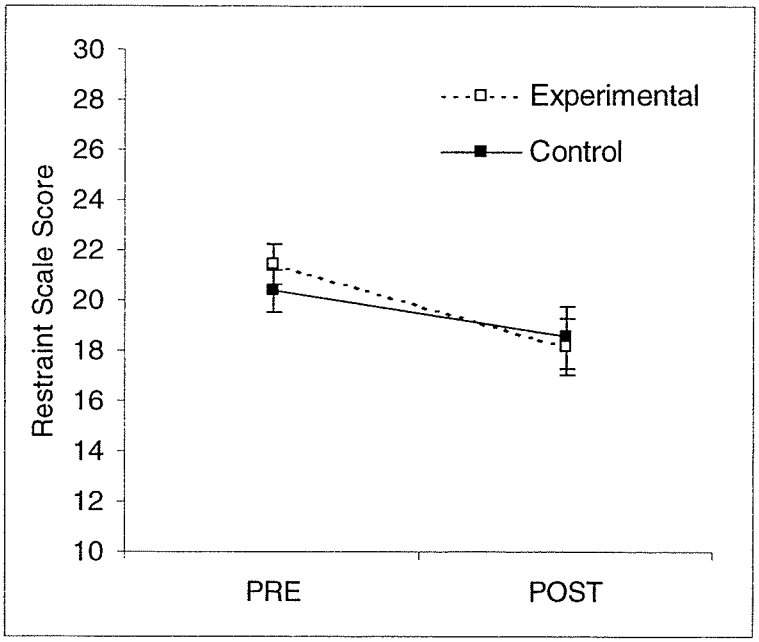

Figure 1. Mean change in Restraint Scale score: group by time interaction, represented as estimated marginal means. Error bars represent the standard error of the mean. Non-significant, $p \geq 0.05$.

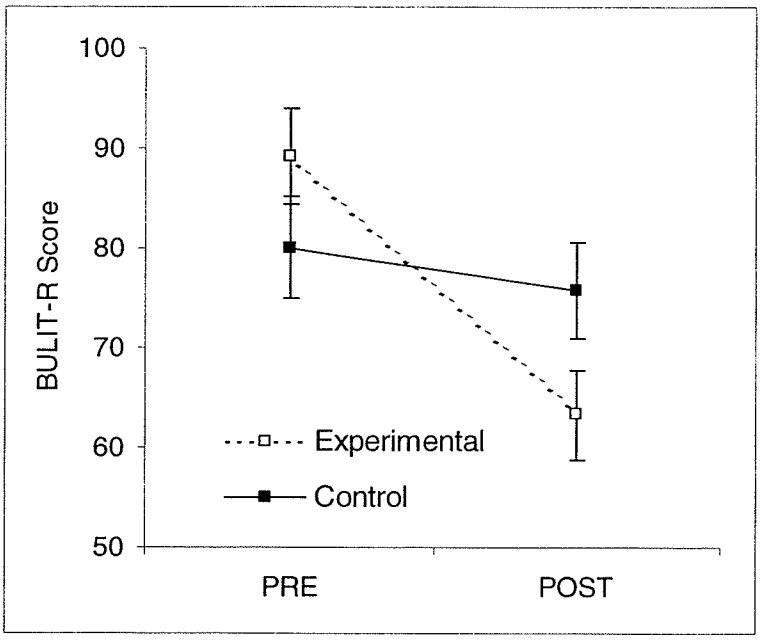

Figure 2. Mean change in BULIT-R score: group by time interaction, estimated marginal means. Error bars represent the standard error of the mean. Significant, $p < 0.05$.

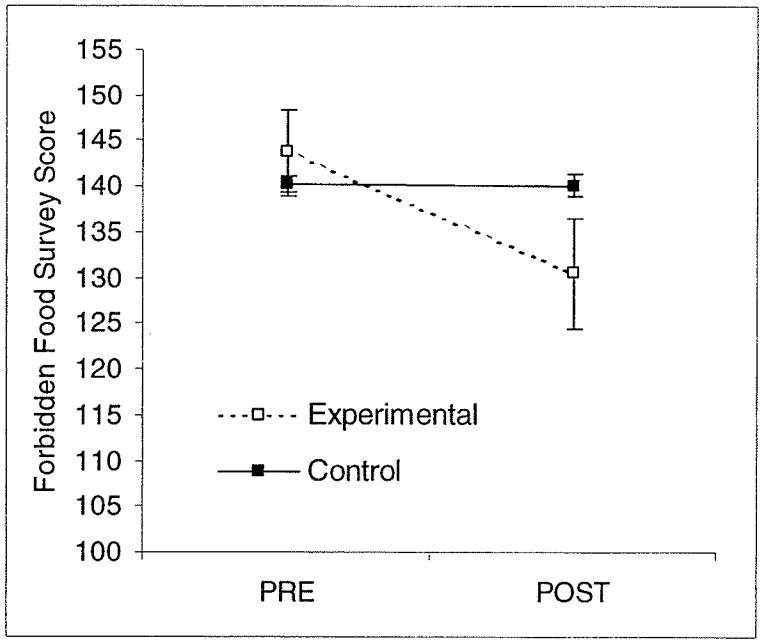

Figure 3. Mean change in FFS score: group by time interaction, estimated marginal means. Error bars represent the standard error of the mean. Significant, $p < 0.05$.

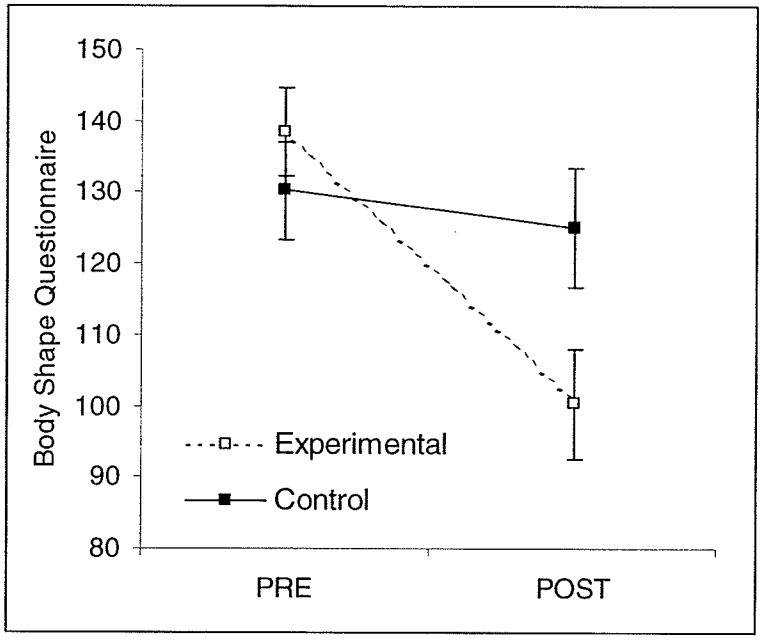

Figure 4. Mean change in BSQ score: group by time interaction, estimated marginal means. Error bars represent the standard error of the mean. Significant, $p < 0.05$.

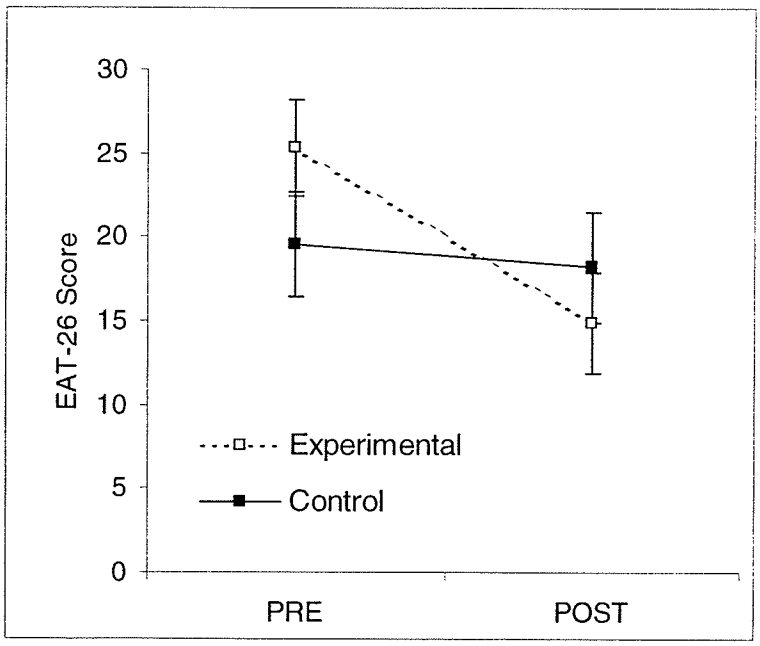

Figure 5. Mean change in EAT-26 score: group by time interaction. Error bars represent the standard error of the mean, estimated marginal means. Significant, $p < 0.05$.

Self-Monitoring (Non-Psychometric) Data

Daily self-monitoring data from the week pre-study, and from the week post-study was examined. Analysis of daily self-monitoring data reveals a significant main effect for time, multivariate F (4, 19) = 5.889, p = .003, partial η^2 = .55. Additionally, and most importantly, the G x T interaction was also significant, multivariate F (4, 19) = 3.648, p = .023, partial η^2 = .43. As the multivariate tests for T and G x T were significant, they were followed by univariate testing on each of the dependent measures. A significant univariate Time effect was observed for the number of self-reported binge-episodes per week, F (1, 22) = 14.691, p = .001, partial η^2 = .40; the number of days on which forbidden foods were consumed, F (1, 22) = 8.869, p = .007, partial η^2 = .29; and the number of meals eaten per week, F (1, 22) = 11.952, p = .002, partial η^2 = .35. A significant G x T interaction was noted for number of meals eaten per week, F (1, 22) = 8.148, p = .009, partial η^2 = .27, and for the number of days on which "forbidden foods" were consumed, F (1, 22) = 9.631, p = .005, partial η^2 = .30. Post-hoc testing using Tukey's HSD test did not reveal a significant effect for any of the pairwise comparisons. Examination of marginal means, displayed graphically, reveals that participants in the psychoeducational group demonstrated a greater increase in number of meals eaten per week over the course of the study, and evidenced a greater decrease in self-reported consumption of "forbidden foods" than participants in the control group (Figs. 6-9). There was no significant effect for either number of self-reported binge-eating episodes per week or minutes exercised per week.

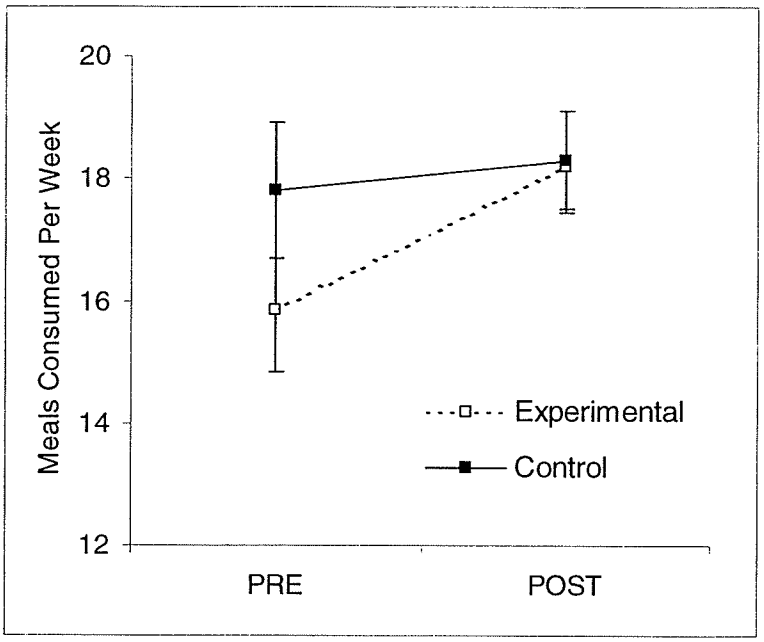

Figure 6. Mean change in number of meals consumed per week: group by time interaction, marginal means. Error bars represent the standard error of the mean. Significant, $p < 0.05$.

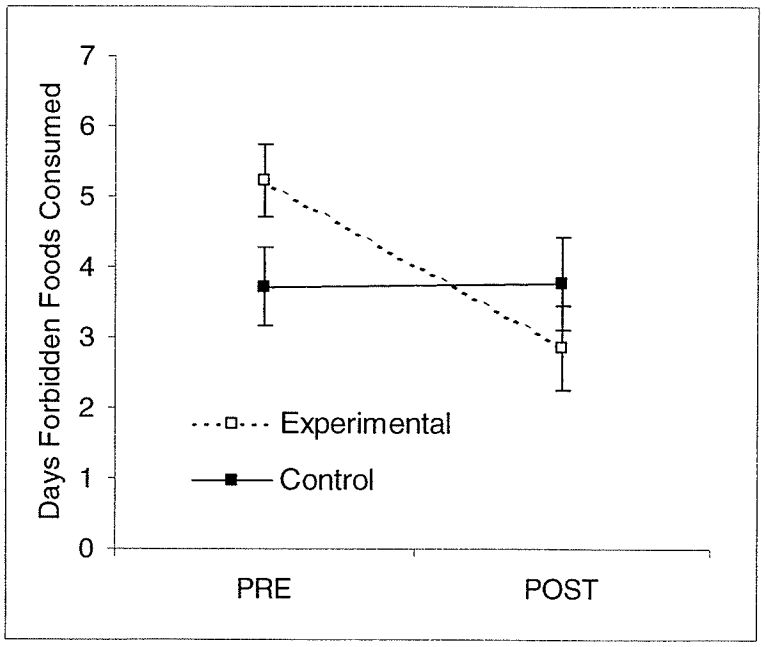

Figure 7. Mean change in number of days on which participants self-reported consuming a "forbidden food": group by time interaction, estimated marginal means. Error bars represent the standard error of the mean. Significant, $p < 0.05$.

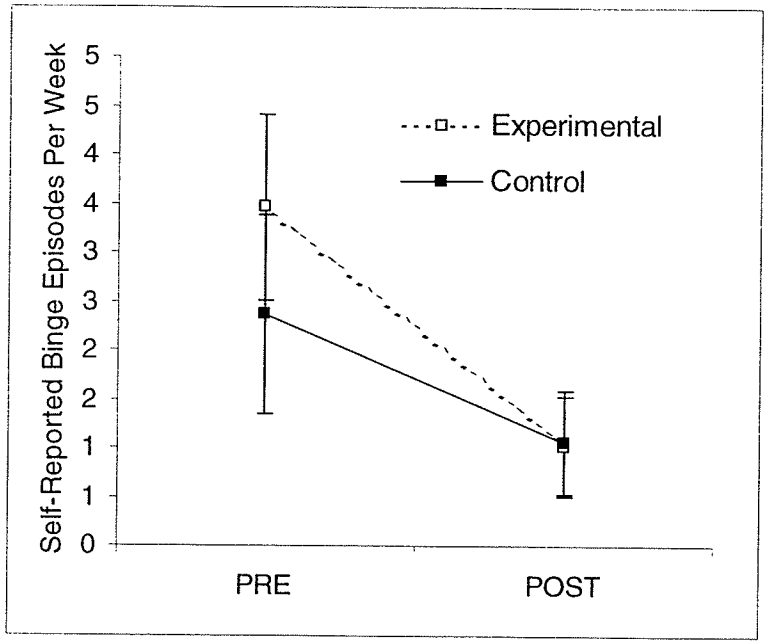

Figure 8. Mean change in number of self-reported binge eating episodes per week: group by time interaction, estimated marginal means. Error bars represent the standard error of the mean. Non-significant, $p \geq 0.05$.

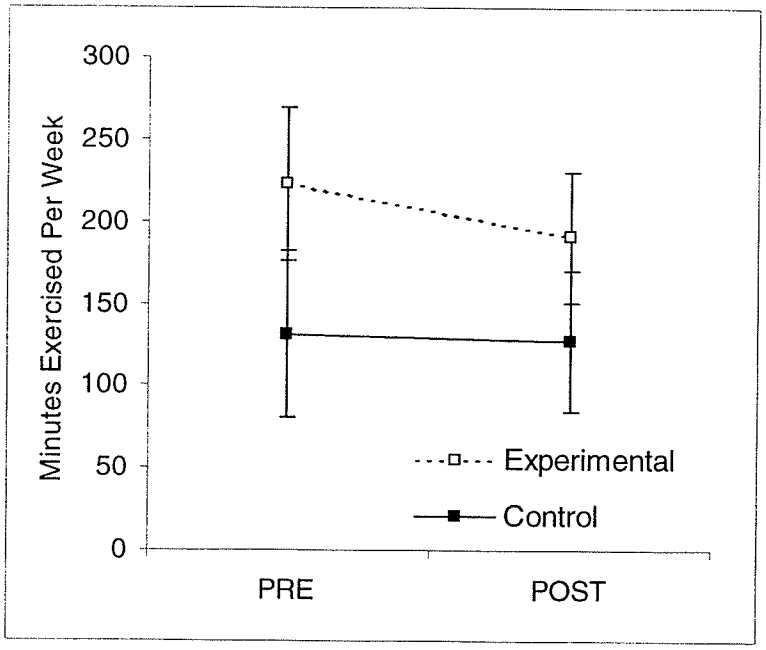

Figure 9. Mean change in self-reported levels of exercise per week. Error bars represent the standard error of the mean. Non-significant, $p \geq 0.05$.

Secondary Variables of Interest

These variables were not directly targeted in the current study, but are considered as secondary items of interest. Weight, measured in pounds, and depression score, measured using the BDI-II, were analyzed using a between-and-within groups analysis, based on pre-and post-intervention scores. Multivariate analysis reveals a significant main effect for time, F (2, 21) = 8.789, p = .002, partial η^2 = .46. Univariate testing of the time main effect revealed an effect for the BDI only, F (1, 22) = 17.43, p = .000. However, the group by time interaction was non-significant, and data were not subjected to further analyses.

Durability of Effects: Three and Six Month Follow-Up

The durability of the intervention effects (i.e., across time) was assessed statistically using dependent-samples t-tests. The wait-list control group and the experimental group were assessed separately, and differences between post-test and each follow-up period (three month, sixmonth) were compared. Graphical depiction of scores for each psychometric variable over time, beginning with pre-study and ending with the last six-month follow-up data points, is presented in Figures 10-14. These figures allow for a visual inspection of the nature of change on each of the psychometric variables, expressed as a function of group membership over time.

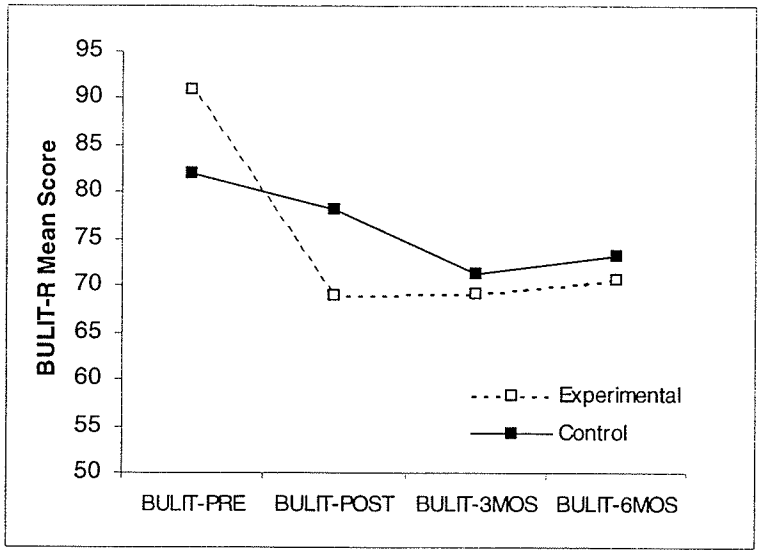

Figure 10. Change in mean scores on the Bulimia-Test Revised over time: Pre-test, post-test, and follow-up periods.

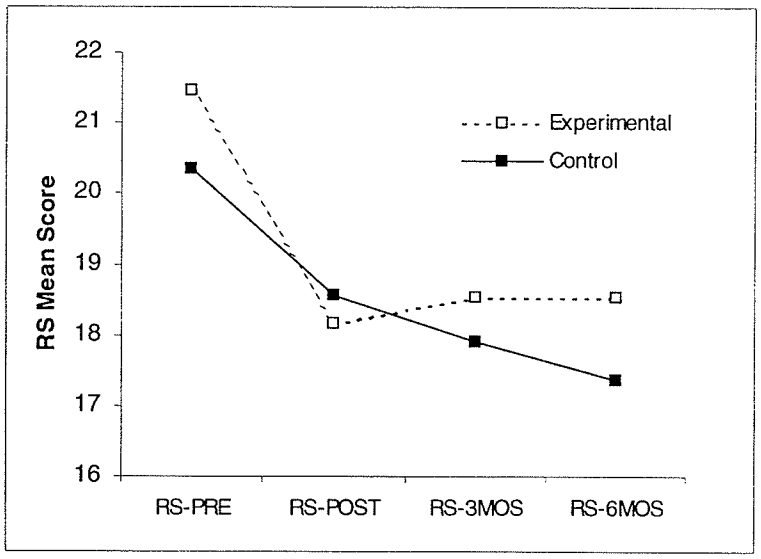

Figure 11. Change in mean scores on the Restraint Scale over time: Pre-test, post-test, and follow-up periods.

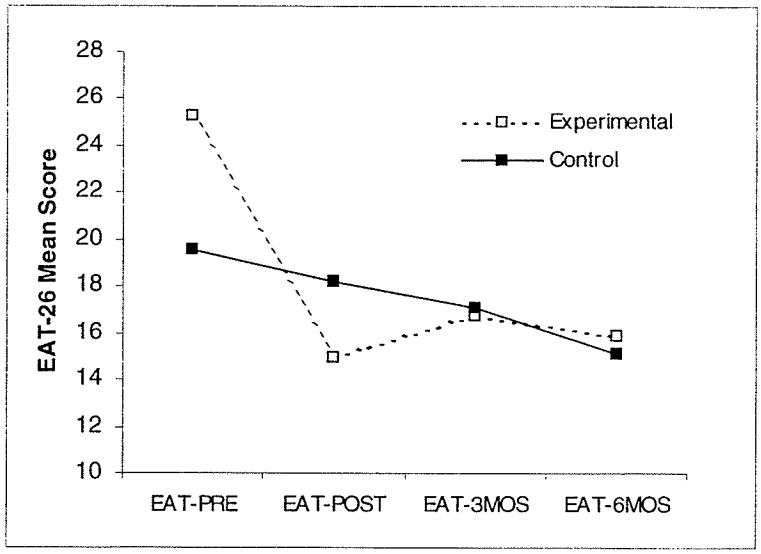

Figure 12. Change in mean scores on the Eating Attitudes Test-26 over time: Pre-test, post-test, and follow-up periods

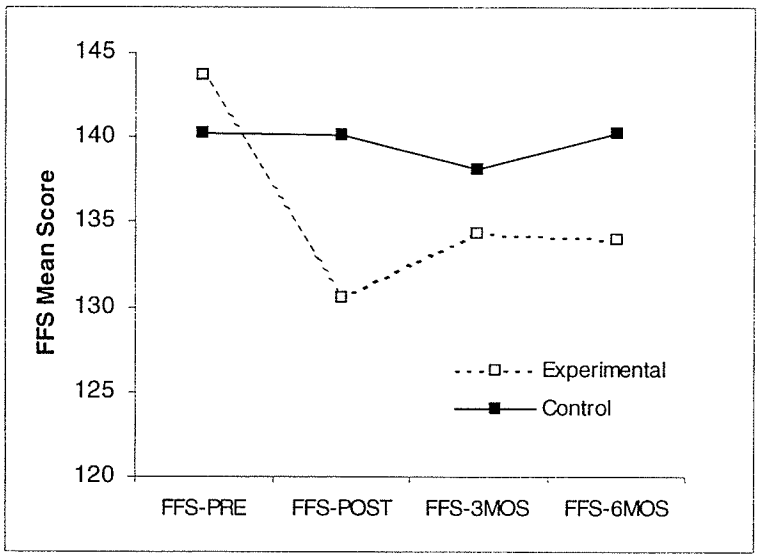

Figure 13. Change in mean scores on the Forbidden Food Survey over time: Pre-test, post-test, and follow-up periods.

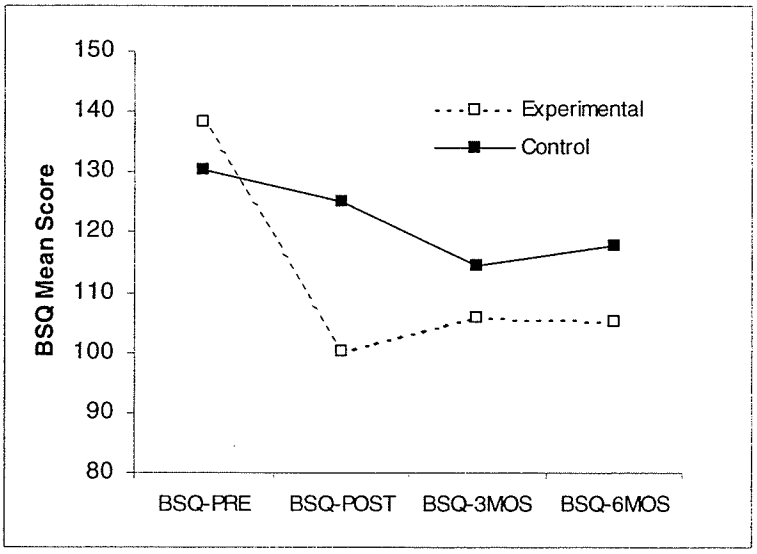

Figure 14. Change in mean scores on the Body Shape Questionnaire over time: Pre-test, post-test, and follow-up periods

The results of the statistical analyses (dependent samples t-tests) are presented in Tables 4 and 5. As reflected in the tabular data, only two of these items attained significance. Within the experimental group, scores on the EAT-26 significantly increased between the post-test and 3 month follow-up period, while control-group scores on the BULIT-R significantly decreased between post-test and the three month follow-up period. No other significant changes emerged between post-test and three month follow-up. With respect to the six month follow-up period, no statistically significant changes were observed as compared to the post-test data.

Due to the amount of participant attrition that occurred at both the three and six-month follow up periods, these results should be interpreted cautiously. Additionally, and related to the attrition, follow-up between-groups analyses of the BULIT-R and EAT-26 were not conducted, although we had initially planned to do so. While the intent-to-treat analysis procedure provides us with data for analysis, these data are likely too biased, as a

result of the attrition, to allow for meaningful between-group comparisons. However, between groups analysis of BULIT-R and EAT-26 data was included in the initial (pre-post) multivariate analyses described earlier.

Table 4

Psychometric Measures: Three-Month Follow Up Data

Group	Paired Differences	*M*	*SD*	*SE*	*t*	df	*p* (2-tailed)
EX	BULIT-POST - BULIT-3MOS	-0.15	4.72	1.31	-0.12	12	0.91
	EAT-POST - EAT-3MOS	-1.85	3.05	0.85	-2.18	12	0.05
	RS-POST - RS-3MOS	-0.38	1.76	0.49	-0.79	12	0.45
	FFS-POST - FFS-3MOS	-3.85	6.97	1.93	-1.99	12	0.07
	BSQPOST - BSQTHREE	-5.46	12.63	3.50	-1.56	12	0.14
WLC	BULIT-POST - BULIT-3MOS	6.82	9.62	2.90	2.35	10	0.04
	EAT-POST - EAT-3MOS	1.09	2.47	0.74	1.47	10	0.17
	RS-POST - RS-3MOS	0.64	1.63	0.49	1.30	10	0.22
	FFS-POST - FFS-3MOS	2.00	10.24	3.09	0.65	10	0.53
	BSQPOST - BSQTHREE	10.55	17.80	5.37	1.96	10	0.08

Note. Eating Attitudes Test-26 scores significantly increased for EX group members, while BULIT-R scores significantly decreased for WLC group members.

Table 5

Psychometric Measures: Six-Month Follow Up Data

Group	Paired Differences	*M*	*SD*	*SE*	*t*	*df*	*p (2 tailed)*
EX	BULIT-POST - BULIT-6MOS	-1.77	9.79	2.72	-0.65	12	0.53
	EAT-POST - EAT-6MOS	-1.00	2.94	0.82	-1.22	12	0.24
	RS-POST - RS-6MOS	-0.38	1.76	0.49	-0.79	12	0.45
	FFS-POST - FFS-6MOS	-3.38	11.25	3.12	-1.08	12	0.30
	BSQPOST - BSQTHREE	-4.85	10.76	2.98	-1.62	12	0.13
WLC	BULIT-POST - BULIT-6MOS	4.91	7.85	2.37	2.07	10	0.06
	EAT-POST - EAT-6MOS	3.09	4.91	1.48	2.09	10	0.06
	RS-POST - RS-6MOS	1.18	2.64	0.80	1.49	10	0.17
	FFS-POST - FFS-6MOS	-0.18	6.08	1.83	-0.10	10	0.92
	BSQPOST - BSQTHREE	7.27	14.09	4.25	1.71	10	0.12

Graphical depiction of scores for each non-psychometric variable over time, beginning with pre-study and ending with the 6-month follow-up data, is presented in Figures 15 - 18.

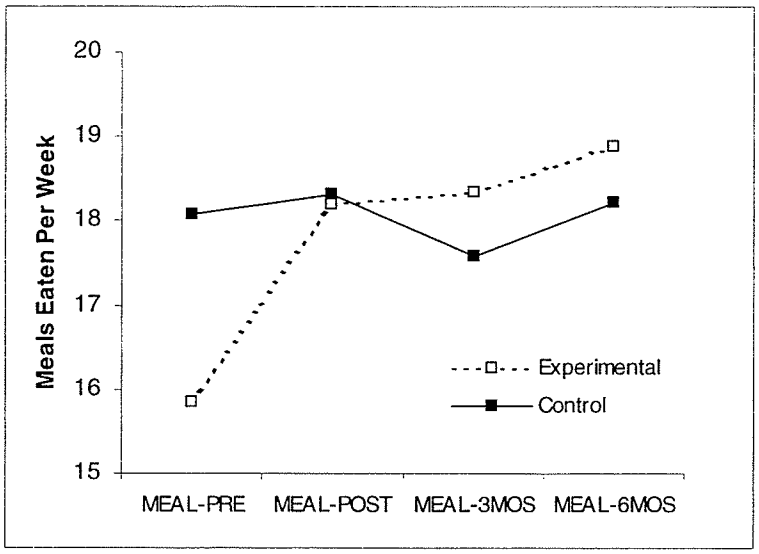

Figure 15. Change in mean number of self-reported meals consumed per week, over time: Pre-test, post-test, and follow-up periods.

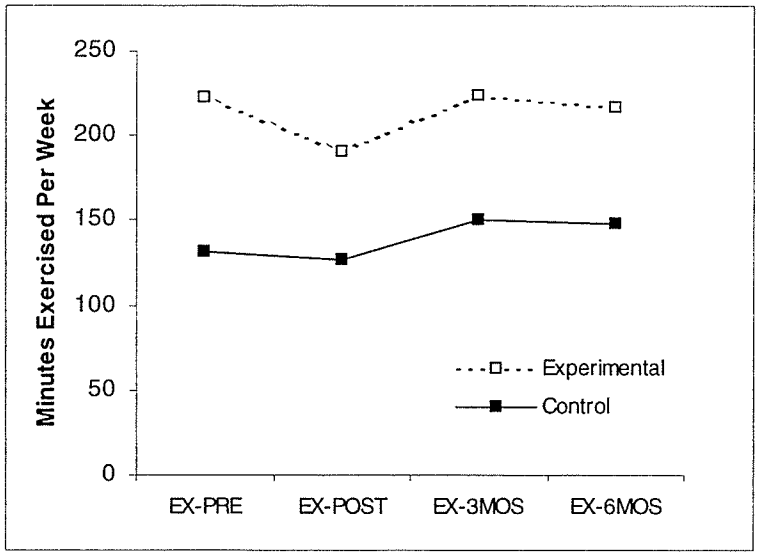

Figure 16. Change in mean number of self-reported minutes exercised per week, over time: Pre-test, post-test, and follow-up periods.

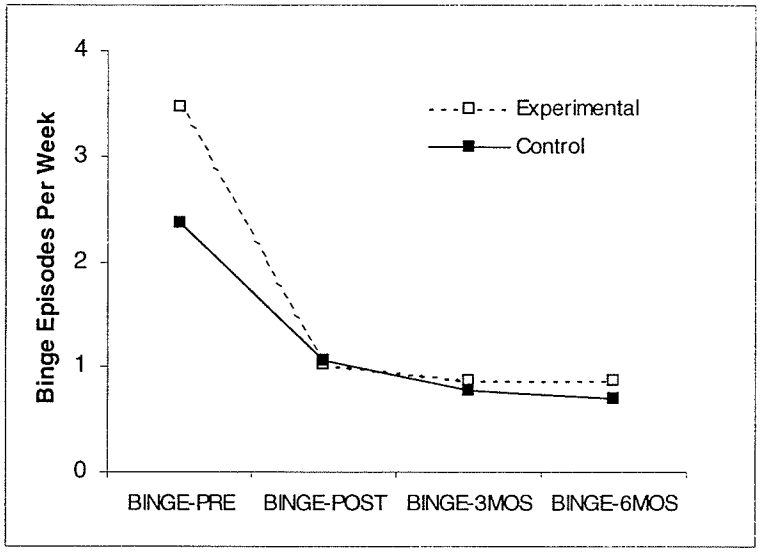

Figure 17. Change in mean number of self-reported binge-episodes per week, over time: Pre-test, post-test, and follow-up periods.

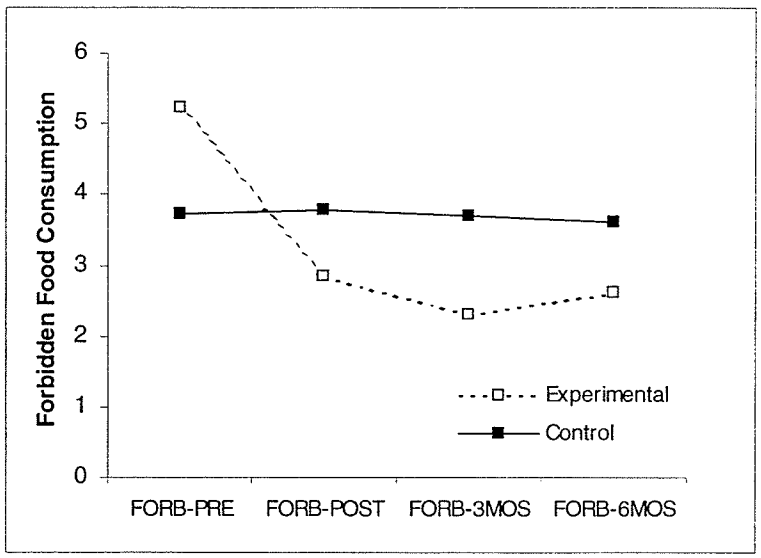

Figure 18. Change in mean number of days on which "forbidden foods" were consumed, over time: Pre-test, post-test, and follow-up periods.

For non-psychometric measures (daily self-monitoring record data), no significant changes were noted between post-test scores and three or six month follow up data. These data, assessed statistically through the use of dependent-samples t-tests, are presented in Tables 6 and 7.

Table 6

Non-Psychometric Measures: Three-Month Follow-up Data

Group	Paired Differences	*M*	*SD*	*SE*	*t*	df	*p*(2 tailed)
EX	POST-MEAL - 3 MOS MEAL	-0.15	2.44	0.68	-0.23	12	0.82
	POST-EXER - 3 MOS EXER	-32.92	137.81	38.22	-0.86	12	0.41
	POST-BINGE - 3 MOS BINGE	0.15	0.38	0.10	1.48	12	0.17
	POST-FORB - 3 MOS FORB	0.54	1.94	0.54	1.00	12	0.34
WLC	POST-MEAL - 3 MOS MEAL	0.73	2.76	0.83	-1.13	10	0.40
	POST-EXER - 3 MOS EXER	-23.34	54.70	16.49	-60.09	10	0.19
	POST-BINGE - 3 MOS BINGE	0.27	1.27	0.38	-0.58	10	0.49
	POST-FORB - 3 MOS FORB	0.07	1.76	0.53	-1.11	10	0.90

Note. MEAL = Number of self-reported meals per week; EXER = Number of minutes exercised per week; BINGE = Number of self-reported binge-episodes per week; FORB = Number of days on which a "forbidden food" was consumed.

Table 7

Non-Psychometric Measures: Six-Month Follow-up Data

Group	Paired Differences	*M*	*SD*	*SE*	*t*	df	*p*(2 tailed)
EX	POST-MEAL – 6 MOS MEAL	-0.69	1.55	0.43	-1.61	12	0.13
	POST-EXER – 6 MOS EXER	-26.38	148.24	41.11	-0.64	12	0.53
	POST-BINGE – 6 MOS BINGE	0.15	0.38	0.10	1.48	12	0.17
	POST-FORB – 6 MOS FORB	0.23	1.48	0.41	0.56	12	0.58
WLC	POST-MEAL – 6 MOS MEAL	0.09	0.70	0.21	0.43	10	0.67
	POST-EXER – 6 MOS EXER	-21.34	57.53	17.35	-1.23	10	0.25
	POST-BINGE – 6 MOS BINGE	0.36	1.21	0.36	1.00	10	0.34
	POST-FORB – 6 MOS FORB	0.16	1.89	0.57	0.28	10	0.78

Note. MEAL = Number of self-reported meals per week; EXER = Number of minutes exercised per week; BINGE = Number of self-reported binge-episodes per week; FORB = Number of days on which a "forbidden food" was consumed.

To summarize, the following is a list of each of the a priori hypotheses, and whether it was supported or not supported by the results of the current study.

- Hypothesis 1, which stated that participants in the EX group would evidence greater pre to post-test change on the FFS than WLC participants, was supported, with experimental participants' scores becoming significantly lower over time.
- Hypothesis 2, which stated that participants in the EX group would evidence greater pre to posttest change on the RS than WLC participants, was not supported, with both groups evidencing equal degrees of change over time.
- Hypothesis 3, which stated that participants in the EX group would decrease Meal Skipping over time relative to WLC participants, was supported.
- Hypothesis 4, which stated that participants in the EX group would evidence greater pre to posttest change on the BDI-II than WLC participants, was not supported.
- Hypothesis 5, which stated that participants in the EX group would have lower BSQ scores at posttest relative to WLC participants, was supported.
- Hypothesis 6, which stated that participants in the EX group would evidence greater pre to posttest change in self-reported binge-eating episodes than WLC participants, was not supported.
- Hypothesis 7, which stated that participants in the EX group would demonstrate less food avoidance at post-test than WLC participants, was tentatively supported; this is discussed further in the Discussion section.
- Hypotheses 8-11. These were not tested as worded initially, due to the attrition at the two follow-up periods. However, a repeated measures between-group analysis

(using pre and post-study data) was conducted of the EAT-26 and BULIT-R variables. EX participants had significantly greater pre-posttest change, in the desired direction, than did WLC participants. At 3-month follow-up, EX participants' scores on the EAT-26 had significantly increased from post-test, while WLC participants' scores on the BULIT-R had significantly decreased from posttest. The follow-up data must be interpreted cautiously due to attrition.

Discussion

One of this study's main research questions was, "Can a psychoeducational program reduce maladaptive dietary and exercise habits in women with sub-clinical levels of eating pathology?" This question was largely answered in the affirmative: the results of this study provide evidence, based on a randomized, controlled trial, that a purely psychoeducational intervention can alter sub-clinical levels of eating pathology in a culturally diverse group of university women. Specifically, analyses reveal a significant group by time interaction effect for several psychometric and non-psychometric measures known to be related to eating and eating disorder symptoms (e.g., BULIT-R, EAT-26, FFS), as well as body image (BSQ). Post-hoc analyses of these significant interaction effects reveals a significant pre-post test change for the EX group (but not the WLC condition) on the BULIT-R, the BSQ, and the number of days on which forbidden foods were consumed. It is important to note that the fairly small sample size limits the power of these statistical analyses, particularly the power of the post hoc tests due to their stringently adjusted alpha levels. This increases the chances of making a Type II error.

A Surprising Finding

Interestingly, the strongest univariate effect size estimate (partial $\eta^2 = .35$) was observed for Body Shape Questionnaire (BSQ) scores, the psychometric instrument which, among measures used in this study, loads most heavily on concerns with appearance/body shape. This result suggests that there is a strong association between BSQ score and group membership, with EX group participation being associated with a large decrease in score (i.e., in the less pathological direction). This is notable, in that "body image", as a construct, was the least-discussed of all of the target areas within the psychoeducational program, with only one of the eight sessions including discussion of this topic. A possible explanation for this large and significant finding is that many of the questions on the BSQ address cognition, in the sense that they inquire about the participants' cognitions regarding weight and shape. For example, questions which address cognition are, "Has eating even a small amount of food made you feel fat?" and "Has eating sweets, cakes, or other high calorie food made you feel fat?". While questions such as these do relate to the body image construct, they are also examples of *dysfunctional automatic thoughts,* which were most certainly addressed during the psychoeducational program. In fact, a large percentage of the psychoeducational program was spent focussed on negative thinking, methods for challenging dysfunctional automatic thoughts, and challenging barriers to exercising and eating healthfully. It may be that the intervention was particularly effective in teaching participants to challenge dysfunctional cognitions, which also affected participant scores on the BSQ. Additionally, as mentioned in the introduction, it is possible that unsuccessful dieting is a

contributing factor related to body dissatisfaction, and therefore, a decrease in maladaptive dieting behavior may have concomitantly decreased body dissatisfaction.

Expected Findings

The EX group's improvement in levels of concern with body shape/appearance, as measured by the BSQ, was paralleled by reductions on well established measures of eating pathology (the BULIT-R and EAT-26), as well as on a scale intended to assess participant's feelings about themselves after consuming various foods (FFS), and on a behavioral measure of stringent dieting behavior (meal skipping). An outline of the between-group changes observed immediately post-intervention, and a summary of the changes maintained at follow-up, is presented in Table 8. As reflected in the tabular data, EX group participants' scores on many of the measures administered in the current study became significantly less pathological over time than did WLC participants'. Most of these changes were maintained at follow up.

Table 8

Summary of Changes in Target Variables at Posttest and Follow-up Periods

Variable	Posttest (Between Groups)	3 Months (Within Group)	6 Months (Within Group)
BSQ	Significant decrease in score for EX group.	No change from posttest.	No change from posttest.
BULIT-R	Significant decrease in score for EX group.	Significant decrease in score for WLC group.	No change from posttest.
EAT-26	Significant decrease in score for EX group.	Significant increase in score for EX group.	No change from posttest.
FFS	Significant decrease in score for EX group.	No change from posttest.	No change from posttest.
RS	Non-significant.	No change from posttest.	No change from posttest.
MSkip	Significant increase in weekly meal consumption for EX group.	No change from posttest.	No change from posttest.
Binge-Eating	Non-significant.	No change from posttest.	No change from posttest.
Exercise	Non-significant.	No change from posttest.	No change from posttest.
Forbidden	Significant decrease in self-reported Forbidden Food consumption for EX group.	No change from posttest.	No change from posttest.

Note. BSQ = Body Shape Questionnaire; BULIT-R = Bulimia Test Revised; EAT-26 = Eating Attitudes Test-26; FFS = Forbidden Food Survey; RS = Restraint Scale; Mskip = Number of meals consumed per week; Binge-Eating = number of self-reported binge-eating episodes per week; Exercise = minutes exercised per week; Forbidden = number of days on which "forbidden foods" (foods participants avoid for weight/shape related reasons) were consumed.

These results clearly indicate that women participating in the psychoeducational intervention benefited from it, with EX group mean scores on the psychometric instruments becoming significantly less pathological over the course of the intervention. Additionally, EX group participants evidenced significantly greater pre-post change in terms of the number of meals they ate per week (eating more by the end of the study), suggesting that the intervention also had an effect on participants' actual eating behavior, over and above mere attitudinal change. Each of these significant results is encouraging and impressive, particularly given the small sample size of the current study, as attaining significance with a smaller sample size requires a strong intervention effect. EX group participants also self reported eating "forbidden foods" on fewer days at post-test than at pre-study, as measured through a frequency count of Daily Meal Record data. Unfortunately, the interpretation of this result is less than clear. It may be that these participants changed their definition of "forbidden food", as discussed in the psychoeducational program, and continued to eat these foods but no longer labeled them in the same manner (i.e., as a "forbidden" food item). Conversely, it may be that participants actually ate fewer of these foods because they were no longer experiencing the paradoxical effects of self-induced deprivation or the abstinence violation effect. Finally, it is possible that participants became more restrictive in their consumption of these foods, which would be an undesired effect. Further study of this program will need to clarify the nature of this particular effect, in order to determine the exact nature of these more qualitative characteristics.

As already mentioned, post-treatment gains on most of these measures were maintained at the three-month and six-month follow up periods, with the exception of

scores on the EAT-26. On this measure, we observed a significant increase in score among EX group participants at the time of three-month follow-up. Unfortunately, significant attrition by the time of the two follow-up periods makes intensive evaluation and interpretation of these data unwise. Although intent-to-treat analysis was used, we do not know whether the attrition was differential (i.e., whether those who became less/more pathological in their eating behavior were more likely to drop-out of the study by the time of follow up). Thus, in terms of answering the second question proposed by this study, "Does altering maladaptive dietary and exercise habits reduce the risk of the development of more severe eating pathology over the long-term?", the jury is, as they say, still out.

The Effect of Time

A strong and significant main effect for time was observed in the multivariate statistical analyses of both psychometric and non-psychometric measures. That is, over the course of the initial component of the study (pre to post-test), both EX and WLC group participants evidenced a significant decrease in scores on psychometric and non-psychometric measures. There is more than one plausible explanation for this result. It may be that the participants, at the time of self-referral, were at a high point in terms of their "chronic dieting" behavior (pathological eating behavior) and dieting-related distress, which prompted their self-referral; if this was the case, it is natural to assume that some regression toward the mean occurred over the course of the study, influencing the variable "time". Overall, participant BDI-II scores are supportive of this hypothesis, in that there was a significant main effect for time for scores on this measure (i.e., both groups decreased over time, with a non-significant group by time interaction). Thus, there was an across-time improvement in participant's emotional health that occurred

independent of group membership. This may have been a factor in some of their improvement on measures of eating pathology. If this is the case, it is an unsurprising finding given the correlation between depression and eating behavior/self-image.

Another possible explanation for the observation that both groups, as a whole, became less pathological in their responding on measures of eating pathology is related to the self-monitoring procedure. It is likely that the act of self-monitoring dietary and exercise habits, over time, exerted some effect on participants, as opposed to acting as an inert placebo. In fact, self-monitoring is frequently used as an adjunct to treatment of eating disorders and obesity, and is often presumed to be an active component of this treatment. If self-monitoring did exert an effect on its own, this would assist in explaining why both the EX and WLC groups changed over time. Finally, it is possible that there was an effect related to the repeated administration of the psychometric instruments, with participants tending to respond in a less extreme manner over time.

The Group-by-Time Interaction

The use of a randomized controlled trial allows us to control for the effect of time, as it is expected to have affected both the EX and WLC groups equally both prior to and during the course of the study (i.e., all individuals experienced the stressors of university life during the study period; all individuals would be expected to be equally "emotionally distressed" at the time of self-referral). While the effect of time was a factor in this study, possibly affected by individuals' levels of emotional distress at the time of self-referral, group by time interactions for both psychometric and non-psychometric measures also produced strong effect size estimates and statistically significant results. This demonstrates that the effects of group membership (and, therefore, the psychoeducational

program) surpassed the effect of time alone in decreasing experimental group participants' scores on relevant dependent measures, particularly on psychometric measures.

Variables Which Did Not Attain Statistical Significance

Exercise

Non-significant results were obtained for the non-psychometric (self-monitored) variables exercise (minutes exercised per week) and binge-eating (number of self-reported binges per week). Participants' initial levels (pre-study levels) of exercise behavior were highly interpersonally variable. It may be that, given this high variability, any changes in behavior were undetectable using a statistic which is dependent on the detection of changes in group means. Additionally, while the more sedentary participants did have the potential to effect measurable changes in their behavior over the course of the study, the more active individuals may have had little room for increase in exercise (a ceiling effect).

Binge Eating

In terms of self-reported binge-eating behavior, about one third of the participants reported that they did not engage in any binge eating behavior at all, either at baseline or during the study. Overall, levels of binge-eating were quite low. Thus, there was little room for change, at least in the less-pathological direction, on this variable. It is not surprising that many participants self-reported little to no binge eating during the study, as participants were carefully screened for the presence of a diagnosable eating disorder prior to beginning this study. Therefore, those with significant, clinically diagnosable levels of binge-eating would have been screened out, unless they underreported

symptoms at the screening interview. Additionally, although the definition of the word "binge" was provided to all participants at the start of the study, it is possible that their definition of "binge-eating" drifted over time as a function of the long period of data collection, or that some individuals forgot to record subjective binges on their monitoring forms. Actually writing the operational definition of binge-eating on participants' self monitoring sheets would solve this possible problem in future research related to this intervention.

Dietary Restraint (Restraint Scale)

Surprisingly, the construct targeted the most heavily within the psychoeducational program, dietary restraint, did not attain significance on univariate testing of its psychometric corollary (the Restraint Scale). The Restraint Scale, as a measure, is known to differentially select for dieters who have a tendency towards disinhibition (e.g., van Strien, 1999), or unsuccessful dieters with a tendency to binge/overeat, which is part of the reason it was chosen for use in the current study.

Since three of the ten RS items ask about lifetime weight fluctuations/changes, we hypothesized that these questions may have limited the degree to which significant change could be measured on this instrument, as scores on these three items would not be expected to change over time and could dampen any intervention effect. To test this hypothesis, we removed these three items from each individual's pre and post-intervention RS score and conducted a re-analysis of the data using these revised scores. However, even in the absence of these more globally oriented questions, the RS did not attain statistical significance.

It is possible that the RS was not successful in identifying the construct of "chronic dieting" as targeted by the current study. For example, some researchers have suggested the division of the construct of restraint into two categories, flexible and rigid (Westenhoefer, Stunkard, & Pudel, 1999), with rigid restraint being more dichotomous in nature and suggestive of more severe and entrenched eating pathology. It may be that the Restraint Scale is more successful in tapping this more rigid dimension of restraint than the "flexible" dimension, while the "flexible" dimension is likely more malleable following a relatively short term psychoeducational intervention such as the one used in the current study. Further research on this program should incorporate other measures of dietary restraint, in addition to the RS. Additionally, further research of this program could separately evaluate outcomes for "flexibly" versus "rigidly" restrained individuals to assess whether this type of intervention is equally or differentially effective for the two groups.

Clinical Significance

Clinical significance sometimes differs from statistical significance, and can be difficult to evaluate. Within the context of the present study, we evaluate clinical significance for three of the variables which were previously tested statistically. The clinical significance of changes on two of the psychometric measures with established norms related to eating pathology are evaluated; additionally, we evaluate the clinical significance of a non-psychometric measure, the number of meals eaten per week, which was also found to be statistically significant in the current study.

Psychometric Measures: Clinical Significance

BULIT-R. Scores on the BULIT-R are reflective of varying levels of self-reported bulimic symptomatology, with scores falling above the cutoff of 104 being suggestive of bulimia nervosa (although this instrument should not be used as a diagnostic instrument). At baseline, considering study completers only, two experimental and two control group participants obtained scores falling at above or near this cutoff: the experimental participants' scores were 125 and 105, while the control participants' scores were both 101. At post-test, the experimental participants' scores had decreased to 40 and 60 respectively (difference scores of 85 and 45), while control participants' scores decreased to 85 and 87 (difference scores of 16 and 14). All four of these participants demonstrate decreases in their BULIT-R score which are significant, in the sense that they no longer fall above or near the cutoff suggestive of bulimic symptomatology. However, the magnitude of change in the experimental group participants' scores was much greater, and may represent a more clinically significant outcome. Additionally, two wait-list control participants actually obtained higher post-test (compared to baseline) BULIT-R scores. In one case, the participant's score increased from 81 to 100, while in the other case, an increase from 85 to 93 was observed. In contrast, none of the experimental group participants evidenced a post-test increase in their BULIT-R score.

EAT-26. On the EAT-26, a score falling above 20 is considered suggestive of eating disordered symptoms. Of the 21 EX and WLC group participants who completed the entire study, 12 obtained pre-study EAT-26 scores falling above this cutoff (eight experimental and four control group participants). Of the four control participants, one participant's score decreased from 22 to 4, a clinically significant change; one

participant's score decreased from 27 to 24 by post-study, then to 13 by 3 month follow up; one participant's score remained stable at 28 from pre to post-study; and one control participant's score increased from 21 to 32 between pre and post-testing. Among the experimental group participants, five of the eight with high pre-test scores evidenced a clear, clinically significant change in score between pre and post-testing. These five participants' scores decreased from 48 to 25, 28 to 4, 26 to 3, 42 to 20, and 25 to 1 between pre and post-test. One of the experimental participants demonstrated a very small increase in score between pre and post-test (25-26), while the remaining two high-scorers demonstrated small, clinically insignificant reductions in their EAT-26 scores between pre and post-testing.

Non-Psychometric Measures: Clinical Significance

Meal skipping. Although no norms exist to assist us in determining the clinical significance of the statistically significant "meal skipping" variable, a closer and more detailed qualitative examination of this data reveals that none of the experimental group participants demonstrated an increase in meal-skipping over the course of the study. In fact, several (6 of 11 treatment completers) participants actually increased the number of meals they consumed each week by two or more (as measured at post-study). In contrast, 4 of the 10 wait-list control study-completers reported skipping more meals by the end of the experiment than they had at baseline. This finding represents a clinically significant trend, a trend which strongly suggests that the psychoeducational program exerted a prophylactic effect in terms of meal skipping behavior, or even more promisingly, that it may have encouraged participants to decrease their meal skipping behavior and focus on establishing a "three meal a day" eating pattern.

In terms of the clinical significance of the findings, participants in the EX group evidenced clinically significant reductions in their scores on psychometric estimates of eating disorder symptoms (the EAT-26 and BULIT-R), as well as a clinically significant reduction in meal skipping. Neither of these patterns was observed among WLC participants. As previously mentioned, participants in the EX group also self-reported eating fewer forbidden foods than did WLC participants at the end of the study than at pre-test. Unfortunately, it is unclear whether this is due to a change in their own definition of "forbidden food" following participation in an intervention designed to promote the idea that "all foods can fit" in a healthy diet, or whether they actually ate fewer of the foods that they had previously been attempting to avoid. Future studies of this psychoeducational program should more clearly assess this variable, perhaps by having participants keep detailed food diaries and engaging in analysis of food content and quantities over time. This method was not used in the current study due to potential reactivity related to engaging in this procedure.

Strengths of the Current Study

Use of a Randomized Controlled Trial

Relatively few studies assessing psychoeducational interventions for eating pathology have utilized randomization to treatment and control groups. Often, there has been no control group, or a convenience-based control group such as two different classrooms has been used. Thus, the randomization to groups is a relative strength of the current study.

Use of Intent-to-Treat Analysis

Although intent-to-treat procedures have become standard in other areas of psychological research (e.g., anxiety disorder treatment outcome studies), few researchers within the eating disorder treatment/prevention field have utilized this strategy for dealing with treatment drop-outs. Thus, they may inadvertently introduce bias into their results by ignoring the data obtained from individuals who subsequently drop out of the study. In contrast, the current study implements intent-to treat analysis as a way of reducing potential bias in the data, including data from all individuals who completed pre-testing, whether they completed the full intervention/control period or not. However, because of the large degree of attrition which occurred at follow up, these results must be interpreted with considerable caution due to the large proportion of estimated data points.

Low Attrition Rates During the Pre-Post Intervention Period

Once participants became involved in the study, attrition rates during its initial component (from pre to post-testing) were minimal, with only 3 of 24 participants (12.5%) leaving the study. This is a particularly interesting finding given the fairly arduous nature of this study (it required continuous daily self-monitoring over a period of 10 weeks, as well as attendance at weekly sessions for those in the EX group). The low attrition rate speaks to the high motivation level of those who did self-refer, and perhaps to their own level of frustration with the "status quo" of chronic dieting.

Good Participant Adherence

Participants were, overall, conscientious in their attendance at scheduled meetings, with most EX group participants attending all eight of the scheduled sessions. Additionally, both experimental and control participants were quite conscientious in their

return of weekly self-monitoring records. However, this high level of adherence decreased by the time of the three and six-month follow ups, at which time it became very difficult to contact participants, engage participants in self-monitoring, and have them attend scheduled appointments.

Use of a Didactic, Scripted Protocol

The eight interventions were largely scripted, and were delivered according to a specific protocol. This allows for complete replicability of the study, and minimizes the unknown effects of unplanned dialogue. To my knowledge, no other prevention-oriented program for individuals with eating pathology has used this approach, most intermingling a more psychotherapeutic or group-discussion oriented component with the psychoeducational aspects of the program.

Difficulties Encountered During the Implementation of the Current Study

The greatest difficulty encountered during the implementation of the present study occurred at the recruitment stage. A similar issue is noted by Franko (2001). She reports that in attempting to implement a targeted intervention with adolescent girls identified as "at risk" for the development of an eating disorder, only 1 of the 55 identified girl/parent dyads agreed to participate in the study. She hypothesized that parents may experience denial that their child is considered at risk for developing an eating disorder, and was forced to abandon that particular study due to lack of participant interest.

In the current study, 65% of the individuals who expressed an interest in participating in the study, and were interviewed by the experimenter, met all of the *a priori* selection criteria and were accepted into the study. This suggests that individuals were quite effective at self-selecting for the study based on their interpretation of the recruitment

information (posters, newspaper advertisements). However, the number of individuals who actually did telephone the experimenter for information regarding the study was quite low (less than 50), particularly considering the degree of effort and amount of time spent in recruiting—participants were recruited over a period of eight full months, and the study took place, on three separate occasions, over a full 12 months.

There are several possible explanations for the low level of expressed interest in the study. An unlikely explanation is that women in their first and second year of university are not concerned about their weight and body shape and do not engage in extreme dieting behaviors. This hypothesis is not supported by previous research (e.g., Drewnowski, Yee, Kurth, & Krahn, 1994) which suggests that large numbers of university women are dissatisfied with their weight and shape and engage in extreme behaviors in an attempt to alter it. Therefore, let us consider more plausible explanations.

First, chronic dieting behavior may, for many, be ego-syntonic, and individuals may not identify it as a concern or problem and therefore not volunteer for a treatment-oriented study. An extension of this hypothesis is the idea that weight dissatisfaction has become a "normative discontent" (Rodin, Silberstein, & Striegel-Moore, 1984) in our culture, such that women perceive body and weight dissatisfaction, with its attendant repeated dieting attempts, as a normal part of the human female experience and are unlikely to take action to change their behavior. A second possible explanation is that concern about weight may be a source of embarrassment for some, and these feelings of shame may prevent individuals from self-identifying, to a researcher, that they are weight preoccupied. Third, the time pressures inherent in university, and the possible lack of perceived "payoff" for investing time to be a volunteer in psychology research, may have

taken its toll. Finally, fear about changing dieting behavior (perhaps due to fear that relentless weight gain will be the certain result) may affect potential participants' desire to self refer for a study advertising the teaching of lifetime healthy eating habits/behaviors.

Methodological Alterations Resultant to Low Self-Referral

As a result of the low level of self-referral to the study, we decided to alter some aspects of the methodology. First, both first and second year university students were recruited (initially, only first year students were targeted) to expand the available participant base. Second, we had initially intended to include an attention-placebo control group to aid in controlling for the potential effects of weekly experimenter attention on outcome. Placebo for attention is increasingly considered to be important in program evaluation research (e.g., Adair, Sharpe, & Huynh, 1990). Unfortunately, sample size limitations prohibited the inclusion of this third group in the current study. Future study of this psychoeducational program should certainly include an attention-placebo control group, given the promising and significant effects noted in its current comparison with a WLC group. Although the lack of an attention-placebo control group was an unavoidable weakness in this study, it is important to note that the WLC group used did include some, albeit limited, contact with the experimenter, and also provided a control for the effects of self-monitoring and repeated administration of psychometric instruments. Additionally, this group provided a control for the effects of time and the "stresses" of university life.

A final methodological alteration was the elimination of the grouping of participants into "sedentary" and "non-sedentary"categories for the purposes of statistical analysis of

the exercise variable. While this would be an interesting analysis, the size of the groups precludes their further division (i.e., beyond EX and WLC).

Suggestions for Future Research

The present study is encouraging as it shows that sub-clinical levels of eating pathology are affected by a behaviorally oriented psychoeducational intervention targeting chronic, extreme dieting behaviors. These results also raise a number of questions, and present a set of problems, that must be addressed by future research. (1) It does appear important that researchers attempting to implement this sort of program establish a clear target population with specific dysfunctional eating behaviors or negative attitudes toward body shape/weight, rather than using a "shotgun" approach. However, obtaining "high risk" individuals for this sort of study has proven difficult at best, and impossible at worst, both within the context of the current study, and for other researchers (e.g., Franko, 2001). Therefore, novel recruitment strategies may need to be implemented. For example, psychometrically based pre-screening of large groups of individuals likely to contain a high percentage of "at risk individuals" (e.g., females living in university dorms) could be followed by individual telephone invitations to identified "high risk" individuals. During these telephone contacts, the nature and purpose of the study could be clearly outlined, and the researcher could directly address concerns that prospective participants might have. It is possible that the use of this method could elicit higher levels of participation. However, higher levels of attrition may also be problematic in this sort of study, as it could potentially include a more reluctant/less enthusiastic group of individuals.

(2) A dismantling strategy (i.e., isolating the component parts of the intervention and administering each, in isolation, in a controlled manner) could be used to identify, and perhaps streamline, the intervention program into its most effective component parts. It may be that certain sessions were very helpful in leading to participant attitudinal and behavioral change, while others could be superfluous. Streamlining the program would improve its cost effectiveness, and possibly, its palatability to potential group participants in that it would require a smaller time investment on their part.

(3) Collecting follow-up data over as long a period as possible is the preferred strategy in intervention-based research. However, attrition at the two follow-up periods was a significant problem in the present study, possibly due to the fairly transient lifestyle characteristic of many university students (i.e., moving home for the summer, work abroad projects), or due to individuals losing interest in participating in the study over the longer term. One method of coping with this attrition problem would be to collect more data points during the follow up period, perhaps at one, two, three, four, five, and six months post-intervention. This methodological change might be beneficial in two ways: first, it would allow for greater continuity of contact between experimenter and participant, perhaps reducing attrition, and also allowing for greater monitoring of address or telephone number changes; and second, a more complete dataset might be provided by earlier follow-ups (due to reduced attrition) which would yield valuable information regarding whether gains are maintained post-intervention.

4) As previously mentioned, comparing the intervention group to an attention placebo control condition will be an important follow up to the present study.

Conclusions

The results of the present study may be best and most succinctly summarized by the following:

- A pure psychoeducational format is effective for the dissemination of information related to healthy weight management, and can lead to attitudinal and behavioral change in the short term. It is important to note that this program was largely scripted, involved fairly minimal verbal participation from participants, and was didactic in nature.
- As reflected in participant's high scores on weekly quizzes assessing attention to information in the program, individuals listened to and understood the material presented at the weekly seminars.
- This program focused on the hazards of chronic, extreme dieting, and taught alternatives to this behavior. It appears that it was most effective in:
    - altering women's dysfunctional cognitions regarding their bodies, perhaps by teaching them to challenge negative automatic thoughts
    - altering eating pathology (as measured by self-report questionnaire)
    - reducing meal skipping, one aspect of stringent dieting behavior
- Whether this program can reduce the risk of individuals developing more severe eating pathology/an eating disorder over the long term is less clear, due to participant attrition at follow up.
- The major difficulty encountered in the implementation of this type of research is related to participant recruitment. This issue will likely limit sample sizes in similar research projects and should be taken into account when designing intervention

studies targeting individuals with sub-clinical levels of eating pathology/chronic dieters.

Given the longstanding nature of participant's chronic dieting behavior, it is noteworthy that EX group participants evidenced clinically significant changes in attitude and behavior after participating in a time-limited, eight session program that was exclusively psychoeducational (i.e., lacking in a psychotherapeutic component). Overall, the results of this study substantiate the effectiveness of earlier studies (e.g., Davis, Olmsted, & Rockert, 1990; Killen, 1996) which have used a targeted approach to intervention (i.e., identifying a clear target population as opposed to using a "shotgun approach"), in which a focus on observable behaviors is a key component of the intervention, and which provide clear alternatives for extant maladaptive behaviors, with changes on measures of body image (BSQ) and eating pathology (EAT-26, BULIT-R). Behavioral outcome measures have not been utilized by other researchers, and were therefore unique to the current study. These measures suggest that the current intervention assisted experimental participants in reducing meal-skipping behavior, and may have led them to change their consumption patterns of "forbidden foods".

Other researchers, including some which have included a more experiential component, noted changes on the RS (dietary restraint; for example, Cliska, 1990, Polivy and Herman, 1992) suggesting that this may increase efficacy along this dimension. The addition of an experiential component could assist in evaluating whether this "lack" was a factor in the non-significant results for the RS within this study.

Importantly, the results of the present study are congruent with recent results reported by Stice, Trost, and Chase (2003), who utilized a "healthy weight" psychoeducational

program as a placebo control condition. These researchers found, to their surprise, that participants randomized to this placebo (which consisted of psychoeducation aimed at encouraging participants to develop a permanent healthy lifestyle, based on consuming a lower-fat diet and exercising) evidenced statistically significant changes on the study measures. These authors note: "We might have inadvertently developed another preventive intervention that is effective in reducing eating pathology and related risk factors for eating disturbances by effecting behavioral change versus attitudinal change" (Stice, Trost, & Chase, 2003, p. 12). This mirrors the intent of the current study.

Pure psychoeducation as an intervention format could prove highly useful in the reduction of maladaptive eating behaviors such as chronic dieting. It does not require the use of trained clinicians, can be standardized and manualized, and may be delivered to large groups of individuals at once, all of which maximize its cost-effectiveness. Additionally, early intervention with individuals demonstrating sub-clinical levels of eating pathology is an under-utilized strategy for eating disorder prevention/treatment.

The results of the present study provide strong evidence that short term pure-psychoeducation can effect significant changes in the eating attitudes and behaviors of university women, a population well known to experience high levels of maladaptive eating behavior. Future research with this promising intervention will aid in determining its potential utility in preventing full blown eating disorders and its efficacy over the longer term.

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Appendix A

Sample Recruitment Poster

Appendix B

Author Devised Exercise Questionnaire

1. How often do you engage in vigorous exercise (exercise that gets your heart rate high, like running, aerobics, cross-country skiing, etc.)?

a. Every day, I never take a day off

b. On 6 days of the week

c. On 5 days of the week

d. On 4 or fewer days per week

e. I never do vigorous exercise

2. How long do you exercise at each session? This includes both vigorous exercise and less cardiovascularly intense exercise such as weight-training.

a. 3 or more hours

b. between 2 and 3 hours

c. between 1 and 2 hours

d. between 30 minutes and 1 hour

e. less than 30 minutes

f. I do not exercise

3. On days when you **do not** exercise, which of these best describes how you feel?

a. I never miss a day of exercising

b. I worry about my weight or body shape

c. I feel bad about myself

d. I feel neither good nor bad about myself

e. I enjoy taking days off

Appendix B (cont'd)

4. If I feel like I have overeaten or eaten foods high in calories or fat, I:

a. Exercise for longer than usual, and more vigorously than usual

b. Exercise for longer than usual

c. Continue to exercise at my usual level

d. Decrease the amount that I exercise

e. I do not exercise

5. If I had an injury and it hurt to exercise I would:

a. Continue to exercise anyway

b. Not exercise, but I would worry about my body weight or shape

c. Not exercise, and I would not worry about my body weight or shape

d. I do not exercise

Appendix C

Definitions

1. Sedentary: less than 30 minutes of physical activity on less than 5 days per week (Centers for Disease Control and American College of Sports Medicine Recommendations, 1993).
2. Physical activity: walking, running, swimming, cycling, skiing, aerobics, dance; any sport involving movement at walk or higher speed.
3. Vigorous exercise: an aerobic activity which leads heart rate to rise to 70% or more of maximum heart rate; examples of exercise which would meet this criteria are running, aerobics classes, or cross country skiing.
4. Binge: eating, within any 2-hour period, an amount of food that is definitely larger than most people would eat in a similar period of time under similar circumstances; and a sense of lack of control over eating during the episode (DSM-IV).
5. Compensatory exercise: exercise that is done to make up for perceived or actual overeating, and for weight or shape related reasons. For this study, defined as someone who answers a, b, or c to question 3 on the Compensatory Exercise questionnaire; *and* a or b on questions 4 and 5 on the questionnaire.

Appendix D

Demographic Information Sheet

Name:_____ **Phone:** _____

DOB: _____ Email:_____

Mail address:_____

Living situation: a) at home with parent(s):_____
b) on-campus residence:_____
c) off-campus with roommate:_____
d) off-campus alone:_____
e) other (specify):_____

Current Height:_____

Current Weight:_____

Do you sometimes skip meals? How often (per week: 2 cutoff)?_____

Are there any foods that you avoid eating? (list here: 3 cutoff)

_____

If so, why do you avoid these foods?

_____

Have you ever had an eating disorder?_____

How much alcohol do you consume per week (# of drinks)_____

Are you currently seeing a therapist, psychologist, psychiatrist?_____

Do you have any health problems that affect your ability to exercise or influence your eating habits?_____

Are you pregnant?_____

Appendix E

Daily Meal Record

Name_____ **Day**_____ **Date**_____

Time	Meal (M) Snack (S) Was this a Binge? Write * if yes.	Avoided Foods: Did you eat a "Forbidden Food" today? (Yes or No). If so, what was it/what were they?

Appendix F

Daily Exercise Record

Name_____ **Day**_____ **Date**_____

Time	**Type of Exercise**	**Length of Exercise**	***Why* did you exercise today?**

Appendix G

A Psychoeducational Intervention for University Females With Subclinical Eating Pathology

*This section contains its own References and Appendix section. Appendices are denoted by Roman Numerals, to distinguish them from those in for the main body of the document.

General Introductory Information

Program leader: Karina O'Brien, M. A.

Meeting times: We will be meeting on a weekly basis for eight weeks, from _____ to _____. Each session will last approximately one to one and a half hours. At the end of each meeting, there will be a brief set of review questions on the information provided in that session. You will not receive a grade for these questions—it is merely for my information, as I want to make sure that the information provided is clear to everyone.
Additionally, each of you will have a short individual meeting time with me either just before or just after our session, to hand in and review weekly records.

Purpose of these sessions: To provide information about healthy weight management, and provide alternatives for unhealthy cognitions and behaviors. Between-session practice of the new behaviors discussed during each weekly session is encouraged.

Why is this important? Why now? The first year of University is a time of great change for many people.

- For many of you, this is your first year away from home, and your first experience of deciding what, when, and where to eat. This is a major change for many people, and some find it difficult to maintain healthful eating habits.

- Many people find that the pressures of school, combined with pressures related to "dating", can be frustrating, and lead to negative mood and negative or overly perfectionistic feelings about your body.

- Participating in this program will assist you in maintaining your weight and health in a manner that is both physically and psychologically beneficial.

Review the importance of confidentiality: At times, I will be posing questions to you; please remember that what other people say in these sessions is confidential. Please try to respect others' need for respect and confidentiality. This will help everyone feel more comfortable sharing their thoughts.

Session 1: Part A "Dieting" Intervention

Main Topic: addressing the target behavior "Attempted Caloric Restriction (Dieting)".
Hand Out Booklet: weekly self-monitoring forms

Defining the Issue

As we get started, I think it is important to get an idea of what the word "dieting" means to people. This is a word that gets used a lot. I want to get an idea of what people here think of when they say they are "on a diet".

Question to participants: What does the word "dieting" mean to you?

- Write suggestions from participants on chalkboard. If participants are unable to provide several definitions, write some of your own
  - e.g.: "Reducing the number of calories you eat every day as a way of losing weight"
- The word "dieting" is generally used in our society to mean that you are trying to lose weight. It has different meanings for different people; some people see it as meaning that you are eating more healthfully; some describe it in the context of unhealthy eating behaviors; and some use it as a more general description of different types of behaviors people do to try to lose weight.
- Many people view being "on a diet" as a difficult and problematic eating regimen (information in preceding paragraph based on focus groups conducted by Neumark-Sztainer & Story, 1998)

Question to participants: What are some reasons why people diet?

- Write answers on chalkboard. If participants are unable to provide several reasons, provide some

- In talking about dieting today, when I use the word I mean attempting to, or actually, changing the way you eat for the purposes of losing weight.
- In our society, "dieting" for weight loss is extremely common, particularly among women
  - Dieting is promoted in the media (magazine articles and advertisements, television) as an effective way of losing weight
  - Each day, we are bombarded with advertisements for weight-loss programs, special foods like meal-replacement bars, and diet drugs (multi-billion dollar industry)

<u>Looking at what Research Tells Us</u>

- In our sessions together, I'll be talking about *scientific research* at various points. This is something that is important because:

- Example of using one example of something, vs. having a large sample of people to draw your information from (e.g.: knowing a smoker who lived to be 100 and had no health problems, vs. research demonstrating that many smokers will develop health problems as a result of smoking, and are at a higher risk of developing health problems)

- Unfortunately, many commercial weight-loss programs, and diet books, have not been tested out in an objective manner
- And the scientific research that *has* been done on long-term maintenance of weight loss after calorie-deprivation dieting is poor. Today, I'd like to talk about some of the reasons for this.

How Dieting Can Backfire

- Beyond being merely ineffective, dieting can actually contribute to problematic eating behavior in some people
- Let's look at what some scientific research suggests about dieting
- The first question we'll look at is:
  - "Do dieters act differently from non-dieters?"
- There is evidence that they do!
  - Describe the "Minnesota Experiment" data: effects of actual caloric deprivation on eating:
    - In the 1940's, Ancel Keys and colleagues conducted an experiment on semistarvation, using 34 male conscientious objectors (Keys, Brozek, Henschel, Mickelsen, & Taylor, 1950)
    - Important note: called "semistarvation", but caloric deprivation at levels consistent with current weight-loss-diet levels (Stunkard, 1987)
    - During and subsequent to weight loss, men experienced preoccupation with food and eating
    - Following weight loss, during the re-feeding period, some men "binge-ate" although they had no previous history of doing so (expand on Keys experiment)

  - *Question to participants:* What do the results of this experiment suggest about dieting?
    - Write answers from participants on chalkboard
    - e.g., pitfalls of strict dieting on weight management, increased tendency to binge, lowered metabolic rate, tendency to "obsess" about food.

- In the Minnesota experiment, the men did not have "free" access to food, beyond what was provided by the experimenters, until the re-feeding period.
- Now let's talk about situations where a person is *not* prohibited from eating more than a certain number of calories per day—this is the situation that almost all "dieters" are subjected to.

- Basically, most people can eat whatever food they want whenever they want, as we live in a country where there is a lot of food and it is easy to get.
- This means that dieting requires replacing *internally regulated* (hunger driven) eating with planned, cognitively determined, "diet-approved" eating (or dietary restraint) (Polivy & Herman, 1995).
    - That is, when you diet, you need to override your physical desire to eat more somehow, because you always have access to food.
- So the weight-loss dieter will be ignoring her internal hunger signals
    - Some people have called this a "diet boundary" (Herman & Polivy, 1984), which means that the person has "rules" about how much they can eat that are set to below their actual fullness level
    - *Question to participants*: What do you think might happen if the person broke one of these rules? Like if they ate something that they felt they shouldn't?
    - Write answers from participants on chalkboard
    - Lets look at what the research tells us can happen in this situation.

    - (Wardle & Beales, 1988)
    - 26 women in either a diet group, an exercise group, or a control group
    - After 4 weeks in these groups, all persons were asked to drink a milkshake
    - Then took part in a "taste test" where they were told to sample ice cream
    - Here's what happened: the women in the "diet" group actually ate twice as much ice cream after drinking the milkshake than did the women in the other two groups.
        - What might this mean? Looking at the "boundary" that we talked about before...it seems that if a dieter crosses the boundary they have set for themselves, the boundary is broken down and they actually end up eating more than someone who was not dieting!
- There is a lot of other research that shows the same effect: that people who are always trying to limit the number of calories they eat tend to overeat under certain conditions
    - Like if their boundary is crossed by eating a food they think they shouldn't have eaten
    - Or if they are stressed about something
    - Or if they have consumed alcohol

- *Question to participants:* Why might this happen?
    - write answers from participants on chalkboard
        - e.g.: discuss "all or nothing thinking"
            - i.e., "if I have one cookie I might as well have 11, and then starting tomorrow I will never have cookies again"

- *Question to participants:* We started today by asking if dieters act differently from non-dieters: What is the research we have looked at so far suggesting that dieters do differently?

- write answers from participants on chalkboard
- e.g.: Dieters appear to be vulnerable to overeating in certain situations, like when they cross the boundary they have set for themselves

- *Question to participants:* What kind of effect could this have on your body?
  - write answers on chalkboard
  - e.g.: weight fluctuation due to changes in eating habits over time
    - problems determining when you are really hungry

Reasons for Changing Dieting Behavior

- Coming back to reasons for dieting: The main reason that people diet is to try to lose weight.
- Dieting does tend to lead to some weight loss for people
  - Unfortunately, most research shows that dieters who do lose weight gradually return to their pre-diet weights.

- Also, as we have learned, dieting can lead to overeating for some people in some situations.
- Dieting can lead to alterations in metabolism that make the body less efficient at burning calories
- Dieting can lead to preoccupation with food

- What does all of this suggest? This suggests that chronic dieting can actually leave a person vulnerable to gaining weight, exactly the thing that the dieting person wants to prevent!

- Now I'd like to read you something called the "wood burning stove": this is a way of illustrating what I've talked about today. Please listen closely and try to visualize the scene as I talk about it.
  - The Wood Burning Stove Metaphor: Hill (1993) (Appendix I)

Specific homework assignment-- Week 1: Continue to fill out self-monitoring measures.

Session 2: Part B "Dieting" Intervention

Main Topic: Ways of altering patterns of chronic dieting
Hand Out Booklet: Handouts containing Food Pyramid; guidelines for what a serving is; fat content of selected foods; a sample meal plan that includes types of foods and amounts that fall within these guidelines; weekly self-monitoring forms.

Eating Smart Without Chronic Dieting

- Last week we talked about dieting, and some of the research about dieting that suggests that it can backfire.
- In looking at the research on the effectiveness of weight-loss diets, it appears that they tend to be effective over the very short term, but over the longer term most people return to their pre-diet weight (e.g., Miller, 1999)
  - This does not imply that it is not important to choose healthful foods most of the time-we are referring here to restrictive dieting aimed at weight loss, not a pattern of healthful eating over the lifetime
- Today, I'd like to talk about some of the ways that a person can begin thinking about eating without dieting. This is a very scary idea for a lot of people, one which has a lot of fears associated with it.
- What are some of the fears associated with not dieting?
  - Will I eat uncontrollably?
  - Will I gain weight?
  - *Question to participants:* Others? (write on chalkboard)

- It is important to note that eating without "dieting" does not imply that you eat constantly, eat junk foods all the time, or pay no attention to eating a variety of healthy foods
- But based on what we have learned about dieting so far, it makes sense that these things will be worrisome for people
  - Because when you are always trying to reduce the number of calories you are eating, you could be hungry a lot of the time, which could lead to thinking about food a lot
  - If you are thinking about food a lot (preoccupied), it makes sense that you'd worry about eating too much if you "threw caution to the wind", because both your mind and your body are feeling deprived and want to eat more
- A healthful strategy and effective way of maintaining weight over time is to eat regular meals, and implement foods into your diet that you enjoy eating, that are mostly healthy (with some "treats"), and most important, that you can maintain this way of eating over time

Getting Some Structure

- Many people who are used to restricting their food intake all the time have rather chaotic eating habits
- Eating without dieting has to begin with creating some structure in your eating habits.
  - I have heard people say that they try to only eat when hungry, rather than at set "meal" or "snack" times
  - This strategy is probably effective for people who do not have a history of chronic dieting
  - However, if you are someone who has tried to ignore your body's signals of hunger (by eating less than you need, skipping meals, fasting), it is likely that you are no longer in tune with what your body is telling you about whether it is hungry or full
- So what does this mean?
  - In the beginning, it will be necessary to structure your eating, so that your body gets used to eating at certain times and in appropriate amounts
  - Later, with practice doing this, you will get better and knowing when you are hungry and also when you are full
  - This also ties in with people's fears about overeating if they are not always "dieting"
    - As you develop a more structured pattern of eating, your body will get better at knowing when it is hungry, and because it is not constantly wondering when and if the next meal is coming, it will get better at letting you know it is full too.

Figuring Out What, and How Much, To Eat

- In order to begin developing some structure to your eating, it is necessary as a first step to determine the kinds and amounts of foods that make up a healthy, well balanced diet: This is what we will look at today.
- Go over the Canada Food Guide Pyramid, and samples of what a serving is; refer participants to handouts as appropriate
  - Remember: The Pyramid is a basic guide, not a set of inflexible rules that is telling you what to eat (Frank & Baker, 1996)

    - For women 15-24, the recommended daily caloric intake is 2200, for women of average height (5'5") and weight (Seabrook, 1997); of course, this varies from person to person, depending on their energy expenditure and their height and body size, so it's very important to take that into consideration

      - It is important not to get into a "calorie counting" mindset; but I would like to give you some examples of what reasonable amounts of food are for an "average" female. These are not plans that are meant to be followed to the letter; I just want you to get an idea of

what the amounts and kinds of foods are that fit into a healthy daily living plan.

- Sometimes it is easier to imagine this with a concrete example.

- What does 2200 calories a day look like, in actual food amounts? (Appendix II: turn to booklet; contains sample meal plans which model sample sizes and food varieties which provide a balanced nutrient intake and adequate caloric content)

- When eating a variety of foods each day, a person can emphasize eating in a healthy way that helps promote healthful weight management.
- One way of doing this is looking at the fat content of your diet.
  - By now, most of you are probably aware that current health professionals recommend that people be aware of the amount of fat they are consuming in their diet.
  - There are several reasons for this; certain kinds of fats can contribute to heart disease
  - And fats are usually calorie dense and tasty, which means that eating too many fatty foods can contribute to weight gain.
  - It is important that you don't take an "all or nothing approach" to eating fat; everyone needs some fat in their diet, both to stay healthy and so that eating is realistic and enjoyable.
  - The trick is to a) be aware of fat contents in foods; and b) choose foods that are low in fat most of the time.
  - Let's look at step one—being aware of the fat content of foods. First, let me say that many current guidelines recommend that people try to limit the fat they eat to less than 30% of their total caloric intake for the day (Van Way III, 1999)
  - It can be difficult to do this figuring out though! So it is important to know the fat content of what you are eating, decide whether it is worth it to you to eat that fat, or if you would rather make a lower fat choice for the day.
  - You could also decide to be "smart" about eating fats; if you decide to eat higher fat foods at one meal in the day, or during a snack, you could choose lower fat items during your other meals.
  - Lets look at fat contents of some common foods; this can also debunk some myths, I think!
  - One common myth I'll call the "Bran muffin/bread myth". It seems that a lot of people view muffins as low calorie or "diet" food, while bread is often seen as fattening.
  - Bread: trace-1 gram of fat per slice
  - Bran Muffin-5-6 grams of fat per muffin
  - (source: Fletcher, 1994) Show selected items from "Fat content of selected foods", from Fletcher, 1994, pp.123-127.

Specific homework assignment—Week 2: Practice eating based on the Food Guide Pyramid (with appropriate alterations for special diets). Continue daily self-monitoring records.

Session 3: Physical Activity Intervention: Part A

Main Topic: Health, Weight, and Shape Benefits of Regular Exercise
Hand Out Booklets: Daily self-monitoring forms

- Today we will begin talking about physical exercise, and we'll continue talking about it next week. Exercise is one of the most important things you can do for maintaining your body weight and shape, as well as your health, and for reducing stress
  - Although the average number of calories eaten per person each day has, on average, decreased across the past century, people have become heavier, on average. This is partially explained by a reduction in energy expenditure (Wilfley, Grilo, & Brownell, 1994)
  - Some research suggests that a large proportion of adults do not do any vigorous exercise, and are sedentary (Wilfley et al., 1994; Bock, Marcus, Rossi, & Redding, 1998)
  - Sedentary means less than 30 minutes of physical activity on less than 5 days per week (CDC and ACSM recommendation, 1993)
  - Other factors, like increasing TV viewing and increased consumption of fast foods, have been shown to be related to weight gain in women (Jeffery & French, 1998)—and watching television is not an exercise activity, so one way of getting around this problem is upping your activity level

Why is Exercise Important?

  - What are some of the benefits of regular exercise?
  - Outlining the benefits of regular exercise
    - Exercise has many *weight and shape-related* benefits;
      - Regular exercise is crucial for losing weight, and is the best predictor of weight maintenance across time (Wilfley et al., 1994)
- We talked about the way in which dieting can impact metabolic rate (slowing)-exercise can also impact metabolism
  - Exercise increases the amount of lean muscle in your body, which means that more calories are consumed at rest
  - This can increase your metabolic rate
- This is very important, because your resting metabolic rate uses 60-75% of your daily energy needs (Wilfley et al., 1994)
- So the benefits of exercising are not just that it uses up energy while you are doing it—it can actually have benefits while you are not doing it, by maintaining lean (muscle) mass, which uses up more energy than non-lean mass
- Exercise can also reduce negative feelings that people might have (e.g., Kaplan & Ciliska, 1999), like depression or anxiety, or even boredom
  - This is very important for several reasons;

- First, it can help you deal with the high-pressures that can be involved in University coursework and social life
- Second, depression or anxiety can lead to overeating for some people, as can boredom

Determining Your Current Level of Activity

- In-session exercise: take the next 5 minutes to fill out the brief questionnaire in your booklet. This is just a rough guide, but may help you figure out whether you need to increase your level of activity.

- Some of you will notice that you scored in the inactive or moderately active range. What does this mean for you?
  - It may mean that you could benefit from increasing either the amount or intensity of exercise you are currently doing.

- Others will have scored in the active or very active ranges; this is usually positive! However, there are some people for whom high levels of exercise is a sign of an underlying problem.

Overdoing it

- Although exercise is a positive addition to one's lifestyle, it is possible to have too much of a good thing (as with most things in life!)
  - Exercise can become a really stressful activity if done as part of a "relentless search for perfection", or as a way of compensating for overeating or poor feelings about weight and shape (Wilfley et al., 1994).
    - *One* reason for exercising for many people is that it can help maintain a fit-looking appearance
      - However, when this is a person's only reason for exercising, and this becomes all-consuming, it can lead to "overdoing" exercise

- *Question for participants*: What are some of the hazards of exercise that is compulsive or obligatory? (Note: By hazards we are looking at both dangers to the body, and negative effects on mood or thinking)
  - write answers on chalkboard

    - e.g. Feeling bad about self if you miss a day (From Grilo & Wilfley, 1992)
      - Preoccupied with exercise (can't stop thinking about it) (Grilo & Wilfley, 1992)
      - Overuse injury
      - Worrying: "If I don't exercise every day, I will gain weight"

- It is very important to take breaks from exercise; at least one or two days of the week need to be "days off" from your routine

- It is important to challenge the idea that taking a day off will lead to weight gain:
  - Incorporating at least one or two days off per week into your exercise routine is very important. Even elite athletes take days off from training. Your muscles need time to recuperate, in order to get stronger
- Taking one or two days off a week will not cause you to gain weight!
  - The process of weight gain or loss occurs over time and in response to energy intake and energy output
  - The key words here are OVER TIME: remember, even on a "day off" your body is still using a lot of energy just to maintain its regular activities (60-70% of the energy you use every day is used for these processes, remember!); taking one day off or two days off or even a week off here and there cannot lead to a significant change in your weight or shape!

Homework Assignment—Week 3: Complete the longer-answer questions in your booklet, if you found that it would help to increase your level of activity. On the sheet provided, write out the days of the week on which you will exercise, as well as the times. Make sure that you have at least two planned days off! Continue filling out self-monitoring forms.

Session 4: Physical Activity, Part B

- **Major Topic:** information on starting an exercise program.
- **Hand Out Booklet:** Handout with recommended levels of exercise; daily self-monitoring forms.

Barriers to Exercising

Before we start talking about ways of getting started on an exercise program, it is important to look at some of the barriers that can stand in the way of people exercising.

- Overcoming "barriers" to exercise; identification of perceived barriers, examples, and challenges to these actual and perceived barriers.
- *Question for participants:* What are some reasons why people do not exercise?
  - write down "barriers" on chalkboard. If participants cannot provide several reasons, provide some:
  - e.g., lack of time, lack of exercise clothing, embarrassment, don't like aerobics, don't know how to use equipment at gym.

- Before starting to even think about exercising, it is important to examine these barriers, and come up with some ways of looking at the situation from other angles.
  - *Question for participants:* Is it possible to overcome these barriers in any way?
    - write down ways of overcoming barriers on chalkboard, suggested by participants
      - e.g.: Choosing an activity that can fit into your schedule, timewise
        - Choosing an activity that does not require special clothing, such as brisk walking
        - Get someone who works at the gym to help you with the equipment the first time you go

Starting or Maintaining Exercise

- Choosing an activity or activities
  - *Question for participants:* What are some modes of exercise that will increase heart rate, improve cardiovascular health, & burn calories? (write suggestions on chalkboard)
    - It is ideal to choose an activity or activities that use large muscle groups, and which are done in a rhythmic and continuous manner (O'Toole & Douglas, 1994)

- Examples of exercise that fits into this category are:
- Walking

- Bike riding
- Jogging/running
- Skating (ice or inline)
- Swimming
- Cross-country skiing

- When starting to exercise, you need to consider the (1) kind of activity you want to do, its (2) intensity level, (3) how long you are going to do it, (4) how often you are going to do it, and (5) whether or how you will progress in this over time (O'Toole and Douglas, 1994). Let's look at each of these in turn.

KIND OF EXERCISE

- First, you need to decide on the kind of physical activity you would like to do.
- The most important thing is that you choose something that you think you will do regularly and can continue doing over time.
  - Why do I say this? If you choose "running" as your activity, but you know you tend to get sore knees and are unable to run after 2 weeks, this is a poor choice, as it cannot be maintained.
- Similarly, if you choose "swimming", but you live a 45 minute drive from the nearest swimming pool or you don't have a car and would have to take 2 different buses to get to the pool, you are choosing an activity that is unlikely to be maintained because it is just too much of a pain to get to it!

- *Question to participants:* What are some ways of facilitating exercise, meaning, making it easier to fit into your life?
  - Write suggestions from participants on chalkboard
  - e.g.: If you have friends who are already active on a regular basis, and you think it would be better for you to exercise with a motivated friend, ask if you can join them. Some people get most enjoyment from team sports such as soccer, or playing racquet sports with a friend
    - In contrast, some people find that they enjoy exercising on their own better, going to a gym, running, or swimming laps
    - Or, a combination of individual and group activities
    - There is a gym here at the U of M, conveniently located on campus, which is an inexpensive and easy to access facility; you can just pop in before or after class; there are also aerobics classes, dance classes, martial arts classes, and swimming at the U of M gym

INTENSITY OF EXERCISE

- The intensity of exercise that you choose depends on your current level of physical fitness—the more fit you already are, the higher the intensity you

may choose. A practical rule is that you should be able to talk, but not sing, during exercise

- As I said about deciding on the kind of exercise, the most important thing to consider when deciding on intensity is choose an activity that you will actually do and can maintain. If you have not exercised for a long time, and you decide to start running as your activity, you may find it quite aversive and peter out quickly.
  - In this case, it will be preferable to start with walking and maybe increase your intensity very slowly and over time
  - The most important thing is maintaining it! Starting is not the hardest part—maintenance is. Make this foremost in your mind as you begin.

DURATION AND FREQUENCY OF EXERCISE

- Identification of "best case scenario" levels of exercise; weekly: between 4 and 5 sessions of moderate to vigorous exercise, for 30-60 minutes per session, is a "goal" to aim towards
- Remember, if you are starting an exercise program, you will vary the kind of exercise and its intensity to suit your fitness level.
  - For example: someone who has not exercised for a while can start with walking on 4 days of the week, for 20 minutes per session
  - While someone who has been exercising for a while and feels like they want to do more can move to a longer duration and/or higher frequency of exercising: say walking for 45 minutes on 5 days of the week

PROGRESSION OVER TIME

- This brings us to talking about progression of exercise
- People who are exercising regularly will find that over time, their fitness level will increase and they may want to vary some of their original factors. For example, you may decide in increase the intensity of your exercise (e.g., move from walking to jogging), or you may wish to increase the duration and/or frequency of exercise (e.g., walk on 5 days of the week instead of 4, or increase walking time from 25 minutes to 35 minutes).

Resisting the "All-Or-Nothing Trap"

- It is very important to resist thinking that there is a specific threshold of exercise that you have to do, or it "doesn't count"!
  - Any exercise is better than none at all—challenge dichotomous thinking related to exercise
- Remember in the first session we talked about all-or-nothing thinking related to eating (if I have one cookie I might as well have them all....); this can be a challenge for people in terms of exercise, too.

- For example, some may say, "Unless I am running for at least 20 minutes, I might as well not exercise at all". This promotes the idea that other exercise doesn't "count".

Making Goals Realistic

- As I said before, and will say again, the most important thing is choosing an exercise you *enjoy and will maintain*!
  - If you are currently not active, and decide that you are going to start jogging for 30 minutes 6 times per week as your goal, it is very likely that you will go jogging once and feel very out of breath long before 30 minutes is up. This will produce a negative experience of exercise, and possibly negative feelings about exercise. You may say to yourself, "I hate jogging". It is possible that you will not jog again. You have gained nothing by this endeavor.
    - What if your goal was different, more realistic? Let's say you decided to walk for 20 minutes on three days of the week. You made a longer-term goal of beginning to jog for 1 minute every 5 minutes of the 20 after 2 weeks. In this fashion, you could gradually increase your activity, if you desire.
    - It is much more likely that you would be able to accomplish this goal. You would feel positive about accomplishing your goal, and likely continue to do it. You have gained 4 hours of physical activity per month!

- Even day-to-day activities that are not part of formalized exercise routines can be an important source of activity. Walking to work, walking up the stairs, going out dancing, or running with your dog for 5 minutes are important sources of activity. There is no "magic number" at which physical activity starts to "count". It all helps, and all adds up over time.

  - Suppose you convince yourself that it is not worth exercising sometimes, because you are having a busy day, and don't have enough time. Suppose this happens about once a week (I am not talking about planned days off, only days when you had planned to exercise then convince yourself otherwise). If instead you exercised for 10 minutes on those days (e.g., run for 10 minutes), you would have gained 520 minutes of running time over one year!

Specific Homework Assignment—Week 4: Participants will be encouraged to review last week's homework during which they planned when to exercise. Participants falling into the "too-sedentary" category will be encouraged to increase their level of exercise, in a slow and realistic fashion. Participants who are over-exercising (and not doing so

because they are in training for an athletic sport/event) will be encouraged to plan "days off" into their routine.

Participants will be reminded to continue eating a variety of foods in amounts suggested by the food guide, and to continue filling out their self-monitoring records.

Session 5: Meal Skipping Intervention

Main Topic: addressing the target behavior "Meal Skipping"
Hand Out Booklet: Daily self-monitoring forms.

Today we will be talking about the importance of eating regular meals for weight maintenance

- Some people skip meals to try to control weight (e.g., Nowak, 1998)
- On the face of it, this seems like it might work; seems like if you eat only two instead of three, or one instead of three, meals a day you might eat fewer calories and lose weight.

How Skipping Meals Can Backfire

- Looking at this more objectively: Is this an effective way of reducing the number of calories eaten each day, and of controlling your weight?
- It appears that there are a couple of ways in which meal skipping can "backfire"

Question for participants: Does anyone have any ideas about how skipping meals could "backfire" in terms of their actual eating habits?

- Write suggestions from participants on chalkboard
- From a cognitive standpoint
  - e.g., cognitions such as "well, I didn't have breakfast, so I can have this piece of chocolate cake for dessert at lunch"; had you eaten breakfast, you may have been less likely to overeat and/or eat "empty calories" later in the day
    - How such cognitions can lead to increased fat/caloric intake during the day
    - Preoccupation with food
- From a physiological standpoint
  - e.g., diminishing the likelihood of overeating or binge-eating due to extreme hunger.
  - Tendency for persons who skip a meal to "make up" the missed calories during the remainder of the day
  - Metabolic effects of meal skipping (slowing of metabolism)
  - Evening binge-eating, partially due to inadequate caloric intake during the day

Breakfast

- Breakfast seems to be a meal that people skip most often
- Is Breakfast important?

- Yes, because after the body has gone without food for several hours, the metabolic rate is very low and food has the effect of increasing it by up to 20% (Seabrook, 1997).
- Additionally, skipping breakfast may lead you to be so hungry by lunch time (or morning coffee-break time) that you end up eating more than you would have if you ate breakfast, which could either balance out the amount you eat or even increase it

Meal "Replacement" Bars/Shakes

- What about meal replacement bars/shakes? This means I am not really skipping the meal, right?
  - Unfortunately, these may be high in sugar/sweetener, and fat. Additionally, and important for your behavior, these products do not help you to re-train your body to choose healthful foods (i.e., you may get in the habit of eating "bars" or "milkshakes" as a meal), and they do not train you to make eating regular meals a part of your life.
  - Use on a very occasional basis, such as when extremely busy, is not problematic. Carefully read the label to note the product's composition, particularly fat and sugar content.
- A note about artificial sweeteners: There is no research evidence to suggest that persons who eat artificial sweeteners are any better at controlling their weight than are those who eat regular sweetener. Due to the fact that these artificial sweeteners are so low in energy, one may actually increase food intake later to make up for the caloric deprivation (Seabrook, 1997). One group of researchers found that people will "make up" the calories they have lost by consuming products sweetened artificially; then, when the artificially sweetened foods were switched to regularly sweetened foods, individuals failed to decrease their calorie intake and they maintained the increased level of calorie intake! (Foltin, Fischman, Emurian, & Rachlinski, 1988).

Eating Regular Meals

- Direct instruction in eating at regular times
- For most people, eating three meals a day offers a reasonable pattern of food intake; with a snack in between if you have a long interval (4 hours or so) in between meals
- If you are not used to eating meals consistently or at regular times, this could be difficult
  - *Question for participants:* What are some of the barriers people have to eating three meals a day?
    - Write answers on chalkboard
- Fears about eating regular meals & snacks:
  - Some people fear that eating 3 meals a day, and/or including snacks in their diet, will lead to weight gain

- In fact, the opposite may tend to occur. For example, if a person's meal pattern is "infrequent", compared to "frequent", and the total daily caloric intake is constant, your metabolic rate could be higher in the "frequent" condition because your body produces more heat energy as it is digesting and metabolizing the food (Drummond, Crombie, & Kirk, 1996).
- Some researchers have found that people who eat more frequent meals or snacks actually have lower body weights than people who eat less often (Drummond, Crombie, & Kirk, 1996).
- It is possible that eating less frequently can actually lead to increased craving for high-fat foods (Drummond et al., 1996).

- *Question for participants:* What are some ways of overcoming these barriers to eating three meals a day?
  - Write suggestions on chalkboard

Planning Regular Eating

- In moving towards more regular eating patterns, it is important to plan to eat meals and snacks at specific times, at least in the beginning. This is because you may not be in the habit of doing this
- Most people find that eating three meals a day is most appropriate for their schedule. I would not recommend less than this number. Some people may wish to include more frequent, smaller meals, if they are particularly active
- Usually, it is best to have breakfast soon after waking, lunch in the early afternoon, and dinner in the evening. Adjust times according to your schedule

- Example: If you get up at 8:00 a.m., you could eat breakfast at 8:30.
  - Lunch should be planned for between 12 and 1p.m.; this will ensure that you do not wait too long and get too hungry before eating
  - If you plan to eat dinner between 6 and 6:30 p.m., and ate lunch at 12:00, it is important to have a small snack in the afternoon, at about 4p.m.; this will help prevent getting "over-hungry" and eating unhealthily at dinner, like getting so hungry that you decide to stop at a fast food place on the way home instead of cooking a healthful meal

- **Specific Homework Assignment—Week 5: practice eating three meals per day. Plan to eat these meals at regular times. If there is more than a 4 hour stretch between your meals, (not including overnight!) plan a small snack. Try to actually sit down at the meal time with a focus on the eating (e.g., not watching TV, driving in car, or reading). Continue filling out self-monitoring records.**

- **Reminder: To continue eating based on the food guide, and to continue engaging in regular exercise. If participants feel like it, they can make a small increase in their exercise goal for this week. Participants trying to**

incorporate days off into their routine will be encouraged to continue to do so, while eating normally on their days off.

Session 6: Food Avoidance Intervention

Major Topic: "food avoidance"
Hand Out Booklet: Forbidden food page; daily self-monitoring records.

Defining "Forbidden Foods"

- Many people who tend to be dieting most of the time categorize foods as "good" (allowed by your own rules or diet rules) or "bad" (not allowed by your own rules or your diet rules; seen as fattening). Today, I'd like to talk about this way of categorizing foods.
  - We will call avoided or "bad" foods "forbidden foods".

- Let's start by figuring out what your own "forbidden foods" are. This is something that is very individual for everyone.
- Write down any foods that you currently avoid eating on Page 1 of your booklet.
  - Why don't you eat them? Take a moment to write down your reasons for avoiding these foods
  - *Get some feedback:* if anyone feels comfortable sharing a reason why they don't eat some foods, have them talk about this
    - Write answers on chalkboard
  - Review of reasons why people avoid certain foods (provided by leader, if few participants offer reasons)
    - e.g., fattening, makes me feel guilty, makes me feel fat
  - If your reasons are related to weight or shape, and not moral or religious reasons, you may wish to begin including these foods into your diet. Even if you have written down that the food is not "healthy", which may be true, examine this idea for yourself
    - Is saying it's not healthy a disguise for saying it is "fattening"?
    - Most people eat unhealthy things sometimes
  - Examples of unhealthy foods that tend to be "forbidden foods" for people are deep fried things, chocolate, sweets (O'Dea, 1999)
  - These foods are definitely not good for you when eaten in large amounts or on a regular basis. However, it is unrealistic to expect that you will never eat anything unhealthy.

How Avoiding "Forbidden Foods" Can Backfire

- Let's look at some reasons why it is unrealistic, and actually counterproductive, to try to eliminate "forbidden foods" from your life.
  - Let's use the example of "ice cream" as a forbidden food

- *Question for participants:* What might a person who viewed ice cream as forbidden think to herself after eating ice cream? (Thoughts and Feelings)

- write answers on chalkboard
- e.g.: "I've blown it"

- *Question for participants*: Is it possible that this way of thinking and these feelings after eating one of these foods leads to maladaptive behaviors?
  - We are back to "all-or-nothing-thinking" again, as we discussed with dieting and exercise

  (Examples: "I might as well eat it all" (overeating on the forbidden food); "I've blown it, the day is shot" (overeating on a variety of foods for the day, with the resolve to go back to deprivation eating the next day).

  - examples of dichotomous thinking (e.g., "good" vs. "bad" foods), and how this can lead to maladaptive behavior (e.g., binge-eating on "forbidden" food, feelings of guilt and remorse after)

  - What does the scientific research say can happen here?
  - In one study (Knight & Boland, 1989), people who tended to be chronically dieting were given either a milkshake or cottage cheese.
    - Then, they did a "taste test" of ice cream flavors.
    - Both the milkshake and the cottage cheese contained the same number of calories. The people were told how many calories were in the cottage cheese, if that is what they were given, or in the milkshake, if that's what they were given
    - So what happened?
    - The people (chronic dieting people) who had the milkshake ate more ice-cream during the taste-test than people who ate the cottage cheese, even though the number of calories in each was the same.

  - *Question for participants*: What do people think was a reason for this, based on our discussion of thinking and feeling after eating "forbidden foods"? (elicit comments from participants)

  - Seems that the type of food eaten influences a person's thinking and behavior; may be that eating a "forbidden food" can increase a person's likelihood of overeating, due to their reaction to the experience.

  - Seems like there are two ways of overcoming this problem:
    (1) Never eat "forbidden foods",
    (2) or change your way of thinking such that you don't see foods as "forbidden" anymore, and can include them in your diet.

  - One of these choices is realistic; the other is virtually impossible. As you know, it is almost impossible to eliminate a food from your diet; eventually, temptation wins out, and if you see the food as "forbidden" you will likely experience guilt, beat yourself up, possibly overeat, and then vow not to eat that food again (for the 50th time!)

- So let's take a look at what the more realistic option could look like.....

All Foods Can Be Part of a Healthy Diet!

- By consuming small quantities of previously "forbidden foods", you can gradually reduce their "power" over you
  - By this I mean that you can reduce the power they have to influence your thinking and feelings, and can therefore reduce the chances that you will overeat when you have one of these foods
  - What are some ways that you can start including some of these foods in your diet, in a positive way?

- If you have been avoiding certain foods, and have viewed them as "bad" for a long time, it will take some time before you feel comfortable eating them, and possibly before you feel able to eat them without being worried about overeating. Let's look at some ways in which you can start trying them out...

  - Strategies for learning to eat these foods with a sense of control will be suggested (e.g., buying a single-serving container of ice cream and eating that, rather than trying to eat part of a carton and leave the rest.)
    - Set aside one or two nights a week on which you have dessert—e.g., buy yourself or make yourself a single serving of a dessert and have it at a planned time after your meal
    - NB: one thing that people will sometimes try to do is eat the "forbidden food" INSTEAD of a meal.
    - *Question for participants:* Why does this often backfire? (get input from the participants)
    - This can just lead to more eating/snacking later, because your body will want it's proper meal, and you may feel deprived and resentful

Specific Homework Assignment—Week 6: Try to eat a small quantity of one of your "forbidden foods" on at least 2 days this week. Use the suggestions for eating the food with a sense of control. Continue daily self-monitoring records.

Reminder: Continue regular exercise. Continue eating meals regularly, and snacks if there's a large (4 hour) gap between meals. Continue eating based on food guide recommendations.

Session 7: Body-Image Intervention

Main Topic: Discussion of body image
Hand Out Booklet: Daily self-monitoring forms

- A very large number of women in our society are dissatisfied with their body weight and shape.
- Body-image problems overall appear to be increasing in North American Society. (Show Cash Table 15.1): This table is based on two Psychology Today-magazine surveys: Cash, Winstead, & Janda,1985, and Berscheid, Walster, & Bohrnstedt, 1973; in Cash & Grant, 1996)

- Many people experience a large discrepancy between the way they look at their actual body weight and shape, and their ideal body weight and shape.
  - This can lead to "dissonance" (Festinger, 1957); this means that the difference between the actual body shape and the ideal body shape is different enough that the person feels upset about themselves.
  - And even beyond this, this state of dissonance can be a factor that spurs people to try to get rid of the negative feelings, which in this case, can lead to dieting or really unhealthy weight management practices (because the person is trying to reduce the difference between "actual" and "ideal")

Question for participants: What are some reasons why our society is a place where this state of "dissonance" happens for a lot of people?
  - write answers from participants on chalkboard

- Reasons for the large discrepancy that happens in our society
  - Unfortunately, the "ideal" shape that a lot of women are comparing themselves to is artificial and unrealistic.
  - The images of women that we see all the time are actresses and models (in TV, movies, magazines), who are almost without exception unusually thin, toned, youthful, and attractive.
  - Additionally, in magazines many photos are computer-enhanced to make the model's legs longer, skin clearer, teeth whiter, etc.
  - This creates a situation where some women may find themselves aspiring towards an image that is not only unrealistic, but which does not even exist!
    - (e.g., it is partially created by a computer/ideal lighting conditions/makeup. Even the woman in the photo does not look like that)
- As the level of discrepancy between the way you perceive yourself, and the image to which you aspire (which may be based on these media images) increases, dissatisfaction and other negative feelings can increase

How Does All Of This Affect Behavior?

- I mentioned that this state can lead people to act in a certain way
- Let's take a closer look at this
  - Sometimes the way people are feeling about their bodies influences their behavior
  - What do I mean by this?
  - Has anyone ever not done something because they didn't like the way their body looked that day? For example:
    - Didn't go to a party because they felt fat
    - Didn't join a gym because they felt uncomfortable
    - *Question for participants:* Any others from people?
      - write down participant's answers on chalkboard

- As you can see, sometimes feeling dissatisfied with your body leads to avoidance of social situations, or to avoidance of exercise, or just avoidance of a fun life experience
- This can really be "shooting yourself in the foot" in terms of healthy weight management!
  - Why do I say this?
    - Avoiding social situations repeatedly can lead to a certain amount of isolation from others.
    - This, in turn, can lead to or promote negative feelings like getting depressed, which makes it even less likely that you will want to see people in the future, and more likely that you will be staying at home.
    - Getting depressed is one factor that can increase people's level of isolating themselves, and can decrease motivation to exercise and eat a balanced diet
    - If you tend to avoid going to the gym, or going out walking/biking/jogging due to self-consciousness, this can also be pretty counterproductive.
    - For example, I have heard people say things like "I have to lose 10 pounds before I start going to the gym". Given what we have learned about the importance of exercise in one's weight management, this appears to be an important barrier to overcome

- Sometimes a person's actions can affect how they feel or think about their body.
  - One example of how a person's thinking can be influenced is:
    - Suppose you are feeling OK about your body, then you eat a hot fudge sundae.
    - *Question for participants:* Does anyone think that their perception of their body might change in this situation?
      - Get feedback from participants
    - In fact, it is impossible that a person is actually "OK" one minute and then "fat" 20 minutes later due to eating a sundae! This is an example

of how your body image can change quickly and due to an experience you have, rather than due to actual "fact"

- Here's another example that ties in with what we were talking about with exercising. Some people feel OK about their bodies on days when they exercise, then feel "fat" if they do not exercise for one day or two days.
- Again, it is not possible that someone would be "OK" one day and then "fat" in one or two days!
- Our bodies do not work this way or this quickly—weight maintenance is something that happens over a longer-term, and is based on our behaviors OVER TIME; that is, it is based on our energy intake and energy expenditure over time, not over the space of hours or even 2 days.

The Body-Image Barrier

So let's look at the other side of the coin...

- Getting out with friends often makes people feel happier and better, which can increase positive feelings.
- There is a lot of scientific research that tells us that getting out and doing some kind of exercise usually makes people feel less anxious, less depressed, and can improve how people see their body
- This is easy to say, but harder to actually do...So what are some ways of getting around the "barrier" of body dissatisfaction?
- What I mean by this is, how can a person try to convince herself to problem solve when a "body dissatisfaction barrier" comes up?
    - Let's use the example of not wanting to go to the gym because of feeling self-conscious about how your body looks.
        - *Question to participants:* What could you say to yourself, and do, that would make it easier to get out the door? Any suggestions?
        - Write responses on chalkboard
        - e.g.: people will be focusing on their own workout, not looking at me
            - even though it will be hard to go to the gym, I will feel better about myself after I work out
            - over time, it will get easier to go to the gym
            - working out is part of the process of feeling better about my body

- People come in a variety of shapes and sizes. The images presented in the media are generally showing one way of being, a way that is only accessible to a very small proportion of the population.
- Focusing on your own personal strengths is important
- The body is not infinitely malleable
    - With exercise and healthful eating, each person can reach their "personal best". This will be different for everyone depending on a lot of factors, like your genetic makeup, the type of job you have (active vs. sedentary), the amount of time you have to devote to exercise, what you like to eat, and so on

Specific Homework Assignment: Week 7: Continue keeping daily self-monitoring records.

Session 8: Review and Relapse-Prevention (RP: developed by Marlatt & Gordon, 1985)

- **Main Topic**: Review/summary previous sessions and provide relapse-prevention information (programming for maintenance)
- **Hand Out Booklet:** Daily self-monitoring forms

Review / Summary of Previous Sessions

Relapse Prevention Strategies

- During our time together, we have talked about the hazards of trying to diet all the time, the importance of eating regular meals and getting regular exercise, and some of the thinking traps that people can fall into that can trigger unhealthy behaviors

- As you move towards more healthy ways of managing your weight, there will be times along the way when you will "slip" back into some of the more unhealthy patterns. This is to be expected; you have spent a long time learning your usual ways of doing things, and the new behaviors won't "stick" right away
  - Because of this, it's really important to learn how to cope with times when you do have a slip towards your old way of coping
  - So let's take some time to talk about this
- Let's look at an example of a way in which you could have a "slip" towards an older way of coping.
    - Suppose you are at home watching TV, and your roommate or family member bought a bag of cookies that day. You know that the cookies are in the cupboard and really want one. However, you decide that cookies are fattening and that you cannot have one.
      - old way of thinking
    - After 30 minutes of watching TV, you can't stand it anymore and take 2 cookies out of the bag and eat them. You are immediately filled with thoughts...."now I've blown it"; "I had two cookies, I am going to get fat"; "I have no self control";
      - old ways of thinking
  - You also have certain feelings about this situation: angry at yourself, sad, anxious
  - The old behavior might be eating the whole bag of cookies and then vowing to never eat cookies again

- Lets look at this example more closely.....
  - (Example will be split into each component, and ways of coping with each aspect of the lapse will be included)

- Differentiate "lapse" from "relapse
  - "Relapse" has a lot of negative connotations: it has traditionally been used to describe a return to negative behavior after a time of abstinence (Marlatt, 1995)
  - Relapse can be associated with failure, or as a "dead end" (Marlatt, 1995)
    - In this context, relapse can be considered as a mistake or error in maintaining new behavior patterns
    - Relapse is also considered a "chain" of events which happen over time
- A "lapse" occurs when a person is at one of these links in the chain of events- it involves taking a "step" towards relapse
- Our previous example shows several examples of "lapses" into old ways of thinking and acting; however, it is important to know that you can intervene at any of these steps along the way!
  - Having a lapse does not mean that you have blown it and are right back into your old way of doing things; it is just a time to put your new ways of doing things to the test

- Triggers for lapse:
  - Eating a "forbidden" food and thinking "I might as well have the whole bag/container, then I'll never eat it again"
    - Challenging this: "just because I had a cookie (or two, three, ten) does not mean that I have to have all of them. I can stop now and get back on track"
    - "It is unrealistic to think that I will never have unhealthy foods. Having a couple of cookies will not lead to weight gain, but overeating in response to my "all or nothing thinking" is not going to help me. Allowing for "treats" in everyday life is important!"
    - "I have had my two cookies for today, and I can have two more tomorrow. I do not need to have all of them today and then try to never eat them again"
    - *Question for participants*: Does anyone have examples of other triggers for them?

- I will be meeting with all of you individually next week, so you can hand in your self-monitoring forms.

Homework Assignment: Week 8: Continue to fill out self-monitoring forms

Appendix G (cont'd.)

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Appendix I

The Wood Burning Stove Metaphor

The Wood-Burning Stove

Imagine that you are in a room. In the middle of the room is a round, wood-burning stove. It is morning. The wood in the stove has burned down through the night and now the room feels chilly. You open the door of the stove and find that there are red hot coals, and ashes left as waste from the wood.

In order to get the fire started you need to place a few small twigs on the coals. Perhaps you blow gently as you place the twigs on the coals. As a result, a small flame begins to develop and burn the twigs. As more twigs are placed in the stove the flame will increase. Then add a few small branches and eventually a couple of small logs to the burning fire. As the fire increases, a large portion, if not all, of the wood can burn.

As the morning progresses, you may go to work or classes. Your fire has been burning, and the fuel is about burned up. It's about noon. You place a few small logs into the stove to allow the fire to continue burning into the afternoon. As you work and do your many activities, if the fire starts to go down, maybe about mid-afternoon, add another small log. Every time the fire starts to go down, or about every three hours, add another small log to the burning fire, depending on your need.

At about supper time, you may put a couple of logs on the fire, allowing it to burn well into the night. You could use a hard wood, which burns slowly, instead of paper, which burns fast. Your room is warm, concentration was good throughout the day, and you may feel strong as you go to bed.

The next morning, once again the room is a little chilly. Your coals are red hot and you have wood to fuel the coals, but, you decide that you are

Appendix I (cont'd.)

Metaphor for Treatment of Eating Disorders

not going to put any fuel into the stove. You head off to work or classes. At first all seems fine. As the morning passes, your coals get weaker. Your concentration begins to fade. By afternoon you may find yourself less patient, more irritable, and constantly thinking about fuel. The temperature in the room gets colder. The coals are weak grey embers. You feel weak and dizzy. As you enter the room, in desperation and with a sense of no control, you take several large logs and stuff them into the stove at once. You binge. Those logs sit in the stove smoldering. Most of them unable to burn.

Your body is like the wood-burning stove. The fire is like your metabolic rate. When you get up in the morning, your metabolic rate is lower, but it is ready, red hot, to get started.

When you think of food from now on, I would like you to replace the word "calories" with "fuel." Calories are fuel. Fueling the fire inside your body provides you with needed energy, strength, and potential for greater control.

Just like the wood-burning stove, it is important for you to get your metabolic fire going in the morning while your coals are prime to start. Each bite of food that you eat is like placing some twigs on the coals to start your fire.

You could eat small amounts of food throughout the morning, or fuel your stove by putting all the twigs in at one time in the morning. About two or three hours later you may need to place more fuel in your stove to keep the fire going. (You may feel a gurgling sensation in your stomach. That is your message that your fire is beginning to go down.) Add more fuel to the fire or the fire will die down. Once the fire gets going it burns best if you put something substantial in it for lunch. It doesn't have to be a huge amount, just a couple of small logs to keep your fire going into the afternoon.

Just as two logs burn better than one, two types of food often digest better than one food type alone. Your body uses different foods to help in digestion. [Work with a nutritionist to develop food combinations best for the client.]

As you go through the day, when you feel that gurling sensation again, know it's a sensation that your fire is going down. It is time to put more fuel in your fire. If you don't get the gurgling sensations, fuel your fire about every two to three hours, regularly, as you would add fuel to a stove. Eat a little, to maintain your fire.

At supper, you might need to put two or three logs into your stove so that they burn well and into the night to keep you warm, so you can rest. If your fire is going well, the temptation to put more fuel in your fire before bedtime is much less, because your body feels stronger and more satisfied, more in control.

If you delay and do not fuel your fire throughout the day, it is more difficult to get your fire started; you force your metabolic rate to go down. When you finally give in and eat, or binge, later in the day when your coals

Appendix I (cont'd.)

are weak, a larger portion of the binge goes to fat because your metabolic rate is not yet high enough to burn up the food. The very thing you fear comes true. Eating after fasting could initially encourage your body to send more food to fat. If you start fueling your fire in the morning and keep your fire going all day, just like the wood-burning stove, larger portions, if not all, the fuel can burn up.

Let's say you get your fire started and burning well, and then you put an extra piece of wood into the fire. Does that mean that the extra wood will just lie there and not burn or turn to fat? Not necessarily. Because the fire is already burning well, the extra wood makes the fire higher and you get overheated (hyperthermic). You burn up the excess fuel more easily when your fire is going well than when you eat nothing and go a long time without fueling. It is harder to burn up excess fuel if no fire has been started.

So when you eat this week, each morning I would like you to think, "I need to get my fire started" and "Each bite is a twig beginning to burn up and give me strength for the day." I would like you to imagine how you are going to add fuel to your fire throughout the day. As you get your fire going in the morning, let's discuss the types and amounts of fuel you need. [Each client works out her or his own meal plan.]

[Optional, depending on client] Exercise is like putting a billows on a fire, making the fire hotter and burning up the fuel faster. But just as you can fan a fire too long and blow it out, too much exercise can bring down your metabolic rate. Too little and too much exercise are not as healthy as an amount that allows the fire to intensify and burn the fuel well.

Appendix II

Sample of Daily Eating Plan

Breakfast	Lunch	Dinner
½ cup apple juice ¾ cup dry cereal 1 hard boiled egg 1 slice toast 1 tsp margarine 1 tsp jam 1 cup milk coffee	1 cup tossed salad 1 oz salad dressing 3 ½ oz beef teriyaki ½ cup stirfried vegetables ½ cup white rice 1 dinner roll 1 tsp margarine ½ cup milk coffee **Afternoon snack** ½ cup ice cream 1 banana	2/3 cup vegetable soup ¾ cup turkey a la king 1 piece toast ½ cup spinach ½ cup milk coffee 2 plums **Evening** ½ cup cranberry juice

*approximately 2000 calories
Adapted from Frank & Baker, 1999; p. 590

Appendix III

Slides Used for Psychoeducational Group

General Introductory Information

- *Program leader:* Karina O'Brien, M. A.
- *Meeting times:* Weekly basis for eight weeks, from today until to Aug. 7.
- *Session duration:* Approximately one and a quarter hours (1 hour 15 mins)

General Introductory Information

- At the end of each meeting, there will be a brief set of review questions on the information provided in that session.
- Score less that 7 out of 10, & I'll give you the information from that week in booklet form to take home.
- Each of you will have a short individual meeting time with me either just before or just after our session, to hand in and review weekly records.

Purpose of Meetings

- To provide information about healthy weight management.
- To provide alternatives for unhealthy weight related thinking and behaviors.
- Between-session practice of the new behaviors discussed during each weekly session is encouraged.

Why is this important? Why now?

- University is a time of change.
- This may be your first year away from home, and your first experience of deciding what, when, and where to eat.
- Some find it difficult to maintain healthful eating habits.

Why is this important? Why now?

- The pressures of school, combined with pressures related to dating & social life, can be frustrating, and lead to negative mood and negative or perfectionistic feelings about your body.
- Participating in this program will assist you in maintaining your weight and health in a manner that is both physically and psychologically beneficial.

Confidentiality is Important

- remember that what other people say in these sessions is confidential.
- this will help everyone feel more comfortable sharing their thoughts.
- there is no obligation to share any personal information here!
- I will be asking general types of questions during the program.

Session 1: DIETING

- *Question:* What does the word "dieting" mean to you?
- *Question:* What are some reasons why people diet?

Session 1: DIETING

- when I use the word dieting I mean attempting to, or actually, changing the way you eat for the purposes of losing weight.

Session 1: DIETING

- In our society, "dieting" for weight loss is extremely common, particularly among women
- Dieting is promoted in the media (magazine articles and advertisements, television) as an effective way of losing weight
- Each day, we are bombarded with advertisements for weight-loss programs, special foods like meal-replacement bars, and diet drugs (multi-billion dollar industry)

Looking at what Research Tells Us

- In our sessions together, I'll be talking about *scientific research* at various points.
- Unfortunately, many commercial weight-loss programs, and diet books, have not been tested out in an objective manner
- The scientific research that *has* been done on long-term maintenance of weight loss after calorie-deprivation dieting shows that dieting doesn't work very well.

Looking at what Research Tells Us

- Looking at research also means that you don't have to "take my word for it!"
- I'll back up what I'm talking about with some data!

How Dieting Can Backfire

- The first research question we'll look at is:
  "Do dieters act differently from non-dieters?"
  - There is evidence that they do!

"Minnesota Experiment":

- In the 1940's, Ancel Keys and colleagues conducted an experiment on semistarvation, using 34 male conscientious objectors
  - preoccupation with food and eating
  - "binge-ate" although they had no previous history of doing so
- *Question:* What do the results of this experiment suggest about dieting?

How Dieting Can Backfire

- In the Minnesota experiment, the men did not have "free" access to food, beyond what was provided by the experimenters, until the re-feeding period.
- But in our society, people can eat whatever food they want whenever they want, as we live in a country where there is a lot of food and it is easy to get.

How Dieting Can Backfire

- This means that dieting requires replacing *internally regulated* (hunger driven) eating with planned, "diet-approved" eating
  - You decide what to eat based on "SHOULDS", not your stomach!
- When you diet, you need to override your physical desire to eat more, because you always have access to food.

How Dieting Can Backfire

- So the weight-loss dieter will be ignoring her internal hunger signals
  - "diet boundary" which means that the person has "rules" about how much they can eat that are set to below their actual fullness level
- *Question*: What do you think might happen if the person broke one of these rules? Like if they ate something that they felt they shouldn't?
  - Lets look at what the research tells us can happen in this situation.

How Dieting Can Backfire

- 26 women, random assignment to diet group, exercise group, or control group
- After 4 weeks in these groups, all persons were asked to drink a milkshake
- Then took part in a "taste test" where they were told to sample ice cream
  - Here's what happened: **the women in the "diet" group actually ate twice as much ice cream after drinking the milkshake than did the women in the other two groups!**

How Dieting Can Backfire

- What might this mean?
- if a dieter crosses the boundary they have set for themselves, the boundary is broken down and they actually end up eating more than someone who was not dieting!
- There is a lot of other research that demonstrates :
  - that people who are always trying to limit the number of calories they eat tend to overeat under certain conditions

How Dieting Can Backfire

- Like if their boundary is crossed by eating a food they think they shouldn't have eaten
- Or if they are stressed about something
- Or if they have consumed alcohol

- *Question:* Why might this happen?

Summing Up the Information

- *Question:* We started today by asking if dieters act differently from non-dieters: What is the research we have looked at so far suggesting that dieters do differently?

- *Question:* What kind of effect could this have on your body?

Reasons for Changing Dieting Behavior

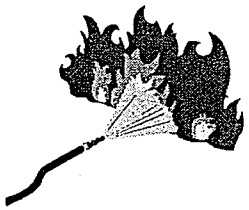
- The main reason that people diet is to try to lose weight.
  Dieting does tend to lead to some weight loss for people

- Unfortunately, most research shows that dieters who do lose weight gradually return to their pre-diet weights.
- Dieting can lead to overeating for some people in some situations.

Reasons for Changing Dieting Behavior

- Dieting can lead to changes in metabolism that make the body less efficient at burning calories
- Dieting can lead to preoccupation with food
- Chronic dieting can actually leave a you vulnerable to gaining weight, exactly the thing that the dieting person wants to prevent!

The Wood Burning Stove Metaphor: Hill (1993)



- Illustrates the way your body uses food to fuel itself.

Assignment, Week 1: Continue to fill out self-monitoring measures & bring to next session:)

Review Questions

Session 2: Part B "Dieting"

- **Main Topic:** Changing old habits: Escaping the dieting trap!
- **Hand Out Booklet:**
  - Food Pyramid;
  - guidelines for what a serving is;
  - fat content of selected foods;
  - weekly self-monitoring forms.

Eating Smart Without Always Dieting

- Last week we talked about dieting, and some of the research about dieting that suggests that it can backfire
- In looking at the research on the effectiveness of weight-loss diets, it appears that they tend to be effective over the very short term, but over the longer term most people return to their pre-diet weight
  - can lead to a physical "roller coaster"
  - as well as an emotional one!
- So today I'd like to talk about eating without dieting

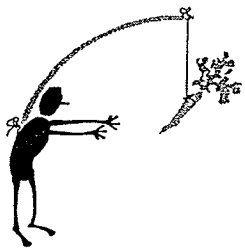
Eating Smart Without Always Dieting

- Question: Are You Afraid To Eat Without Dieting?
  - Some of the worries people may have:
    - Will I eat uncontrollably?
    - Will I gain weight?

Eating Smart Without Always Dieting

- Eating without "dieting" does not imply that you eat constantly, eat junk food all the time, or pay no attention to eating a variety of healthy foods
- But based on what we have learned about dieting so far, it makes sense that folks who diet a lot will worry that this could happen

Eating Smart Without Always Dieting



- When you are used to dieting, you are likely:
  - preoccupied with food (think about it a lot)
  - hungry a lot of the time
  - a poor judge of your body's signals (telling you you're full, hungry)

Eating Smart Without Always Dieting

- Therefore, it can seem like if you quit dieting you'd just want to eat everything in sight
- But here's a different way of thinking about it:
  - sometimes people do find it difficult to eat moderately and decide when they are full when they first stop dieting
  - they may only feel like eating "forbidden foods" because they've felt deprived for so long
  - but over the longer term, many people find that this changes
    - and they learn to interpret their bodies hunger/fullness signals better
    - and they crave healthy foods, not junk foods (at least not all the time!)

Healthful & Effective Strategies for Maintaining Weight Over Time:

- eat regular meals
- eat foods that you enjoy eating
- eat foods that are mostly healthy (with some "treats")
- make sure that you can maintain this way of eating over time

Healthful & Effective Strategies for Maintaining Weight Over Time:

- This is different from the idea of being "on a diet"
  - which seems like a temporary way of eating with the goal of losing weight
- Healthy eating is a way of eating that you can realistically maintain for YOUR WHOLE LIFE
  - it includes eating things you like, both healthy & unhealthy!

Getting Some Structure

- Many people who are used to restricting their food intake all the time have rather chaotic eating habits
  - eating at irregular times
  - eating "on the run"
  - missing meals
  - going for long periods of time with no food then overeating
  - eating junk food and then skipping a meal to make up for it
  - eating junk food "instead" of a meal)

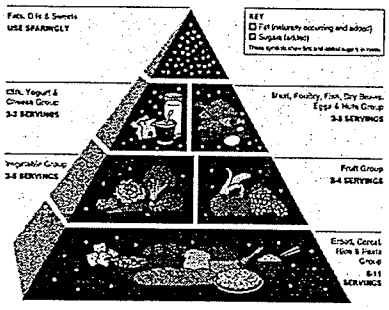
Getting Some Structure

- Eating without dieting has to begin with creating some structure in your eating habits.
  - Later, with practice doing this, you will get better at knowing when you are hungry and also when you are full
  - This also ties in with people's fears about overeating if they are not always "dieting"
  - As you develop a more structured pattern of eating, your body will get better at knowing when it is hungry, and because it is not constantly wondering when and if the next meal is coming, it will get better at letting you know it is full too.

Figuring Out What, and How Much, To Eat

- In order to begin developing some structure to your eating, it is necessary as a first step to determine the kinds and amounts of foods that make up a healthy, well balanced diet:

Food Guide Pyramid



How Many Servings Do You Need?

- If you are an active woman who needs about 2, 200 calories a day, 9 servings of breads, cereals, rice, or pasta would be right for you. You'd also want to eat about 6 ounces of meat or alternates per day. Keep total fat (fat in the foods you choose as well as fat used in cooking or added at the table) to about 73 grams per day.
- Some less active women may need only 2,000 calories to maintain a healthy weight. At that calorie level, 8 servings from the grain group would be about right. A marathon runner who is training may need a much larger # of calories, and should increase her intake accordingly!

What Counts as a "Serving"?

- **Milk, Yoghurt, and Cheese**
  - 1 cup of milk or yoghurt; 2 slices cheese, 1/8" thick (1½ oz.); 2 ounces of process cheese; 2 cups cottage cheese
- **Meat, Poultry, Fish, Dry Beans, Eggs, and Nuts**
  - 2-3 ounces (size of a deck of cards) cooked *lean* meat, poultry, or fish; 1/2 cup of cooked dry beans; 1 egg, or 2 tablespoons of peanut butter count as 1 ounce of lean meat; 7 oz. tofu; 1/2 cup nuts or seeds

What Counts as a "Serving"?

- **Vegetable**
  - 1 cup of raw leafy vegetables; 1/2 cup of other vegetables, cooked or chopped raw; 3/4 cup of vegetable juice
- **Fruit**
  - 1 medium apple, banana, orange; 1/2 cup of chopped, cooked, or canned fruit; 3/4 cup of fruit juice
- **Bread, Cereal, Rice, and Pasta**
  - 1 slice of bread; 1 ounce of ready-to-eat cereal; 1/2 cup of cooked cereal, rice, or pasta

Figuring Out What, and How Much, To Eat

- For women 15-24, the recommended daily caloric intake is 2200, for women of average height (5'5") and weight
- this varies from person to person, depending on their energy expenditure and their height and body size

Little Tricks to Avoid Overeating

- 1) Eat at the table! (not in front of the TV, in the car, or while studying)
- 2) Try to eat at regular times as much as possible
- 3) Don't buy big packages of tempting foods--if you want chocolate, buy one chocolate bar, not a whole bag of snack size Halloween candy chocolate bars
- 4) Slow down your rate of eating--put your fork down between bites
- 5) Don't wait until you are STARVING to eat a meal--you'll be tempted to eat a lot & it may tend to be higher fat/calorie food than you'd otherwise choose.

Fats in Foods: To Eat, or Not To Eat?

- By now, most of you are probably aware that most health professionals recommend that people be aware of the amount of fat they are consuming in their diet.
  - certain kinds of fats can contribute to heart disease
  - fats are usually calorie dense and tasty, which means that eating too many fatty foods can contribute to weight gain.

Fats in Foods: To Eat, or Not To Eat?

- It is important that you don't take an "all or nothing approach" to eating fat; everyone needs some fat in their diet, both to stay healthy and so that eating is realistic and enjoyable.
- The trick is to:
  - a) be aware of fat contents in foods;
  - b) choose foods that are low in fat most of the time.

Fats in Foods: Yes, Eat Them! (Just Not Too Much!)

- many current guidelines recommend that people try to limit the fat they eat to less than 30% of their total caloric intake for the day
  - It can be difficult to do this figuring out though! So it is important to know the fat content of what you are eating, decide whether it is worth it to you to eat that fat, or if you would rather make a lower fat choice for the day.

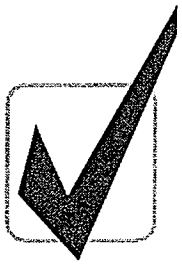
Fat Content of Foods: Being Aware

- Lets look at fat contents of some common foods; this can also debunk some myths, I think!
- Example: "Bran muffin/bread myth".
  - It seems that a lot of people view muffins as low calorie or "diet" food, while bread is often seen as fattening.
  - Bread: trace-1 gram of fat per slice
  - Bran Muffin-5-6 grams of fat per muffin

Fat Content of Foods: Being Aware

- Turn to booklet: "Fat content of selected foods"
  - You could also decide to be "smart" about eating fats; if you decide to eat higher fat foods at one meal in the day, or during a snack, you could choose lower fat items during your other meals.

Bringing it all together



- General guidelines for healthy eating, without dieting
  - Stop seeing the way you eat as dieting!
    - You must adopt a way of eating that will become a life-plan!
  - Eat regular meals, generally 3 meals a day
  - Try to eat at a similar time each day

Bringing it all together

- General guidelines for healthy eating, without dieting
  - Have treats once in a while
  - Eat lower-fat foods most of the time
  - Eat a variety of foods-don't get stuck eating the same things all the time, or only one thing at a meal
  - Set realistic goals
    - E.g., not "I will never eat chocolate again", but "I will have chocolate on Sunday and Wednesday".

This week's assignment:

- Practice eating based on the Food Guide Pyramid.
- Continue daily self-monitoring records.

Review Questions:

Session 3: Physical Activity: Part A

- Health, Weight, and Shape Benefits of Regular Exercise

Today's "Toxic" Sociocultural Environment

- Today's environment is highly conducive to weight gain, preoccupation with eating and weight, and body dissatisfaction
- Some stats: (from Battle &Brownell, 1996)
- 1) 7% of the US population eat at McDonald's each day
- 2) The average US child views 10,000 food commercials each year (95% of these commercials are for candy, fast food, soft drinks, and sugared cereals)
- 3) Due to energy-saving devices and less physically demanding work, many individuals do not get physical exercise during their day-to-day activities.

Today's "Toxic" Sociocultural Environment

- Seems like the environment (lots of unhealthy, fattening foods, lots of advertising of that food, reduction in our day-to-day activity level) is directly at odds with maintaining a healthy weight, and with incorporating physical activity into daily life!

Physical Activity: Introduction

- [redacted], we started to talk about healthy eating and reducing our fat intake.
- Today we will begin talking about physical exercise, and we'll continue talking about it next week.
- Exercise is one of the most important things you can do for maintaining your body weight and shape, improving your health, and for reducing stress

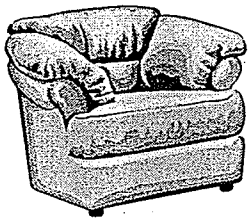
Exercise: What is it?

- Can anyone here give a definition of exercise?

Exercise: What is it?

- There are many ways of getting exercise: but in general, it is important that you do *some* exercise that increases your heart rate and breathing rate (aerobic exercise).
- Examples of aerobic exercise:
- Walking
- Running
- Cross-country skiing
- Cycling
- Squash
- Tennis

Interesting to note....



- Although the average number of calories eaten per person each day has, on average, decreased across the past century, people have become heavier over time.
- Why do you think this might be? (Hint: The picture to the left!)

Interesting to note...

- This is partially explained by:
  - a reduction in energy expenditure (calories used in daily activities, exercise)
    - Research suggests that a large proportion of adults do not do any vigorous exercise, and are sedentary
      - Sedentary means less than 30 minutes of physical activity on less than 5 days per week (CDC and ACSM recommendation, 1993)

Interesting to note...

- Other factors, like increasing TV viewing and increased consumption of fast foods, have been shown to be related to weight gain in women
  - One way of getting around this problem is upping your activity level

Question:

- What Are Some of the Benefits of Regular Exercise?

Why is Exercise Important?

- Exercise has many *weight and shape-related* benefits...
- 1) Regular exercise is crucial for losing weight, and is the best predictor of *weight maintenance over time*

Why is Exercise Important?

- 2) We talked about the way in which dieting can impact metabolic rate (slowing)- exercise can also impact metabolism—by increasing it!
  - Exercise increases the amount of lean muscle in your body, which means that more calories are consumed at rest
  - This can increase your metabolic rate
    - very important, because your resting metabolic rate uses 60-75% of your daily energy needs
  - The benefits of exercising are not just that it uses up energy while you are doing it—
    - it can actually have benefits while you are not doing it, by maintaining lean (muscle) mass, which uses up more energy than non-lean mass!

Why is Exercise Important?

- 3) Mood Effects: Exercise can also reduce negative feelings;
  - like depression, or anxiety, or even boredom
  - depression or anxiety can lead to overeating for some people, (especially people who diet), as can boredom
- Even a single bout of exercise can have a positive mood effect (McGowan, Pierce, & Jordan, 1991)
- Exercise can help you deal with the high-pressures that can be involved in University coursework and social life

Determining Your Current Level of Activity

- In-session activity: take the next 5 minutes to fill out the brief questionnaire in your booklet.
  - This is just a rough guide, but may help you figure out whether you need to increase your level of activity.

Determining Your Current Level of Activity

- Some of you will notice that you scored in the *inactive* or *moderately* active range. What does this mean for you?
  - It may mean that you could benefit from increasing either the amount or intensity of exercise you are currently doing.
- Others will have scored in the active or very active ranges; this is usually positive! However, sometimes too much exercise, or exercise that is "compulsive", can be problematic.

Overdoing it

- Although exercise is a positive addition to one's lifestyle, it is possible to have too much of a good thing (as with most things in life!)
- Exercise can become a really stressful activity if done as part of a "relentless search for perfection", or as a way of compensating for overeating or poor feelings about weight and shape (Wilfley et al., 1994).

Overdoing it

- *One* reason for exercising for many people is that it can help maintain a fit-looking appearance
- However, when this is a person's only reason for exercising, and this becomes all-consuming, it can lead to "overdoing" exercise

Overdoing it

- *Question* : What are some of the hazards of exercise that is compulsive or obligatory? (Note: By hazards we are looking at both dangers to the body, and negative effects on mood or thinking)
  - e.g. Feeling bad about yourself if you miss a day
  - Preoccupied with exercise (can't stop thinking about it)
  - Overuse injury
  - Worrying: "If I don't exercise every day, I will gain weight"

Overdoing it

- ~~It's very important to take breaks from exercise;~~ at least one or two days of the week need to be "days off" from your routine
  - Even elite athletes take days off from training. Your muscles need time to recuperate, in order to get stronger!
- Taking one or two days off a week will not cause you to gain weight!

Overdoing it

- The process of weight gain or loss occurs *over time* and in response to energy intake and energy output
- The key words here are OVER TIME:
  - remember, even on a "day off" your body is still using a lot of energy just to maintain its regular activities (60-70% of the energy you use every day goes to these processes)
  - taking one day off or two days off here and there will not lead to a significant change in your weight or shape!

So How Much is the "Right Amount"?

- There is no absolute "rule" regarding how much exercise you should get
- Remember to fight against "all or nothing thinking", like saying, "well, I can't run for half an hour so I might as well not run at all"

Exercise Mythology

- 1. Exercise will make me too hungry.
  - Actually, if you increase your exercise rate moderately, it may actually *decrease* your appetite!
- 2. I don't have/can't afford exercise equipment/clothing.
  - Walking is an excellent way to exercise, & doesn't require any special clothing or equipment

Exercise Mythology

- 3. If your muscles aren't sore the next day, you didn't work out hard enough.
  - This one is just false! You don't need to put yourself through pain to experience the benefits of exercise.
- 4. "I hate exercise!"
  - There are so many different ways of getting active! The key is finding one that you can maintain over time and that you will actually do! It is unlikely that you will hate all of them.

Exercise Mythology

- 5. "I don't have any time".
  - This is one of the most common myths! Exercise does not have to involve a long, arduous process. It is a matter of scheduling and prioritising it into your daily life.

Homework Assignment—Week 3:

- Complete the longer-answer questions in your booklet, if you found that it would help to increase your level of activity.
- On the sheet provided, write out the days of the week on which you will exercise, as well as the times.
  - Make sure that you have at least two planned days off!
- Continue filling out self-monitoring forms.

Session 4: Physical Activity, Part B

- **Major Topic:** information on starting an exercise program.

Barriers to Exercising

- Before we start talking about ways of getting started on an exercise program, it is important to look at some of the barriers that can stand in the way
- Barriers: Things you say to yourself that prevent you from exercising, or problems that keep you from exercising
  - **Sometimes people tend to say "yes, but...." a lot!**
  - *Question:* What are some reasons why people do not exercise?

Sample Barrier to Exercise:

- **"I am too busy to exercise; when I get home, I am tired and need to relax"**

Barriers to Exercising

- Before starting to even think about exercising, it is important to examine these barriers, and come up with ways of looking at the situation from other angles
- We could call this CHALLENGING the thoughts that are getting in the way of exercising
- *What are some challenges to the thoughts you came up with?*

Sample Challenges to that Barrier:

- "I may be tired when I get home, but I'll have MORE energy if I go for a brisk walk"
- "I have time to watch TV to unwind, so I can probably fit in some exercise"
- "I don't have any classes until 10:00 in the morning, so if I make a commitment to get up a little earlier I can exercise before school"

Barriers to Exercising

- There are other people who are considering adopting a healthier lifestyle, but who tend to be thinking about or trying a lot of "QUICK FIXES"
- They may want to know about fad diets, gimmicky exercise machines
  - as a way of finding a substitute for doing some work!

Barriers to Exercising

- There is no getting around it: in order to be strong, toned, and healthy, you have to exercise!
  - When you see diet/exercise plans that say "lose 10 lbs in one weekend" or "lose weight and gain muscle effortlessly, no exercising!"
    - **alarm bells should go off in your head! There is no easy way out!**

Scheduling

- **Saying to yourself, "I will exercise four times this week": a nice goal, but can we make it more specific?**
  - **It is easy to put off or forget about a non-specific goal**
  - **It helps to really schedule and plan out when, where, and how you will exercise.**
- **Better: "On Monday, Wednesday, Friday, and Saturday, I will go for a 45 minute brisk walk between 5 and 5:45 pm. I have a new umbrella and some mittens in case it is raining or cold"**

Starting and Maintaining Exercise

- It is ideal to choose an activity or activities that use large muscle groups, and which are done in a rhythmic and continuous manner (O'Toole & Douglas, 1994)
- *Question:* What are some modes of exercise that will increase heart rate, improve cardiovascular health, & burn calories?

Starting and Maintaining Exercise

- Examples of exercise that fits into this category are:
  Walking
  Bike riding
  Jogging/running
  Skating (ice or inline)
  Swimming
  Cross-country skiing
- Others?

Starting and Maintaining Exercise

- Some of the exercise that you do should be **aerobic**, meaning that it will improve your cardiovascular system, boost your metabolism, and lower your percentage of body fat.

Starting and Maintaining Exercise

- **A strength increasing form of exercise, such as weight training, may be something you decide to add later on, once you are used to exercising on a regular basis**
- **Or, you could add some push ups or crunches to your routine**

Starting and Maintaining Exercise

- You need to have the correct equipment for any form of exercise you choose
- Easist: Walking. Most people have a pair of shoes that will be OK for walking, even brisk walking
- Cycling: all you really need is a bike! A pair of bike shorts will keep your butt from getting sore!
- Running: make SURE you get a good pair of running shoes (not cross trainers) that have an appropriate support system for your foot. The people at running stores are a good resource.
- Any higher impact form of exercise: get a good sports bra!

Starting or Maintaining Exercise

- When starting to exercise, you need to consider the
  - (1) kind of activity you want to do, its
  - (2) intensity level,
  - (3) how long you are going to do it,
  - (4) how often you are going to do it, and
  - (5) whether or how you will progress in this over time
- Let's look at each of these in turn.

KIND OF EXERCISE

- First, you need to decide on the kind of physical activity you would like to do.
- The most important thing is that you choose something that you think you will do regularly and can continue doing over time.
  - If you choose "running" as your activity, but you know you tend to get sore knees and are unable to run after 2 weeks, this is a poor choice, as it cannot be maintained.

KIND OF EXERCISE

- Similarly, if you choose "swimming", but you live a 45 minute drive from the nearest swimming pool or you don't have a car and would have to take 2 different buses to get to the pool, you are choosing an activity that is unlikely to be maintained because it is just too much of a pain to get to it!
- Make sure that you don't pick something that will give you an easy excuse not to do it!

KIND OF EXERCISE

- *Question:* What are some ways of facilitating exercise, meaning, making it easier to fit into your life?
  e.g.: If you have friends who are already active on a regular basis, and you think it would be better for you to exercise with a motivated friend, ask if you can join them.
- Some people get most enjoyment from team sports such as soccer, or playing racquet sports with a friend
- In contrast, some people find that they enjoy exercising on their own better, going to a gym, running, or swimming laps
- Or, a combination of individual and group activities

INTENSITY OF EXERCISE

- The intensity of exercise that you choose depends on your current level of physical fitness—the more fit you already are, the higher the intensity you may choose.
- Similar to the kind of exercise, the most important thing to consider when deciding on intensity is choose an activity that you will actually do and can maintain.
  - If you have not exercised for a long time, and you decide to start running as your activity, you may find it quite aversive and peter out quickly.

INTENSITY OF EXERCISE

- In this case, it will be preferable to start with walking and maybe increase your intensity very slowly and over time
- A practical rule is that you should be able to talk, but not sing, during exercise
- The most important thing is maintaining it! Starting is not the hardest part—maintenance is. Make this foremost in your mind as you begin.

DURATION AND FREQUENCY OF EXERCISE

- Aim towards 4 and 5 sessions of moderate to vigorous exercise, for 30-60 minutes per session
- Remember, if you are starting an exercise program, you will vary the kind of exercise and its intensity to suit your fitness level.
- For example: someone who has not exercised for a while can start with walking on 4 days of the week, for 20 minutes per session
- Someone who has been exercising for a while and feels like they want to do more can move to a longer duration and/or higher frequency of exercising: say walking for 45 minutes on 5 days of the week

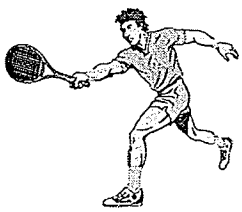
PROGRESSION OVER TIME

- This brings us to talking about progression of exercise
- People who are exercising regularly will find that over time, their fitness level will increase and they may want to vary some of their original factors.
- For example, you may decide in increase the intensity of your exercise (e.g., move from walking to jogging), or you may wish to increase the duration and/or frequency of exercise (e.g., walk on 5 days of the week instead of 4, or increase walking time from 25 minutes to 35 minutes).

Resisting the "All-Or-Nothing Trap"

- It is very important to resist thinking that there is a specific threshold of exercise that you have to do, or it "doesn't count"!
  Any exercise is better than none at all
- Remember in the first session we talked about all-or-nothing thinking related to eating (if I have one cookie I might as well have them all....); this can be a challenge for people in terms of exercise, too.
- For example, some may say, "Unless I am running for at least 20 minutes, I might as well not exercise at all". This promotes the idea that other exercise doesn't "count".

Making Goals Realistic



- As I said before, and will say again, the most important thing is choosing an exercise you *enjoy and will maintain*!

Making Goals Realistic

- If you are currently not active, and decide that you are going to start jogging for 30 minutes 6 times per week as your goal, it is very likely that you will go jogging once and feel very out of breath long before 30 minutes is up.
- This will produce a negative experience of exercise, and possibly negative feelings about exercise.
- You may say to yourself, "I hate jogging".
- It is possible that you will not jog again. You have gained nothing by this endeavor.

Making Goals Realistic

- What if your goal was different, more realistic? Let's say you decided to walk for 20 minutes on three days of the week.
  - And you made a longer-term goal of beginning to jog for 1 minute every 5 minutes of the 20 after 2 weeks. In this fashion, you could gradually increase your activity, if you desire. It is much more likely that you would be able to accomplish this goal.
  - You would feel positive about accomplishing your goal, and likely continue to do it. You have gained 4 hours of physical activity per month!

Increasing Activity in Daily Life

- Even day-to-day activities that are not part of formalized exercise routines can be an important source of activity (in addition to a good exercise program!)
- Can you think of ways of increasing your activity level in daily life?

Increasing Activity in Daily Life

- Walking to work, walking up the stairs;
- going out dancing,
- running with your dog for 5 minutes
- getting off the bus two stops early

- There is no "magic number" at which physical activity starts to "count". It all helps, and all adds up over time.

Making the Choice to Exercise

- Suppose you convince yourself that it is not worth exercising sometimes, because you are having a busy day, and don't have enough time.
- Suppose this happens about once a week (I am not talking about planned days off, only days when you had planned to exercise then convince yourself otherwise).
- If instead you exercised for 10 minutes on those days (e.g., run for 10 minutes), you would have gained 520 minutes of running time over one year!

Last List of "Tips"

- Go slowly--you are not going to get into shape overnight!
- Keep it up–promise yourself a minimum time period of 8 weeks to see if your new exercise program is working for you
- Establish clear goals--don't let excuses creep in!
- Avoid becoming obsessive about exercise
- Take days off
- Drink plenty of water
- Warm up and cool down
- Stretch after exercising

Homework Assignment—Week 4:

- Review last week's homework.
- If you found you needed to increase your level of exercise, do so in a slow and realistic fashion.
- If you are over-exercising (and not doing so because you are in training for an athletic sport/event) try to plan some "days off" into your routine.
- Continue eating a variety of foods in amounts suggested by the food guide, and continue filling out your self-monitoring records.

Session 5: Meal Skipping

- Today we will be talking about the importance of eating regularly spaced meals for weight maintenance
- We will talk about the ways in which meal skipping can be counterproductive
- We will talk about meal replacement bars and "diet" foods that contain artificial sweeteners

Meal Skipping

- Some people skip meals to try to control weight
- On the face of it, this seems like it might work;
  - seems like if you eat only two instead of three, or one instead of three, meals a day you might eat fewer calories and lose weight.

Meal Skipping

- Let's look at this more objectively
- Today I would like to answer the question: Is Meal Skipping an effective way of reducing the number of calories eaten each day, and of controlling your weight?
- *Question:* Does anyone have any ideas about how skipping meals could "backfire" in terms of their actual eating habits?

How Skipping Meals Can Backfire

- **5 reasons meal skipping does more harm than good**
- **1) After a skipped meal (esp. breakfast) your body goes into starvation mode...metabolism slows down, etc.**
- **2) Less available fuel = less energy for you, your daily activities, and your daily exercise**
- **3) Blood sugar levels may drop, which can result in headaches, irritability, & difficulty concentrating**

How Skipping Meals Can Backfire

- **4) Undereating in the day can lead to over-eating or binge-eating later in the day.**
- **5) When you go for too long between meals, it is harder to make healthy food choices.**

How Skipping Meals Can Backfire

- **Let's discuss each of these factors in more detail.**
- **1) Slowing of metabolism**
  - **For example: if you eat just one large meal per day, your metabolism is only raised at that meal.**
  - **Your body will produce more insulin than usual, which can cause any excess calories your body doesn't use to be stored as fat.**
  - **If you spread out the calories throughout the day, your metabolism will be raised at each meal.**

How Skipping Meals Can Backfire

- 2) Less available fuel, therefore less energy for you
  - You may run out of steam partway through the day, and be so tired that you give up on your planned workout
  - You may have trouble staying awake for your classes

How Skipping Meals Can Backfire

- 3) Blood sugar levels may drop, which can result in headaches, irritability, & difficulty concentrating
  - Remember your brain (you need your brain for your classes!) is fueled by glucose, so it is important for your thinking processes that you eat regularly spaced meals!
  - Other people may not enjoy being around you if you are irritable & nasty by dinnertime!

How Skipping Meals Can Backfire

- 4) Undereating during the day can lead to over eating or binge-eating later in the day.
  - Question: Why might this happen?
- From a cognitive standpoint
  - e.g., thoughts such as "well, I didn't have breakfast, so I can have this piece of chocolate cake for dessert at lunch";
  - had you eaten breakfast, you may have been less likely to overeat and/or eat "empty calories" later in the day
  - These kinds of thoughts can lead to increased fat/caloric intake during the day
  - Preoccupation with food

How Skipping Meals Can Backfire

- From a physiological standpoint
  - e.g., increases the likelihood of overeating or binge-eating due to extreme hunger
  - Tendency for persons who skip a meal to "make up" the missed calories during the remainder of the day
  - Evening binge-eating, partially due to inadequate caloric intake during the day

How Skipping Meals Can Backfire

- From a physiological standpoint
  - Research shows that meal skippers consume more snacks, and these snacks tend to be high in simple sugars, salt, & low in fiber
  - Research shows that meal skippers are more likely to be overweight (Dwyer et al., 2001)

How Skipping Meals Can Backfire

- 5) When you go for too long between meals, it can be hard to make healthy food choices.
  - You could be so hungry that you can't be bothered with choosing a healthy snack such as fruit or a bagel--instead, you hit the chocolate bar machine, or eat fast food

Breakfast

- Breakfast seems to be the most frequently skipped meal
  - Question: is Breakfast important?
  - Yes, because after the body has gone without food for several hours, the metabolic rate is very low and food has the effect of increasing it by up to 20% (Seabrook, 1997).
  - Skipping breakfast may lead you to be so hungry by lunch time (or morning coffee-break time) that you end up eating more than you would have if you ate breakfast, which could either balance out the amount you eat or even increase it

What happens when you skip breakfast?

- What You Do
- Wake up not hungry
- Skip Breakfast
- Eat a Light Lunch

- What Your Body Does
- Food from night before is still fueling your body
- Begin to use glycogen, a form of sugar stored by your body for quick fuel access .Fat is also used as a fuel , but very slowly.
- Slight replenishment of fuel but still relying on glycogen stores

What happens when you skip breakfast?

- What you do
- Start Snacking
- Starving By Dinner
- Eat Large Night Meal

- What your body does
- By Mid-Afternoon Glycogen stores are running low. Blood sugar begins to dip.
- Very low glycogen stores. Low blood sugar stimulates appetite and hunger.
- Urgency to eat comes on because blood sugar is very low. Adrenaline, a hormone, activates a survival drive to eat. Food is eaten quickly and in large volume.

What happens when you skip breakfast?

- What you do
- Snack
- Go to Bed full
- Wake up not hungry, again

- What your body does
- More Insulin is activated by large meal ingestion. Excess fuel, both fats and sugar, are quickly stored. Later, you may have room to "eat more". Plan to start diet tomorrow.
- Fuels, both fat and sugar, are stored throughout the night as digestion continues at a slow rate.
- Last night's meal is still fueling your body. Repeat the cycle above.

Breakfast

- Also, breakfast is very important from a nutritional standpoint..
  - breakfast often provides 1/4 of our daily nutrient needs, including calcium, vitamin C, iron, and folate
- No time? Keep quick to fix foods on hand! eg: Bagels, yoghurt, ready to eat cereal, fresh fruit...you can even eat them on the go if you have to!

Meal "Replacement" Bars/Shakes

- What about meal replacement bars/shakes? This means I am not really skipping the meal, right?
- Unfortunately, these may be high in sugar/sweetener, and fat.

Meal "Replacement" Bars/Shakes

- Behavior wise:
  - these products do not help you to re-train your body to choose healthful foods (i.e., you may get in the habit of eating "bars" or "milkshakes" as a meal), and they do not train you to make eating regular meals a part of your life.
  - Training yourself to make eating regular, healthy meals is about changing your behavior, so it is important that you avoid making processed food/convenience foods a habit

Meal "Replacement" Bars/Shakes

- Use on a very occasional basis, such as when extremely busy, is not problematic
- Carefully read the label to note the product's composition, particularly fat and sugar content
- Try to choose items that are lower in fat & refined sugars
- Some are really glorified chocolate bars--be careful!

Artificial Sweeteners

- A note about artificial sweeteners: There is no research evidence to suggest that persons who eat artificial sweeteners are any better at controlling their weight than are those who eat regular sweetener
- Due to the fact that these artificial sweeteners are so low in energy, one may actually increase food intake later to make up for the caloric deprivation

Artificial Sweeteners

- **Also, using artificial sweeteners is not teaching you to choose healthful and natural foods most of the time--**
- **instead, you continue to eat processed and sweetened items, and may continue to "crave" them**

Artificial Sweeteners

- **Question: What could you do instead of consuming artificial sweeteners (like in diet pop)?**

Eating Regular Meals

- For most people, eating three meals a day offers a reasonable pattern of food intake; with a snack in between if you have a long interval (4 hours or so) in between meals
- If you are not used to eating meals consistently or at regular times, this could be difficult
- *Question:* What are some of the barriers people have to eating three meals a day?

Challenging Barriers

– *Question:* What are some ways of overcoming these barriers to eating three meals a day?

- **Some people fear that eating 3 meals a day, and/or including snacks in their diet, will lead to weight gain**
- **In fact, the opposite may tend to occur.**

Challenging Barriers

– **For example, if a person's meal pattern is "infrequent", compared to "frequent", and the total daily caloric intake is constant...**

– **your metabolic rate could be higher in the "frequent" condition because your body produces more heat energy as it is digesting and metabolizing the food**

Challenging Barriers

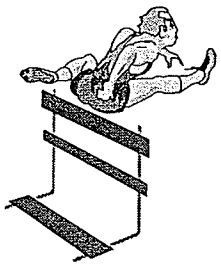
– Some researchers have found that people who eat more frequent meals or snacks actually have lower body weights than people who eat less often (e.g., Drummond, Crombie, & Kirk, 1996).

- **And to add insult to injury, these researchers found that eating less frequently can actually lead to increased craving for high-fat foods!**
- **(Drummond et al., 1996).**

Planning Regular Eating

- In moving towards more regular eating patterns, it is important to plan to eat meals and snacks at specific times, at least in the beginning.
- This is because you may not be in the habit of doing this
- Most people find that eating three meals a day is most appropriate for their schedule.
- I would not recommend less than this number.

Planning Regular Eating



- **Some people may wish to include more frequent, smaller meals, if they are particularly active**
- **Usually, it is best to have breakfast soon after waking, lunch in the early afternoon, and dinner in the evening. Adjust times according to your schedule**

Planning Regular Eating

- Example: If you get up at 8:00 a.m., you could eat breakfast at 8:30.
- Lunch should be planned for between 12 and 1p.m.; this will ensure that you do not wait too long and get too hungry before eating

Planning Regular Eating

- If you plan to eat dinner between 6 and 6:30 p.m., and ate lunch at 12:00, it is important to have a small snack in the afternoon, at about 4p.m.
- this will help prevent getting "over-hungry" and eating unhealthily at dinner, like getting so hungry that you decide to stop at a fast food place on the way home instead of cooking a healthful meal

Homework Assignment— Week 5:

- **Practice eating three meals per day.**
- **Plan to eat these meals at regular times.**
- **If there is more than a 4 hour stretch between your meals, (not including overnight!) plan a small snack.**
- **Try to actually sit down at the meal time with a focus on the eating (e.g., not watching TV, driving in car, or reading).**
- **Continue filling out self-monitoring records.**

Homework Assignment-- Week 5

- **Reminder: To continue eating based on the food guide, and to continue engaging in regular exercise. If you feel like it, make a small increase in your exercise goal for this week. Continue including days off in your exercise routine.**

Session 6: Food Avoidance

Major Topic: "food avoidance"
Hand Out Booklet:
Forbidden food page; daily self-monitoring records.

Defining "Forbidden Foods"

- Many people who tend to be dieting most of the time categorize foods as;
- "good" (allowed by your own rules or diet rules); or
- "bad" (not allowed by your own rules or your diet rules; seen as fattening).
- Today, I'd like to talk about this way of categorizing foods.
- We will call avoided or "bad" foods "forbidden foods".

Defining "Forbidden Foods"

- It seems like there are two categories of forbidden foods:
- 1) Foods that actually are not particularly nutritious, and tend to be high in fat or refined sugar
  - E.g., candy, chocolate
- 2) Foods that people have *decided* are fattening, often based on erroneous information or "fad diets"
  - E.g., bread, pasta, bananas, potatoes

Defining "Forbidden Foods"

- Keep these two categories in mind when we are talking today—and try to decide which category each of your own "forbidden foods" falls into.

Defining "Forbidden Foods"

- Let's start by figuring out what your own "forbidden foods" are.
  - This is something that is very individual for everyone.
  - Examples of foods that tend to be "forbidden foods" for people are deep fried things, chocolate, sweets
- **Write down any foods that you currently avoid eating on Page 1 of your booklet.**
- *Why* don't you eat them?
- Take a moment to write down your reasons for avoiding these foods

Defining "Forbidden Foods"

  - Does anyone feel like talking about WHY they don't eat certain foods?
- Review of reasons why people avoid certain foods
  - e.g., fattening, makes me feel guilty, makes me feel fat
- If your reasons are related to weight or shape, and not moral or religious reasons, you may wish to begin including these foods into your diet.

But Some of These Are Unhealthy!

- Even if you have written down that the food is not "healthy", which may be true, examine this idea for yourself
  - Is saying it's not healthy a disguise for saying it is "fattening"?
- Most people eat unhealthy things sometimes
- These foods are definitely not good for you when eaten in large amounts or on a regular basis.
- However, it is unrealistic to expect that you will never eat anything unhealthy.

How Avoiding "Forbidden Foods" Can Backfire

- Let's look at some reasons why it is unrealistic, and actually counterproductive, to try to eliminate "forbidden foods" from your life.
- Let's use the example of "ice cream" as a forbidden food
- *Question:* What might a person who viewed ice cream as forbidden think to herself after eating ice cream? (Thoughts and Feelings)

How Avoiding "Forbidden Foods" Can Backfire

- e.g.: "I've blown it"
- "I have no self control"
- "I feel depressed"

- *Question*: Is it possible that this way of thinking and these feelings after eating one of these foods leads to maladaptive behaviors?

How Avoiding "Forbidden Foods" Can Backfire

- We are back to "all-or-nothing-thinking" again, as we discussed with dieting and exercise
  - (Examples: "I might as well eat it all" (overeating on the forbidden food);
  - "I've blown it, the day is shot" (overeating on a variety of foods for the day, with the resolve to go back to deprivation eating the next day).

How Avoiding "Forbidden Foods" Can Backfire

- We are also back to black-and-white or dichotomous thinking
  - (e.g., "good" vs. "bad" foods), and how this can lead to maladaptive behavior (e.g., binge-eating on "forbidden" food, feelings of guilt and remorse after)

Some Research

- What does the scientific research say can happen here?
  (Knight & Boland, 1989)
- people who were "dieters" were given either a milkshake or cottage cheese.
- Then, they did a "taste test" of ice cream flavors.
- Both the milkshake and the cottage cheese contained the same number of calories.
- The people were told how many calories were in the cottage cheese, if that is what they were given, or in the milkshake, if that's

Some Research

- What do you think happened?

Some Research

- The "dieters" who had the milkshake ate more ice-cream during the taste-test than people who ate the cottage cheese, even though the number of calories in each was the same!
- *Question*: Can you explain this, based on our discussion of thinking and feeling after eating "forbidden foods"?
  - Seems that the type of food eaten influences a person's thinking and behavior;
  - may be that eating a "forbidden food" can increase a person's likelihood of overeating, due to their reaction to the experience.
  - Rather that some sort of biological response to the actual number of calories in a food

Eating Forbidden Foods

- Seems like there are two ways of overcoming this problem:
  - (1) Never eat "forbidden foods",
  - (2) or change your way of thinking such that you don't see foods as "forbidden" anymore, and can include them in your diet.

Eating Forbidden Foods

- One of these choices is realistic; the other is virtually impossible.
- As you know, it is almost impossible to eliminate a food from your diet;
- eventually, temptation wins out, and if you see the food as "forbidden" you will likely experience guilt, beat yourself up, possibly overeat, and then vow not to eat that food again (for the 50th time!)
- So let's take a look at what the more realistic option could look like.....

All Foods Can Be Part of Healthy Eating!

- By consuming small quantities of previously "forbidden foods", you can gradually reduce their POWER over you
- By this I mean that you can reduce the power they have to influence your thinking and feelings, and can therefore reduce the chances that you will overeat when you have one of these foods
- What are some ways that you can start including some of these foods in your diet, in a positive way?

All Foods Can Be Part of Healthy Eating!

- If you have been avoiding certain foods, and have viewed them as "bad" for a long time, it will take some time before you feel comfortable eating them, and possibly before you feel able to eat them without being worried about overeating. Let's look at some ways in which you can start trying them out...

All Foods Can Be Part of Healthy Eating!

- First: If you tend to eat foods that are high in fat and are in the "treats" category almost every day....
- You can, and should, still eat them!
- But it may help to plan out two days of the week on which you will have a treat.
- For example: if you know you love croissants, and you also love ice cream...
  - Maybe you could have one croissant for breakfast or for a snack on Wednesdays, and have ice cream for dessert on Sunday.
  - On the rest of the days of the week, try sticking with lower-fat choices
  - See how that goes!

All Foods Can Be Part of Healthy Eating!

- Second: Try to set weekly goals, rather than "always" goals
  - For example-plan out the days you'll have your "treat" food for the week & see how that goes, rather than saying "for the rest of my life, I will..."
  - It is important to leave some room for error, and to allow yourself to change on a gradual basis

All Foods Can Be Part of Healthy Eating!

- Third: Try to steer clear of "RULES"
  - If you've decided to have your treat foods on two days of the week, but it's your birthday that week, it would be just plain silly to say. "I am terrible for having birthday cake because I didn't plan it and it wasn't the right day!

All Foods Can Be Part of Healthy Eating!

- Fourth: Keep your eye on the bigger picture
  - What do I mean by this?
  - Included in your goal of having treat foods, enjoying them, and planning them into your life, you can concentrate on increasing healthful choices....more fruits, vegetables, whole grains....
  - If you have a day where you eat a lot of treat foods, instead of feeling bad about yourself, you can remember that you have been choosing healthy foods most of the time and congratulate yourself on that!

All Foods Can Be Part of Healthy Eating!

- What if some of your "forbidden foods" are actually healthy things?
  - Like: pasta, bread, fruit, potatoes, corn, cereal...
  - You could try including these in your diet on a daily basis if you like! The challenge is the way you THINK about eating them

All Foods Can Be Part of Healthy Eating!

- What about the less-healthy forms of "forbidden foods"?
- **Strategies for learning to eat these foods with a sense of control**
  - (e.g., buying a single-serving container of ice cream and eating that, rather than trying to eat part of a carton and leave the rest.)
- Set aside one or two nights a week on which you have dessert—e.g., buy yourself or make yourself a single serving of a dessert and have it at a planned time after your meal

All Foods Can Be Part of Healthy Eating!

- If you know you LOVE a food that is high in fat or calories, don't keep it in the house—buy a small amount of it when you really want it
- Try keeping a lot of healthy foods THAT YOU LIKE around the house, so you'll use those for meals and snacks most of the time

All Foods Can Be Part of Healthy Eating!

- So what if you do start munching on cookies or chocolate or something, and think, "I've blown it"?
- Instead of thinking, "I might as well eat the whole bag", you could say to yourself
  - "eating one or two cookies will not make me gain weight, but eating the whole bag will, so I can put it down now, no harm done, & enjoy my two cookies"
  - What else could you say to yourself?

All Foods Can Be Part of Healthy Eating!

- NB: one thing that people will sometimes try to do is eat the "forbidden food" INSTEAD of a meal.
  Question: Why does this often backfire?
- This can just lead to more eating/snacking later, because your body will want it's proper meal, and you may feel deprived and resentful

Homework Assignment—Week 6:

- **Try to eat a small quantity of one of your "forbidden foods" on at least 2 days this week. Use the suggestions for eating the food with a sense of control. Continue daily self-monitoring records.**

  Reminder: Continue regular exercise. Continue eating meals regularly, and snacks if there's a large (4 hour) gap between meals. Continue eating based on food guide recommendations.

Session 7: Body-Image

- **Main Topic:** Discussion of body image
  Hand Out Booklet: Daily self-monitoring forms

Body Image

- What is BODY IMAGE?

Body Image

- A very large number of people in our society are dissatisfied with their body weight and shape.
- Body-image problems overall appear to be increasing in North American Society.
  - This table is based on two Psychology Today-magazine surveys

Sources of Body-Image Discontent

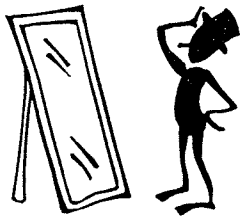
	1972 Survey		1985 Survey	
Disliked physical attribute	Men	Women	Men	Women
Height	13%	13%	20%	17%
Weight	35%	48%	41%	55%
Muscle tone	25%	30%	32%	45%
Face	8%	11%	20%	20%
Upper torso	18%	27%	28%	32%
Mid torso	36%	50%	50%	57%
Lower torso	12%	49%	21%	50%
Overall appearance	15%	23%	34%	38%

From Cash, Winstead, & Janda, 1986.

Body Image

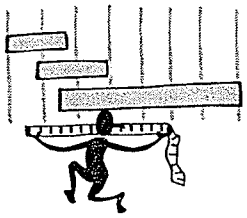
- **Why do you think there has been an increase in body dissatisfaction?**

Body Image



- **Many people experience a large discrepancy between the way they look at their actual body weight and shape, and their ideal body weight and shape. This can lead to "dissonance" (Festinger, 1957)**

Body Image



- Dissonance = the difference between the actual body shape and the ideal body shape is different enough that the person feels upset about themselves.
- **In theory, the greater the difference between the actual and the desired body shape, the greater the degree of dissonance, or "upset-ness"**

Body Image

- This state of dissonance can spur people to try to get rid of the negative feelings;
- In this case, it can lead to dieting or really unhealthy weight management practices
  - (because the person is trying to reduce the difference between "actual" and "ideal")

Body Image

- ***Question*: What are some reasons why our society is a place where this state of "dissonance" happens for a lot of people?**

The Unrealistic Ideal

- Reasons for the large discrepancy that happens in our society
  - Unfortunately, the "ideal" shape that a lot of women are comparing themselves to is artificial and unrealistic.
  - The images of women that we see all the time are actresses and models (in TV, movies, magazines), who are almost without exception thin, toned, youthful, and attractive.

The Unrealistic Ideal

- **Additionally, in magazines many photos are computer-enhanced to make the model's legs longer, skin clearer, teeth whiter, etc.**
- **This creates a situation where some women may find themselves aspiring towards an image that is not only unrealistic, but which does not even exist!**
  - **As the level of discrepancy between the way you perceive yourself, and the image to which you aspire (which may be based on these media images) increases, dissatisfaction and other negative feelings can increase**

How Does All Of This Affect Behavior?

- Sometimes the way people are feeling about their bodies influences their behavior
  - What do I mean by this?
- Has anyone ever avoided doing something because they didn't like the way their body looked that day?

How Does All Of This Affect Behavior?

- **For example:**
  - Didn't go to a party because they felt fat
  - Didn't join a gym because they felt uncomfortable
  - Any others?

How Does All Of This Affect Behavior?

- Sometimes feeling dissatisfied with your body leads to avoidance of social situations, or to avoidance of exercise, or just avoidance of a fun life experience
- This can really be "shooting yourself in the foot" in terms of healthy weight management!
  - Why do I say this?

How Does All Of This Affect Behavior?

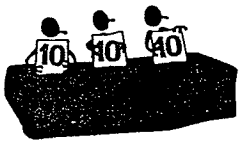
- Avoiding social situations repeatedly can lead to a certain amount of isolation from others.
- This, in turn, can lead to or promote negative feelings like getting depressed, which makes it even less likely that you will want to see people in the future, and more likely that you will be staying at home.

How Does All Of This Affect Behavior?

- Getting depressed is one factor that can increase people's level of isolating themselves, and can decrease motivation to exercise and eat a balanced diet
- If you tend to avoid going to the gym, or going out walking/biking/jogging due to self-consciousness, this can also be pretty counterproductive.
  - For example, I have heard people say things like "I have to lose 10 pounds before I start going to the gym". Given what we have learned about the importance of exercise in one's weight management, this appears to be an important barrier to overcome

The Way We Think About Our Bodies

- Sometimes a person's actions can affect how they feel or think about their body.
- One example of how a person's thinking can be influenced is:
- Suppose you are feeling positive about your body

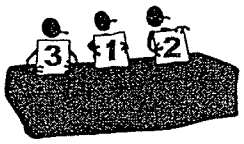


The Way We Think About Our Bodies

- Then you eat a hot fudge sundae....
  - *Question:* Does anyone think that their perception of their body might change in this situation?

The Way We Think About Our Bodies

- Sometimes, eating something you think of as fattening can change the way you feel about your body!



The Way We Think About Our Bodies

- In fact, it is impossible that a person is actually "OK" one minute and then "fat" 20 minutes later due to eating a sundae!
- This is an example of how your body image can change quickly and due to an experience you have, rather than due to actual "fact"
- Here's another example that ties in with what we were talking about with exercising.
- Some people feel OK about their bodies on days when they exercise, then feel "fat" if they do not exercise for one day or two days.

The Way We Think About Our Bodies

- Again, it is not possible that someone would be "OK" one day and then "fat" in one or two days!
- Our bodies do not work this way or this quickly—weight change is something that happens over a longer-term, and is based on our behaviors OVER TIME;
- that is, it is based on our energy intake and energy expenditure over time, not over the space of hours or even 2 days.

The Body-Image Barrier

- So let's look at the other side of the coin…
  - Getting out with friends often makes people feel happier and better, which can increase positive feelings.
  - There is a lot of scientific research that tells us that getting out and doing some kind of exercise usually makes people feel less anxious, less depressed, and can improve how people see their body
  - This is easy to say, but harder to actually do…So what are some ways of getting around the "barrier" of body dissatisfaction?
  - What I mean by this is, how can a person try to convince herself to problem solve when a "body dissatisfaction barrier" comes up?
  - Let's use the example of not wanting to go to the gym because of feeling self-conscious about how your body looks.

The Body Image Barrier

- *Question:* What could you say to yourself, and do, that would make it easier to get out the door? Any suggestions?
  - **e.g.: people will be focusing on their own workout, not looking at me**
  - **even though it will be hard to go to the gym, I will feel better about myself after I work out**
  - **over time, it will get easier to go to the gym**
  - **working out is part of the process of feeling better about my body**

Having Realistic Goals

- **The body is not infinitely malleable!**
  - **No matter how religiously you exercise, your body cannot change into absolutely any shape you desire!**
- But….With exercise and healthful eating, each person can reach their "personal best".

Having Realistic Goals

- This will be different for everyone depending on a lot of factors...
  - like your genetic makeup
  - the type of job you have (active vs. sedentary)
  - the amount of time you have to devote to exercise
  - what you like to eat, and so on
- People come in a variety of shapes and sizes!
- The images presented in the media are generally showing one way of being, a way that is only accessible to a very small proportion of the population.

Having Realistic Goals

- Focusing on your own personal strengths is important, rather than comparing yourself to others
- by focusing on your own lifestyle and your own progress with developing healthful eating and exercise habits, you can reduce "dissonance"
- because you will be comparing against yourself, and focusing on your growth, rather than focusing on an unattainable goal! (which will just continue those feelings of upsetness!)
- Focusing on your positives can be the first step towards having a healthier lifestyle!

Homework Assignment

- Specific Homework Assignment: Week 7: Continue keeping daily self-monitoring records.

Session 8: Review and Relapse-Prevention

- Main Topic: Review previous sessions and provide relapse-prevention information
- Hand Out Booklet: Daily self-monitoring forms, questionnaires

Review of Previous Sessions

- Sessions 1 & 2: "Dieting":
  - Main issues: constant dieting, meaning always trying to eat small amounts in order to control weight, can actually backfire!
  - Discussed the "diet boundary": "rules", set to below actual fullness level
  - We discussed some research showing that people who are always dieting can end up overeating in certain situations (may be more prone to binge-eating), like when they cross their "diet boundary"

Eating Without Dieting

- Talked about learning to eat without dieting, based on the Food Guide Pyramid which emphasises whole grains, fruits, and vegetables, and limits oils/fats
- Emphasized eating mostly healthy foods, with some treats, rather than being "on a diet" (temporary)
- Talked about getting some structure in eating habits, & aiming for about 2200 calories a day

Sessions 3 &4

- Physical activity
- Possibly the MOST IMPORTANT component of lifetime weight management!
- Discussed the importance of doing some aerobic exercise, e.g., exercise which increases your heart rate and breathing rate
  - On most days of the week
  - Need to take days off if you are doing vigorous exercise

Physical Activity

- Aerobic exercise can increase your metabolic rate, your lean muscle mass, and improve mood
- We discussed ways of challenging and overcoming barriers to exercise like being "too busy"
- We talked about the importance of setting specific goals
- Any exercise is better than none at all!

Session 5

- Meal skipping, and ways it can backfire:
  - 1) slow down metabolism, especially if you skip breakfast
  - 2) less energy for daily activities, including exercise
  - 3) low blood sugar, which can lead to irritability, problems concentrating, and headaches
  - 4) can lead to late-day overeating and/or binge eating

Meal Skipping

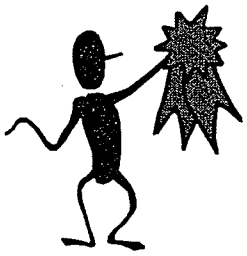
- 5) can make it harder to make healthy food choices when you are STARVING before a meal
- We talked about the importance of eating 3 meals a day, with a snack in between if you have 4 or more hours between meals

Session 6

- Food Avoidance
- We discussed the way in which people sometimes categorize foods as "good" or "bad", and try to avoid the "bad", or "forbidden", foods
- We talked about planning treats into our lives;
  - for example, having a treat food twice a week, while eating healthily as much as possible at other times

Session 7

- Body Image
- Emphasized a focus on being your PERSONAL best, rather than comparing oneself to unrealistic images presented in the media.



Relapse Prevention Strategies

- So, we have talked about the hazards of trying to diet all the time, the importance of eating regular meals and getting regular exercise, and some of the thinking traps that people can fall into that can trigger unhealthy behaviors
- Many of you have probably thought about trying out new behaviors, or have started doing things like trying not to skip meals or exercising more

Relapse Prevention Strategies

- As you move towards more healthy ways of managing your weight, there will be times when you will "slip" back into some of the more unhealthy patterns
- This is to be expected; you have spent a long time learning your usual ways of doing things, and the new behaviors won't "stick" right away
- Because of this, it's really important to learn how to cope with times when you do have a slip towards the "old ways" of thinking or behaving

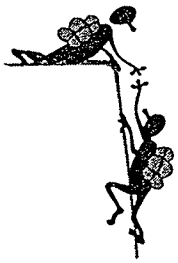
Definitions...

- Lapse vs. Relapse
- "Relapse" is a word that has a lot of negative connotations: it has traditionally been used to describe a return to a negative behavior after a time of abstinence
- Our definition of relapse.....
  - Think of a RELAPSE as going all the way back to a previous behavior.
  - Relapse usually happens after a "chain" of events occur, not from out of nowhere

"Lapse vs. Relapse"

- A "lapse" is different from a "relapse"
- A "lapse" occurs when a person is at one of the links in the chain of events that can *lead* to a relapse
- Having a lapse does not mean that you have blown it and are right back into your old way of doing things;
  - it is just a time to put your new ways of doing things to the test

Dealing with "lapses"



- Let's look at an example of a way in which you could have a lapse, or "slip" towards an older way of coping.

Dealing with "lapses"

- EXAMPLE:
  - Suppose you are at home watching TV, and your roommate or family member bought a bag of cookies that day. You know that the cookies are in the cupboard and really want one.
    - old way of thinking: You decide that cookies are fattening and that you cannot have one.

Dealing with "lapses"

- After 30 minutes of watching TV, you can't stand it anymore and take 2 cookies out of the bag and eat them.
  - old ways of thinking: You are immediately filled with thoughts...."now I've blown it"; "I had two cookies, I am going to get fat"; "I have no self control"

Dealing with "lapses"

- You also have certain feelings about this situation: angry at yourself, sad, anxious
- The old behavior might be: eating the whole bag of cookies and then vowing to never eat cookies again
- All of the "old behaviors" along the way are lapses; they are steps in a process that, unchecked, could lead to a "relapse".

Dealing with "lapses"

- **What could be a different way of handling this situation, based on what we have talked about in our sessions?**

Keys to Maintaining New Behaviors

- Maintaining new behaviors means that you can cope with lapses.
- One step in coping with lapses is *preparing* for them.
- Know your personal triggers for lapse:
  - "triggers" could be things like:
  - eating a food you had previously tried to avoid
  - missing a day or two of exercising
  - having a large amount of "treat" foods in the house
  - having a large meal at a restaurant
  - reading about a "great new diet" where you only eat _____ for 2 weeks

Keys to Maintaining New Behaviors

- For some of you, a trigger to old ways of thinking and behaving could be reading about a new diet.
  - This could lead to the thought: "I really want to lose weight, I'll just eat cabbage soup for 2 weeks and then I can go back to how I usually eat"

Keys to Maintaining New Behaviors

- Challenging this:
  - "I need to eat in a manner that I can maintain--no one can eat cabbage soup for the rest of their life!"
  - "Fad diets like this one can backfire--leave me vulnerable to overeating, slow down metabolism, and it won't help me learn to make healthy food choices as part of my daily life!"

Question:

- Can anyone give an example of a personal trigger, something that can lead to negative thinking or acting (lapses)?

Question:

- What do you think could be done to cope with these "triggers"?

Next Week:

- I will be meeting with all of you individually next week, so you can hand in your self-monitoring forms.
- Please fill out the package of questionnaires next Tuesday, before you hand them in to me!

Next Week:

- *I will be handing out $100 cash to one person next week, drawn at random!*

Follow-ups

- 3 & 6 month follow ups....I will be handing out two packages when you meet with me next week-one contains forms for the 3-month follow-up, one for the 6-month follow-up.
- Directions for how to complete them will be given when we meet next week.
- Everyone will be put back in the running to win $100 again, if they hand in the 3 and 6 month follow-up packages!!!

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Appendix IV

Weekly Review Questions for the Psychoeducational Group

Week 1: Review Questions

Name:_____

1. Why is it important to look at scientific research when evaluating the effectiveness of weight-loss dieting?
   a) Because looking at what happens in one person's case might not tell us what happens for most people
   b) Because it is unhealthy to read the newspaper
   c) So you know if you should go on that diet or not
   d) So you can talk about it at family dinners

2. Which of these things did the men in the Minnesota experiment do after they were allowed to eat what they wanted? (After the semi-starvation period?)
   a) Ran marathons
   b) Binge-ate
   c) Went to the doctor
   d) Went to Disneyland

3. What is the "diet boundary"?
   a) The weight you are trying to lose
   b) The size of pants you are trying to fit into
   c) A new book by Suzanne Somers
   d) "rules" about how much a dieter should eat, set to below their fullness level

4. What does the research say can happen if a person who tends to diet all the time crosses the "diet boundary"?
   a) They might get angry
   b) They may eat more than they would otherwise
   c) They might exercise more
   d) They may study more than usual

5. What is an example of "all or nothing thinking"?
   a) "if I have one cookie I might as well have the whole bag and then I'll never have cookies again"
   b) "if I have two cookies now then I will have only one more cookie after dinner"
   c) "if I have one more cookie I will feel bad about myself"
   d) "I should never eat cookies"

6. According to what you learned today, can dieting make a person vulnerable to <u>gaining</u> weight?
   a) No
   b) Yes
   c) We don't know, there is no research in this area
   d) Both a & c

Appendix IV (cont'd)

7. Dieting a lot may lead to all of the following except:
   a) preoccupation with food
   b) binge eating
   c) changes in metabolism
   d) increased bone density

8. Based on what you learned today, would you say that dieters act differently from non-dieters?
   a) yes, the research suggests that they do
   b) no, the research suggests that they don't
   c) possibly, the research is unclear
   d) yes, dieters seem to have more control over their eating

9. In the study I told you about where women did the ice cream "taste test":
   a) women in the "diet" group ate less ice cream after drinking the milk shake
   b) women in the exercise group ate more ice cream after drinking the milk shake
   c) women in the "diet" group ate more ice cream after drinking the milk shake
   d) all of the women ate the same amount of ice cream

10. It is important to respect others' confidentiality because:
   a) everyone will feel more comfortable knowing that their information is confidential
   b) it shows respect for each other
   c) sometimes people may want to discuss personal information here
   d) all of the above

Appendix IV (cont'd)

Week 2: Review Questions

Name: _____

1) What is the recommended daily caloric intake for an "average" woman ages 15-24?
   a) 2200
   b) 2000
   c) 1500
   d) 1200

2) What is the percentage of calories from fat that we should eat each day (approximately)?
   a) 50
   b) 40
   c) 30
   d) 20

3) Why is it important to get structure in your eating when you are used to dieting?
   a) Because your body might not be good at interpreting its signals of "hunger" or "fullness"
   b) Because you may end up eating more than you should if you stop dieting
   c) Because you might become upset if you stop dieting
   d) You should never try to structure your eating

4) Which of the following foods contains the highest percentage of fat?
   a) bologna
   b) eggs
   c) bread
   d) rice

5) Which of the following will **not help** you structure your eating & eat sensibly without dieting?
   a) trying to eat at a regular time each day
   b) limiting the number of foods you put on your plate
   c) buying "treat" foods in small amounts, rather than buying a large quantity and trying to "save" them
   d) eating more slowly

6) What is the Food Guide Pyramid?
   a) it tells you exactly how much you should eat and must be followed in order to "eat properly"
   b) a set of rules that tells you if you are allowed to have bread or not
   c) a set of guidelines that outlines the food groups and recommends that you never eat fats, oils, or sweets
   d) a set of guidelines that give you an idea of the amounts and kinds of foods you need each day to stay healthy

Appendix IV (cont'd)

7) How much is one serving of cheese?
   a) a slice the size of a deck of cards
   b) you should never eat cheese, it is too fatty
   c) about two slices
   d) about four slices

8) What is "chaotic eating"?
   a) eating at irregular times, in irregular amounts
   b) eating too much junk food
   c) fasting
   d) bingeing

9) Is it a good idea to eat only when you are really hungry?
   a) yes, absolutely
   b) no, absolutely not
   c) maybe
   d) I am not sure

10) How do you determine how much you should eat each day?
   a) based on your height & body size
   b) based on your gender
   c) based on your activity level
   d) all of the above
   e) none of the above

Appendix IV (cont'd)

Week 3 Review Questions

Name:_____

1. All but one of the following are examples of "aerobic" exercise (exercise that gets your heart and breathing rate up, over time):
   a) running
   b) cross-country skiing
   c) weight lifting
   d) cycling

2. Which of the following sociocultural factors is NOT related to weight gain in women?
   a) Increased TV viewing
   b) Increased vitamin consumption
   c) Increased fast food consumption
   d) Decreased daily exercise

3. Which of the following is a hazard of over-exercising?
   a) Over-use injury
   b) Rapid weight loss
   c) Muscles getting too big
   d) Increased appetite

4. Which of the following is NOT a benefit of regular exercise?
   a) Increased metabolic rate
   b) Better mood
   c) Weight maintenance over time
   d) Decreased metabolic rate

5. What is the rule about how much you should exercise?
   a) You should exercise every day for 2 hours
   b) You should exercise every day for 1 hour
   c) There is no "rule"
   d) You should exercise every second day

6. Which of the following statements is FALSE?
   a) Moderate exercise will increase your appetite
   b) Exercise increases your body's lean muscle mass
   c) You don't need expensive equipment to exercise
   d) Regular exercise is the best predictor of weight maintenance over time

Appendix IV (cont'd)

7. Finish the statement: although the average number of calories eaten per person has decreased over the past century....
   a) People have become heavier, on average
   b) People have become lighter, on average
   c) Average weights have remained similar across time
   d) None of the above

8. What percentage of your daily calorie intake goes towards your body's "daily activities" like studying, working, etc.?
   a) 1-2%
   b) 10-15%
   c) 20-30%
   d) 60-70%

9. Beyond just using extra calories while you are doing it, exercise may burn even more calories afterwards because:
   a) You will have more muscle mass, and muscle uses calories even at rest
   b) Your metabolic rate may be increased by exercise
   c) You will want to eat a big snack
   d) Both (a) and (b)

10. It is very important to take "days off" from vigorous exercise.
    a) True
    b) False

Appendix IV (cont'd)

Review Questions: Week 4

Name: _____

1. Which of the following types of exercise does not require special equipment?
a) Walking
b) Running
c) Skiing
d) Tennis

2. What is an important benefit of including aerobic exercise in your workout program?
a) Aerobic exercise will make you tired
b) Aerobic exercise will dull your appetite
c) Aerobic exercise uses calories and helps reduce body fat percentage
d) Aerobic exercise does not require special equipment

3. What will help you decide on the *intensity level* of the exercise you do?
a) the amount of time you have
b) your current fitness level
c) a personal trainer
d) your friends

4. Which of the following statements is FALSE?
a) Daily activities that are not part of formal exercise routines can be an important source of exercise
b) It is important to schedule exercise
c) If you are planning to start running, you will need to get shoes made specifically for running
d) Unless you can work out for at least 30 minutes on 5 days of the week, you might as well not exercise at all

5. Which of the following statements is TRUE?
a) Weight training is a good aerobic exercise
b) Walking is a good aerobic exercise
c) Stretching is a good aerobic exercise
d) It is a bad idea to schedule exercise because it can make you obsess about it

6. When setting a goal for exercise, it is important to be:
a) specific
b) ambitious
c) happy
d) overwhelmed

7. What is the exercise frequency and duration I suggested as a goal to aim for?
a) 2-3 sessions of moderate exercise, for 20-30 minutes per session
b) 4-5 sessions of moderate to vigorous exercise, for 30-60 minutes per session
c) 1-2 sessions of vigorous exercise, for 40-90 minutes per session
d) 6-7 sessions of moderate exercise, for 60-90 minutes per session

8. If you find yourself thinking of barriers to exercise, such as "I don't have time", what can you do?
a) give in
b) take a nap
c) think of a challenge to the barrier
d) ask a friend to exercise with you

9. When choosing a type of exercise to do, make sure that:
a) you don't pick an activity that you can't or won't maintain
b) you choose something that will burn the most calories
c) you will do it every day
d) you include weight lifting

10. Why should you take some days off from exercising?
a) so you don't become obsessive/preoccupied with exercising
b) so you don't get an overuse injury
c) so your muscles have time to recover
d) all of the above

Appendix IV (cont'd)

Review Questions: Week 5

Name: _____

1. Which of the following statements is TRUE?
   a) Skipping meals will help you eat fewer calories each day.
   b) Skipping breakfast will raise your metabolism
   c) Skipping meals will temporarily increase your energy level
   d) Skipping meals can lead to overeating

2. Research shows that…
   a) Meal skippers consume more unhealthy snacks than non-meal-skippers
   b) Meal skippers tend to be underweight
   c) Meal skippers tend to eat more fiber
   d) Meal skippers tend to eat more vegetables

3. Breakfast is important because…
   a) It is good to eat cereal
   b) It can increase your metabolic rate by up to 20% in the morning
   c) It will make you hungry later
   d) It will decrease your metabolic rate by up to 20%

4. Meal replacement bars/shakes…
   a) Are an excellent source of vitamins
   b) Are an excellent way to lose weight
   c) Do not help you learn to choose healthful foods or eat regularly spaced meals
   d) Do not contain vitamins

5. Artificial sweeteners…
   a) could lead you to increase your food intake after eating them, because your body may try to make up for caloric deprivation
   b) will help you lose weight and keep it off
   c) are much more nutritious than sugar
   d) should always be used instead of sugar

6. Skipping breakfast can lead to…
   a) lowered calorie intake during the day
   b) euphoric mood
   c) increases in metabolism
   d) overeating in the evening

7. What could you do if you had "no time" to eat breakfast or lunch?
   a) Keep easy to fix and nutritious foods available, and bring them with you to school or work
   b) Eat meal replacement bars on a regular basis
   c) Skip lunch, but not breakfast
   d) Stop at a fast food restaurant

Appendix IV (cont'd)

8. Which of the following is TRUE?
   a) People who skip one or more meals per day tend to be slimmer than people who eat 3 meals a day
   b) Snacking will lead to weight gain
   c) You should try to eat less than 1600 calories a day
   d) If you have a long interval between meals, you should eat a nutritious snack so you aren't starving my mealtime

9. Research suggests that eating too infrequently can…
   a) lead to a reduction in craving for high-fat foods
   b) lead to an increased craving for high-fat foods
   c) lead to euphoric mood
   d) lead to rapid weight loss

10. People who eat artificial sweeteners…
   a) are no better at controlling their weight than people who don't
   b) are better at controlling their weight than people who don't
   c) should just eat sugar instead
   d) tend to be irritable and have difficulty concentrating

Appendix IV (cont'd)

Review Questions: Week 6

Name:_____

1. What is a "forbidden food"?
   a) a food that someone is trying to avoid eating, for weight or shape related reasons
   b) a food that someone is trying to avoid eating, for religious or ethical reasons
   c) a food that a person doesn't like
   d) any food that a person tends to over-eat

2. According to the study by Knight & Boland (1989), what happens when dieters eat "forbidden foods"?
   a) they eat less at their next meal
   b) they eat more ice cream after eating a "forbidden food"
   c) they eat less ice cream after eating a "forbidden food"
   d) they feel upset and are more susceptible to depression

3. What is one structured way of including "treat" foods in your life?
   a) eat them after every meal
   b) carefully count the number of calories in them, and make sure you do not exceed 150 calories
   c) set aside 2 days of the week on which you can have one "treat" food
   d) only eat chocolate once a month

4. Which of the following foods may lead to weight gain, if eaten in large quantities, due to its high fat and calorie content?
   a) Baked potato
   b) French fried potato
   c) Bread
   d) Pasta with tomato sauce

5. What is one method of reducing the likelihood that you will overeat on "treat" foods?
   a) make sure that you don't eat them at all
   b) buy a large bag of treats with individually wrapped portions
   c) eat a treat after every meal
   d) buy a single-serving of the treat when you want one

6. What is one way of teaching yourself to choose healthy snacks more often?
   a) keep a selection of healthy foods in your home, and make sure you don't have easy access to the "junk foods" you like at home
   b) tell yourself that you are a bad person when you eat junk food
   c) punish yourself when you eat junk food
   d) eat meal-replacement bars instead of lunch

Appendix IV (cont'd)

7. What is a challenge to the thought, "I've blown it, I ate two cookies, so I might as well eat them all?"
   a) "I won't gain weight if I eat two cookies, but eating a whole bag may lead to weight gain, so I can stop now, no harm done"
   b) "I will eat all of these cookies now, and then I won't have any left so I won't be able to snack on them tomorrow"
   c) "I am an idiot for eating cookies, I will never be able to stop"
   d) "I will start avoiding cookies tomorrow"

8. If your really want a yummy dessert, like cheesecake, it is a good idea to:
   a) have cheesecake for dinner, and skip dinner
   b) have cheesecake, then skip breakfast the next day
   c) tell yourself that you should not ever eat cheesecake
   d) ask yourself if you have eaten mostly healthful foods in the past couple of days, and if you have, go ahead and enjoy a treat of cheesecake

TRUE or FALSE

9. People who successfully maintain a healthy weight try to avoid junk food like chips, and always eat healthy foods.
   True
   False

10. Baked potatoes are fattening.
    True
    False

Appendix IV (cont'd)

Review Questions Week 7

Name:_____

1) What is Body Image?
   a) The way you think and feel about your body
   b) The way you look
   c) Your reflection in the mirror
   d) How other people perceive your body

2) Between 1975 and 1985, both men and women became:
   a) more dissatisfied with many aspects of their physical appearance
   b) less dissatisfied with many aspects of their physical appearance
   c) more depressed
   d) more fashion conscious

3) Dissonance occurs when:
   a) a person becomes upset because their weight has changed
   b) there is a difference between the "actual" and the "ideal", which leads to negative thinking and feeling
   c) the "actual" and the "ideal" are very similar
   d) a person's negative thoughts are related to their body image

4) Body dissatisfaction can lead to
   a) avoidance of social situations
   b) depression
   c) isolation
   d) all of the above

5) Eating one serving of a food that is perceived as fattening could:
   a) make you gain weight
   b) ruin your diet
   c) lead you to feel "fat", although having one treat will not alter your weight
   d) lead you to feel "fat", and means that you should eat less for the rest of the week

6) Your body type/shape partly depends on:
   a) your personality
   b) your genetic makeup
   c) the amount of willpower you have
   d) the type of diet you are on

7) Focusing on your positive qualities can:
   a) reduce dissonance
   b) increase dissonance
   c) lead to depression
   d) reduce happiness

Appendix IV (cont'd)

8) What is one reason why the images of women presented in the media are unrealistic?
   a) all of the models and actors are perfect
   b) all of the models and actors have personal trainers
   c) the photos presented in magazines have been altered, eg. Legs stretched, airbrushed, computer enhanced
   d) most people do not have as much willpower as the women in magazines

True or False

9) If you exercise enough and in the right way, you can make your body look any way you want it to.
   True
   False

10) Feeling badly about your body can be good, because it will force you to exercise and eat right
   True
   False

Appendix IV (cont'd)

Review Questions Week 8

Name:_____

1. What is a relapse?
   a) a step in the chain of events leading to a return to a previous behavior (usually a negative behavior)
   b) eating a chocolate, when you have decided not to eat chocolate
   c) missing a day of exercise
   d) returning to a previous level of a behavior (usually a negative behavior)

2. What is a lapse?
   a) a step in the chain of events leading to a return to a previous behavior (usually a negative behavior)
   b) eating a chocolate, when you have decided not to eat chocolate
   c) missing a day of exercise
   d) returning to a previous level of a behavior (usually a negative behavior)

3. What is a "trigger"?
   a) a food that makes you very hungry
   b) an event or thought that can lead to a lapse
   c) a step in the chain of events leading to a return to a previous behavior
   d) another word for "relapse"

4. According to what we have learned, what is the most important factor in healthy weight management?
   a) doing aerobic exercise on a regular basis
   b) avoiding chips
   c) making sure you don't eat snacks
   d) eating less food

5. All but one of the following are ways that meal-skipping can backfire:
   a) can slow your metabolism
   b) can lead to late-day overeating and/or binge-eating
   c) harder to make healthy food choices when you are starving before a meal
   d) can lower your calorie intake

6. Which of the following statements is TRUE?
   a) having a lapse does not mean you have "blown it"
   b) having a lapse means you have "blown it"
   c) it is important to stop eating after 5pm
   d) foods should be categorized as "good" or "bad"

7. One way in which dieting can backfire is:
   a) it can lead to poor digestion
   b) it can increase your risk of hearing loss
   c) it can lead to weight gain

d) it can increase your intake of whole grains

Appendix IV (cont'd)

8. What could be one way of coping with the "trigger" of having a large meal at a restaurant?
   a) remind yourself that weight gain and weight loss happen over time, not suddenly in response to one large meal
   b) remind yourself that you can just skip breakfast the next day
   c) you cannot cope with something like this
   d) tell yourself that you will never eat in a restaurant again

9. Which of the following is emphasized in the Food Guide Pyramid?
   a) eating large quantities of "protein" foods from the meat and alternates category
   b) eating mostly whole grains, vegetables, and fruits
   c) eating mostly dairy products
   d) eating large amounts of fats, oils, and sweets

10. What is the 'diet boundary"
   a) rules, set to below your actual fullness level
   b) rules, set to above your actual fullness level
   c) a boundary that you draw around your refrigerator
   d) a boundary that divides foods into "allowed" and "not-allowed"

Appendix H

Consumer Satisfaction Index

1) Were you satisfied with the results of this program?

2) How did you benefit from the program?

3) What helped you the most?

4) What helped you the least?

5) Has your behavior changed as a result of this program?

Appendix I

Feedback From Two Participants

1) Were you satisfied with the results of this program?
   a) *Yes I was. I've been doing exercise on a daily basis and have maintained the body weight I prefer.*
   b) *Yes, very satisfied.*

2) How did you benefit from the program?
   a) *I learned the truth about a lot of diet and weight loss myths that are floating around. I also learned that a permanent change to a healthy lifestyle and eating habits in the best way to get and stay in shape.*
   b) *I found the information you gave us about dieting very helpful. I've learnt how to eat healthy with an ideal amount of fat and nutrition in my meals.*

3) What helped you the most?
   a) *The knowledge that getting and staying in shape is an ongoing process, not some temporary diet to lost a couple pounds and then stop, totally changed my attitude towards weight loss.*
   b) *The idea that the best way of keeping fit is to do exercise regularly and to stop binge eating which is what I used to do quite often*

4) What helped you the least?
   a) *I don't know. Everything discussed at the meetings was relevant.*
   b) *I still don't have much control over food although I don't binge anymore. It's just hard to resist the temptation of high-in-fat food. Whenever I realize that I've gained some weight, I have to reduce some calories in my diet.*

5) Has your behavior changed as a result of this program?
   a) *Yes. I've paid less attention to my weight and become less obsessed with food*
   b) *Yes, drastically.*