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The treatment validity of classifying obese clients on a cognitive measure

Willis, Susan Elizabeth, Ph.D.

The University of North Carolina at Greensboro, 1986

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THE TREATMENT VALIDITY OF CLASSIFYING OBESE CLIENTS ON A COGNITIVE MEASURE

by

Susan E. Willis

A Dissertation Submitted to
the Faculty of the Graduate School at
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in Partial Fulfillment
of the Requirements of the Degree
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1986

Approved by

Dissertation Advisor

APPROVAL PAGE

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This dissertation investigated client-by-treatment interactions in the treatment of obesity and examined process issues related to the two treatments employed. Specifically, the "treatment validity" of classifying subjects on the basis of the severity of their negative and self-defeating eating-related thoughts was examined by evaluating the contribution of the assessment distinction to treatment effectiveness for two types of treatment. The prediction was made that subjects high in such thoughts would respond better to a cognitive treatment, while subjects low in such thoughts would respond better to a behavioral treatment.

Thirty-two clinically overweight females participated. On the basis of their scores on the Master Questionnaire and a role-play task, subjects were classified as "high" or "low" on the self-reported frequency of negative and self-defeating eating-related thoughts. Subjects then received one of two self-control treatments for weight control: (a) a cognitive change treatment, or (b) a behavior change treatment. Weight measures, psychological measures, and measures of change in cognitions and eating habits were collected pre-and-post-treatment and analyzed statistically.

In short, the results showed that both types of treatment produced significant weight loss although subjects classified as "low" (i.e., those with less frequent negative thoughts) lost significantly more weight than those classified as "high" regardless of the treatment received, contrary to the predicted interaction. Subjects receiving the

cognitive treatment evidenced positive changes in their depression and self-efficacy ratings. In the behavioral treatment, subjects classified as "low" evidenced positive changes in their depression and self-efficacy ratings while those classified as "high" evidenced no change. Individually, some subjects in this latter group evidenced increases in their depression ratings and decreases in their self-efficacy ratings. Overall, subjects' binge-eating scores were highly predictive of weight loss with higher scores predicting lower weight losses. Higher binge-eating scores were also associated strongly with lower scores on the Master Questionnaire which indicate severe problems with negative and self-defeating eating-related thoughts. The clinical implications of these findings for assessment and treatment selection for individual over-weight clients are discussed.

In examining treatment process issues, the results indicated that both treatments produced significant change in the specific behaviors targeted for change (cognitions or eating habits), and that these changes were related to weight loss. The interdependency between eating behavior and eating-related thoughts was differentially affected by the two types of treatment. Interpretations of these findings from both mediational and nonmediational theoretical perspectives on behavior change are presented.

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CHAPTER I

INTRODUCTION

Since the mid-1960s, there has been extensive interest among behavioral researchers and clinicians in the study of self-control. The clinical importance of overeating as an example of addictive behavior, the convenient and objective measure of treatment outcome offered by weight loss, and the ready availability of large samples of overweight subjects for research all combined to make the treatment of obesity an important arena for the evaluation of behavioral self-control methods.

Despite the adverse effects on health and the social stigma of being obese, the problem of overeating (as well as other addictions) has been highly resistant to change. An examination of the contingencies governing the behavior shows several reasons why this type of behavior has proven difficult to modify.

Like other addictive behaviors (e.g., smoking, alcohol drinking), the contingencies governing overeating provide immediate positive consequences for the individual, while the positive consequences for refraining from eating are considerably delayed in time. Moreover, the negative consequences of overeating are also temporally distant from the behavior. Further resistance to change may also come from the fact that eating occurs in a wide range of situations and may come under the control of many stimuli other than physiological stimuli of hunger (Ferster, Nurnberger, & Levitt, 1962; Goldiamond, 1965).

Finally, unlike other addictions, the individual cannot be totally delivered from temptations. While an individual may abstain from alcohol or cigarettes, and successfully avoid many of the associated stimuli, the average individual must eat at least two or three times per day.

Behavioral self-control treatments for obesity have been found to be highly effective in producing short-term weight loss (see Foreyt & Kondo, 1984, for review). Despite the overall success achieved, the outcome of behavioral treatments has been marked by a high degree of interclient variability and clinically modest weight losses. Early enthusiasm with success directed attention toward outcome questions without asking the process questions: Why and how do these treatments work? And with whom? (Foreyt & Kondo, 1984). Progress toward more effective treatment for individual clients may derive from the development of functionally based and evaluated assessment strategies.

The major purpose of this dissertation was to investigate client-by-treatment interactions experimentally in the application of self-control treatment strategies for obesity. In the present study, a classification of obese clients was proposed that is functionally and conceptually related to treatment selection. The contribution of that assessment classification to treatment effectiveness was then evaluated empirically. A second purpose was to examine process issues related to evaluation of the success of the treatments employed. It was believed that the results of this study would have implications for the assessment and treatment of obesity as well as for related problems in self-control (e.g., smoking, alcohol drinking).

Status of Behavioral Treatments of Obesity

Behavioral treatments have been consistently more effective than traditional (e.g., psychotherapy, nutrition counseling) approaches in producing short-term weight loss (see Foreyt & Kondo, 1984; Jeffrey, Wing, & Stunkard, 1978; Stunkard & Mahoney, 1976; Wilson & Brownell, 1980, for reviews). Traditional psychotherapy approaches to the treatment of obesity were aimed at producing changes in the presumed psychological factors determining overeating (e.g., personality style, psychopathology). Dietary or nutrition counseling approaches focused on prescribing specific foods and amounts and/or providing knowledge of food values with the assumption that these factors can determine food intake. The behavioral approach to the self-control of overeating is based on learning principles and focuses attention on the environmental (antecedent and consequent) determinants of eating, and the topography of the eating response itself. In treatment, clients are taught a number of controlling responses (responses which affect environmental variables in such a way as to decrease the probability of overeating) with the assumption that once the effective controlling responses (techniques) are learned, clients will be able to self-manage their eating outside the treatment setting. The content of most behavioral treatment programs reported in the literature has been modeled after the approach described by Stuart and Davis (1972). The program format generally includes 8-12 weekly group treatment sessions for educational presentation of behavioral techniques and nutrition information. The basic treatment components include self-monitoring, stimulus control training for restricting external cues for

eating, modification of the topography of eating, and contingency management of behavior change (see Foreyt & Kondo, 1984; Stunkard & Mahoney, 1976; Wilson & Brownell, 1980, for reviews). Despite the success achieved with this treatment methodology, several recurrent problems in treatment investigations have tempered the initial expectations that an effective treatment for obesity had been developed.

Recurrent Problems

Treatment Outcome

Modest and variable weight losses. The finding of an average group weight loss of 10-12 pounds, or 1-2 pounds per week has been surprisingly consistent across studies (Jeffrey, Wing, & Stunkard, 1978; Wilson & Brownell, 1980). While such losses are statistically significant, most participants do not reach their goal weight with a loss of only 10 or 12 pounds. Given the frequent failure to find continued weight loss after treatment is terminated, the initial treatment losses represent the total treatment effect for many clients. For clients who are often 75 to 100 pounds overweight, the clinical significance of the average 10-12 pound treatment losses is questionable (Stunkard & Penick, 1979).

Unfortunately, even the average 10-pound weight losses may be enjoyed only by some. The mean group weight-loss figures mask the variability among clients in treatment outcome. To illustrate, Jeffrey, Wing, and Stunkard (1978) reported treatment weight changes ranging from a gain of 7 lbs to a loss of 47 lbs. Harris and Bruner (1971) reported treatment weight changes in a behavioral program ranging from a gain of 3 lbs to a loss of 17 lbs. Penick, Filion, Fox and

Stunkard (1971) found that while the mean weight losses in behavioral treatment groups were significantly greater than those produced by traditional group psychotherapy, the behavioral treatment also produced greater variability in treatment outcome. The behavioral treatment groups contained both those subjects who had lost the most weight and those subjects who had lost the least weight. The full extent of the variability in behavioral treatments is uncertain as individual subject data are seldom reported. Focus on group mean weight loss figures may produce misleading conclusions. The degree of variability noted in treatment outcome suggests that the behavioral techniques employed may be significantly effective only with a subgroup of obese clients.

Research attempts to identify reliable predictors of treatment outcome have been unsuccessful. Numerous subject variables including age, sex, socio-economic status, problem severity, age of onset, history of dieting success, and personality measures such as anxiety, depression and MMPI profiles have been examined but not been found to be reliably related to treatment outcome (see Cooke & Myers, 1980; Stuart, 1980; Weiss, 1977 for reviews).

Poor maintenance. A long term comparison of the effects of behavior therapy and other treatment methods has not been possible due to the lack of well controlled, long-term studies with any other form of treatment (Stunkard & Penick, 1979). The hope of behavioral treatments of obesity was that, during treatment, clients would be taught to modify effectively their eating habits in such a way that they could continue weight-loss on their own after treatment. The

overall picture suggested by studies with at least a 1-year followup is, however, that weight loss is poorly maintained. Some clients do continue to lose weight, others maintain treatment losses, while others regain the weight lost (Foreyt, Mitchell, Garner, Gee, Scott, & Gotto, 1982; Wilson & Brownell, 1980). In two major follow-up studies, less than 30% of clients continued to lose weight during maintenance (Beneke, Paulsen, McReynolds, Lutz, & Kohrs, 1978; Stalonas, Johnson, & Christ, 1978). Similar to weight loss during treatment, there is great individual variability in maintenance of weight loss.

The initial enthusiasm with outcome success rushed examination of maintenance issues before consistent outcome was demonstrated. Further, consideration must be given to the fact that the processes controlling behavior change and maintenance of that change may be different and hence dictate different strategies (Bandura, 1977a). The clinical utility and ethics of conducting follow-up on clients who do not lose weight is questionable. From a research perspective, there are serious questions regarding the validity of causal inference after long periods of time (i.e., attributing behavior or weight change during maintenance to the original treatment program) (cf. Brownell, 1982; Foreyt & Kondo, 1984). Given the problems of initial treatment outcome, "... the demand for long term results is asking for a marathon when we cannot run a mile" (Brownell, 1982, p. 833).

Treatment Process

In addition to the limitations in treatment outcome, conclusions regarding the effective processes in behavioral treatments of obesity

have been hampered by the failure of investigators to assess change in the treatment-prescribed behaviors and to demonstrate a relationship between these behavior changes and weight loss. This shortcoming has been called the "Achilles Heel" of behavioral weight control research (Johnson, Wildman, & O'Brien, 1980).

Most researchers do not report measures of change on the specific eating habits targeted in behavioral treatments. The effectiveness of the techniques in producing changes in eating habits and the relationship of these changes to weight loss have been typically inferred from weight-loss (Mahoney, 1975; Stalonas et al., 1978; Stunkard & Mahoney, 1976). To date, only a handful of studies have attempted to assess change in the targeted behaviors and to examine the relationship between these changes and weight loss with mixed results. Some studies have reported significant correlations between measures of treatment-directed behavior change and weight loss (Hagen, 1974; Heckerman & Prochaska, 1977; Katell, Callahan, Fremouw, & Zitter, 1979; Mahoney, 1974; Ost & Gotestam, 1976; Sandifer and Buchanan, 1983; Stalonas & Kirschenbaum, 1985; Wollersheim, 1970), while others have failed to find a significant relationship (Bellack, Rozensky, & Schwartz, 1974; Brownell, Heckermen, Westlake, Hayes, & Monti, 1978; Stalonas et al., 1978; Jeffrey, Wing, & Stunkard, 1978).

In addition to reporting weight loss as a measure of treatment outcome, there is a need for researchers to assess routinely specific changes in the treatment-prescribed behaviors and the relationship between treatment-prescribed behavior changes and weight loss. Ob-

servance of this practice over time may allow evaluation of the contribution of specific program components to weight loss. With continued assessment it may be possible to identify particular client-by-treatment component interactions, both positive and negative in their impact on weight loss. For example, Rozensky and Bellack (1976) found that subjects classified as having high rates of positive self-evaluation lost significantly less weight in a program which included a therapist-administered financial contingency for weight loss than in a program using a self-reinforcement procedure.

Current Trends

With the hope of improving clinical outcome, researchers have proposed the addition of new treatment components to the basic behavioral treatment methodology. Notable in the recent development of treatments has been the inclusion of cognitive intervention strategies (e.g., cognitive restructuring). The inclusion of these strategies reflects the advancement of a cognitive-behavioral perspective within behavior therapy in which cognitive processes as determinants of behavior are afforded equal attention and explanatory potential as the environmental antecedents and consequences with which they interact. This cognitive-behavioral perspective has been well integrated into current conceptualizations of self-control (Bandura, 1977a; 1981; Karoly & Kanfer, 1982; Mahoney & Arnkoff, 1978). The premise that changes in overt behavior and feelings may be effected through the alteration of cognitive processes (e.g., thoughts, beliefs, images) has provided the basis for the successful treatment of a wide variety of behavioral disorders including depression (Beck, 1976; Beck, Rush, Shaw, &

Emery, 1979), disorders of impulse control (Meichenbaum, 1977), anxiety (Beck, 1976; Suinn & Richardson, 1971), as well as a specific eating disorder, anorexia nervosa (Garner & Bemis, 1982). Proponents of the cognitive-behavioral perspective (e.g., Mahoney, 1977; Wilson, 1980) have suggested that enhanced treatment effectiveness (greater losses, decreased interclient variability, enhanced maintenance) may depend on attention to the role of cognitive processes in the self-regulation of eating and the incorporation of techniques designed to alter these processes into our treatments.

Before summarizing the outcome research on cognitive intervention strategies in the treatment of obesity, a brief discussion of the hypothesized role of cognitive processes in the self-regulation of eating, and the ways in which these variables are seen to facilitate or hamper effective self-control of dieters is warranted.

The Role of Cognitions in the Self-Regulation of Eating

Following an intensive retrospective survey, Leon, Roth, and Hewitt (1977) reported that successful dieters (both obese and non-obese) reported an abundance of food-related thoughts in the form of covert self-instruction, or positive self-evaluative statements which they used to control urges to overeat. Relatedly, Sjoberg and Persson (1979), investigating the difference between successful and unsuccessful dieters in a nutrition counseling clinic, reported that the major common characteristic of unsuccessful dieters was the distorted reasoning frequently associated with episodes of overeating and the decision to abandon the weight control effort. Rozensky and Bellack (1974) conducted a retrospective study in which they found that individuals

able to lose weight or quit smoking cigarettes administered significantly more positive self-evaluation for performance on a simple verbal learning task than individuals who had been unsuccessful in weight loss or smoking cessation.

Relatedly, Mahoney and his associates (Mahoney, Rogers, Straw, & Mahoney, 1977; Straw, Straw, Mahoney, Rogers, Mahoney, Craighead, & Stunkard, 1984) have stressed the importance of eliminating discouraging thoughts or negative self-evaluations to successful weight reduction. They postulated a relationship between subjects' positive self-statements relating to their ability to lose weight and success in treatment. These researchers developed the Master Questionnaire (MQ) which assesses three areas related to effective self-regulation of eating: cognitions (e.g., discouraging thoughts as negative self-statements related to weight or eating); energy balance habits (e.g., stimulus control of eating); and energy balance knowledge (e.g., factual information on nutrition and exercise). Subjects' scores on the Cognitive Factors Subscale of the MQ have been found to be significantly predictive of the subjects' weight losses during treatment, with higher scores being positively correlated with weight loss (Mahoney et al., 1977). Clients who enter treatment with relatively positive cognitions are most likely to be successful in treatment. Conversely, clients with relatively negative or self-defeating cognitions are less likely to be successful. The finding of the predictive value of subjects' pretreatment cognition scores was interpreted as evidence of the importance of cognitive factors. Specifically, positive self-statements regarding one's weight loss effort and ability may reflect a

mediating state sufficient to reinforce continued self-regulation behavior.

More generally, Bandura (1977b) recently highlighted the role of subjects' self-efficacy statements as a determinant of behavior in all situations in his self-efficacy theory of behavior change. Essentially, Bandura argues that the effect of all behavior change procedures is mediated by the modification of self-efficacy.

An interesting series of laboratory investigations of eating have been interpreted as support for the role of cognitive processes in the self-regulation of eating (Herman & Mack, 1975; Polivy, 1976; Spencer & Fremouw, 1979; Woody, Costanzo, Liefer, & Conger, 1981; Wooley, 1972). (Each study used the methodology described by Herman and Mack, 1975). Subjects (both obese and normal weight) were first classified as dieters or nondieters (on the basis of the Restraint Scale, Herman & Mack, 1975). Under the guise of a "taste test", subjects were given either a high calorie preload or a low calorie preload. The measure of interest was the amount of food consumed by subjects in each condition (dieter status x size of preload) in a second eating opportunity ("taste test"). The consistent finding of this line of research has been that dieters (obese or normal weight) significantly increased their consumption (compared to nondieters) following a large (high calorie) preload. This finding has been aptly labeled the "counter-regulatory effect" (Polivy, 1976). Paradoxically, after low calorie preloads, dieters ate significantly less than the nondieters. Nondieters ate less following a high calorie preload and more after the low calorie preload. This counter-regulatory effect has been obtained

when the preloads used were actually high or low in calories (e.g., Herman & Mack, 1975) and when the subject's belief that the preload was high or low in calories was manipulated experimentally (e.g., Polivy, 1976; Spencer & Fremouw, 1979; Woody et al., 1981). Further, this effect has been observed with both males (e.g., Hibscher & Herman, 1977) and females (e.g., Herman & Mack, 1975; Polivy, 1976; Spencer & Fremouw, 1979).

From a self-control perspective, it is worth emphasizing that it is the subjects' classification as dieter versus nondieter and not their weight classification (obese or normal) that predicts the magnitude of eating after the differing preloads (high or low). The isolated ingestion of the 400 or 500 calories presumably contained in the high calorie preload is itself unlikely to be regarded as having any long-term dietary significance. When individuals label themselves as dieters, however, the criteria for what constitutes a significant violation (i.e., overeating) may be defined more narrowly in terms of both the amount and the time frame. Thus, the high calorie preloads are viewed as having immediate and significant consequences for the diet. Given that it is the dieting subject's belief that s(he) has overeaten in the preload situation that predicts the amount of subsequent eating, several researchers (e.g., Spencer & Fremouw, 1979; Woody et al., 1981) have argued that the results of this line of research demonstrate the importance of cognitive factors in the self-control of overeating.

Further evidence of the role of cognitions in self-regulation has been suggested by recent psychological explanations of relapse in addictive disorders (e.g., alcohol drinking, cigarette smoking). In

predicting relapse, Marlatt (1978) proposed that it is not the behavioral violation itself (e.g., a martini, a box of cookies) that determines subsequent behavior (i.e., continued drinking or overeating), but rather the meaning the individual attaches to the violation. Reactions to the behavioral violation may be facilitating or debilitating. For example, negative self-evaluations or attributions (e.g., "it's hopeless, I can't do it.") are debilitating and may signal a return to former patterns (relapse). Marlatt (1978) termed the negative cognitive and affective reactions following a violation the Abstinence Violation Effect (AVE). To prevent relapse, clients are taught first to expect relapse and then to use a variety of cognitive intervention strategies to alter or minimize the negative cognitive and affective responses to the violation.

As noted previously, the control of overeating may be particularly difficult because one cannot totally abstain from the behavior. Application of the AVE model to dieting may necessitate viewing each eating episode as a potential occasion for "relapse"--i.e., the individual will either engage in controlling behaviors or the behavior to be controlled (overeating). Having made a resolution to lose weight, a failure to engage in the treatment prescribed controlling responses (e.g., to self-monitor intake, restrict all activity while eating, or eat in the designated eating place) may produce cognitive and affective cues that decrease the probability of performing these behaviors at the next eating episode and simultaneously increase the probability of the controlled response. The obese client who overeats or fails to follow treatment prescriptions in the morning may decide she has "blown" the

program for that day, overindulge the remainder of the day, and "start over" tomorrow. We know that the weight control efforts of some clients are marked by successions of starts and stops. As one client described: "I've been on hundreds of diets that lasted anywhere from 4 hours to 4 days." The clients' reactions to their violations of the treatment prescriptions could hamper effectively the acquisition or maintenance of the techniques (controlling responses) taught in behavioral weight control programs because the individual learns competitive behaviors to the same cues.

To provide evidence for distinctive thought patterns in overweight individuals, O'Connor and Dowrick (1983) attempted to identify and characterize cognitions which would distinguish normal weight and overweight populations. They developed a self-statement inventory from the self-monitored dieting-eating-and-weight-related cognitions of a sample of obese subjects.

Independent judges classified the cognitions as representing learned helplessness attributions (Abramson, Seligman, & Teasdale, 1978) or cognitive distortions (Beck et al., 1979). Preliminary validation of this measure revealed significant differences between overweight and normal weight individuals on their rated frequency of and belief in 13 of the 26 self-statement items. Of the 13 discriminating cognitions, 10 were classified as learned helplessness attributions (i.e., internal and stable attributions for maladaptive eating behavior and outcome). Additionally, 4 items were found to discriminate significantly between normal weight subjects and subjects who were currently of normal weight but had a history of overweight. No

relationships between the subjects' frequency or belief ratings and extent of the subjects' obesity were found. O'Connor and Dowrick (1983) concluded that for some obese people a particular cognitive style may facilitate or reflect overeating behavior. They offered the Obesity Cognitions Scale as an assessment and outcome measure for the cognitive patterns of individual overweight clients.

Evaluating the Contribution of Cognitive Intervention Strategies

Mahoney and Mahoney (1975; 1976 a,b) were among the first to investigate the clinical implications for weight control treatment of the cognitive-behavioral analysis of self-regulation. These researchers posited the role of cognitive distortions (negative self-statements) in the maintenance of overeating and developed a cognitive intervention strategy to teach clients to monitor, evaluate, and alter negative weight-relevant self-statements. In support of the effectiveness of this strategy, the Mahoneys (1975) offered a detailed single subject report of successful weight loss produced using only the cognitive restructuring technique. Subsequently the Mahoneys (1976 b) added their cognitive restructuring technique to a 10-week behavioral program. Group results (N=13) showed an average loss of 15.1 lbs for the 10 weeks. Weight loss continued through the 6-month follow-up, but declined at the 1-year assessment. Disappointing, however, was the continued finding of variability among subjects in initial treatment outcome (range +1.5 lbs to -22.5 lbs).

Data from uncontrolled clinical trials regarding the contribution to treatment outcome made by cognitive intervention strategies have been mixed. The long-term results of the Pennsylvania State University

Weight Control Program based on the Mahoneys' treatment program have shown weight loss maintenance and variability no different from that of the basic behavioral program alone (Wilson & Brownell, 1980). The results of the Yale University Program have been more encouraging. In contrast, Rodin (cited in Wilson & Brownell, 1980) reported that 60% of clients treated with a behavioral program incorporating a cognitive component (e.g., cognitive reappraisal and coping strategies) showed large and lasting weight losses compared to only 36% of clients receiving the basic behavioral program alone (a la Stuart & Davis, 1972), suggesting that the cognitive strategies may enhance maintenance of behavior change and weight loss.

The first controlled demonstration of the efficacy of cognitive treatment strategies for obesity was provided by Dunkel and Glaros (1978) using a self-instructional training procedure similar to Meichenbaum's (1975) stress inoculation training. They compared four treatment groups: (1) a self-instructional training group (SI); (2) a group given training in stimulus control (SC); (3) a combined self-instructional training/stimulus control training group (SI-SC); (4) a relaxation training control group (C). Treatments were administered weekly over a 6-week period. At a 7-week follow-up, the SI-SC and SI groups showed significantly greater weight reduction quotients than either the SC or the control group. The percentage of subjects who continued to lose weight from posttreatment to follow-up were: SI=100%, SC=60%, SI-SC=100%, C=33%. The authors concluded that self-instructional training was singularly effective not only in producing weight loss, but also in enhancing the continuation of weight loss after treat-

ment. While these data seemingly supported the therapeutic benefits of the addition of a cognitive treatment component, several methodological problems merit consideration. First, specific attention was not given to initial treatment outcome results. Analyses were reported only on the follow-up data. Second, by follow-up, the attrition rates (unexplained) were exceedingly high (e.g., 44-70% across groups), leaving only 3-6 subjects in each group.

Youdin and Hemmes (1978) reported the successful treatment of five obese females, using a cognitive focus on the urge to overeat. Each of the subjects reported at least a 20-year history of "chronic overeating" uncontrolled by previous treatment interventions. Following baseline recording of urges to overeat, subjects were trained in the self-monitoring, self-questioning, and rational countering of the urges to overeat. At the end of 8 weeks of treatment, weight losses ranged from 10-45 pounds (mean = 26.6 lbs). The consistency and magnitude of the weight losses suggest that a cognitive intervention strategy alone may effect significant weight loss.

Block (1980) provided another experimental demonstration of the efficacy and sufficiency of cognitive change strategies for weight reduction. The cognitive intervention used was modeled after the cognitive restructuring techniques described by Mahoney and Mahoney (1976 a). Experimental subjects completed 10 sessions of active training in cognitive restructuring and kept daily diaries of thoughts relevant to eating. Two control groups, a relaxation/discussion group and a waiting list control, were also used. Subjects trained in cognitive restructuring showed significantly greater ($p < .001$) weight losses

at posttreatment, and at an 18-week follow-up than both types of control subjects. Unfortunately, the data were not reported so as to allow assessment of the variability in treatment outcome.

A direct investigation of the efficacy of cognitive strategies alone and in combination with behavioral treatments for initial weight loss and maintenance was reported by Collins (1980). Four treatment groups were compared: (1) a cognitive treatment group; (2) a behavioral treatment group; (3) a combined cognitive and behavioral treatment group; (4) a nutrition and exercise training control group. Subjects in the cognitive treatment were taught to identify and challenge their negative thoughts relating to food, weight, and dieting (Beck, 1976; Ellis & Harper, 1976; Mahoney & Mahoney, 1976a). Subjects in the behavioral group received treatment modeled after Stuart and Davis (1972), and the combined group received elements of both the behavioral and cognitive treatments alternated on a session by session basis over the 8 weeks of treatment. At the end of treatment, the weight losses by subjects in the behavioral and cognitive-behavioral groups were significantly greater than the weight loss of the nutrition and exercise control group, though not significantly different from one another or significantly greater than the weight loss for the cognitive treatment group. The cognitive treatment group did not differ significantly from the nutrition and exercise control group. At the 7-month follow-up, there were no significant differences among the cognitive, behavioral, and cognitive-behavioral groups. Examination of the patterning of weight loss reveals that subjects in the cognitive therapy group evidenced slow, steady weight loss from pretreatment to

the 7-month follow-up. Weight losses for the cognitive-behavioral and behavioral groups continued to the 5-month follow-up, then decreased steadily to the 7-month follow-up. The enhanced performance in the follow-up phase of the groups receiving cognitive components suggested that the inclusion of cognitive components to treatment programs may contribute to long-term treatment success.

Several factors are important in considering these results. First, the mean group weight loss for both the behavioral and the cognitive-behavioral groups (posttreatment) appeared to be inflated significantly by one subject in the behavioral group losing 26 lbs in the 8 weeks of treatment and one subject in the cognitive-behavioral group losing 25.75 lbs. Significant variability in weight loss was shown by subjects in both the behavioral treatment group (range 1.5 lbs lost to 26 lbs lost) and the cognitive-behavioral group (range 1.25 lbs lost to 25.75 lbs lost). A second problem in comparing the performances of the three experimental groups relates to treatment differences other than the focal differences (i.e., stimulus control strategies and changing eating habits versus cognitive change strategies) among the three experimental groups. Both the behavioral and cognitive-behavioral groups self-monitored calorie intake and were given a 1200 calories per day restriction. Subjects in the cognitive treatment group did not self-monitor food intake in any way, nor were they given a calorie restriction of any kind. Further, subjects in both the behavioral and cognitive-behavioral groups received instruction on nutrition and specific directives for exercise in their treatment program (as did subjects in the nutrition-exercise control group). Subjects in the

cognitive treatment received neither the nutrition component nor the exercise component, but rather were told to "use your own knowledge about losing weight". The weight-loss performance of subjects in the cognitive treatment condition becomes more impressive in light of these disparities in the number of active treatment components received.

In summary, the data indicate that cognitive intervention strategies are effective in producing weight loss. The addition of these strategies to a behavioral program improves initial treatment outcome and enhances maintenance. Nevertheless, the problem of marked interclient variability in treatment response persists.

A major criticism of behavioral treatments of obesity has been that, despite wide differences among subjects in response to treatment, the same treatment is given to all subjects. The implication is that the same eating habits are problematic for all subjects. Similarly, the wide-spread inclusion of cognitive components to treatment programs has presumed the importance of negative and self-defeating cognitions for all subjects. While more effective treatments for obesity are needed, treatment building by the addition of components of unknown effectiveness with the hope of bigger and longer lasting treatment effects may not be prudent (Marlatt & Gordon, 1980). To date, there is no evidence that multi-faceted treatment programs are preferable to simpler interventions (Franks & Wilson, 1976), though there is evidence that the addition of inappropriate program elements can mitigate the value of an otherwise effective program (Bellack, 1977; Bellack et al., 1974; Franzini & Grimes, 1975; Rozensky & Bellack, 1976).

An alternate strategy for improving treatment outcome is to assess individual differences in problematic responses that may predict success or failure in different types of self-control programs for weight loss. It seems more likely that maximum treatment effectiveness can be brought about by individualizing treatment programs on the basis of assessed individual differences. In short, the development of a single treatment approach or technique that will work equally well for all obese clients is unlikely. Our assessment strategies need attention if we are to match clients and treatments effectively.

Assessment Issues in the Treatment of Obesity

The early success of behavioral treatments of obesity and the enthusiasm of researchers for the objective measure of treatment outcome offered by weight loss directed attention away from many important assessment issues in the treatment of obesity. Behavioral assessment serves multiple functions including screening, classification of clients, selection of target behaviors for intervention for individual clients, program evaluation, selection of treatments, and monitoring of progress (Hawkins, 1979). Thorough assessment is necessary for the evaluation of both treatment outcome and process.

Treatment Outcome

Given the complex nature of overeating and obesity, the use of weight loss as the sole measure of treatment outcome is no longer acceptable (Brownell, 1980; Wilson, 1978). Previous research (e.g.,

Stunkard & Rush, 1974) has demonstrated a relationship between dieting and/or weight loss and psychological disturbance (e.g., depression). Specific assessment of the effect of a given treatment on the client's psychological functioning is indicated. Assessment of the breadth and nature of the changes produced by a given treatment is needed to compare the advantages and disadvantages of two particular treatments and to identify potentially important relationships among different response systems. For example, two treatments may be equally effective in producing weight loss, but one treatment may yield greater psychological improvements. Conversely, a treatment may produce only moderate weight loss, but may produce desirable psychological changes. The possibility that an effective treatment may produce adverse psychological side-effects cannot be ruled out. Though no adverse psychological effects produced by weight loss in behavioral treatments have been noted (Brownell & Stunkard, 1981; Brownell et al., 1978; Craighead, Stunkard, & O'Brien, 1981; Straw & Terre, 1983; Wollersheim, 1970), given the fact that some clients have left treatment heavier than upon entering, the possibility that they were in some way harmed by the treatment cannot be ruled out. The use of group averages with psychological measures may have masked the negative psychological effects for particular subgroups of obese clients.

Treatment Process

Global measures of treatment effects can determine only whether or not a given treatment is effective, not how or why it is effective. In addition to assessing the nature and breadth of treatment effects, thorough assessment must include measurement of the specific effects

of the independent variables. Without this assessment, the action of specific treatments can only be inferred from treatment outcome, a step that is unacceptable. Specific measures of the behaviors targeted by a given treatment are necessary to evaluate treatment process. Ideally, measures of the effects of a given treatment on all response classes identified by theory and research as relevant to the problem at hand should be included. Such assessment may allow identification of important response covariations relevant to effective treatment selection for a particular client and to understanding of the behavior change process involved for a particular treatment.

The majority of studies in the literature have failed to assess the specific changes in the treatment-prescribed behaviors (e.g., eating habits, cognitions), or to examine the relationship between changes on these measures and treatment outcome (cf. Johnson et al., 1980). For example, both changes in eating habits and change in cognitions have been identified as important in the control of overeating, yet no examination of the relationship between these two response classes has been made. In addition to measurement of the specific effects of the independent variables, another function of assessment is to determine if the independent variables were really implemented. This has been termed "treatment integrity" (Peterson, Homer, & Wonderlich, 1982; Yeaton & Sechrest, 1981). For example, measures of the extent to which the subjects actually implemented the treatments are needed. Measures of "treatment integrity" contribute to the internal validity of a study and increase the confidence with which the results are interpreted.

Treatment Selection

A particularly important function of assessment is to improve the treatment selection for a particular client (Nelson & Hayes, 1979). In order to serve this function effectively for obese clients, development of assessment strategies that enhance client-treatment pairing is needed.

Previous research has attempted to identify client characteristics as potential determinants of treatment outcome. The obvious clinical implication of identifying accurate predictors of treatment response is that potentially unsuccessful clients could be screened out of a particular treatment. On a conceptual level, the identification of client characteristics predictive of differential treatment response could enhance our understanding of the behavior change process involved particularly if the particular characteristics are suggested by theory or research on the particular problem or its treatment. Previous research has often focused attention toward classifying clients on the basis of person characteristic (age, SES, personality traits) or obesity-related characteristics (e.g., age of onset, severity of the problem). The relationship of these variables to treatment outcome has then been assessed using a post hoc methodology. From an applied perspective, two problems limit the usefulness of such research: (a) the limitations of the post hoc analyses of differential treatment effectiveness; (b) the use of measures of limited conceptual or clinical relevance (cf. Hayes et al., 1986).

Post hoc analyses offer clinical external validity. Even when relationships are observed they may be limited to the specific sample

studied. Further, post hoc analyses do not identify success or failure or differential treatment effects at the level of the individual. Consequently, precise information regarding treatment selection for a particular individual is not available.

In research attempts to identify subjects variables which predict treatment response among obese clients, the measures selected often have been selected more as the basis of availability than for any clinical or conceptual relevance. While demographic and personality style measures may be found to predict treatment outcome successfully, the study of such variables does not help to identify the relevant, problematic responses or response classes involved in treatment success with a particular treatment or important in the self-regulation of eating. Consequently, while the use of demographic or problem severity measures may predict outcome (e.g., the best predictor of weight loss in treatment may be pretreatment weight), these relationships do not offer differential treatment decisions.

One way to identify subgroups of the obese clients who respond differentially to our treatments would be to first select a subject variable that is clinically and/or conceptually related to current conceptualizations of the self-regulation of eating or the treatment of obesity. Second, individuals assessed as differing on this variable should be selected and finally, their performance in different types of treatment should be compared. This strategy allows for the identification of client by treatment interactions as well as overall treatment and client differences.

A classification of clients based on the severity of their negative and self-defeating eating-related cognitions seems promising for several reasons. First, negative self-statements are clinically relevant as clients frequently report problems with this response class and often attribute their failure to sustain weight loss efforts to their inability to change these responses (e.g., Sjoberg & Persson, 1979). Second, there are data supporting the role of this response class as a determinant of overeating (e.g., Polivy, 1976; Spencer & Fremouw, 1979; Woody et al., 1981). Third, there are treatment strategies of demonstrated efficacy specifically designed to alter these responses. Finally, this response class may be important in the study of the self-regulation of eating and other addictive behaviors (e.g., alcohol consumption, cigarette smoking).

Proposed Classification of Obese Clients:

Pilot Study

Prior to proposing an examination of the treatment validity of grouping subjects on the basis of the severity of negative and self-defeating eating-related thoughts, a pilot study was conducted to examine the practicality of the proposed classification of obese clients.

Female volunteers (N=50) consenting to participate (Appendix A-1) completed an assessment battery of questionnaires measuring both cognitive and eating style variables relevant to weight control. Subjects were recruited from females presenting for weight control treatment in three clinical settings: a private HMO (n=33), a fee-for-service clinic operated by the UNCG Psychology Department (n=9), and a private practice clinic (n=8). All assessment questionnaires were

completed by the subject at home and returned to the investigator (anonymously) in stamped envelopes provided for them. The return rate for questionnaires was 100%. The average age of the participants was 39.6 years (range = 27-62 yrs.). The average weight was 181.9 lbs. (range = 135-245 lbs.), and the average percentage overweight (based on the Metropolitan Life Insurance tables, 1983) was 50.2% (range 24-78%).

To assess cognitive variables relevant to weight control, two measures were used: (a) the Cognitive Factors subscale of the Master Questionnaire (MQ) (Straw et al., 1984; Appendix D-2 & D-3), and (b) the Obesity Cognitions Scale (O'Connor & Dowrick, 1983; Appendix E-3). Assessment of eating style variables was made using (a) the Eating Patterns Questionnaire (Wollersheim, 1970; Appendix E-4) which provides a general measure of eating habit deficits frequently targeted in behavioral treatments, and (b) the Energy Balance Habits subscale of the MQ which assesses stimulus control deficits (see Appendices D-3).

In addition to the cognitive and eating style measures specific to weight control, two general measures of negative and irrational thoughts were included to allow assessment of the relative specificity of weight-relevant cognitive variables. The global measures of negative and irrational thoughts were (a) the Automatic Thoughts Questionnaire (ATQ) (Hollon & Kendall, 1980), and (b) the Personal Beliefs Inventory (PBI) (Munoz & Lewinsohn, 1976). Subjects also completed an information sheet providing data pertinent to analyzing their responses.

Results and discussion. The first question addressed was whether sufficient variability was present within the sample of obese clients on the self-reported severity of negative and dysfunctional weight-relevant cognitions to suggest the existence of two clinically distinct subgroups. To answer this question, the range of subjects' scores on the Cognitive Factors subscale of the MQ was examined. Scores on the Cognitive Factors subscale of the MQ showed considerable intersubject variability (range of scores = 7-35; mean = 18.33; median = 18.0). The range of scores obtained was considered as evidence of sufficient variability to support the dividing of subjects into two subgroups. A median split was used to divide the sample in half. Subjects scoring less than 18 were classified as evidencing significant problems with negative and self-defeating eating-related cognitions, while subjects scoring 18 or greater were considered as evidencing relatively few problems with such cognitions. For convenience, the two subgroups are subsequently referred to as "highs" and "lows", respectively. A description of the two groups produced by the median split is in order. Examination of Table 1 (Appendix A-2) reveals that the two groups were amazingly similar in age, weight, and their percentage overweight. The remaining experimental questions were addressed by analyses conducted between, within and across these two subgroups. Two types of data analysis, t-tests and correlations, were used.

A second question addressed by this study was the specificity of negative and self-defeating eating-related cognitions. That is, are measures of negative thoughts related to weight independent of, or

related to general measures of negative and maladaptive thinking. The data suggested that the negative and self-defeating eating-related cognitions as measured by the Cognitive Factors subscale of the MQ and the Obesity Cognitions Scale are specific to weight, and are not merely reflective of a generalized negative thinking style. No statistically significant differences were found between the "highs" and "lows" on their scores on the Automatic Thoughts Questionnaire (ATQ), or the Personal Beliefs Inventory (PBI), both measures of generalized negative and irrational thinking (see Table 1, Appendix A-2). Further, examination of the correlation matrix provided in Table 2 (Appendix A-3) reveals that no statistically significant relationships between subjects' scores on the specific, eating-related measures of negative thinking (i.e., the Cognitive Factors subscales and the Obesity Cognitions Scale) and their scores on the general measures of negative and irrational thinking (i.e., the ATQ and PBI) were found. The finding of the specificity of the eating-related cognition measures held both within the groups of highs and lows and for the combined sample (see Table 2; Appendix A-6).

A third question addressed in this pilot study concerned differences in eating style possibly related to a subject's rated severity of negative and self-defeating eating-related cognitions. A demonstration of such a difference would provide a basis for classifying obese clients on both a cognitive and a behavioral (e.g., eating habits) dimension conjointly. Support for this question was mixed. The results obtained are discussed for each questionnaire measure separately.

As shown in Table 1 (Appendix A-2), no statistically significant differences were found between the "highs" and "lows" on their scores on the Eating Patterns Questionnaire (EPQ). The EPQ provided a general measure of the subjects' adherence to eating habits frequently targeted for change in behavioral programs. Scores on this questionnaire can range from 112-320 with higher scores reflecting more problem eating habits. Unfortunately, responses on the EPQ were available for only 34 of the 50 subjects (14 "highs" and 20 "lows") which may limit the conclusiveness of this finding.

Examination of the mean scores obtained on the Energy Balance Habits subscale of the MQ revealed a significantly higher (p = .0001) mean score for "lows" (4.5) as compared to the "highs" (3.0) (see Table 1; Appendix A-2). Statistically, this finding suggests that subjects evidencing more severe problems with negative and self-defeating eating-related cognitions ("highs") also evidenced more problems with poor eating habits (specifically, problems of stimulus control). This difference, however, did not appear to be of clinical or practical significance. Though the mean scores of the "highs" and "lows" differed statistically, the range of scores was 0-8 for both the "highs" and "lows" (total possible score = 9). The grand mean for the groups combined was 5.6. The modal score for the "highs" was 5, while scores for the "lows" showed a bi-modal distribution; the scores of 3 and 7 were each obtained by 6 subjects. The correlational analysis between subjects' scores on the Cognitive Factors subscale and the Energy Balance Habits subscale of the MQ revealed a significant, moderate and positive relationship for the combined sample (r =

.398, p .01), and for the "lows" (r = .410, p .02), but no relationship between the two for the "highs" (r = .035, n.s.). (See Table 2, Appendix A-3.) Though the data suggest that the "highs" are not a homogeneous group with respect to eating habits, all in all, the results obtained did not support the possibility of differentially grouping subjects on cognitive and behavioral dimensions conjointly.

Two additional findings of the pilot study warrant brief note. First, as can be seen in Table 2 (Appendix A-3), the correlations obtained between subjects' scores on the Cognitive Factors subscale of the MQ and their scores on the Obesity Cognitions Scale (OCS) were significant for the groups combined (r = -.653, p .01), within "highs" (r -.483, p .01), and within "lows" (r = -.451, p .02). (The negative relationships result from the fact that high scores on the OCS evidence maladaptive cognititons, while low scores on Cognitive Factors subscale evidence maladaptive cognitions.) These correlations suggest at least moderate overlap between these two measures. This is further evidenced by the data presented in Table 1 (Appendix A-5) which shows a highly significant (p = .0001) difference between "highs" and "lows" on their scores on the Obesity Cognitions Scale. Finally, subjects' scores on the Cognitive Factors subscale were not significantly correlated with their percentage overweight for the combined sample (r = -.174, n.s.), within "highs" (r = -.145, n.s.), or within "lows" (r = -.249, n.s.). (See Table 2; Appendix A-3), suggesting that the cognitive measures are not simply reflecting problem severity.

The results of the pilot study indicate that obese clients may differ markedly in the extent to which they engage in negative and self-defeating eating-related cognitions. The interclient variability demonstrated suggests that a grouping of these clients on this dimension is clinically practical. The two subgroups ("highs" and "lows") identified in the pilot study were similar with respect to age, weight, percentage overweight, and scores on a measure of eating habits. This suggests that the severity of negative and self-defeating eating-related cognitions may be a critical difference between the two groups. Further, the results here indicate that the negative eating-related cognitions are indeed specific to weight and not reflective of a generalized negative thinking pattern.

Treatment Validity: A Functionally Based Evaluation of Assessment

Recently within behavioral assessment, an approach termed treatment validity has been offered as a means of evaluating the quality of behavioral assessment (Nelson & Hayes, 1979). Treatment validity seeks to evaluate the quality of assessment by examining the contribution which an aspect of assessment makes to treatment effectiveness. If an assessment strategy or device can be shown to enhance treatment effectiveness, then the assessment is functionally useful.

Treatment validity issues are addressed in this dissertation by investigation of the contribution to treatment effectiveness made by classifying subjects as either "high" or "low" on their severity of

negative eating-related thoughts and examining the effects of different treatments for the two distinct subject types. Following is an overview of the conceptual framework of treatment validity and the relevance of its methodology for the present study.

Overview of Treatment Validity

Until recently, the differences between behavioral and traditional assessment were viewed primarily as conceptual rather than methodological in nature (cf. Cone, 1977). Consequently the psychometric criteria of reliability (consistency) and validity of measurement used to evaluate the quality of data obtained by traditional assessment procedures were thought to apply equally to behavioral assessment (Hartmann & Wood, 1982). Psychometric criteria for evaluation of assessment rest on the assumption that the response (e.g., trait, behavior) measured is stable. More specifically, the assumptions underlying psychometric theory are that behavior is consistent across time (test-retest reliability and predictive validity), situation (alternate forms reliability and concurrent validity), and response systems (convergent validity).

The use of traditional psychometric methods to evaluate behavioral assessment has generated considerable disillusionment with behavioral assessment techniques. This disillusionment has stemmed generally from the failure of the assessment measures to meet the basic psychometric standards of quality. For example, measures of the same behavior (e.g., anxiety) do not often show convergent validity when assessed by two methods (e.g., self-report and physiological measures). Further, many of the frequently used assessment devices are

"psychometrically impure" (e.g., they have low split-half reliability or test-retest reliability coefficients).

The disillusionment with the quality of behavioral assessment measures has been most intense for those viewing behavioral assessment as a subarea of all assessment distinguished only by its concern for the measurement of behavior (as opposed to personality traits, for example). If behavioral assessment is viewed simply as a content sub-area of traditional assessment or a collection of techniques, then the assumption that psychometric standards of quality should be obtained is logical. Recently, however, Nelson (1983) has argued that behavioral assessment should be viewed as a conceptual approach rather than as a collection of techniques or as a content subarea of traditional assessment. On the basis of their differing assumptions about the nature of behavior, their differing levels of analysis, and their differing models of scientific explanation, Nelson (1983) concluded that traditional psychometric assessment and behavioral assessment are practically, conceptually, and philosophically incompatible. Further, these differences have consequences for the methodology used to evaluate the quality of the assessment measures (Nelson, 1983; Nelson & Hayes, 1981). For example, in traditional psychometrics, low test-retest reliability coefficients are the mark of a poor measuring device. Yet, inconsistent responding may well reflect real changes in behavior rather than the inferiority of the device (Nelson, Hay, & Hay, 1977). The differing implications are clear. Positing the source of variability in the instrument directs researchers to study the instrument with the goal of refining its accuracy of measurement. Viewing variability as

the property of behavior directs researchers to study behavior to identify the variables controlling the variability (cf. Barlow, Hayes, & Nelson, 1984; Johnston & Pennypacker, 1980). The assumptions underlying behavioral assessment are that behavior is modifiable, situation specific, and variable across response systems. Given these assumptions, the prediction of test-retest reliability, concurrent validity across test situations, and concurrent validity across methods of assessment are not warranted.

The differing levels of analysis between traditional and behavioral assessment have implications for the uses of the data obtained. Psychometrically based assessment analyzes the variability across individuals. The principles derived cannot be applied to any single individual in the group, but are generalizable only to other similar groups. Behavioral assessment focuses on variability in the behavior of an individual across time and situations. Focus on the individual is the essence of clinical practice. Repeated assessments across individuals over time can lead to the development of general principles of behavior applicable to all individuals in a group. Focus on the group as the level of analysis, regardless of time and trials, is unlikely to generate principles applicable to all individuals in the group.

Finally, traditional and behavioral assessment are philosophically incompatible. Psychometric theory derives from structuralism. Behavioral assessment is founded in functionalism. Structuralism is concerned with the identification and labeling of stable, internal properties of the organism. Causation may be attributed to both identified and hypothesized structures. Structurally identified "causes" are

often predictive of behavior, but they cannot tell us how to control behavior (Skinner, 1953; 1974). In contrast, functionalism seeks to define and evaluate psychological concepts by the function they serve (Skinner, 1974). For the behaviorist, "cause" is addressed with reference to the ability to predict and control. Control implies manipulation, manipulation that can be initiated only from outside the structure. To maintain conceptual and philosophical consistency, behavioral assessment must be evaluated functionally (Nelson, 1983; Nelson & Hayes, 1979; Nelson & Hayes, 1981). In short, "As a structural approach, psychometrics can provide data to be evaluated functionally, but cannot functionally evaluate data, including those derived from behavioral assessment (Hayes et al., 1986)." Nelson and Hayes (1979) offered treatment validity as a functionally based alternative to traditional psychometrics to evaluate the quality of data produced by behavioral assessment.

As a means of evaluating behavioral assessment, treatment validity is concerned with the impact of assessment decisions on treatment effectiveness. For example, within behavioral assessment, it has been assumed generally that effective treatment results from the identification of meaningful target behaviors for modification in treatment. This assumption, however, has been seldom demonstrated empirically (Hayes et al., 1986; Nelson, 1983). Recently, the treatment validity of identifying target behaviors for treatment has been demonstrated for depression (McKnight, Nelson, Hayes, & Jarrett, 1984), and social anxiety problems (Trower, Yardley, Bryant, & Shaw, 1978). The treatment validity of identifying specific client characteristics has also

been demonstrated for a variety of disorders including depression (Simons, Lustman, Wetzel, & Murphy, 1985), social anxiety (Elder, Edelstein, & Fremouw, 1981; Ost, Jeremalm, & Johansson, 1981), insomnia (Borkovec, Grayson, O'Brien, & Weerts, 1979), and dysmenorrhea (Chesney & Tasto, 1975).

Treatment validity questions are relevant for each stage of the assessment process including the selection of an assessment device, the choice of a target behavior, classification of clients, the use of a functional analysis, and the selection of a treatment strategy (Hayes et al., 1986). A treatment validity framework can also be used to test the nature of theoretical distinctions. Over time, behavioral assessment may contribute to our general understanding of behavior through descriptions of phenomena and consistent explanations of why events interact in certain ways. For example, treatment validity studies have already increased our understanding of the critical response classes involved in depression and problems of social anxiety. When functionally evaluated assessment contributes to the establishment of general principles of behavior and behavior change, it may be said to have "conceptual validity" (Nelson & Hayes, 1979; Hayes et al., 1986). Conceptual validity comes over time and repeated trials. Demonstrations of the treatment validity of all stages of behavioral assessment across a variety of clinical problems and populations is needed. Such demonstrations can lead to a greater understanding of behavior, and thus, to greater conceptual validity (Nelson & Hayes, 1979; 1981).

Several treatment validity questions can be asked simultaneously in the same study. Studies which vary systematically at least two

dimensions of the assessment procedure have been categorized by Hayes et al. (1986) as a priori multiple-dimension treatment validity studies. Essentially, these studies cross two or more types of treatment with subject groups distinguished in some way by assessment. The present study is an example of an "observed differences with two treatments" design. Distinct subject groups identified in assessment were crossed with two types of treatment. Such a study can test both the treatment validity of the subject groups identified in assessment, and possible theoretical or conceptual distinctions underlying the subject classification or the treatments (Hayes et al., 1986).

Statement of Purpose

The clinical outcome of behavioral treatments of obesity is characterized by the repeated finding of marked interclient variability. This variability suggests that certain treatments may be effective only with certain subgroups of obese clients (cf. Mahoney, 1974; Wilson & Brownell, 1980). Research attempts to identify the sources of the variability in the treatment outcome have been few in number and largely inconsistent in their findings. Much of the failure of research to identify subgroups of the obese who respond differentially to treatment is owing to the use of post hoc methodology and the selection of variables for study which lack clinical or conceptual relevance to the self-regulation of eating (e.g., demographic variables, personality traits).

From a treatment perspective, attempts to remediate the problem of interclient variability in treatment outcome in behavioral treatment of obesity have led to the use of new treatment strategies. Most

notable among these strategies are cognitive therapy techniques which have been used both in combination with and as an alternative to a basic behavioral program focusing on change in eating habits. While there are outcome data to support the overall clinical efficacy of cognitive therapy techniques in the treatment of obesity, the problem of interclient variability in treatment outcome remains. Thorough evaluation of these cognitive techniques will be delayed until we can identify subgroups of obese clients for whom these techniques may be more effective. If clinical researchers are to enhance the efficacy of behavioral treatments of obesity and begin to identify the mechanisms through which these treatments have their effect, examination of the relationship between assessment and treatment is critical. That is, the conditions under which a distinct therapy is effective for a given client with identified characteristics or problems must be specified.

The purposes of this dissertation were (a) to provide an experimental investigation of subject-by-treatment interactions in the treatment of obesity; (b) to examine process issues related to the hypothesized diffferential success of the treatments employed. The results of this study have implications for the assessment and treatment of obesity by furthering our understanding of the critical response classes involved in the self-regulation of eating for different subgroups of obese clients.

It is considered that the present study makes two important contributions to research on obesity and its treatment. First, this study represents one of the few attempts in the treatment literature on obesity to investigate experimentally subject-by-treatment interactions.

Earlier research had generally used subject variables in a post hoc fashion. Second, in contrast to previous research, in the present study, the subject variable (severity of negative and self-defeating eating-related cognitions) was selected on the basis of its clinical and conceptual relevance to the problem of overeating specifically and to current conceptualizations of self-regulation and behavior change within psychology generally.

The present study is an example of the use of treatment validity methodology using an observed-differences design where two types of subjects are crossed with two types of treatment. The classification of obese subjects by assessment was accomplished by classifying subjects as either "high" or "low" on their self-reported severity of negative and self-defeating eating-related thoughts as assessed by the Master Questionnaire and a role-play task. The two treatments employed (a cognitive change treatment and a behavioral treatment which focuses on change in eating habits) are procedurally and conceptually distinct. They differ in the behaviors targeted for change and in their proposed mechanism of change. The treatment validity issue was addressed in the question: Do the different types of treatment differentially affect outcome for two distinct subject types? That is, is it important to treatment effectiveness to identify whether an individual client reports severe problems with or relatively few problems with negative and self-defeating eating-related thoughts?

The treatment validity question was answered using measures of weight loss. There were several predictions regarding the treatment validity issue. Because both types of treatments have been found to

effect weight loss, it was predicted generally that subjects would lose weight in both types of treatment regardless of assessment classification. The issue of treatment validity, however, is not simply one of "effective" treatment, but rather one of "more effective" treatment produced by assessment distinctions. The specific prediction regarding treatment validity was that there would be a significant subject type by treatment type interaction. Specifically, the prediction was that those subjects evidencing severe problems with negative and self-defeating eating-related thoughts ("highs") would be more successful (i.e., lose more weight) when receiving the cognitive self-control treatment than when receiving the behavioral self-control treatment. Subjects classified as "high" were also predicted to be more successful in the cognitive self-control treatment than subjects classified as "low". These predictions were based on research findings regarding the role of cognitions in the self-regulation of eating (e.g., Leon et al., 1978; Mahoney et al., 1977; Polivy, 1976; Straw et al., 1984; Woody et al., 1981). The cognitive treatment which focuses on teaching subjects to monitor, evaluate, and alter their negative and self-defeating thoughts was predicted to be more effective for subjects classified as "high" as these subjects evidence a problem in the particular response class targeted by this treatment. Subjects evidencing problems in negative thoughts ("highs") were not predicted to do well in the behavioral treatment which focuses on the acquisition of new eating habits because the negative thoughts might interfere sufficiently with the acquisition and consistent use of the new eating habits so as to lessen the effect of the techniques in producing weight loss.

related thoughts (i.e., those with positive cognitions) were predicted to respond better in the behavior change treatment than in the cognitive treatment. While the process by which the behavioral treatments effect weight loss is as yet unclear, the treatment has been shown to be an effective treatment for obesity. It was believed that subjects who already evidenced positive eating-related cognitions would benefit maximally from a treatment that teaches specific techniques for changing eating habits. The positive self-statements would then serve to reinforce or maintain the subjects' attempts to acquire the new behaviors. Subjects who already evidence positive cognitions (the "lows") would not be predicted to improve as much with the cognitive treatment as they do not evidence a problem (i.e., an excess) in the response class targeted by the treatment (i.e., a "floor effect" was predicted). In further support of the predictions for the "lows", other research investigating client by treatment interactions in response acquisition and cognitive restructuring treatments (for social anxiety) has found that subjects with low scores on faulty cognitive self-appraisal performed better in a response acquisition treatment program than in a cognitive restructuring treatment (Elder et al., 1981).

Treatment outcome was assessed not only by the weight measures, but also by measures of psychological change. Generally, it was predicted that, regardless of the type of treatment received, subjects losing weight would evidence improvement on the depression measure (Beck Depression Inventory) and a self-efficacy measure (the Confi-

dence Scale). Subjects who did not lose weight were predicted to evidence no change, or deterioration effects on the psychological measures.

One purpose of this study was to provide data relevant to the examination of the processes by which the two treatments employed effect change in weight. Thus, measures specific to each type of treatment (i.e., cognitions, eating habits) were employed. Two questions were addressed using measures specific to each of the treatments: (a) Do the treatments produce change in the behaviors that they purportedly target? That is, does cognitive therapy produce changes in self-defeating eating-related thoughts and does the behavioral treatment produce changes in the specific eating habits it targets?; (b) How do these specific changes (cognitions or eating habits) relate to each other and to changes in overeating?

Several predictions regarding the specific measures of treatment effects were made. First, in regard to the question, Do the treatments produce change in the behavior(s) targeted for change, it was predicted that regardless of subject classification ("high" or "low"), subjects receiving the cognitive treatment would evidence significant change on the cognitive measures of treatment effects (e.g., the Obesity Cognitions Scale) and that this change would be significantly greater than the change for subjects receiving the behavior change treatment. Conversely, it was predicted that subjects receiving the behavioral treatment would evidence significant changes on the specific eating habits (assessed by the Eating Patterns Questionnaire), and that this change would be significantly greater than that for subjects

receiving the cognitive treatment. A failure to confirm these predictions would, regardless of the treatment outcome on weight measures, seriously call into question the treatments' proposed mechanisms of change. Conversely, confirmation of these predictions would suggest, although not demonstrate conclusively, the correctness of the proposed mechanisms of change for these treatments. A single study designed to demonstrate that a given treatment works through a specific process can never rule out all factors other than the specific process of interest which may be responsible for the change produced.

Demonstration of change in the specific behavior targeted by a given treatment is necessary for claims of change by a given process. It is, however, the relationship between the specific changes directed by treatment (e.g., thoughts, eating habits) and the target of change (e.g., weight) that is critical to evaluation of the proposed mechanism of change. In the present study, it was generally predicted that changes in the behaviors targeted by the treatments (e.g., thoughts, eating habits) would relate significantly to changes in eating (e.g., weight).

Information regarding the relationship of the changes produced by the treatments to each other (i.e., cognitions and eating habits) and to changes in eating (weight) would contribute to our speculation regarding the mechanism of change involved in these treatments. Knowledge of these relationships may also further our understanding of the critical response classes for particular subgroups of the obese which would have implications for the development of our assessment and treatment strategies. On a theoretical level, data from this study

would be relevant to the understanding of the relationship between thoughts and overt behavior generally. In the present study, the nature of the covariation between thoughts and overt behavior was addressed by the question: Is the relationship between eating-related thoughts and eating behavior differentially affected by the two treatments? Examination of the interrelationships among the measures (weight, thoughts, eating habits) produced by each of the two treatments provided data relevant to this question.

To summarize, the present study sought to address both outcome and process issues involved in the treatment of obesity. The treatment validity question addressed by this dissertation was: Is it important to treatment effectiveness to identify whether an individual client reports severe problems with or relatively few problems with negative and self-defeating thoughts and to match treatment to this assessment distinction? Measures of weight loss were used to answer this question. Specific measures of treatment effects were used to address process issues. The process questions addressed were these: (a) Do the treatments produce change in the behaviors they purportedly target?; and (b) How do these specific changes relate to each other and to change in weight? The results of this study may have implications for the conceptualization of the problem of overeating and for the assessment and treatment of obese clients. Further, these results may contribute to our understanding of other addictive disorders and to the general processes of self-regulation and self-control.

CHAPTER II

METHOD

Subjects

A total of 32 overweight females served as subjects. They averaged 33.8 years of age (range 22-46 years), 186.0 lbs. (range 154.5-234 lbs.), and 35.3% above their ideal body weight (range 21-62%). Their average number of years of education was 14.3 (range 12-18 years), and their occupations included managers, salespeople, teachers, and homemakers (Table 1; Table 1 and all subsequent tables are located in Appendix B).

Screening and Selection

Volunteers to serve as subjects were recruited from the local community through a newspaper advertisement regarding the availability of a research project for weight control. Participation was limited to females between 22 and 46 years of age who were at least 20% but not more than 70% above their ideal weight (as indicated by the Metropolitan Life Insurance Height and Weight Tables, 1983), physically healthy, and who were not currently enrolled in a weight reduction program elsewhere. Volunteers were disqualified if they planned to become pregnant during the period of the study, if they had medical conditions for which dieting is contraindicated unless under medical supervision (e.g., ulcerative collitis, diabetes mellitus), took medications known to influence weight gain or loss, or did not have a two-hour block of time one evening each week (for 8 weeks) to attend group sessions. All subjects were required to obtain their physician's approval for participation.

A total of 94 women responded to the advertisement for subjects. Of these, 45 were deemed inappropriate for participation in the study during the initial telephone contact; of these, 17 had weight-related medical problems and/or were taking medications known to influence weight, 4 were more than 100% overweight, 21 were less than 20% over ideal weight, and 3 had work schedules that precluded attendance at the treatment sessions. The remaining 49 women were scheduled for a selection interview with the principal investigator.

The purposes of the selection interview were to provide potential subjects with a general explanation of the program and to further assess each individual's appropriateness for participation in the study. Final acceptance into the study was based on the volunteer's expressed interest and motivation, and the absence of contraindicative medical, social, or psychological problems. Of the 49 women scheduled for a selection interview, 4 cancelled or did not attend the appointment. The remaining 45 women who attended the appointment consented to participate in the selection interview (Appendix C-1).

At the time of the selection interview, volunteers completed the Social Readjustment Rating Scale (Holmes & Rahe, 1967) which provided a general index of the volunteer's current level of stress from general life event changes, and the Stanford Eating Disorders Questionnaire (Agras, Ferguson, Greaves, Qualls, Rand, Ruby, Stunkard, Taylor, Werne, & Wright, 1976) which provided the format for a structured interview. The Stanford Eating Disorders Questionnaire provides information on demographic, social and psychological functioning, medical and weight history, and has been found to be a useful screen-

ing device in weight control treatment programs and research (Agras et al., 1976; Brownell, 1981).

Of the 45 women interviewed, 7 were deemed inappropriate for participation; of these, 2 were found to have contraindicative medical conditions which they failed to report during the initial telephone contact, 1 woman met the Diagnostic and Statistical Manual of Mental Disorders, third edition (American Psychiatric Association, 1980) criteria for bulimia (she was offered assistance with a referral for treatment in the community), and 4 obtained scores of over 400 on the Social Readjustment Rating Scale (SRRS). Individuals with scores above 300 on the SRRS have been found to be at high risk (80%) for the development of stress-related health problems (Holmes & Rahe, 1967). Concurrent multiple life changes have also been reported to have a negative impact on some individuals' weight control efforts (Gormally, Rardin, & Black, 1980). The remaining 38 women were accepted into the study.

Following the selection interview, eligible subjects participated in a role-play task in which they were asked to describe "what you might be thinking" in response to descriptions of three eating situations (Appendix D-1). Subjects then completed two questionnaires: the Master Questionnaire (Straw et al., 1984; Appendix D-2), and the Eating Habits Checklist (Gormally, Black, Daston, & Rardin, 1982; Appendix E-1). (These questionnaires are described fully under the section entitled "Dependent Measures".) Subjects then made arrangements to obtain physician approval for participation, and to make a data deposit of $32.00 by the first treatment session. Refundable

deposits have been shown to result in fewer absences and more consistent data (Ersner-Herschfield, Connors, & Maisto, 1981; Hagen, Foreyt, & Durham, 1976; Wilson, 1978). A specified portion of the data deposit was returned to the subject at previously agreed-upon times during the study (Consent Form I; Appendix C-1).

Any volunteer not accepted into the study for any reason during the screening and selection phases was given an explanation for her exclusion and offered a list of referral sources available in her area.

Subject Assignment to Treatment

First, on the basis of her score on the Cognitive Factors subscale of the Master Questionnaire (MQ) and her responses to the three role-play scenes, each subject was classified as either a "high" or "low" cognitive responder. (The details of this grouping of subjects is discussed under the section entitled "Independent Variables"). Eighteen subjects were classified as "high" and 20 as "low". Within each of the two subject groups ("high" and "low" cognitive responders), subjects were rank-ordered by percentage over ideal weight and assigned on an alternating basis to one of two types of treatment -- a treatment focusing on behavior change, or a treatment focusing on cognitive change yielding four experimental conditions. Treatment was conducted by two therapists using a group format. To form treatment groups, a second assignment of subjects was made so that four treatment groups (two cognitive change and two behavior change, one of each assigned to each therapist) were formed, with each group containing an approximately equal number of subjects classified as "high" and "low" cognitive responders.

Three subjects withdrew from the study following the selection interview and prior to the first treatment session; two subjects were classified as "low" and had been assigned one to the behavioral treatment and one to the cognitive treatment. The third subject ("high") had been assigned to the behavioral treatment. Three additional subjects withdrew during treatment (prior to the third session) for personal reasons: one ("low") in the behavioral group and two (1 "high", 1 "low") in the cognitive treatment group. Thus, 32 subjects completed the study, 8 in each treatment condition. The attrition rate was 8.5%.

Experimental Design

A 2 (subject type) x 2 (treatment type) x 2 (measurement occasions) factorial design was employed over an 8-week period during which treatment sessions were administered weekly. Because two therapists conducted the treatments, therapists were included as a factor in the initial data analysis, but this factor was not of theoretical concern to the study. A two-month follow-up was also conducted for the benefit of the participants. The follow-up data are not, however, included in this dissertation. In the present study, the experimental questions were specifically and exclusively concerned with comparisons among outcomes by treatment type and subject type. Thus, a minimal or no-treatment control group was not included. Essentially, each of the two types of treatment employed was considered a sufficient control condition against which to test the other type of treatment.

The first factor, subject type, was a between-subjects factor which refers to the "severity" of the subject's score on the Cognitive

Factors subscale of the MQ (see Appendix D-3). Subjects' scores on the Cognitive Factors subscale and their responses to three role-play scenes were used to group subjects into one of two types (see "Independent Variables" section below). For convenience, the two types were labeled "highs" and "lows". Lower scores on the Cognitive Factors subscale of the MQ ("highs") indicate the subject's endorsement of a greater number of negative and distorted beliefs about weight, eating, and dieting than do higher scores. (Scoring for the MQ is accomplished by assigning 1 point for each response marked "false"; therefore, greater endorsement, "true" responses, yields lower scores.)

The second factor in the design, type of treatment, was also a between-subjects factor. Following classification as either a "high" or "low" cognitive responder, subjects received one of two treatment approaches: (1) a behavior change treatment focusing on change in eating behavior (frequency, topography, setting), and hence weight, by teaching the subject a variety of stimulus control and self-management techniques; (2) a cognitive change treatment focusing on changes in eating behavior, and hence weight, by restructuring cognitive distortions related to weight, eating, and dieting. An equal number of each subject type received each of the two treatment approaches.

The third experimental factor, measurement occasions, was a within-subjects factor which refers to the times at which experimental measures were collected for data analysis purposes. In the present study, experimental measures were taken on two occasions: pretreatment and posttreatment.

Independent Variables

One goal of this dissertation was to examine the contribution of assessment (pretreatment classification of subjects) to treatment outcome. More specifically, this study sought to examine differential treatment outcomes as a function of assessment classification and the type of treatment approach employed. Thus, the pretreatment classification of subjects (assessment) and the type of treatment approach employed were both independent variables.

Classification of Subjects by Assessment

In the present study, assessment was used to classify subjects into one of two types. The dimension selected for classification of subjects was the severity of subjects' self-reported negative and maladaptive weight, eating, and dieting-related cognitions and attitudes. Subjects were assigned to one of two assessment groups on the basis of their scores on the Cognitive Factors subscale of the MQ (Appendix D-3) and their responses to three role-play scenes. The MQ is a 56-item true/ false questionnaire developed specifically for use in weight control research. The questionnaire assesses the areas of Cognitive Factors, Energy Balance Habits (e.g., stimulus control), and Energy Balance Knowledge. The MQ was selected here to distinguish subject types for three reasons. First, the MQ was developed using overweight populations, and the basic psychometric standards of test-retest reliability and internal consistency have been demonstrated (Straw et al., 1984). Second, subjects' scores on the Cognitive Factors subscale have been shown to correlate significantly with weight-loss in a cognitive-behavioral treatment program (Straw et al., 1984).

Third, the MQ has been shown to be a sensitive outcome measure thus suggesting that the attitudes and behaviors it measures are amenable to psychological intervention (Straw et al., 1984).

To be classified as "high", a subject had to meet the following criteria: (a) a score less than 18 on the Cognitive Factors subscale of the MQ; and (b) at least 50% of the responses given when asked to describe "what she might be thinking" in three role-play scenes of eating situations had to be scorable as negative or self-defeating thoughts (self-statements). (The criteria used to categorize subject responses may be seen in Appendix D-4.) Conversely, to be classified as "low", a subject had to have a score of 18 or greater on the Cognitive Factors subscale of the MQ and have less than 50% of their responses to the role-play scenes scorable as negative or self-defeating thoughts. The cut-off score of 18 was selected on the basis of the results of a pilot study reported in the first chapter (the Introduction). The score of 18 was the median score from the pilot study sample. In the pilot study sample, the median split produced two groups of subjects similar in age, percentage overweight, and on scores on an eating habits measure.

In the present study, the range of scores on the Cognitive Factors subscale was 5-34. The highs had a mean score of 11.6 (Md 12.5, range 5-16), and the lows had a mean score of 24.4 (Md 24, range 19-34). (The individual subject data are shown in Table 2.) subscale is 0-37.) The two groups did not differ significantly on the Energy Balance Habits subscale, t (30) = 1.02, p = .31, or the Energy Balance Knowledge subscale, t (30) = .99, p = .33. They were also

similar in age (mean 33.2 years, "highs"; mean 34.5 years, "lows"), and percentage overweight (mean 35.3%, "highs"; mean 35.3%, "lows").

On the role-play task, the "highs" gave an average of 5.6 responses scorable as negative or self-defeating thoughts. The "lows" gave an average of .4 responses scorable as negative or self-defeating thoughts. In contrast, these latter subjects gave an average of 2.6 responses scorable as positive self-statements (thoughts). (Table 3 shows the mean number of responses given in each scoring category by each subject type.)

Treatments

In the present study, two distinct treatment approaches were employed: (1) a behavioral approach and (2) a cognitive therapy approach. The two approaches differ in their proposed mechanisms of change and in the behaviors targeted for change. The program descriptions, treatment rationales, outlines of the eight treatment sessions, and copies of the session summaries provided to the subjects, for both the behavioral and the cognitive treatments are provided in the Appendices (Appendix F and Appendix G, respectively). Only a general summary of the procedural and conceptual similarities and differences between the treatments is given here.

Behavioral treatment. The conceptualization of obesity presented in the behavioral treatment group was that obesity is the consequence of a prolonged positive energy balance resulting from inappropriate eating and activity habits. The aim of the treatment program was presented as the learning and practicing of new, more appropriate habits. Specifically, inappropriate eating habits were defined as

relating to problems in eating style (e.g., in frequency, amount, topography, and a greater response to external cues). The program represented an orderly, sequential presentation of the various techniques directed toward remediating the problems in eating style commonly incorporated in behavioral programs for weight reduction. The specific material used was based on the manual Learning to Eat (Ferguson, 1975) and selected portions of the LEARN Program for Weight Control (Brownell, 1985). Topics for Sessions 1-7 included self-monitoring, stimulus control, eating inhibitors, individual problem solving, and modification of eating topography. In Session 8 (post-treatment), subjects were given information on and techniques for social support and the prevention of relapse.

Subjects in the behavioral treatment groups kept a daily food diary monitoring the stimulus parameters of each eating episode (e.g., time, setting, body position, activity, and mood) as well as the amount and type of food consumed (see Appendix F-4 for a sample Food Diary form). In addition to keeping a food diary, subjects completed weekly homework assignments. The purpose of the assignments was to encourage implementation of the techniques taught in sessions and to provide a source of feedback on progress for the subject. Homework assignments involved keeping checklists of adherence to program guidelines and self-monitoring of other treatment-related behavior (e.g., use of eating inhibitors), and required 15-20 minutes of the subject's time each day.

Cognitive treatment. Subjects in the cognitive treatment group focused on learning to identify, evaluate, and alter their negative and

self-defeating thoughts (self-statements) and attitudes relating to weight and dieting. The rationale for the treatment approach described the relationship of thoughts to feelings and behavior, specifically to eating patterns and how overeating may result from negative or faulty cognitive patterns. Emphasis was placed on the fact that cognitive patterns that initiate and maintain overeating are learned, and that new more adaptive patterns can be learned with a resultant decrease in overeating.

The specific material presented in each of the eight sessions was based on The Rutgers University Cognitive Therapy Weight Reduction Program (Collins, 1980), and selected portions of the LEARN Program for Weight Control (Brownell, 1985). Subjects were taught to identify and alter their negative and self-defeating cognitions by using a variety of techniques including cognitive restructuring (Beck, 1976; Goldfried, Decentecero, & Weinberg, 1974; Mahoney & Mahoney, 1976 a), self-instructional training (Meichenbaum, 1977), and rational-emotive therapy (Ellis & Harper, 1976). Similarly to the behavioral treatment group, in Session 8 (posttreatment), subjects in the cognitive treatment were given information on and techniques for social support and the prevention of relapse.

Subjects in the cognitive treatment groups were taught to self-monitor weight-relevant thoughts throughout treatment by keeping a daily Thought Diary (Appendix G-4). In addition, subjects in the cognitive change condition also self-monitored food intake, but recorded only the time of consumption and the type and amount of food consumed. (See Appendix G-5 for a sample Food Record form.)

Subjects in the cognitive treatment groups also completed weekly homework assignments designed to encourage the subject's use of the techniques taught in sessions and to provide a source of feedback to the subject on her progress. Homework assignments required 15-20 minutes per day of the subject's time and consisted of the subject completing forms on the use of the techniques, and self-monitoring of other treatment related behavior.

Measures of Treatment Integrity

Check on manipulation. Treatment sessions from each of the two types of treatment for each of the two therapists were audiotaped periodically. These tapes were reviewed by two independent raters (both clinical psychology graduate students) to ensure consistency in the administration of the treatments. As a check on the independent variable (type of treatment), tapes of 37.5% of the sessions were reviewed by the two raters (three sessions from each type of treatment for each of the two therapists). Each rater identified each taped session as either the behavior change or the cognitive change treatment approach. All sessions were identified correctly by both raters suggesting that the interventions were identifiably different.

Treatment outcome expectancy. In addition to the use of identifiably distinct treatments, it seems important for the integrity of the treatment manipulation that the treatments be perceived as "effective" or credible by the subject at the outset of treatment as expectancy for improvement with a given treatment plays an important role in an individual's response to treatment (Borkovec & Nau, 1972). In the first treatment session, after reading the program description and

treatment rationale, all subjects completed a treatment outcome expectancy measure (Appendix H-1). The measure consisted of two questions assessing subjects' belief in the effectiveness of the program and their rating of how well the treatment would fit their particular needs. Each question was rated on a 7-point scale, "1" representing "no help" and "7" representing "very helpful". Both treatments received similar ratings for perceived effectiveness (a mean rating of 5.95 for the cognitive treatment and a mean rating of 6.20 for the behavioral treatment). Subjects also rated both treatments similarly on the extent to which the treatments met their particular needs (a mean rating of 6.0 for the cognitive treatment, and a mean rating of 6.2 for the behavioral treatment).

Adherence to treatment-prescribed tasks. Weight loss per se cannot be appropriately equated with program adherence. Further, even effective treatments cannot produce weight loss unless they are implemented. Consequently, self-monitored data submitted by the subjects at the weekly meetings following Sessions 1, 4, and 7 were used to provide a limited basis for assessing relative levels of adherence to the treatment prescribed tasks in the two types of treatment. In the first week, adherence was measured by the number of days (expressed as a percentage of the total number of days) the subject completed the relevant diary (i.e., Food Diary or Thought Diary). For Sessions 4 and 7, adherence was assessed by the number of days the subject completed the appropriate diary and reported (on their daily self-monitoring forms) performing the treatment-prescribed task for that week. A percentage adherence score for each of these three

weeks was computed for each subject. (The average percentage adherence score obtained by each treatment group is presented in Table 4.) Subjects in both treatment groups showed moderately high levels of adherence to treatment-prescribed tasks across the three sampled weeks of self-monitoring (range 86-93.5% for the cognitive treatment and range 89-90.5% for the behavioral treatment).

Anecdotally, it is worth noting that all subjects in each of the four treatment conditions mentioned at least one specific treatment technique on the program evaluation questionnaire when asked to indicate what about the treatment program helped them most with their weight problem (Question 5, Appendix K).

Monitoring of non-treatment-prescribed behavior. A behavior that may be related to weight loss, increased activity, but which was not an explicit part of either type of treatment used, was evaluated. All subjects completed an exercise survey pre- and posttreatment (Ordman & Kirschenbaum, 1980; Appendix H-2). The mean number of minutes per week of exercise reported by the subjects pre- and posttreatment in the four treatment conditions are presented in Table 5. As can be seen from Table 5, there was little variability in the mean number of minutes of exercise per week reported within or between the two types of treatment suggesting that increased activity did not substantially influence weight loss. Further, a correlation computed for the 32 subjects between total number of minutes of exercise (light and moderate) reported at posttreatment and pounds lost was not significant (rho=.14, p .05).

Dependent Measures

Three categories of measures were used in the present study: (a) measures of clinical outcome; (b) specific measures of treatment effects (process); (c) a measure of the specific eating style of binge-eating for post hoc examination.

Measures of Clinical Outcome

Weight. The number of pounds lost and a weight reduction quotient (WRQ), modified from Feinstein's (1959) weight reduction index (Wilson, 1978), were used as measures of treatment outcome. Use of the weight reduction quotient has been recommended as an outcome measure because it controls for the subject's initial degree of obesity as well as variations in height and body weight (Jeffrey, 1975; Wilson, 1978). The weight reduction quotient also provides a useful means for comparing data from different studies (Brownell, 1981). The weight reduction quotient (WRQ) was computed by dividing the number of pounds lost by the initial number of pounds over ideal weight and multiplying by 100. (Ideal weight was derived from the Metropolitan Life Insurance Height and Weight Tables, 1983, using the midpoint of the weight range for the subject's height and frame size.) Weight measures were recorded to the nearest one-half pound using Health-O-Meter two beam balance scales. The subject's weight in the first and last treatment sessions was used for data analysis purposes.

Psychological change. Two measures of psychological change, a depression measure and a "self-efficacy" (Bandura, 1977) measure, were administered in the first and last treatment sessions. A depression measure seemed appropriate in light of the debate over the role of

depression in weight reduction (Glucksman et al., 1968; Nisbett, 1972; Stunkard & Rush, 1974). A measure of self-efficacy was also deemed relevant for inclusion to evaluate the changes in a subject's "self-efficacy" score as a function of the type of treatment received.

The Beck Depression Inventory (BDI) (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) was used as the depression measure. The BDI is a 21-item multi-symptom self-rating scale of depression. Scoring is accomplished by summing the highest numbered statements endorsed by the subject for each of the 21 items. The time frame for subject ratings was "the past week, including today." While not appropriately used to diagnose depression (Hammen, 1981), the BDI does provide a sensitive pre- and posttreatment rating of the severity of depression symptoms.

A Confidence Scale questionnaire (Collins, 1980; Appendix E-2) was used to assess subjects' change in self-efficacy ratings as a function of treatment. The questionnaire consists of descriptions of 34 high probability eating situations. Subjects rated their confidence in their ability to cope successfully in each of the 34 situations. Confidence ratings were made on a 7-point scale where 1=no confidence and 7=very confident. A total Confidence Scale score was computed by summing the confidence ratings for the 34 items.

Specific Measures of Treatment Effects

Two questionnaire measures, administered in the first and last treatment sessions, were used to assess changes in the specific behaviors targeted by each of the two treatments (cognitions or eating habits). All subjects received both questionnaires.

Cognitions. The Obesity Cognitions Scale (OCS) (O'Connor & Dowrick, 1983; Appendix E-3) was used to assess change in the frequency of, and belief in negative and self-defeating cognitions related to weight, eating, and dieting. The OCS is a 26-item inventory which asks the subject to give frequency and belief ratings to possible self-statements (thoughts) related to weight, eating, and dieting (e.g., "I've done nothing today but eat."). Subjects rated the "frequency" of the self-statement (i.e., 1="not at all" and 5="all the time"), and their "belief" in the self-statement (i.e., 1="not at all" and 5="100% belief"). (It should be noted that the rating scale described here represents a modification of that contained in the original form of the questionnaire. The rating scale used is more easily understood by subjects and simplifies arithmetic computations.) Two scores for the OCS were computed for each subject: (a) a frequency score, and (b) a belief score. Each of the scores was obtained by summing the subject's ratings across all items of the questionnaire.

Eating Habits. The Eating Patterns Questionnaire (EPQ) (Wollersheim, 1970; Appendix E-4) was used to assess change in eating habits. The EPQ is a 72-item questionnaire which assesses the degree to which subjects report engaging in inappropriate eating habits (e.g., "Do you eat while reading?", "Do you eat when bored?"). Each item is scored on a 5-point scale where 1=never and 5=always. Higher scores indicate a greater frequency of problem eating habits (i.e., those targeted by behavioral weight control programs). Using categories derived from the EPQ by Stalonas and Kirschenbaum (1985), five separate scores representing different categories of eating habits

were computed for each subject. The five categories were eating frequency, eating topography, eating in response to inappropriate stimuli (emotional eating), eating areas, and eating--no other activity. The five categories and a brief description of the eating habits assessed are provided in Appendix E-5. Changes in subjects' scores on the EPQ were used to assess the effects of both treatments on eating habits and to assess the relationship between change in specific eating habits and weight-loss.

Assessment of a Specific Eating Style as a Predictor of Treatment Outcome

A major concern in the literature on behavioral treatments of obesity has been the marked interclient variability in response to treatment, and the failure to identify successful predictors of treatment outcome. In the present study, the specific eating style of binge-eating was selected for post hoc examination. This eating style measure is conceptually relevant to the study of overeating and obesity and is considered particularly relevant to the assessment distinction employed here as cognitive variables have been implicated strongly in the study of binge-eating habits (e.g., Orbach, 1978).

The Eating Habits Checklist (EHC) (Appendix E-1) was used to assess the severity of binge-eating problems. The EHC is a 16-item scale containing items which assess both behavioral (e.g., eating rapidly, eating in secret) and cognitive/affective (e.g., preoccupation with loss of control over eating, feeling guilty) correlates of binge-eating. Subjects are instructed to select one statement from each of the 16 clusters of statements that best describes them. Scoring is

accomplished by summing the weights assigned to the items endorsed by the subject. Scores may range from 0 to 46 with higher scores reflecting greater frequency and severity of binge-eating.

Therapists

The author and a therapist from the local community who holds a master's degree in clinical social work (MSW) served as therapists. Both had a minimum of 6 years clinical experience, and were experienced in the treatment approaches employed in the present study. To insure consistency of presentation, both therapists participated in 4 hours of training with the two treatment packages. Each therapist conducted two treatment groups, one behavioral treatment group and one cognitive treatment group. Both therapists were blind to the subjects' assessment classification ("high" or "low") during treatment.

Procedure

Selection Interview

Volunteers who contacted the principal investigator expressing an interest in the research project, and who met the eligibility criteria specified in the section entitled "Screening and Selection" were scheduled for a selection interview.

First, the interviewer described the procedures to be followed during the session and obtained the volunteer's consent for participation (Appendix C-1). The interviewer also described the program offered and the responsibilities of participation (Appendix C-2), but emphasized that at that time the subject was participating only in a selection interview. Subjects then completed the Social Readjustment Rating Scale (SRRS) and the Stanford Eating Disorders Questionnaire

which provided the format for the structured interview. The subject's height and weight measurements were taken, and frame size was assessed by wrist circumfrence (medium frames, 6 in. to 7 in.). After the interview, eligible subjects were invited to participate in the project and signed a consent form (Appendix C-2). Arrangements for a data deposit of $32.00 were made privately with each subject. Special arrangements were made if a subject was unable to make the full data deposit. No subject was disqualified for financial reasons. At the end of the selection interview, subjects completed the Master Questionnaire and the Eating Habits Checklist, and made arrangements to obtain their physician's approval for participation.

Treatment Sessions

In the first treatment session, subjects in both the behavioral and cognitive groups completed the following questionnaires: a current exercise survey, the Beck Depression Inventory, the Confidence Scale, the Obesity Cognitions Scale, and the Eating Patterns Questionnaire. After reading the program description and appropriate treatment rationale, all subjects completed the treatment outcome expectancy measure. The first session for both treatment groups focused on the importance of and training in self-monitoring (eating habits or cognitions for the respective treatment groups).

Each treatment group was composed of eight subjects and a therapist. During the treatment phase, groups met for eight weekly sessions which lasted an average of 90 minutes each, and focused on the learning and practicing of treatment techniques. Throughout the treatment phase, subjects in both types of treatment were given

various record-keeping and homework assignments. The general format for each of the eight weekly sessions was as follows:

a. individual private weigh-in and collection of previous week's homework assignments

b. discussion and review of the previous session's material with subjects being encouraged to relate their experiences and reactions to what they learned

c. presentation of new material by the therapist

d. general discussion and role play of the new techniques with both therapist and subjects

e. subject given summary of important points from the session, new homework assignments, and record-keeping materials

At the beginning of the last treatment session, subjects completed a current exercise survey, the Beck Depression Inventory, the Confidence Scale, the Obesity Cognitions Scale, and the Eating Patterns Questionnaire. Subjects also completed a program evaluation questionnaire (Appendix I).

Follow-up and Debriefing

Only the eight weeks of the treatment phase are included for purposes of this dissertation. For the participant, however, the program included a follow-up/maintenance phase (described in Consent Form II, Appendix C-2). At the end of the treatment phase, four subjects (all "highs") in the behavioral treatment group withdrew from the program because they had either not lost weight or had obtained only modest losses; of these, two accepted referrals to a 16-week behavioral and nutrition education weight reduction program in the

community (free of charge to the subject), one subject was seen individually (free of charge) by the principal investigator, and one subject decided to join Weight Watchers. Subjects continuing in the program were provided with a written debriefing statement for the project at the last follow-up session (Appendix J).

CHAPTER III

RESULTS

Overview

The results section is divided into two major sections corresponding to the two types of issues addressed by the present study -- issues of treatment outcome and issues of treatment process. The first section examines issues of treatment outcome. Subjects' pre-post changes in weight provided the primary measure of treatment outcome. For weight loss, the specific outcome questions were the following: Did the different treatments differentially affect outcome for the two subject types? That is, was the predicted interaction between subject type (i.e., "high" and "low" cognitive responders) and type of treatment (cognitive or behavioral) upheld? Were the two treatments effective in producing weight loss? Was there a significant effect for type of subject on weight loss? Measures of psychological change were also assessed as clinically complementary to the measure of weight loss. The experimental questions were: Did treatments differentially affect change on the psychological measures? Overall, were decreases in the depression measure and increases in the self-efficacy measure related to weight loss? Finally, the results of a post hoc examination of a binge-eating measure and its relationship to treatment outcome as a predictor of treatment outcome is presented.

In the second section, the results of the analysis of the specific measures of treatment effects (i.e., cognitions and eating habits) are

presented. These questions were addressed: Did the treatments produce changes in the behaviors they target? Did changes in the targeted behaviors relate to changes in weight? Was the relationship between eating-related thoughts and eating habits differentially affected by the two treatments?

Treatment Outcome

Weight

The number of pounds lost during treatment was used to assess weight loss. Because two therapists each treated one-half of the subjects, an analysis was conducted with therapists as a separate factor. A 2(subject type) X 2(treatment type) X 2(therapist) analysis of variance (ANOVA) on the number of pounds lost revealed no significant main effect for therapists, nor significant interactions including therapists (Table 6). Both therapists produced weight loss, but not differentially. Consequently, therapists' groups were combined across conditions for the remaining analyses in the study.

A 2(subject type) X 2(treatment type) X 2(therapists) ANOVA was also performed on weight reduction quotients (WRQ) (Table 1). The WRQ is thought to be a more conservative measure of change, and to be more indicative of clinically significant change as it takes into account the subject's initial degree of obesity as well as variations in height and body weight (Brownell, 1981). The results of the analysis for the WRQ and the number of pounds lost were statistically identical (Table 7). Thus, as in previous studies (Ashby & Wilson, 1977; Green, 1978; Kingsley & Wilson, 1977), only the results for pounds lost are discussed in answering the outcome questions.

Did the Treatments Differentially Affect Outcome for the Two Subject Types?

A significant interaction between subject type ("high" or "low") and treatment type (cognitive or behavioral) was predicted for the number of pounds lost. Specifically, the prediction was that subjects classified as "high" cognitive responders would lose more weight when receiving the cognitive treatment than when receiving the behavioral treatment. Conversely, it was thought that subjects classified as "low" would lose more weight when receiving the behavioral treatment than when receiving the cognitive treatment.

The predicted interaction effect was not upheld by the ANOVA. The 2(subject type) X 2(treatment type) X 2(therapists) ANOVA on the number of pounds lost revealed a nonsignificant subject type X treatment type interacion, $F(1,24) = .92$, $p \leq .05$ (Table 6). Thus, the data did not support the hypothesis of differential treatment effects for the two distinct subject types.

Were the Treatments Effective?

It was predicted that, regardless of assessment classification ("high" or "low"), subjects in both types of treatment would lose weight. This prediction was based on the results of previous research supporting the efficacy of the two treatments employed in producing weight loss. Because the issue of treatment validity is not simply one of "effective" treatment, but rather, one of "more effective" treatment produced by assessment distinctions, demonstration that the treatments used were effective is particularly relevant.

Overall, subjects receiving the cognitive treatment showed a mean weight loss of 7.2 lbs (range +2.0 lbs - -18.0 lbs). The percentage of subjects losing at least 1 lb per week was 56.25%. Those receiving the behavioral treatment showed a mean weight loss of 6.7 lbs (range +3.0 lbs - -19.0 lbs). The percentage of subjects losing at least 1 lb per week was 62.5%. The least squares means post hoc tests revealed that both treatments produced weight losses that differed significantly from zero change (p = .0001 for both), but that the two treatments did not differ significantly (p=.69) from each other in the amount of weight loss produced (Table 6). Further, the main effect for treatments on the number of pounds lost was not significant, $F(1,24)$ = .2, $p \leq .05$, indicating that the treatments were not differentially effective.

Was There a Significant Effect of Subject Type on Weight Loss?

As discussed above, the predicted subject type X treatment type interaction was not obtained. Further, results supported the effectiveness of both treatments employed in producing weight loss, but showed no differential effectiveness of the two treatments. The question remaining to be answered is whether or not "high" and "low" cognitive responders responded differentially to both types of treatment.

The results of the ANOVA on pounds lost and the least squares means post hoc comparisons support a significant effect on weight loss for type of subject. The 2(subject type) X 2(treatment type) X 2(therapists) ANOVA revealed a highly significant main effect for type of subject, $F(1,24) = 34.2, p = .0001$. The least squares means post hoc comparisons revealed that both the "high" and "low" subject type

showed treatment weight losses that differed significantly from zero change (p = .0057 and p = .0001, respectively) (Table 6). Overall, however, subjects classified as "low" lost significantly (p = .0001) more weight (mean 10.9 lbs, range -7.0 lbs - -19.0 lbs) than those classified as "high" (mean 2.9 lbs range +3.0 lbs - -9.0 lbs) regardless of the type of treatment received. Of the subjects classified as "low", 100% of the subjects lost at least 1 lb per week; only 18.75% of subjects classified as "high" lost at least 1 lb per week. The mean number of pounds lost by subjects in each of the four treatment conditions is presented in Figure 1 (Figure 1 and all subsequent figures are located in Appendix K). Individual subject weight losses are displayed in Figure 2.

To summarize, the prediction that the two different treatments would differentially affect outcome for the two distinct subject types (a significant subject type X treatment type interaction) was not supported. Instead, the results of the 2(subject type) X 2(treatment type) X 2(therapists) ANOVA on pounds lost and the least squares means post hoc comparisons indicated that, while both types of subjects ("highs" and "lows") showed treatment weight losses significantly different from zero, subjects classified as "low" lost significantly more (p = .0001) weight than those classified as "high" regardless of the type of treatment received.

Effect of Treatments on Psychological Measures

Treatment outcome was also assessed by measures of psychological change. It was considered that the assessment of the covariation between weight loss and psychological change would be of clinical

relevance in determining any comparative advantages or disadvantages of the two treatments.

It was generally predicted that, regardless of the type of treatment received, subjects who lost weight would also evidence improvement on the depression measure and on the self-efficacy measure. Conversely, it was thought that subjects who did not lose weight would evidence no change or deterioration effects on these measures. No predictions regarding differential treatment effects on the psychological measures were made.

To examine data relevant to differential effects of the type of treatment on the psychological measure, and to the predictions made, the data were examined in several ways. First, 2(subject type) X 2(treatment type) analyses of covariance (ANOCOVA) with least squares means post hoc comparisons were used to assess the overall effect of treatments on the psychological measures. To examine further the specific predictions made, correlational analyses and individual subject data were examined. The results for the depression measure and the self-efficacy measure are discussed separately.

Did Treatments Differentially Affect Change on the Psychological Measures?

Depression measure. Subjects' pre-post difference scores on the Beck Depression Inventory were entered into a 2(subject type) X 2(treatment type) ANOCOVA using the pretreatment score as the covariate. The results showed only a significant subject type X treatment type interaction, $F(1,27) = 7.2, p \leq .01$ (Table 8). Least squares means post hoc comparisons revealed that both the cognitive and the

behavioral treatment produced decreases in BDI scores that differed significantly from zero change (p = .0001 and p = .0027, respectively). Also, both the "high" and "low" subject types showed significant decreases in their BDI scores (p=.0090 and p=.0001, respectively). (Table 8). The significant subject type X treatment type interaction resulted from the near zero change in BDI scores (mean .11) for "highs" receiving the behavioral treatment. The "high" subject type--cognitive treatment subjects showed a mean decrease of 4.5 on the BDI which was significantly higher (p = .0038) than the mean decrease of .11 for "high" subject type--behavioral treatment subjects. The mean decrease of 4.9 on depression scores for the "low" subject type--behavioral treatment subjects was also significantly higher (p = .0034) than that of the "high" subject type--behavioral treatment subjects. No other logical comparisons were significant. In summary, the treatments differentially affected change on the depression measure but only for the "high" subject type. The graph of the significant interaction may be seen in Figure 3. The individual subject data are displayed in Table 9.

Self-efficacy measure. A 2(subject type) X 2(treatment type) ANOCOVA conducted on difference scores for the Confidence Scale using the pretreatment score as the covariate revealed only a significant main effect for treatments, $F(1,27) = 4.2, p \leq .05$ (Table 10). Least squares means post hoc comparisons (Table 10) revealed differential effects for the two treatments. Cognitive treatment subjects evidenced mean increases in their Confidence Scale ratings that differed significantly from zero change (p = .0001). In contrast,

behavioral treatment subjects did not show significant change in their Confidence Scale ratings (p = .1172). Finally, the average increase in Confidence ratings shown by the cognitive treatment subjects (18.2) was significantly higher (p = .0502) than the average increase (6.5) for the behavioral treatment subjects. Thus, subjects' self-efficacy ratings were differentially affected by the type of treatment received. The cognitive treatment produced significantly greater increases in subjects' self-efficacy ratings than did the behavioral treatment. The mean increases in Confidence Scale ratings for subjects in the two treatments are shown in Figure 4. (The individual subject data are displayed in Table 9).

Least squares means post hoc comparisons among the four treatment conditions (see Table 10) revealed that both types of subjects ("highs" and "lows") receiving cognitive treatment evidenced significant ($p \leq .01$) increases in their Confidence Scale ratings though they did not differ significantly (p = .61) one from the other. In the behavioral treatment, subjects classified as "low" evidenced significant (p = .0328) increases in their Confidence Scale scores while those classified as "high" did not (p = .9827). The two subject types did not differ significantly (p = .1414), however, one from the other in the behavioral treatment. The mean increase in Confidence Scale scores for subjects in each of the four treatment conditions are depicted in the bar graphs in Figure 4.

Were Decreases in Depression and Increases in Self-efficacy Related to Weight Loss?

Generally, it was predicted that depression ratings would de-

crease and self-efficacy ratings would increase in relation to the subjects' weight loss regardless of the type of treatment received.

Depression measure. As described previously, the results of the ANOCOVA on BDI difference scores revealed that the depression ratings for subjects classified as "high" were differentially affected by the two treatments. Cognitive therapy produced significantly greater decreases in BDI scores for the "highs" than did the behavioral treatment. This finding suggests that the relationship between decreases in depression and decreases in weight was different under the two treatments. To compare the relationship between change in depression ratings and weight loss under the two types of treatment, a Spearman rank-order correlation coefficient was computed between difference scores on the BDI and weight loss for all subjects in each of the two treatments. For subjects in the behavioral treatment, a significant relationship (rho = .72, p = .0018) was found between decreases in BDI scores and weight loss. In contrast, however, a nonsignificant relationship between changes on BDI scores and weight loss was found for subjects in the cognitive treatment groups (rho = .32, p = .1234). The prediction of a relationship between decreases in depression ratings and weight loss was confirmed only for the behavioral treatment subjects.

Examination of the individual subject data (Table 9) revealed that 4 of the 8 "high" subjects (50%) in the behavioral treatment evidenced an increase on their BDI scores. Only 1 (12.8%) "high" subject in the cognitive treatment group evidenced a higher BDI score at posttreatment. Thus, a deterioration effect for some subjects classified as

"high" receiving the behavioral treatment was masked by the group mean which could only be interpreted as showing no change.

Self-efficacy measure. As described previously, the ANOCOVA for Confidence Scale difference scores revealed that subjects' self-efficacy ratings were differentially affected by the two treatments. The cognitive treatment produced significantly greater increases in Confidence Scale ratings than did the behavioral treatment. To examine the relationship between change in self-efficacy ratings and weight loss, a Spearman rank-order correlation coefficient was calculated between subjects' change in Confidence Scale scores and weight loss for subjects in each type of treatment. For subjects in the behavioral treatment groups, a significant relationship between changes in Confidence Scale scores and weight loss was found (rho = .53, p = .0363). Subjects losing more weight reported greater increases in their self-efficacy ratings. No relationship between changes in Confidence Scale scores and weight loss was found for subjects in the cognitive treatment groups (rho = -.06, p = .8135).

The individual subject changes on the Confidence Scale were also examined (Table 9). Similar to the results for the BDI, the group mean masked a deterioration effect for the "high" subject type--behavioral treatment subjects; of the 8 subjects in this treatment condition, 4 subjects (50%) evidenced a decrease in their Confidence Scale ratings at posttreatment. One "high" subject in the cognitive treatment condition also evidenced a decrease. No subject (regardless of type of treatment) classified as "low" evidenced a decrease on their confidence ratings.

Assessment of Binge-eating as a Predictor of Treatment Outcome

The Eating Habits Checklist (EHC) was used to assess the severity of subjects' binge-eating problems. For the total sample (N=32), scores ranged from 8 to 41 (Md=22). Of the total sample, 28.1% (n=9) of the subjects obtained scores evidencing severe problems with binge-eating (i.e., scores of 28 or greater), while only 18.75% (n=6) of the subjects could be classified as having no problems with binge-eating (scores of 15 or less). Examination of the distribution of EHC scores within subject types revealed that all of the subjects classified as having severe problems with binge-eating were in the "high" subject type group. Thus, 56% of the "highs" evidenced severe problems with binge-eating; the remaining 44% (n=7) evidenced moderate problems with binge-eating. Conversely, the 6 subjects classified as having no problems with binge-eating were in the "low" subject type group. Thus, 37.5% of the "low" subjects evidenced no problem with binge-eating; the remaining 62.5% showed moderate levels of binge-eating.

Overall, as shown in Table 11, subjects' scores on the EHC were highly predictive of weight loss during treatment (rho = -.55, $p \leq .002$) with higher scores on the EHC predicting smaller weight losses. Within the two subject types, the EHC continued to be a moderately strong predictor of weight loss (rho=-.47, $p \leq .06$) for subjects classified as "high", but not for those classified as "low" (rho = -.29, $p \leq .05$). Thus, the results showed the particular eating style of binge-eating to be a significant predictor of treatment outcome.

Finally, considering the disproportionate distribution of binge-eating problems between the two subject types and the strong relationship found between the severity of binge-eating and treatment outcome, examination of the nature of the relationship between the binge-eating measure (EHC) and the "subject types" measure (Cognitive Factors subscale of the MQ) seemed warranted. The overall relationship between subjects' ranks on the EHC and their ranks on the "subject types" measure was highly significant (rho = -.63, p = .0001) (Table 11). Greater severity of negative and self-defeating eating-related cognitions was associated with greater severity of binge-eating problems. Within the two subject-type groups, no relationship between subjects' ranks on the EHC and their ranks on the "subject types" measure was noted for either the "highs" (rho = -.06), or the "lows" (rho = -.14).

Treatment Process

The global measure of treatment outcome (weight) can only determine whether a given treatment is effective, not how or why it is effective. One purpose of this study was to provide data relevant to the examination of the process by which the two treatments employed effect change in weight. Thus, specific measures of the proposed efficacious process of the treatments were included. Three questions were addressed using measures specific to each of the treatments: Did the treatments produce change in the behaviors they purportedly target? Did changes in the targeted behaviors relate to changes in weight? Was the relationship between eating-related thoughts and eating habits differentially affected by the two treatments?

Did Treatments Produce Change in the Behaviors They Purportedly Target?

The data for the specific measures of treatment effects, the Obesity Cognitions Scale (OCS) and the Eating Patterns Questionnaire (EPQ), analyzed in this section were collected at two measurement occasions -- pretreatment and posttreatment. Difference scores were calculated for each measure. To answer the question asked in the present section, separate analyses were conducted for the Obesity Cognitions Scale and the Eating Patterns Questionnaire.

A demonstration that a treatment produces change in the specific response class it targets is necessary for claims of change by a given process. In the present study, it was generally predicted that, regardless of subject classification, subjects receiving the cognitive treatment would evidence significant change on the cognitive measure (OCS), and that this change would be significantly greater than that for subjects receiving the behavioral treatment. Conversely, it was predicted that subjects receiving the behavioral treatment would evidence significant change on the specific eating habits (assessed by the EPQ) and that this change would be significantly greater than that for those receiving the cognitive treatment.

Change in Cognitions

The Obesity Cognitions Scale (OCS) was used to assess change in the frequency of and belief in negative and self-defeating eating-related cognitions. Thus, two scores for the OCS, a frequency score and a belief score, were computed for each subject. The differential

effects of the two treatments on the frequency and belief scores are discussed separately. In each case, the data were analyzed using a 2(subject type) X 2(treatment type) ANOCOVA on the difference scores with the pretreatment score serving as the covariate. Post hoc comparison of means was made using the least squares means.

Frequency ratings. The 2(subject type) X 2(treatment type) ANOCOVA on difference scores for the frequency ratings revealed only a significant main effect for treatment type, $F(1,27) = 11.33, p \leq .01$ (Table 12). Comparison of the group means revealed that subjects in both the cognitive and behavioral treatment reported significant decreases in their frequency ratings (compared to zero change) (p's $\leq$ .005 for both; Table 12). Those in the cognitive treatment, however, reported a significantly greater ($p = .0023$) mean reduction in frequency ratings (mean 17.2) than subjects in the behavioral treatment (mean 6.82). The data for frequency ratings on the OCS supported the prediction that the cognitive treatment would produce significant change in subjects' cognitions and that this change would be greater than the change produced by the behavioral treatment. The mean decrease in frequency ratings for each of the four treatment groups may be seen in the bar graphs in Figure 5.

Belief ratings. Similar to the frequency ratings, the 2(subject type) X 2(treatment type) ANOCOVA on the difference scores revealed only a significant main effect for treatment type, $F(1,27) = 22.96, p \leq .0001$ (Table 13). Cognitive treatment subjects evidenced significant decreases ($p = .0001$) in their belief ratings though the behavioral treatment subjects did not ($p = .1274$). Not surprisingly, the mean

decrease in belief ratings for the subjects in cognitive treatment (20.1) was significantly greater (p = .0001) than the mean decrease in belief ratings for the behavioral treatment subjects (3.8). The prediction that cognitive treatment would produce significant changes in subjects' cognitions, and that this change would be greater than that produced by the behavioral treatment was supported also by the belief ratings of the OCS. The mean decrease in belief ratings for each of the four treatment groups may be seen in the bar graphs in Figure 6.

Summary. Overall, the data from the OCS offered firm support for the prediction that the cognitive treatment would produce significant change in the behavior it targeted -- subjects' eating-related cognitions. The cognitive treatment significantly decreased subjects' ratings for both frequency of and belief in the weight-related cognitions as assessed by the OCS. While the behavioral treatment produced significant decreases in subjects' frequency ratings, they were significantly smaller decreases than those produced by the cognitive treatment. The behavioral treatment did not produce significant decreases in subjects' belief ratings on the OCS.

Eating Habits

The Eating Patterns Questionnaire (EPQ) was used to assess change in eating habits targeted by the behavioral treatment. Five eating habits scores generated from the EPQ were computed for each subject. The five eating habits assessed were eating frequency, eating topography, eating in response to inappropriate stimuli (emotional eating), eating areas, and eating--no other activity.

The difference scores for the five eating habit measures were analyzed using a 2(subject type) X 2(treatment type) multivariate analysis of covariance (MANOCOVA) with the pretreatment scores serving as covariates. The results indicated a significant main effect for treatment type with a Wilks' lambda of .1720, which is equivalent to $F(5,19) = 18.29, p$ .0001, and a significant subject type by treatment type interaction effect with a Wilks' lambda of .3680, which is equivalent to $F(5,19) = 6.53, p \leq .001$ (Table 14).

Given the presence of the significant subject type by treatment type interaction effect, the five 2(subject type) X 2(treatment type) univariate ANOCOVAS on difference scores were examined individually. Consistent with the multivariate results, significant main effects for treatment type and/or subject type by treatment type interaction effects were found for the univariates for the eating habit measures of eating topography (Table 15), eating areas (Table 16), and emotional eating (Table 17). The univariate ANOCOVA for the eating frequency measure revealed a marginally significant ($p = .0720$) subject type by treatment type interaction effect (Table 18). No significant effects were found for the univariate ANOCOVA for the eating--no other activity habit measure (Table 19). The results of the 2(subject type) X 2(treatment type) univariate ANOCOVAS and the least squares means post hoc comparisons for each of the five eating habits are discussed briefly.

Eating topography. The 2 X 2 univariate ANOCOVA revealed a significant main effect for treatment type, $F(1,23) = 17.53, p \leq .001$ (Table 15). Subjects in both types of treatment reported significant

change (p = .0001) in the topographical components of their eating (e.g., fewer bites, more chews, increased duration of the eating episode). The behavioral treatment subjects, however, reported significantly greater change (p = .0004) in eating topography than did cognitive treatment subjects. The prediction that the behavioral treatment would produce significantly greater change than the cognitive treatment on the eating habits it targets was supported by the results for the eating topography measure. This significant main effect for treatment type may be seen in the bar graphs in Figure 7.

Eating areas. The 2 X 2 univariate ANOCOVA revealed a significant main effect for subject type, $F(1,23) = 9.20, p \leq .01$, treatment type, $F(1,23) = 23.9, p = .0001$, and a significant subject type by treatment type interaction effect, $F(1,23) = 4.7, p = .0410$ (Table 16). Subjects in all four treatment conditions showed significant change on their eating area scores (all p's $\leq .02$) (Table 16). Within the "low" subject type, subjects receiving behavioral treatment showed significantly greater (p = .0001) change in the degree to which they restricted eating to designated eating areas than did the cognitive treatment subjects. No differential treatment effects were found within the "high" subject type. Finally, within the behavioral treatment condition, "low" subjects evidenced significantly (p = .0015) greater change on the eating areas measure than did the "high" subjects. The prediction that the behavioral treatment would produce greater change than the cognitive treatment on the eating habits it targets was partially confirmed by the data for the eating areas measure. The behavioral treatment produced greater change than did the cognitive

treatment on eating area scores, but only for the "low" subject type. The significant interaction effect may be seen in the bar graphs in Figure 7.

Emotional eating. The 2 X 2 univariate ANOCOVA revealed a significant main effect for treatment type, $F(1,23) = 16.64, p \leq .001$, and a significant subject type by treatment type interaction effect, $F(1,23) = 5.21, p \leq .05$ (Table 17). Both types of treatment produced significant (p's .001) decreases in emotional eating (Table 17). For the "low" subject types, the cognitive treatment produced significantly greater change ($p = .0033$) in subjects' eating in response to inappropriate stimuli than did the behavioral treatment. While the behavioral treatment did produce significant change on this eating habit, the change was significantly less than that produced by the cognitive treatment. Thus, the prediction was only partially confirmed.

Eating frequency. Contrary to the predicted significant main effect for treatment type, the 2 X 2 univariate ANOCOVA revealed a nonsignificant main effect for treatment type, $F(1,23) = 1.3, p \leq .05$, a significant main effect for subject type, $F(1,23) = 4.2, p \leq .05$, and a marginally significant subject type by treatment type interaction effect, $F(1,23) = 3.6, p \leq .07$ (Table 18).

Both types of treatment produced significant reduction (p's = .0001) in the extent to which subjects deviated from the ideal eating frequency of just three meals per day, but with no difference between the reductions produced by the cognitive and behavioral treatments.

Since the interaction effect was marginally significant ($p \leq .07$), a post hoc comparison of treatment means was made. Subjects in all

four treatment conditions reported significant change on the eating frequency measure (all p's = .0001; Table 18). The "low" subject type--cognitive treatment group reported significantly greater improvement ($p = .0546$) than did the "low" subject type--behavioral treatment group. Further, improvement on this measure for the "low" subject type--cognitive treatment group was significantly greater ($p = .0089$) than that of the "high" subject type--cognitive treatment group. No other logical comparisons were significant. Contrary to the prediction, a differential treatment effect was not evidenced for the eating frequency measure. While the behavioral treatment produced significant change on this measure, the change was not significantly greater than that produced by the cognitive treatment. In fact, post hoc comparisons of the marginally significant ($p \leq .07$) interaction effect revealed that the cognitive treatment tended to produce greater change than the behavioral treatment in the eating frequency measure, but only for the "low" subject type (Figure 7).

As noted previously, the results of the 2x2 ANOCOVA revealed that eating frequency scores were differentially affected by the subject classification type (Table 18). A post hoc comparison of the means revealed that, regardless of the treatment received, the "low" subjects evidenced significantly greater decreases ($p = .0534$) on the eating frequency measure than did the "highs".

Eating--no other activity. The 2 X 2 univariate ANOCOVA revealed no significant main effects or interaction effects (Table 19). Least squares means post hoc comparisons revealed that subjects in both the behavioral treatment ($p = .0001$) and the cognitive treatment

(p = .0005) showed significant improvement in the degree to which they restricted all other activities while eating, and these improvements did not differ significantly (p = .6370) from each other (Figure 7). Consequently, the prediction was only partially confirmed.

Summary. It was originally predicted that the behavioral treatment would produce significant change in the specific eating habits it targets, and that the change produced would be significantly greater than that produced by the cognitive treatment. The 2(subject type) X 2(treatment type) MANOCOVA on the five eating habit measures revealed significant treatment type ($p \leq .0001$), and subject type by treatment type interaction ($p \leq .001$) effects. Examination of the five 2 X 2 univariate ANOCOVAS revealed that the predictions were partially confirmed.

As predicted, least squares means post hoc comparisons following the five 2 X 2 ANOCOVAS for the specific eating habits revealed that the behavioral treatment produced significant change for each of the targeted eating habits. The behavioral treatment produced greater improvement than did the cognitive treatment for the eating topography and the eating areas but only for the "low" subject type on this latter measure. For the specific eating habit measure of emotional eating, the change produced by the behavioral treatment was significantly less than that produced by the cognitive treatment, but only for the "low" subject type. Finally, on the eating frequency and eating--no other activity measures, the change produced by the behavioral treatment did not differ significantly from that produced by the cognitive treatment but both treatments produced significant changes.

Did Changes in the Targeted Behaviors Relate to Changes in Weight?

It was demonstrated in the preceding section that both treatments produced significant change in the specific behaviors they purportedly target. Demonstration that a given treatment produces significant change in the behavior(s) it targets for change is necessary, but not sufficient, for a claim of change by a given process. It is the relationship of the specific changes directed by the treatment (e.g., cognitions, eating habits) to weight loss that is critical to evaluation of the proposed mechanism of change. In the present study, it was predicted that changes in the specific behaviors targeted by the treatments would relate significantly to changes in eating (e.g., weight loss). The relationship between specific treatment-directed behavior change and weight loss was assessed for each type of treatment and for each of the four subject type x treatment type conditions by the Spearman rank-order correlation coefficient (see Table 20).

For subjects in the cognitive treatment, moderate relationships between subjects' weight change rank and their rank for change in frequency ratings (rho = .33) and their rank for change in belief ratings (rho = .36) on the Obesity Cognitions Scale were found. While not reaching statistical significance, the relationship between change in eating-related thoughts and weight change was in the predicted direction for subjects in the cognitive treatment.

For subjects in the behavioral treatment, moderate correlations between subjects' weight change rank and their rank for change on the eating frequency (rho = .48), eating topography (rho = .36), and

eating areas (rho = .35) categories of the EPQ were found (Table 19). The correlation for the eating frequency category approached statistical significance ($p \leq .06$). Since the relationship between weight change and change on the individual habit measures is likely to be greatly affected by between-subject differences in the appropriateness of the particular eating habit change for a given subject, subjects' WRQ ranks and ranks in change for all five eating habit categories combined was also assessed. This relationship was significantly strong (rho = .51, $p \leq .05$). Overall, for the behavioral treatment, the prediction that change in the specific treatment prescribed eating habits would relate significantly to weight loss was supported.

Was the Relationship Between Eating-Related Thoughts and Eating Habits Differentially Affected by the Two Treatments?

It was considered that knowledge of the nature and direction of the covariation between changes in eating-related thoughts and eating habits produced by the two treatments would be of clinical and conceptual relevance.

In addition to producing significant change in eating-related thoughts which correlate with weight loss, it would seem important in addressing process issues for the cognitive treatment to identify specific changes in eating habits that relate to weight loss and to show that these eating habit changes were significantly related to changes in eating-related thoughts. It was demonstrated previously that the cognitive treatment produced significant weight loss, and significant changes in the eating habits assessed. The interrelationship among the changes in weight, eating habits, and eating-related thoughts are shown in Table 20.

For subjects in the cognitive treatment, a significant relationship (rho = .55, $p \leq .05$) between change in the frequency of eating-related thoughts and change in the five eating habit categories of the EPQ combined was found. A moderate, though nonsignificant, relationship (rho = .37) between change in the belief in eating-related thoughts and the eating habit categories of the EPQ combined was also noted. No relationship was demonstrated between weight change and change on the eating habit categories of the EPQ combined (rho = .02). Examination of the individual eating habit categories revealed moderate correlations between change in the frequency of eating-related thoughts and all of the eating habit categories except eating topography (rho = .18). Only two of these eating habit changes, eating frequency (rho = .51, $p \leq .05$) and emotional eating (rho = .56, $p \leq .05$), were significantly related to weight change. Change in the emotional eating category was highly related to change in the belief in eating-related thoughts (rho = .48, $p \leq .06$). These findings indicate that a treatment that targeted cognitions also produced specific behavior changes that related significantly to weight change and to the change in the cognitions.

It was demonstrated earlier that the behavioral treatment produced significant change in the frequency of, but not in the belief in, eating-related thoughts. As may be seen from Table 20, no significant relationship among changes in the specific eating habit categories, changes in the frequency, or change in the belief in eating-related thoughts was found. Further, no relationship between changes in eating-related thoughts and weight loss was noted. While the

behavioral treatment produced significant changes in eating habits and in the frequency of eating-related thoughts, there were no relationships between these changes, or between changes in eating related thoughts and changes in weight.

CHAPTER IV

DISCUSSION

The present investigation examined the utility of a subject classification based on assessment results in identifying subjects who are responsive to different types of self-control treatment programs for weight control. More specifically, the "treatment validity" of classifying subjects on the basis of the severity of their negative and self-defeating eating-related thoughts was examined by evaluating the contribution of this assessment distinction to treatment effectiveness for two different types of treatment. The treatment validity question was: Do subjects reporting severe problems with negative and self-defeating weight-related thoughts respond better (i.e., lose more weight) to a treatment which targets this particular response class than to a treatment which teaches new eating habits, and conversely, do subjects reporting few problems with negative and self-defeating eating-related thoughts (i.e., those with positive thoughts) respond better to a treatment which teaches new eating habits than to a treatment which focuses on altering negative thoughts? The relationship of a specific eating pattern--binge-eating--to treatment outcome and to the subject classification based on assessment was also examined. In addition to weight measures, measures of the psychological changes produced by the treatments were included in assessing treatment outcome. The present study further examined process issues relating to the proposed differential effectiveness of the two treatments by

examining specific measures of treatment effects. The questions addressed were: Did the treatments produce change in the specific behaviors they target? Did changes in the targeted behaviors relate to changes in weight? Was the relationship between eating-related thoughts and eating habits differentially affected by the two treatments?

Overall, the results showed that both types of treatment were effective in producing weight loss. Subjects classified as "low" cognitive responders (i.e., those with more positive thoughts) lost significantly more weight than those classified as "high" cognitive responders regardless of the treatment received. The relationship between binge-eating and weight loss and between binge-eating and the subject classification measure (Master Questionnaire) were both highly significant. Higher binge-eating scores were predictive of lower weight losses, and strongly associated with lower scores on the MQ which indicate severe problems with negative and self-defeating eating-related thoughts. Examination of the psychological measures of treatment effects revealed a differential treatment effect for the behavioral treatment but only for those subjects classified as "high". In the behavioral treatment, the "high" subject type group evidenced no improvement on their depression scores; individually, some subjects in this group evidenced increases in their depression ratings at posttreatment. Subjects' ratings of self-efficacy were differentially affected by the two treatments. Cognitive treatment subjects evidenced greater increases in self-efficacy than did the behavioral treatment subjects.

In examining treatment process issues, the results indicated that both treatments produced significant changes in the behaviors they

targeted (eating habits or thoughts), and that these changes were related to weight loss. Finally, the covariation between changes in eating behavior and negative eating-related thoughts was differentially affected by the two types of treatment. The cognitive treatment produced significant changes in the frequency of and belief in negative thoughts and for each of the eating habits assessed by the Eating Patterns Questionnaire. Further, these changes were positively correlated. In contrast, the behavioral treatment produced significant changes only for the eating habits measure and the frequency of negative thoughts, but changes on these measures were not related.

The present study examined both outcome and process questions. In discussing the findings, the outcome questions are addressed first and then the process questions. For each set of questions addressed, the results are compared to the experimental predictions made and to past research. Subsequently, the strengths and limitations and the clinical implications of the findings are discussed.

Treatment Outcome

Treatment Validity Issue

The treatment validity hypothesis examined here necessitates two predictions regarding treatment outcome: (a) a prediction that, overall, both treatments employed would be effective (i.e., produce weight loss); (b) a prediction of differential treatment effectiveness based on the outcome of assessment. First, based on previous research supporting the efficacy of both the cognitive change intervention and the basic behavioral treatment program in producing weight loss, the prediction was made that, regardless of assessment classification

("high" or "low"), overall, subjects would lose weight in both types of treatment. Second, a significant subject type X treatment type interaction was predicted. The general prediction was that those subjects classified as "high" would lose more weight in the cognitive treatment than in the behavioral treatment, and conversely, that those subjects classified as "low" would lose more weight in the behavioral treatment than in the cognitive treatment. From a treatment perspective, the prediction of treatment validity was based on the fact that previous research has shown that effective weight loss can be produced by treatments that target either specific overt eating behaviors hypothesized to contribute to overeating, or treatments that target the particular response class of subjects' negative and self-defeating eating-related cognitions. Thus, both response classes may covary with obesity and contribute differentially to a given obese individual's overeating. The results of a pilot study (reported in the Introduction) indicated that, while not identifiably different on measures of eating habits, subjects differed significantly on the severity of their self-reported negative and self-defeating eating-related cognitions. In the present study, those subjects evidencing severe problems with negative and self-defeating eating-related cognitions were predicted to respond better (i.e., lose more weight) in the cognitive treatment than in the behavioral treatment. For these subjects, the negative and self-defeating eating-related cognitions were viewed as the critical response class maintaining overeating (theoretical controversies regarding the role of cognitions aside). Since the behavioral treatment focuses on teaching specific overt controlling behaviors to particular

environmental stimuli, it was predicted that the behavioral treatment would be less effective for the "high" subject type since it does not target the critical stimuli and responses maintaining the overeating. Conversely, from a treatment perspective, subjects evidencing low rates of negative and self-defeating eating-related cognitions were predicted to be more successful in the behavioral treatment than in the cognitive treatment. While the process by which the behavioral treatments effect weight loss is as yet unclear, the treatment has been shown to be an effective treatment for obesity. Subjects who do not engage in excessive negative eating-related cognitions were predicted to be less successful in the cognitive treatment because they do not have a problem (i.e., excess) in the response class targeted by the treatment (i.e., a "floor effect" was predicted). Further these subjects would not be receiving specific techniques to help them change their eating habits.

In support of these predictions, previous research investigating client-by-treatment interactions has demonstrated that the use of a technique unrelated to or incompatible with the skills or deficits of the subject can mitigate the effect of an otherwise effective treatment (Bellack et al., 1976; Elder et al., 1981; Rozensky & Bellack, 1976). On a conceptual level, the response class of eating-related cognitions has been hypothesized to play a critical role in the self-control of eating and has integrated well into recent theoretical perspectives of self-regulation generally (Mahoney et al., 1977; Mahoney & Arnkoff, 1978). More specifically, recent studies (e.g., Leon et al., 1977; Sjoberg & Persson, 1979; Spencer & Fremouw, 1979; Woody et al.,

1981) suggest that negative cognitions (self-statements) may function both to prompt overeating and to decrease the probability of an individual engaging in an effective controlling response in the eating situation; conversely, positive cognitions (e.g., positive self-evaluations or self-instructions) may serve as effective discriminative stimuli for engaging in a controlling response and as reinforcing stimuli which increase the probability of the individual engaging in the controlling response in the future.

Overall Treatment Effectiveness

The present data are consistent with those of previous studies demonstrating the efficacy of both the cognitive treatment (e.g., Block, 1980; Dunkel & Glaros, 1978; Youdin & Hemmes, 1978) and the behavioral treatment (e.g., Jeffrey, Wing, & Stunkard, 1978: Wilson & Brownell, 1980) in producing weight loss. Overall, in the present study, both treatments produced significant decreases in weight. The magnitude of weight loss produced by both treatments was similar.

Since the questions addressed in the present study were specifically and exclusively concerned with comparisons among outcomes by subject type and treatment type, a control condition was not included. Consequently, no statement regarding the efficacy of these two types of treatment compared to control conditions can be made on the basis of the present study. There are now, however, sufficient data to show that weight does not change significantly as a function of the passage of time or the effects of repeated measures (Jeffrey, 1974; Wilson, 1978). To illustrate, Table 21 (Appendix B) displays the weight change data for ten studies which have used various types of

control groups as well as treatment groups similar in content and duration to those employed in the present investigation. As may be seen in Table 21, a number of well controlled studies have included either a no-treatment control or a waiting-list control group and have found weight changes of ±2 lbs. Because of these consistent findings, the inclusion of a waiting-list or no-treatment control group in the present study was considered unnecessary experimentally and questionable ethically.

A "non-specific" or placebo control condition was not included because both treatments employed were considered to incorporate the "non-specific" influences of the therapeutic process so that differences between the treatments are reasonably attributed to a specific treatment effect (i.e., the focal differences between the treatments) (cf. Wilson, 1978). Essentially, each treatment was considered a sufficient control condition against which to test the other treatment. Finally, to date, the basic behavioral program has been found to be the most effective treatment for producing short-term weight loss and may be considered the standard against which all other treatments must compete.

In the present study, the amount of weight lost by subjects in both the behavioral treatment (6.7 lbs) and the cognitive treatment (7.2 lbs) is similar to that reported by other studies. For example, Ashby and Wilson (1977) reported mean weight losses ranging from 6.36 lbs to 8.93 lbs after 8 weekly sessions of behavioral group treatment (based on Stuart & Davis, 1972). Similarly, Hall, Bass, and Monroe (1978) reported mean weight losses ranging from 7.2 lbs to 8.4

lbs following 10 weekly sessions of behavioral group treatment. In their review of the literature, Jeffrey, Wing, and Stunkard (1978) reported mean weight losses across studies ranging from 3.17 lbs to 19 lbs following behavioral treatment of 4 to 15 weeks duration. Using a cognitive restructuring technique, Block (1980) reported a mean weight loss of 9.3 lbs for subjects following 10 weeks of treatment. After 8 weeks of treatment, Collins (1980) reported a mean group weight loss of 5.5 lbs for the cognitive treatment subjects. Thus, the weight losses in the present study are similar to those of previous studies employing treatments similar to the ones used here.

Differential Treatment Effects Based on Subject Classification by Assessment

Treatment validity of the subject classification based on assessment. The prediction of the "treatment validity" of classifying subjects on the basis of their assessed negative and self-defeating eating-related cognitions was not demonstrated. The two treatments did not differentially affect outcome for the two subject types. The analyses for the number of pounds lost during treatment revealed that, regardless of the treatment received, subjects classified as "low" lost significantly more weight than those classified as "high". Therefore, the utility of the subject classification in making a differential treatment decision (between the cognitive treatment and the behavioral treatment) was not supported. The subject classification based on assessment was found, however, to be useful in identifying treatment responders and non responders for both treatments employed.

The present study is one of the first attempts in the literature to demonstrate the effects of two different treatments for obesity based on a subject classification that is clinically and conceptually relevant to the study of overeating and its treatment. There are several possible reasons why the treatment validity prediction was not obtained. In the case where the predicted significant subject type by treatment type interaction does not obtain, several questions arise: Is the non-significant interaction due to ineffective treatment, ineffective assessment, or to the "match" between the assessment distinction and treatment? The potential contributions of each of these three factors to the results of the present study are addressed.

In the present case, the treatments used were found to be effective treatments. Overall, both treatments produced significant pre-and posttreatment weight loss. The magnitude and intersubject consistency of the weight losses observed for the "lows" in both treatments increase further the confidence with which to assert that treatments were effective. Further, the measures of treatment integrity assessed suggest strongly that the treatments were identifiably different, that the outcomes were not produced by increased exercise (a behavior that may be related to weight loss but which was not an explicit part of either treatment), and that there was a reasonable level of subject adherence to the treatments. Thus, the contribution of ineffective treatment to the present results may be ruled out.

The possible contribution of ineffective assessment to the present results would be that the assessment classification did not make the distinction between those subjects with high vs. low rates of negative

and self-defeating cognitions. To increase the confidence that the assessment distinction was reliable, the present study included a "double screening" procedure for subject classification by using behavioral role-play data in combination with self-report questionnaire data. When examined separately, the two assessment measures (the Master Questionnaire and the role-play responses) yielded identical classification for each of the 32 subjects. Given the problem of obtaining a valid measure of cognitions (i.e., no criterion measure available), however, the possible contribution of ineffective (i.e., inaccurate) assessment to the present results cannot be ruled out completely.

The third possible factor contributing to the present results is that the distinction made in assessment does not distinguish functionally between treatments--i.e., the "match" between assessment and treatment was ineffective. There are several possible reasons why the match did not distinguish between treatments. First, it is possible that the assessment distinction, even if reliable, may have been "over-inclusive" or "impure" which would in turn affect the match between assessment and treatment. The assessment distinction as made by the Cognitive Factors subscale included a broad range of content areas for negative thoughts and attitudes. The assessment included negative and maladaptive thoughts and beliefs relating not only to dieting specifically (e.g., "When I am dieting, I don't feel like I am making progress unless I feel hungry." or "Sometimes I feel like my eating is out of control and I can't do anything to stop it.") but also to the more general category of thoughts and beliefs regarding self and personal capabilities unrelated to dieting (e.g., "Sometimes I feel I have been unjustly treated by God or nature.", "I feel helpless in

many aspects of my life."). The assessment distinction may have distinguished subjects more on the basis of generalized negative thoughts and beliefs regarding self and personal capabilities in a broad range of situations and not just on the basis of negative and self-defeating thoughts related to dieting. While the results of a pilot study conducted by this author (reported in the Introduction) indicated that the negative thoughts and beliefs assessed by the Cognitive Factors subscale of the MQ were specific to weight and not related to a generalized negative thinking style, the results were based on a limited sample. Data to evaluate that question for subjects in the present study were not collected. Greater specificity of assessment for the content of negative cognitions may have resulted in a more effective "match" between assessment and treatment.

In the present study, binge-eating correlated highly with the subject subtypes measure. This finding is consistent with research showing the pattern of binge-eating to be associated strongly with cognitive factors such as distorted reasoning about food or negative attitudes regarding personal efficacy in weight control (e.g., Gormally et al., 1982; Loro & Orleans, 1981). The fact that the "high" subject type contained a disproportionately large number of subjects (relative to the total sample) who evidenced severe binge-eating problems may have precluded the assessment distinction from distinguishing functionally between the treatments. Specifically, this finding offers a possible explanation of the failure of the cognitive treatment to be the more effective treatment for the "high" subject type. Binge-eating may be conceptualized as a complex pattern of behavior involving severe

problems in cognitive and affective responses as well as specific eating habit problems (Gormally et al., 1982; Loro & Orleans, 1981; Orbach, 1978; Wilson, 1976). Effective treatment may require intervention specific to each response class involved (Loro & Orleans, 1981). Thus, while the cognitive treatment would be predicted to be effective for the cognitive and affective responses associated with binge-eating, the cognitive treatment would not be expected to offer a completely effective treatment for binge-eating because it does not teach specific eating habit changes. In the present study, the cognitive treatment did have a significant impact on the negative cognitions of the "highs" (as well as their depression and self-efficacy ratings) but was relatively ineffective in producing weight loss which may be owing to the fact that specific behavior change techniques were not included. The finding that the behavioral treatment was relatively ineffective for the binge-eaters is consistent with past assertions that the typical stimulus control procedures utilized in behavioral treatments for obesity may be ineffective for clients with binge-eating problems (Wilson, 1976). The behavioral treatment would also be predicted to be ineffective with binge-eaters because it does not include techniques which deal directly with the cognitive and affective responses of binge-eating.

Differential treatment outcome based on subject classification. In the present study, subjects classified as "low" lost significantly more weight than those classified as "high" regardless of the type of treatment. In contrast to the initial prediction, that the "low" subject type would be more successful in the behavioral treatment than in the cognitive treatment, both treatments were found to be equally effective

for the "lows". The prediction was based on the assumption that subjects with relatively low rates of negative cognitions would not do well in the cognitive treatment because they did not have problems (i.e., excesses) in the response class targeted by the treatment (i.e., a "floor effect" was predicted). Three questions are raised by these results. First, why was the cognitive treatment effective for the "low" subject types? Second, why was the cognitive treatment not effective for subjects "high" in negative and self-defeating eating-related thoughts? Third, how may the differential treatment outcome based on subject type be explained?

The fact that the cognitive treatment was effective for the "lows" who did not evidence severe problems with negative and self-defeating thoughts may suggest that the cognitive treatment has its effect by processes other than the hypothesized alteration of dysfunctional cognitions. Ideally, an interpretation of the effectiveness of the cognitive treatment for the "lows" should also provide some insight into why the "lows" were more successful than the "highs" in the cognitive treatment. One possible explanation of the effectiveness of the cognitive treatment for the lows is that the intervention behavior (recording the negative thought or "urge to overeat, evaluating the thought and writing a positive counter-response, or the use of self-instructional technique) breaks the normal eating chain in problematic eating situations (cf. Youdin & Hemmes, 1978). Within the perspective offered by this interpretation, the effectiveness of the cognitive treatment would be dependent on subjects' skills in self-observation. As is discussed below, if the "highs" were in some way less proficient at this skill

than the "lows", then this would explain the finding of superior outcome for the "lows".

Alternatively, the cognitive intervention strategy may function to provide a form of consequence control. The intervention (recording the negative thought, evaluating the thought, and writing a positive counter response, or the use of self-instruction) may decrease overeating by serving to make both the long-term negative consequences of overeating and the short-term aversive consequences produced by breaking a resolution of self-control (cf. Skinner, 1953) more cogent when confronting problematic eating situations. At the same time, the long-term positive consequences of controlled eating (i.e., weight loss) and the avoidance of the immediate aversive consequences of breaking self-control are also emphasized (cf. Ferster et al., 1962). Within this perspective, one way to discuss the differences between the highs and lows is with reference to the repertoire of verbal responses with which subjects enter treatment. A goal of treatment within an interpretation by consequence control is to teach subjects an extensive repertoire of verbal responses which they may use to remind themselves of both the negative and positive consequences associated with their behavior in the problematic eating situation. For example, subjects who enter treatment with relatively well developed repertoires of positive self-statements in the form of positive self-instruction and positive self-evaluation would have less to learn in treatment. Treatment may then be viewed as structuring practice for these verbal responses until they have a high probability of occurring in the eating situation. The task of subjects who enter treatment with a repertoire of negative responses

which have a high probability of occurring in situations of self-control would have a more difficult learning task as the repertoire of negative verbal responses may be functionally incompatible with the learning of responses which remind the subject of the contingencies governing overeating and self-control. In the present study, the fact that the "lows" evidenced high rates of responses (mean 2.6) scorable as positive self-statements (e.g., "Eating a cookie will only make you feel worse, your clothes don't fit already.") on the screening role-play task suggests that these subjects entered treatment with a repertoire of verbal responses which they could use to remind themselves of the consequences of overeating. In contrast, the "highs" gave an average of .13 responses scorable as positive self-statements. Anecdotal support of this interpretation is also offered by the Thought Diaries of the "lows". In the first week of self-monitoring (prior to any training in specific cognitive change techniques) the Thought Diaries of the "lows" contained many examples of the use of self-statements as a form of consequence control (e.g., self-defeating thought: "I really want a piece of that cake." positive response: "No, eating it will only make me feel bad. I am determined to lose this weight!").

In the present study, the subject classification predicted treatment responses in both types of treatment with those subjects classified as "low" losing significantly more weight than those classified as "high". These results are consistent with the correlational data of Mahoney and his associates (Mahoney et al., 1977; Straw et al., 1984) which showed that subjects who entered treatment with more positive cognitions (as assessed by the Master Questionnaire) lost more weight

than those subjects entering treatment with relatively negative cognitions. The present findings are also similar to those of Leon et al. (1977) which showed that successful dieters reported using more positive self-statements in the form of covert self-instruction and self-evaluation than unsuccessful dieters. The overall differences found between weight loss for the "lows" and "highs" in the present study is discussed from the perspective of differences between the subjects in the severity of their eating disorder, and from the perspective of differences between the subjects in self-control skills. Interpretations from these two perspectives are not mutually exclusive but rather are viewed as simply differing levels of analysis since deficits in self-control skills may reasonably be used to explain the learning of a number of maladaptive eating patterns.

Given that the subject classification measure also distinguished subjects on the basis of the severity of their binge-eating problems, the subject classification may be considered to be a measure of the severity of the eating disorder. As discussed above, effective treatment of binge-eating may require multi-component treatment programs. In the present study, subjects received interventions which targeted only cognitive-affective responses or specific eating behaviors. For those with more severe eating problems, both types of intervention strategies may be needed. Targeting only one response class as in the present case may produce only minimal success. The present results suggest that subjects with what may be considered less severe eating problems (the "lows") may be treated effectively by targeting either response class. While the effective mechanisms have not been

explained fully as yet, research has shown both approaches to be effective strategies for producing weight loss.

A second interpretation of the present data is that the subject classification distinction reflects differences between subjects in the skills important in self-regulation. Since all major theoretical conceptualizations basically assume that self-control is learned, and since individuals differ in their learning histories, logically one would expect considerable variability in individuals' self-control behavior (cf. Bellack et al., 1976; Rosenbaum, 1980). The assessment of such individual differences has been relatively ignored, however, in the study of self-control treatments. The implicit assumption in the use of self-control treatment strategies has been that all subjects who come to treatment are equally capable of employing the self-control procedures. Kiesler (1966) coined the term "Patient Uniformity Myth" to describe this assumption.

In addition to a repertoire of controlling responses, other skills are necessary for effective self-control. A central task of self-control is to learn to analyze the environment in terms of reinforcement contingencies. Without the ability to discriminate behavior-environment interactions, the repertoire of controlling responses cannot be used effectively. A major behavior for analysis then becomes the individual's self-observation skills (cf. Brigham, 1982). Individual differences in self-observation skills (of which self-monitoring is a specific example) may be one way in which subjects differed in their pretreatment skills in self-control. The severity of subjects' negative and maladaptive self-statements regarding personal ability, eating, and

weight control may be reflective of the subject's deficit in discriminating behavior-environment relationships in his or her own life and of the resultant past failures at self-control. While this may be one way in which subjects differed in their ability to employ the self-control procedures, no data directly relevant to this interpretation were collected and analyzed to address this possibility specifically. The adherence data which consisted of the subjects' completion of self-monitoring records provide some support for this notion, however. The "high" subjects' lower adherence scores may reflect the fact that these subjects initially possessed less effective self-observation skills than did "low" subjects. The interpretation of lower adherence scores may be that subjects were unable as opposed to unwilling to comply with the self-monitoring task. The "high" subjects were not incapable of self-observation/self-monitoring, but may have possessed less ability relative to the specific group of "lows" selected. For subjects receiving the cognitive treatment, a comparison of the Thought Diaries of the "highs" and "lows" for the first week of self-monitoring provides some anecdotal support for the hypothesized differences in self-observation skills. A major difference between the "lows" and "highs" in the recording of negative and self-defeating thoughts appeared to be in the temporal relationship to eating. The "lows" seemed to be able to identify such thoughts prior to eating while the negative thoughts recorded by the highs were frequently noted to occur <u>after</u> an eating episode--i.e., when it was too late to engage in a controlling response. The "highs" seemed to require several weeks of practice before they could use the cognitive intervention techniques as controlling

responses. Some never learned to discriminate the behavior-environment relationships.

If the differential effectiveness of treatments based on the subject classification is interpreted as a result of the difference between subjects in self-control skills, then the failure to find differential treatment effects within the subject types is reasonable. For subjects who came to treatment with the basic skills for effective self-regulation, either type of treatment may offer a strategy for systematically applying these skills to weight control. Conversely, those subjects who come to treatment with less proficient self-regulation skills would evidence similar performance across self-control treatments to the extent that success in the treatment is dependent on the skills in which the subject lacks proficiency. In the present case, that skill may be related to self-observation/self-monitoring skills.

The present findings and interpretations are consistent with those of Rozensky and Bellack (1976). These researchers found that a pretreatment classification of subjects based on their frequency of positive self-reinforcement on an abstract task predicted success in a behavioral weight control program. Subjects evidencing high rates of positive self-reinforcement lost significantly more weight than those subjects evidencing low rates of positive self-reinforcement. These differences were interpreted as reflecting individual differences in self-control skills within a theoretical model conceptualizing self-control as a three-stage process involving self-monitoring, self-evaluation, and self-reinforcement. The claim that the difference assessed was one of self-reinforcement skills is arbitrary, however. The concept of self-

reinforcement may be interpreted in terms of learning to discriminate when a response is appropriate and will be reinforced (cf. Catania, 1976). With this interpretation, the results of Rozensky and Bellack (1976) are interpreted easily as deficits in self-observation skills.

Effects of Treatments on Psychological Measures

The effects of the two treatments on subjects' depression ratings and self-efficacy ratings were assessed. Overall, the prediction regarding these measures was that, regardless of the treatment received, subjects who lost weight would evidence improvement while those subjects not losing weight would evidence no change or deterioration effects. The predictions were only partially confirmed. The effects of each of the two treatments on the psychological measures are discussed separately.

The impact of the behavioral treatment on the measures of psychological change was mediated by subject type. For the "low" subject type, the behavioral treatment produced positive changes on both subjects' depression and self-efficacy ratings. The improvement on depression ratings produced by the behavioral treatment supports the growing body of literature which shows no adverse psychological or emotional consequences as a result of weight loss in behavioral treatment programs but rather suggests that positive changes are more often reported (Brownell et al., 1978; Collins, 1980; Craighead et al., 1981; Straw & Terre, 1983; Wollersheim, 1970). The finding of increases in the "low" subjects' self-efficacy ratings is also consistent with predictions derivable from Bandura's (1977b) self-efficacy theory.

Bandura asserts that self-efficacy is best established (increased) by performance accomplishments.

The impact of the behavioral treatment on the psychological measures for the "high" subject type was in direct contrast to that observed for the "low" subject type. For the "highs", the behavioral treatment did not produce significant improvement for subjects' depression or self-efficacy ratings. On the group level, the finding of no change in depression ratings is consistent with the finding of Taylor, Ferguson, and Reading (1978) who reported no change in depression measured by the Profile of Mood States (POMS) for subjects receiving behavioral weight control treatment. The finding of individual deterioration effects on depression ratings for 50% of the subjects is more consistent with the findings of previous researchers (e.g., Glucksman et al., 1968; Stunkard & Rush, 1974) who have reported increases in depression ratings for subjects receiving traditional treatments for obesity (i.e., psychotherapy and nutrition counseling).

For the "high" subject type when subjects are considered as a group, the behavioral treatment did not produce significant change on subjects' self-efficacy ratings. Individually, 50% of these subjects evidenced <u>decreases</u> in their self-efficacy ratings at posttreatment. In contrasting the effects of the behavioral treatment on the self-efficacy measure for the two subject types, the obvious difference lies in the magnitude of weight lost by the two groups. Even though the explicit goal of the treatment was described as change in eating habits and not simply weight loss, it is possible that in the presence of minimal

weight losses, subjects discounted any success they may have experienced in changing eating habits, contributing to their failure to report change in self-efficacy.

Bandura (1977b) hypothesized that expectations of personal efficacy play an important role in determining whether or not self-control behavior will be initiated and how long it will be sustained in the presence of aversive experiences. Consistent with their lowered self-efficacy ratings, 50% of the "highs" declined further participation in the program at the end of the 8 weeks of active treatment reported here.

The cognitive treatment produced positive improvements on both the depression ratings and the self-efficacy ratings. Further, the cognitive treatment produced similar changes on the psychological measures for both subject types. The present finding of significant decreases in depression produced by the cognitive treatment is consistent with that of Collins (1980) who reported that a cognitive treatment for weight control produced significant decreases on subjects' BDI scores. The present findings are also consistent with a large body of literature supporting the efficacy of a cognitive treatment approach in the treatment of depression (e.g., Beck et al., 1979; Rush, Beck, Kovacs, & Hollon, 1977; Shaw, 1977). In the present case, the cognitive treatment produced changes in subjects' depression ratings independent of their weight loss, a fact which may be interpreted as evidence of greater response generalization produced by the cognitive treatment than by the behavioral treatment. Similarly, the cognitive treatment produced significant increases in subjects' self-

efficacy ratings which were unrelated to the subjects' weight-losses during treatment. Apparently, despite minimal weight losses, the "highs" receiving the cognitive treatment experienced sufficient success in changing cognitions and/or other important areas (e.g., depression) to increase their ratings of self-efficacy. This notion is further supported by the fact that all of the highs receiving the cognitive treatment continued in the treatment program after the 8 weeks of active treatment.

In their review of outcome research, Bergin and Lambert (1978) emphasized the need to assess the possibility of negative effects of treatment. They argued that efficacious techniques capable of producing positive changes are capable of producing negative changes as well. This potential is illustrated clearly by the present findings. The present results emphasize the fact that treatment outcome should not be evaluated solely by measures of weight loss. While the two treatments were equally ineffective in producing weight loss for the "high" subject type, the cognitive treatment produced greater psychological improvements while the behavioral treatment produced adverse side-effects. Further, the present study highlights the need to analyze and report individual subject data on all measures of change. Conclusions based on group means may mask important adverse consequences of treatment for specific individuals.

Treatment Process

Since all subjects, regardless of the treatment received, were assessed for changes on measures relevant to each type of treatment employed (i.e., thoughts, eating habits, and weight), the present

study provides data relevant to the examination of the process by which the two treatments effect change in weight.

Changes in Treatment-Prescribed Behaviors

A demonstration of change in the specific responses or response class targeted by a given treatment is necessary for a claim of change by a given process. The initial predictions were that each type of treatment would produce significant change in the specific responses or response class it targets. That is, the cognitive treatment was predicted to produce significant change in subjects' eating-related cognitions, and this change was predicted to be greater than the change produced by the behavioral treatment. Conversely, the behavioral treatment was predicted to produce significant change on the specific eating habits it targets, and this change was predicted to be greater than the change produced by the cognitive treatment. Overall, the results supported the initial predictions. The specific effects of the treatments on each of the two response classes assessed are examined in more detail.

Differential treatment effects on subjects' eating-related cognitions. Overall, the cognitive treatment produced significantly greater changes in subjects' ratings of both the frequency of and belief in negative and self-defeating eating-related cognitions than did the behavioral treatment. Thus, the cognitive treatment was shown to produce change in the specific response class it targets. The present study is the first study investigating a cognitive intervention for weight control to include assessment of the changes in subjects' cognitions produced by treatment. The demonstration that the cognitive treatment

produced significant changes in subjects' cognitions is an important finding apart from whether or not this change relates to the global measure of treatment outcome (weight loss). On an applied level, if a specific treatment is shown to effect changes in a specific response or response class, then some demonstration of the effectiveness of the technique is provided. The technique may then be of use when the desired change is in the specific response targeted by the technique (cf. Wilson, 1978).

In contrast to the effects of the cognitive treatment, the behavioral treatment produced significant change in the frequency of negative eating-related thoughts but only for the "low" subject type. Subjects' rated belief in the negative cognitions was not affected by the behavioral treatment. The significant decrease in the frequency of negative thoughts produced by the behavioral treatment for the "lows" may be interpreted as covarying with the effective use of the stimulus narrowing and cue elimination techniques taught in the behavioral treatment. By eliminating food cues and restricting food consumption to a limited set of stimulus conditions, subjects perhaps avoided the environmental determinants of the negative thoughts. Consistent use of these techniques (as was reported by the "lows") would also decrease the negative thoughts which may be triggered in response to instances of the subject's violations of self-control. This argument would not, however, apply to the "highs" since they did not show changes in the frequency of their negative cognitions, and showed significantly less change than did the lows in the extent to which they eliminated food cues and restricted their eating to designated eating

places. As for the belief ratings, avoidance of the environmental determinants of negative thoughts would not provide, however, for the learning of an alternate cognitive response. When confronted with the same stimuli, the "belief" (i.e., control by past history of reinforcement) may be unchanged.

Differential effects of treatments on specific eating habits. Overall, the results generally supported the prediction that the behavioral treatment would produce significant change on the specific eating habits targeted. Previously, Wollersheim (1970) has reported that subjects receiving behavioral treatment evidenced greater change on the Eating Patterns Questionnaire than did subjects in a social pressure group, a nonspecific therapy group, or a waiting-list control group. Contrary to the initial predictions, however, the present data only partially supported the prediction that the behavioral treatment would produce greater change than the cognitive treatment on the specific measures of eating habits. The analyses for individual eating habits following the significant treatment main effect and the significant subject-by-treatment interaction effect for the MANOCOVA revealed differential treatment-type and/or subject-type effects for four of the five eating habits assessed.

The behavioral treatment produced significantly greater change than the cognitive treatment on the eating habit category of eating topography, and on the eating areas measures but it did so only for the "low" subject type on this latter measure. Consistent with the weight loss data for the behavioral treatment, subjects classified as "low" reported significantly greater change in the extent to which they

restricted their eating to designated eating areas and eliminated food cues in their environment than did those classified as "high". The strategies for change in eating topography and the "stimulus control" techniques have become hallmarks of the behavioral treatment of obesity. The finding that the behavioral treatment produced greater change than the cognitive treatment on these two habits is particularly strong support for the prediction that the behavioral treatment would change the behaviors it targets.

The eating habit category of eating frequency assesses the extent to which subjects restrict themselves to eating only three meals per day and avoid between-meal snacks. Thus, the eating frequency category provides some measure of the change in the controlled response (eating). Consistent with the weight loss data, on the eating frequency category subjects classified as "low" reported significantly greater change than did subjects classified as "high", but with no significant difference between the reductions produced by the cognitive and behavioral treatments. Logically, regardless of the specific techniques hypothesized to be efficacious in producing weight loss, it is reasonable to expect successful treatment to relate to change in eating frequency. As is discussed below, change in eating frequency was the only measure found to be related significantly to the weight loss produced by both treatments.

The finding that cognitive treatment produced significantly greater change than did the behavioral treatment for the emotional eating category was the one finding in direct contradiction to the initial predictions. The rationale for the cognitive treatment emphasizes the

relationship between cognitions and affect. In training subjects to self-monitor their negative thoughts, subjects are taught to use change in emotions to signal the occurrence of automatic negative thoughts. They are then taught to work backward in time from the emotional response to identify the antecedent cognitions. Thus, considerable emphasis is placed by the cognitive treatment on the monitoring and alteration of affective responses associated with the self-control of eating. While the behavioral treatment required that subjects self-monitor feelings while eating, the techniques presented during the sessions did not focus directly on the use of affective responses as cues for controlling responses.

Finally, while the behavioral treatment produced significant pre- and posttreatment change on the eating--no other activity category, this change was not significantly greater than was the change produced by the cognitive treatment. (No significant main effect or interaction effect was found for this category.) The eating--no other activity category assesses the likelihood of a subject simultaneously eating and engaging in activity not related specifically to the consumption of food. Two explanations may be offered for this finding. First, it is possible that this eating habit was not particularly problematic for subjects in this study (i.e., a "floor effect" was obtained). Conversely, it is possible that this particular eating habit was highly resistant to change. The Food Diaries and group discussion of subjects in the behavioral treatment offer some anecdotal support for this latter possibility. Many subjects refused to give up reading the newspaper with breakfast or watching the evening news on television

with dinner even though they complied with the other treatment-prescribed behavior changes.

Over the course of treatment, a significant change in ratings on all of the eating habits assessed by the Eating Patterns Quesionnaire was noted for all subjects regardless of the treatment received. It is possible that these findings may have resulted from demand characteristics of the experimental setting, or distortion of self-report based on the passage of time and/or subjects' knowledge of their own treatment outcome. Although the role of situational factors or the desirability of particular eating habits was not included in both treatments, subjects may have been sensitized to the role of such factors through the questionnaire itself, or, more likely, from sources outside the treatment. For example, it is difficult to pick up a popular magazine that does not have an article or special section on dieting tips. The procedures and principles of the behavioral approach to weight control have been integrated into nearly all approaches to dieting. Almost every popular article includes tips such as putting the fork down between bites, using smaller bites and more chews, using smaller plates, concealing high calorie foods, engaging in alternate activities when hungry, etc.. All of the subjects in the present study were veteran dieters. The cognitive treatment subjects were told to use their own knowledge about dieting along with the cognitive change techniques taught in treatment. Most likely, through past dieting programs or through popular literature, the cognitive treatment subjects were familiar with many of the eating habits targeted by the behavioral treatment and implemented the habit changes on their own,

which could account for the finding that cognitive treatment subjects showed significant changes on the Eating Patterns Questionnaire. Of major importance, however, is the fact that significantly greater changes were found between treatment groups only for those measures directly targeted by the treatment received. For example, all subjects evidenced change on the eating topography measure though those subjects receiving explicit training in these techniques evidenced significantly greater change than those who did not.

The present findings suggest the potential benefit of examining the effects of different treatments for specific categories of eating habits. Research employing measures of eating habits such as the Eating Patterns Questionnaire has typically analyzed the data only for total change on the measure. As suggested by the present data, a more useful strategy may be to ask: "Which treatment is more effective for which category of problem eating habits?" Knowledge of the effects of different treatments for different categories of problem eating habits may elucidate the ways in which the treatments effect change in overeating and, hence, weight. Subsequently, the assessment of clients for problems in the specific categories of eating habits should lead to more effective treatment selection.

Interrelationships Among Cognitions, Eating Habits, and Weight Loss

Relationship Between Treatment-Prescribed Changes and Weight Loss

There is an extensive body of literature showing the superiority of behavioral treatments of obesity over extant treatments. There has been, however, much question regarding the relationship between the

changes in weight and changes in treatment-prescribed behaviors. Changes in eating habits and cognitions have typically been inferred from weight loss. Similarly, these inferred changes have been assumed to mediate the weight loss produced by the treatments. In addition to monitoring change in treatment-prescribed behaviors, the present study assessed the relationship between these assessed changes and weight loss. The predictions regarding this issue were that the change in the treatment-prescribed behaviors (cognitions or eating habits) would be related to weight loss in treatment.

For the behavioral treatment, results of this study indicate the presence of a relationship between habit change and weight loss (rho=.51). The present data are consistent with those of other research which has used a habit questionnaire to assess the relationship between habit change and weight loss (Castro & Rachlin, 1980; Gormally et al., 1980; Hagen, 1974; Mahoney, 1974; Sandifer & Buchanan, 1983; Stalonas & Kirschenbaum, 1985). These findings are in contradiction to those of other studies which have failed to evidence a significant relationship between behavior change and weight loss (Bellack et al., 1974; Brownell et al., 1978; Jeffrey, Wing, & Stunkard, 1978; Pearce, LeBow, & Orchard, 1981).

For the cognitive treatment, results showed a moderate, though nonsignificant, relationship between change in frequency of cognitions and change in weight (rho=.33), and between change in belief in cognitions and change in weight (rho=.36). There are to date no data with which to compare the present finding. Given that the cognitive treatment produced equal changes for both subject types on the

cognitions measure, but different weight loss, the nonsignificant correlation is not surprising. Theorists who ascribe to a mediational model of behavior change view cognitive change as the independent variable and behavior change as the dependent measure. Consequently, it is the relationship between change in cognitions and behavior change (eating habits) that is deemed critical to evaluating the process by which cognitive treatment effects weight loss. The data from the present study relevant to this issue are discussed below.

Relationship Between Eating-related Thoughts and Eating Habits

One goal of the present study was to examine the relationship between changes in eating-related thoughts and eating habits under the two types of treatments. On a theoretical level, it was thought that such data could contribute to our understanding of the process by which the treatments work and to our understanding of the relationship between thoughts and behavior generally. On a clinical level, knowledge of the nature of these response interrelationships is relevant for behavioral assessment in the measurement and evaluation of treatment outcome and in proposing guidelines for the selection of treatment for individual clients.

In the present study, the cognitive treatment produced a significantly strong relationship between changes in frequency of subjects' eating-related thoughts and changes in their eating habits (rho=.55). Further, the significant changes produced for two specific eating habit categories (eating frequency and emotional eating) related to weight loss in treatment. A moderate, though nonsignificant, relationship between changes in subjects' belief in eating-related thoughts and

changes in their eating habits (rho=.37) was evidenced. Unfortunately, there are to date no other data with which to compare these findings.

In contrast, subjects receiving the behavioral treatment evidenced no relationship between their changes in frequency of eating-related cognitions and eating habits (r=.01), or between change in frequency in cognitions and weight loss (r=.11). Similarly, using the Master Questionnaire as the dependent measure, Straw and Straw (1980) have reported finding a strong relationship between change on the Energy Balance Habits subscale (e.g., eating habits) and weight loss (r = -.45) with no relationship between changes on the Cognitive Factors subscale and weight loss (r = -.04) for subjects receiving a behavioral program based on Ferguson's (1975) Learning to Eat manual.

The interpretation of these data depends upon the theoretical or philosophical view held by the researcher regarding the conditions necessary for a demonstration of causality. The ongoing controversy within psychology typically referred to as the mediational vs. nonmediational debate centers around the nature of the relationship between cognitive processes and behavior. Those adhering to a mediational perspective (e.g., Bandura, Beck) give causal status to thoughts. Radical behaviorists such as Brigham (1982), Catania (1976) and Rachlin (1974; 1977) advocate a nonmediational stance on behavior. The radical behaviorist reserves causality for demonstrations of environment-behavior relationships. Within this perspective, the relationship between thoughts and behavior is viewed as a behavior-

behavior relationship. Consequently, behavior cannot be explained adequately by referring to other behavior of the same individual (in the same frame of reference) regardless of what that behavior is called (e.g., thought, feeling, trait) (cf. Hayes & Brownstein, in press). From this perspective, any relationship between changes in eating-related thoughts and changes in eating habits constitutes an event in need of explanation. Regarding the present data, a mediationalist such as Bandura or Beck would claim that the observed relationship between thoughts and eating habits is evidence of the causal role of thoughts in changing eating behavior.

Proponents of a mediational stance on behavior change (e.g., Beck, Bandura) would argue that the present finding of the significant relationship between change in eating-related thoughts and eating habits for subjects in the cognitive treatment is evidence of the causal role of thoughts in changing eating behavior. In particular, Bandura would emphasize the significant changes in self-efficacy ratings produced by the cognitive treatment as evidence of the causal role of cognitive processes in behavior change. The interpretation of the failure to observe a relationship between these changes under the behavioral treatment would present some difficulty for these theorists. For example, while Bandura might argue that the differential treatment success of the "lows" and "highs" in the behavioral treatment can be explained on the basis of the assessed differences in improvement in ratings of self-efficacy, the minimal weight loss observed for the "highs" in the cognitive treatment in the presence of marked increases

in self-efficacy becomes problematic. The selection of a dependent measure for cognitive change is to a considerable extent arbitrary. When the predicted cognitive changes fail to be observed in the presence of behavior change, proponents of a mediational stance may claim that the critical cognitive changes occurred but were not assessed adequately by the dependent measure. Application of this argument to the present results would, of course, leave the mediationalists with a responsibility to offer some explanation as to what differences were assessed by the cognitions measure given that the measure was sensitive to change produced by the treatments.

In examining response covariations, proponents of a nonmediational stance on behavior would hope to demonstrate functional relationships between the response patterns observed and some environmental event. No assumption regarding a fundamental organization or structure of these responses is required, but rather the response covariations may be described within the principles of a behavioral framework. Thus, for the nonmediationalist, response covariations are described in terms of response chains, response generalization, response hierarchy, concurrent responses, and response class (Baer, 1981; Voeltz & Evans, 1982; Wahler & Fox, 1981). The different interrelationships observed between eating-related thoughts and eating habits in the present study would be viewed as a function of the different stimulus settings or reinforcement contingencies defined by the two different treatments.

Ultimately, empirical analysis cannot resolve the controversy surrounding the relationship between thoughts and behavior. The

controversy is one of interpretational and philosophical differences. Clinically, however, useful information may be derived by experimental investigation of the response covariations made by different types of treatment.

Strengths and Limitations of the Present Investigation

The present investigation has several major methodological strengths. First, subjects in the present study were selected for participation through careful screening to rule out factors which influence fluctuations in weight (e.g., medications, certain physical conditions), or influence participation in the program (e.g., high levels of current stress from life event changes and/or psychiatric disorder). The low attrition rate for the present study is considered to be related to the careful screening and selection of subjects in addition to the use of the data deposit. The selection criteria were also aimed at reducing initial between-subject variability by selecting a sample which was relatively homogeneous with respect to age, sex, and pretreatment weight. The reduction of pretreatment heterogeneity was thought to contribute to the high levels of significance obtained for weight losses between and within the treatment groups despite a moderately small sample size. A second methodological strength of the study was the inclusion of various checks on the independent variables. The treatments were clearly defined, and data were presented which indicate that they were identifiably different, and that they were implemented. The integrity of the assessment distinction was supported by the inclusion of behavioral role-play data in addition to subjects' questionnaire responses. A third methodological strength

may also be interpreted as support for the integrity of the treatments. In the present study, two therapists were used; each therapist treated one-half of the subjects in each of the four treatment conditions. Both therapists produced weight loss, but not differentially. Thus, when treatment techniques are specified explicitly and when therapists are trained in the therapeutic procedures and apply them consistently, treatment outcome becomes more a function of the independent variables than of the particular therapists providing the treatment. A fourth strength is that all subjects were assessed for changes in all responses relevant to each treatment. This is the first study employing a cognitive treatment group to assess change in subjects' cognitions.

Finally, unlike most other weight-reduction studies, a calorie restriction was <u>not</u> included for subjects in each type of treatment. This inclusion in other studies has clouded interpretation of the relationship between treatment-prescribed behavior changes and weight loss since the adherence to the calorie restriction is seldom reported. In addition to the fact that adherence to the calorie restriction alone may produce weight loss whether or not the subject makes the treatment-prescribed behavior changes, the inclusion of calorie restrictions may have differential adverse effects for different subgroups of obese clients which would go undetected. For example, there is reason to suspect that the use of calorie restrictions may increase episodes of overeating for clients with binge-eating problems (cf. Gormally et al., 1980; Woody et al., 1981). Certainly, the use of the same 1200-calories-a-day restriction for subjects varying in their degree of

overweight by as much as 10-100% would be expected to introduce considerable variability into the weight losses observed. In the present study, the finding of the comparatively large and consistent weight losses obtained by the "lows" across treatment types without the use of a treatment-imposed calorie restriction is considered to be strong support for the potency of the treatments in producing weight loss by behavior change.

In addition to the methodological strengths offered, several limitations of the study may be identified. First, the treatment was of relatively short duration. The findings regarding weight losses and the interrelationship among the dependent measures (i.e., cognitions, eating habits, and weight) may be particularly affected by this factor. While the present data show comparatively large and consistent weight losses for the "lows" in both treatments, these findings may not be maintained across time. Conversely, different results could have been obtained for the "highs" with treatment of longer duration. Future research could address maintenance issues for these subjects.

A second limitation of the present study concerns the reliance on self-report measures. In addressing the relationship between habit change and weight loss, self-report of habit change and not actual measures of habit change were used. Generalization across assessment modalities cannot be assumed. Nevertheless, the specificity and consistency of treatment effects on the questionnaire measures would seem to preclude explanations offered frequently for changes in self-report data such as "demand characteristics" and "expectancy". Future research may investigate the use of other assessment modalities such

as observational measures. The confidence with which interpretation is made may not, however, be greatly enhanced by the use of observational measures because of the reactivity of the presence of observers and/or the knowledge of being observed, (cf. Haynes & Horn, 1982; Jacobson, 1985). Jacobson (1985) has emphasized that observational measures cannot be assumed to be superior to self-report measures simply because they are observational. Most likely, self-report measures will continue to be primary in the assessment of the behavior changes related to weight control. Many of the relevant behaviors (e.g., thoughts, affective responses, binge-eating episodes) may be observed best by the individual and therefore assessed best by self-report measures.

A third limitation also relates to the measures used. In the present study, adherence to the treatment-prescribed tasks was assessed solely by the self-monitored data and only for three measurement intervals. More refined measurement of adherence possibly including ways to address the dimensions of quality of performance as well as consistency of performance would be of use in demonstrating the integrity of the treatment and possibly provide important data for discriminations regarding whether the subject is "unable" or "unwilling" to comply with treatment prescriptions. An additional limitation may be the relatively small number of subjects (8) in each treatment condition. A larger sample size would have increased the external validity of the study and would have increased the power of within-treatment group analyses. Finally, the fact that treatment was conducted in groups may have limited the present findings.

Individually administered treatments may have produced different results for both the overall magnitude of weight losses and for the treatment validity question.

Clinical Implications

There are several findings of the present study with immediate relevance to clinical practice. First, the present results support the predictive value of the Master Questionnaire for weight control treatments (behavioral or cognitive) of short duration. The correlation of -.73 between subjects' scores on the Cognitive Factors subscale and their WRQ is the single best predictor of treatment outcome in a weight control program reported to date. The fact that the MQ is an inexpensive and easily administered screening assessment makes this an immensely practical clinical finding. Second, the present findings contraindicate the use of a short-term behavioral group treatment for clients who are high in negative and self-defeating thoughts (i.e., score less than 18 on the Cognitive Factors subscale of the MQ). The guiding principle of clinical practice must be "let us first do no harm." The present data indicate that the behavioral treatment produced adverse psychological side-effects for the majority of subjects high in negative cognitions in addition to producing only minimal weight losses. In contrast, while producing weight loss similar to that of the behavioral treatment, the cognitive treatment produced impressive psychological benefits for subjects classified as "high". The use of an 8-week cognitive program as a "pretreatment" preparation for a behavioral treatment warrants investigation. Steffan and Myszak (1978) have reported enhanced treatment success in a behavioral weight control

program for subjects given pretreatment experience with success with self-control tasks.

A third implication of the present study is that clinicians should assess routinely the severity of clients' binge-eating problems. The finding that 28% of the present sample evidenced severe problems with binge-eating is highly similar to recent findings by other researchers. Loro and Orleans (1981) reported that 28% of a sample of 280 at least moderately obese clients at the Duke University Dietary Rehabilitation Clinic displayed severe problems with binge-eating. Similarly, Jackson and Ormiston (1977) found 27% of a sample of 72 overweight clients to evidence severe problems with binge-eating. Apparently, the prevalence of binge-eating problems in nonpsychiatric client populations is greater than was considered previously. In the present study, greater binge-eating scores were highly associated ($r = -.63$) with lower weight losses in treatment. The Eating Habits Checklist used here offers an inexpensive and easily administered assessment device for identifying clients with severe binge-eating problems. Clients with severe binge-eating problems may be better treated on an individual basis using a more comprehensive treatment approach such as the one described recently by Loro and Orleans (1981).

Finally, the present findings suggest that simpler treatments may be as effective as multi-component treatment packages. Although it included only a few techniques, the cognitive treatment produced weight-losses for the "lows" similar in magnitude and consistency to the weight losses produced by the behavioral treatment. This is particularly notable given that the behavioral treatment used here

included only the components basic to the behavioral approach to weight control.

Conclusions

This study complements previous research by demonstrating that both cognitive intervention strategies and behavioral treatments may be effective in producing weight loss. While not demonstrating treatment validity for the subject classification, the present study did indicate that pretreatment classification of subjects on the basis of the severity of their negative and self-defeating eating-related cognitions can reduce significantly the interindividual variability in treatment outcome. Further, the present investigation is the first weight control study to assess the severity of subjects' binge-eating problems and to examine the potential impact of this problem on success in treatment. The study was also the first study in the weight control literature to provide assessment of multiple responses relevant to evaluation of both treatment outcome and process. Treatment outcome was evaluated not only by weight loss, but also by change on psychological measures. The findings of generalized benefits for the "high" subject-type subjects produced by the cognitive treatment and the negative side effects produced for these subjects by the behavioral treatment emphasizes the need to document routinely concurrent behavior change. Consistent with a number of studies, the present study showed that the behavioral treatment does indeed produce change in eating habits and that these changes are related to weight loss. The cognitive treatment was also found to produce significant changes in eating-related cognitions and changes in specific eating habits. This is the first study using a

cognitive treatment for weight control to assess change in cognitions or change in eating habits. The examination of the differential effects of the two treatments on measures of specific eating habits indicated that questions regarding treatment effects may be more usefully asked as: "Which treatment produces change on which eating habits?" Ultimately, such knowledge may be useful in developing treatment strategies for individual obese clients with assessed problems in specific eating habits.

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Appendices

Appendix A

Pilot Study Materials

Appendix A-1

Consent for Participation in a Research Project

You are invited to participate in a research project entitled "Individual Differences: Habits and Beliefs". The purpose of this project is to investigate individual differences in the beliefs and eating habits of overweight people presenting for weight control treatment. The goal of the project is to attempt to identify distinct patterns of beliefs and habits among overweight persons that may be important to the success of treatment. The findings of this research may be of potential future benefit to clinicians and researchers in designing more effective weight control programs and in tailoring current treatments to individual needs of the client.

Should you decide to participate in this project, you would be asked to complete six questionnaires and one information form which will take 15-20 minutes of your time. Completion of the questionnaires and the information form is the only request that will be made of you for this project. The questionnaires may be completed at home and returned to the investigator by using the addressed, stamped manilla envelope provided for you in the packet.

As a participant in this project, your questionnaire responses will be kept confidential. In fact, you will not be asked to identify yourself in any way other than by filling in your age, sex, height, and weight on the information sheet attached to the questionnaires. You are asked to answer all questionnaires as completely and honestly as possible, and to make sure to return the information sheet along with the six questionnaires to the investigator in the envelope provided.

It is important for you to know that your decision to participate or not participate in this research is in no way related to, nor will in any way influence your treatment in the UNC-G Psychology Clinic's weight control program.

Should you agree to participate and subsequently, for any reason, decide not to complete the questionnaires, due to the costs of printing and postage, you are asked to return the questionnaire packet to your weight control group leader at the UNC-G Psychology Clinic.

If you have any questions concerning this research project, you may contact the investigator, Susan Willis, M.A., by using the letter-sized, postage paid envelope provided for you in the questionnaire packet. Simply write your name and a telephone number where you may be reached on a sheet of paper and mail it in the envelope provided. You will be contacted by telephone to answer any questions you might have.

Appendix A-1, page 2

Thank you for taking the time to consider participation in this project. The time required to answer the questionnaires is short and previous participants have reported that they have found the questionnaires to be interesting and thought provoking. Your participation would be greatly appreciated.

If you are willing to participate in this project, please read the authorization at the bottom of the page carefully, sign it, and give the signed copy to your group leader to obtain the questionnaire packet. You should keep the extra copy of this form for future reference.

Thank you.

Authorization: I have read the above and decide that _____ _____ will participate in the project described.
name of participant

The purposes of the project and my responsibilities as a participant have been explained to my satisfaction. My signature below indicates that I have received a packet of questionnaires and a copy of this consent form.

_____
Signature of participant

_____ _____
Witness Date

_____
Susan Willis, M.A.
Investigator

Dr. Rosemery Nelson
Faculty Supervisor

Appendix A-2
Table 1

Results of t-Tests Assessing Differences Between Subjects

Classified as High and Low on the Cognitive Factors Subscale of the MQ

Variable		N	Mean	SD	t-value	df	p
Age	Highs	24	41.33	8.9	1.19	47.62	.241
	Lows	26	38.03	10.0			
Weight	Highs	24	182.58	34.68	0.11	47.45	.915
	Lows	26	181.42	41.90			
% Overweight	Highs	24	50.4	27.5	0.06	47.59	.952
	Lows	26	49.9	32.8			
Automatic Thoughts Questionnaire	Highs	20	65.95	20.4	1.64	31.45	.110
	Lows	21	50.66	37.1			
Personal Beliefs Inventory	Highs	24	80.45	14.3	0.56	46.97	.576
	Lows	25	78.08	15.3			
Eating Patterns Questionnaire	Highs	14	188.28	24.5	1.29	25.03	.209
	Lows	20	177.90	20.8			

Variable		N	Mean	SD	t-value	df	p
Energy Balance Habits (MQ)	Highs	24	3.0	4.14	-3.30	47.83	.0001*
	Lows	26	4.5	7.0			
Obesity Cognitions Scale	Highs	22	105.5	22.34	4.55	40.81	.0001*
	Lows	24	77.9	18.38			

Note. Alpha levels adjusted for multiple comparisons (12), .0041 required for significance.

*statistically significant

Appendix A-3
Table 2

Correlations Among Experimental Measures for Groups (Highs and lows) and for the Total Sample

	Highs		Lows		Combined	
Tests	Cognitive Factors (MQ)	Obesity Cognitions Scale	Cognitive Factors (MQ)	Obesity Cognitions Scale	Cognitive Factors (MQ)	Obesity Cognitions Scale
Cognitive Factors (MQ)	-	-.483**	-	-.451*	-	-.653**
Automatic Thoughts Question-naire	-.12	.357	-.249	.020	-.181	.248
Personal Beliefs Inventory	.0003	.194	-.158	.247	-.114	.227
Energy Balance Habits	.035	-	.410*	-	.398**	-
% Overwt.	-.145	-	-.249	-	-.174	-

*$p \leq .02$
**$p \leq .01$

Appendix B

Tables

Table 1

Descriptive Data for Subjects Completing the Project

Subject Number	Age	Education (years)	Occupation	% Overweight	Pretreatment Weight
01	23	16	aquatics instructor	46.25	234
02	39	13	housewife	33.59	171
03	45	14	nurse	30.15	170½
04	37	12	bookkeeper	25.00	175
05	31	12	sales manager	27.10	166½
06	33	13	office supervisor	50.90	231
07	34	16	office manager	25.70	176
08	45	14	receptionist	30.00	186
09	22	16	IRS Representative	48.95	213
10	38	12	housekeeping	20.97	173
11	33	16	school counselor	30.90	199
12	38	16	teacher	25.60	154½
13	43	16	nurse	22.40	175
14	30	16	arts & crafts instructor	25.00	160
15	47	14	catering manager	54.5	221
16	35	14	cardiopulmonary technician	35.65	175
17	22	14		31.78	170
18	27	16	lab technician	22.30	167½
19	46	12	housewife	34.40	176
20	25	12	waitress	48.80	195
21	38	16	court reporter	34.60	196½
22	27	14	CRT operator	61.90	217
23	28	13	factory worker	37.00	192
24	31	15	claims supervisor	36.60	179
25	28	18	physician's assistant	25.00	175
26	46	12	salesperson	20.97	173
27	26	16	retail manager	51.95	194½
28	29	14	consumer service representative	39.69	183
29	28	14	housewife/student	35.8	178
30	39	16	sales manager	33.9	191½
31	38	13	secretary	38.9	182
32	34	15	nurse	54.9	203

Table 2
Subject Classification Measures
Individual Subject Data

Subject Number	Subject Classification[a]	MQ Cognitive Factors Subscale Score	Role-play Scores[b]
Cognitive Treatment Condition			
01	1	12	5
02	1	16	6
03	1	12	5
04	1	7	7
05	2	34	0
06	2	20	1
07	2	26	2
08	2	20	1
09	1	9	6
10	1	15	6
11	1	9	5
12	1	8	4
13	2	23	1
14	2	30	0
15	2	24	0
16	2	19	0
mean		17.75	3.06
range		7-34	0-7
Behavioral Treatment Condition			
17	2	26	0
18	2	25	0
19	2	22	1
20	2	26	0
21	1	16	6
22	1	13	7
23	1	8	6
24	1	13	6
25	2	26	0
26	2	24	1
27	2	23	0
28	2	23	0
29	1	13	7

Table 2 (continued)

30	1	14	5
31	1	5	5
32	1	16	5
mean		18.31	3.06
range		5-26	0-7

---

[a]1 = "High" Subject type; 2 = "Low" Subject type. [b]Number of role-play responses scorable as negative or self-defeating thoughts.

Table 3

Mean Number of Responses by Category and

Subject Type for the Screening Role-Play Task

Category	Negative		Positive		Emotional	Total
	Thought	Action	Thought	Action	exclamation	Responses
Subject Type						
High	5.6	1.2	.13	.06	.26	7.2
Low	.4	0.0	2.6	2.0	.25	5.3

Table 4

Adherence to Prescribed Treatment Tasks: Mean Percent Adherence Score by Treatment Condition

Treatment Condition	Mean Percent Adherence Score		
	Measurement Weeks		
	1	4	7
Cognitive			
High	78[a]	84	91
Low	94	92	96
Combined	86	88	93.5
Behavioral			
High	86	87	84
Low	95	92	94
Combined	90.5	89.5	89

[a]The comparatively lower mean percent adherence score for this group was largely owing to one subject who failed to self-monitor (Thought Diary) for 5 of the 7 days in the first week of treatment. Excluding her percent score of 28.5%, the group mean adherence score was 85% producing a mean percent adherence score for the cognitive treatment for week 1 of 89%.

Table 5

Mean Number of Minutes Per Week

Engaged in Exercise (Light and Moderate) Reported

by Subjects on the Current Exercise Survey

Treatment Condition	Mean No. of Minutes Per Week Engaged in Exercise			
	Pretreatment		Posttreatment	
	Light	Moderate	Light	Moderate
Cognitive				
High	45	18.2	60	10.4
Low	52.5	15	47	8.0
Combined	48.75	16.6	53.5	9.2
Behavioral				
High	47	20	59.7	11
Low	48	17.6	43	12
Combined	47.5	18.8	51.35	11.5

Note. None of the 32 subjects reported engaging in any exercise categorized on the Current Exercise Survey as "Heavy"; therefore, that category was not included in the table.

Table 6

2 (Subject Type) x 2 (Treatment Type) x 2 (Therapists)

Analysis of Variance for Pounds Lost

With Least Squares Means

Source	df	MS	F
Subject Type	1	512.0	34.2****
Treatment Type	1	2.5	0.2
Therapist	1	0.3	0.02
Subject Type x Treatment Type	1	13.8	0.92
Subject Type x Therapist	1	2.5	0.17
Treatment Type x Therapist	1	18.0	1.20
Subject Type x Treatment Type x Therapist	1	3.1	0.21
Error	24	14.9	

Least Squares Means

Treatment Type	Mean Difference Scores (lbs)	PROB > |T| HO:LS MEAN=0	PROB > |T| HO: LS MEAN 1=LS MEAN 2
Cognitive	-7.2	.0001****	.6847
Behavioral	-6.7	.0001****	

Subject Type	Mean Difference Scores (lbs)	PROB > |T| HO:LS MEAN=0	PROB > |T| HO: LS MEAN 1=LS MEAN 2
High	-2.9	.0057**	.0001****
Low	-10.9	.0001****	

Therapist	Mean Difference Scores (lbs)	PROB > |T| HO:LS MEAN=0	PROB > |T| HO: LS MEAN 1=LS MEAN 2
01	-6.8	.0001****	.8922
02	-7.0	.0001****	

Table 6 (continued)

Subject Type	Treatment Type	Mean Difference Scores	PROB > |T| HO:LS MEANS	PROB I/J	HO:LS MEAN (I) = LS MEAN (J)			
					1	2	3	4
High	Behavioral	-3.3 (1)	.0234*	1.	____	.7018	.0021**	.0002***
High	Cognitive	-2.6 (2)	.0734	2.	____	____	.0008***	.0001****
Low	Behavioral	-10.0 (3)	.0001****	3.	____	____	____	.3423
Low	Cognitive	-11.9 (4)	.0001****	4.	____	____	____	____

*p ≤ .05
**p ≤ .01
***p ≤ .001
****p ≤ .0001

Table 7

2 (Subject Type) x 2 (Treatment Type) x 2 (Therapist)

Analysis of Variance

for the Weight Reduction Quotient (WRQ)

With Least Squares Means

Source	df	MS	F
Subject Type	1	2747.9	25.32****
Treatment Type	1	37.7	0.35
Therapist	1	89.6	0.83
Subject Type x Treatment Type	1	130.7	1.20
Subject Type x Therapist	1	31.2	0.29
Treatment Type x Therapist	1	156.8	1.45
Subject Type x Treatment Type x Therapist	1	3.9	0.04
Error	24	108.5	

Least Squares Means

Treatment Type	Mean Difference Scores (WRQ)	PROB > |T| HO:LS MEAN=0	PROB > |T| HO: LS MEAN 1=LS MEAN 2
Cognitive	16.85	.0001****	.5609
Behavioral	14.68	.0001****	

Subject Type	Mean Difference Scores (WRQ)	PROB > |T| HO:LS MEAN=0	PROB > |T| HO: LS MEAN 1=LS MEAN 2
High	6.50	.0199*	.0001****
Low	25.03	.0001****	

Therapist	Mean Difference Scores (WRQ)	PROB > |T| HO:LS MEAN=0	PROB > |T| HO: LS MEAN 1=LS MEAN 2
01	17.44	.0001****	.3726
02	14.09	.0001****	

Table 7 (continued)

Subject Type	Treatment Type	Mean Difference Scores	PROB T HO:LS MEANS	PROB I/J	HO:LS MEAN (I) = LS MEAN (J)			
					1	2	3	4
High	Behavioral	7.43 (1)	.0549	1.	____	.7228	.0103**	.0006***
High	Cognitive	5.56 (2)	.1441	2.	____	____	.0044**	.0002***
Low	Behavioral	21.92 (3)	.0001****	3.	____	____	____	.2445
Low	Cognitive	28.14 (4)	.0001****	4.	____	____	____	____

*p ≤ .05
**p ≤ .01
***p ≤ .001
****p ≤ .0001

Table 8

Analysis of Covariance for Difference Scores Using the Pretreatment Score as the Covariate from the Beck Depression Inventory With Least Squares Means

Source	df	MS	F
Pretreatment BDI Score	1	10.2	1.2
Subject Type	1	32.8	3.9
Treatment Type	1	26.6	3.2
Subject Type x Treatment Type	1	60.3	7.2**
Error	27	8.4	

Least Squares Means

Treatment Type	Mean Difference Scores	PROB > |T| HO:LS MEAN=0	PROB > |T| HO: LS MEAN 1=LS MEAN 2
Cognitive	-4.3	.0001****	.0860
Behavioral	-2.4	.0027**	

Subject Type	Mean Difference Scores (lbs)	PROB > |T| HO:LS MEAN=0	PROB > |T| HO: LS MEAN 1=LS MEAN 2
High	-2.2	.0090**	.0583
Low	-4.5	.0001****	

Table 8 (continued)

Subject Type	Treatment Type	Mean Difference Scores	PROB > |T| HO:LS MEANS	PROB I/J	HO:LS MEAN (I) = LS MEAN (J)			
					1	2	3	4
High	Behavioral	-0.11 (1)	.9141	1.	____	.0038**	.0034**	.0097**
High	Cognitive	-4.5 (2)	.0003***	2.	____	____	.7819	.7769
Low	Behavioral	-4.9 (3)	.0001****	3.	____	____	____	.5472
Low	Cognitive	-4.1 (4)	.0006***	4.	____	____	____	____

*p ≤ .05
**p ≤ .01
***p ≤ .001
****p ≤ .0001

Table 9

Individual Subject Data by

Treatment Condition for the

Psychological Change Measures

Subject Number	Pretreatment BDI	Pretreatment CS	Posttreatment BDI	Posttreatment CS
"High" Subject type--Cognitive treatment				
01	13	176	5	168
02	14	186	9	208
03	15	143	10	180
04	10	180	13	204
05	14	130	8	167
06	13	133	5	146
07	15	90	10	125
08	15	139	10	187
"Low" Subject type--Cognitive treatment				
09	10	127	6	147
10	15	87	10	125
11	8	130	0	130
12	14	142	10	163
13	2	133	0	172
14	7	161	5	175
15	12	135	10	168
16	14	128	10	156
"High" Subject type--Behavioral treatment				
17	10	179	6	175
18	16	97	12	132
19	14	188	18	117
20	16	175	20	196
21	14	189	17	165
22	7	139	9	151
23	15	151	12	141
24	10	156	7	174

Table 9 (continued)

Subject Number	Pretreatment BDI	Pretreatment CS	Posttreatment BDI	Posttreatment CS
"Low" Subject type--Behavioral treatment				
25	14	134	7	152
26	4	148	1	160
27	8	144	1	181
28	10	128	8	148
29	7	152	5	161
30	5	118	1	134
31	16	124	10	144
32	5	154	0	159

Note. BDI = Beck Depression Inventory. CS = Confidence Scale.

Table 10

Analysis of Covariance on Difference Scores Using Pretreatment Scores as the Covariate from the Confidence Scale With Least Squares Means

Source	df	MS	F
Pretreatment Confidence Scale Score	1	5796.9	22.75****
Subject Type	1	116.9	0.46
Treatment Type	1	1071.3	4.20*
Subject Type x Treatment Type	1	581.4	2.28
Error	27	254.9	

Least Squares Means

Treatment Type	Mean Difference Scores	PROB > |T| HO: LS MEAN=0	PROB > |T| HO: LS MEAN 1=LS MEAN 2
Cognitive	18.2	.0001****	.0502*
Behavioral	6.5	.1172	

Subject Type	Mean Difference Scores	PROB > |T| HO: LS MEAN=0	PROB > |T| HO: LS MEAN 1=LS MEAN 2
High	10.2	.0215*	
Low	14.5	.0019**	.5041

Table 10 (continued)

Subject Type	Treatment Type	Mean Difference Scores		PROB T HO:LS MEANS	PROB I/J	HO:LS MEAN (I) = LS MEAN (J)			
						1	2	3	4
High	Behavioral	.13	(1)	.9827	1.	____	.0180*	.1414	.0782
High	Cognitive	20.4	(2)	.0014***	2.	____	____	.3674	.6105
Low	Behavioral	12.9	(3)	.0326*	3.	____	____	____	.6956
Low	Cognitive	16.0	(4)	.0113**	4.	____	____	____	____

*p ≤ .05
**p ≤ .01
***p ≤ .001
****p ≤ .0001

Table 11

Correlation Matrix Showing the Predictive Value of the Binge-eating Measure and its Relationship to the Subject Classification Measure

Measures	1	2	3
	Total Sample (N=32)		
1. WRQ	-	-.55**	-.71***
2. Eating Habits Checklist	-	-	-.63***
3. Cognitive Factors Subscale (MQ)	-	-	-
	High Subject Type (n=16)		
1. WRQ	-	-.47*	.32
2. Eating Habits Checklist	-	-	-.06
3. Cognitive Factors Subscale (MQ)	-	-	-

Table 11 (continued)

Measures	1	2	3
	Low Subject Type (n-16)		
1. WRQ	-	-.29	-.02
2. Eating Habits Checklist	-	-	-.14
3. Cognitive Factors Subscale (MQ)	-	-	-

Note. WRQ = Weight Reduction Quotient.

*$p \leq .06$
**$p \leq .002$
***$p \leq .0001$

Table 12

Analysis of Covariance on Difference Scores Using Pretreatment Scores as the Covariate from the Obesity Cognitions Scale Frequency Ratings With Least Squares Means

Source	df	MS	F
Pretreatment Frequency Rating	1	842.9	11.15**
Subject Type	1	50.23	0.66
Treatment Type	1	856.6	11.33**
Subject Type x Treatment Type	1	217.2	2.87
Error	27	75.6	

Least Squares Means

Subject Type	Mean Difference Scores	PROB> |T| HO:LS MEAN=0	PROB> |T| HO: LS MEAN 1=LS MEAN 2
High	-10.5	.0002***	.4220
Low	-13.6	.0001****	

Treatment Type	Mean Difference Scores	PROB> |T| HO:LS MEAN=0	PROB> |T| HO: LS MEAN 1=LS MEAN 2
Cognitive	-17.2	.0001****	.0023**
Behavioral	- 6.8	.0041**	

Table 12 (continued)

Subject Type	Treatment Type	Mean Difference Scores		PROB > |T| HO:LS MEANS	PROB I/J	HO:LS MEAN (I) = LS MEAN (J)			
						1	2	3	4
High	Behavioral	- 2.7	(1)	.4249	1.	____	.0013***	.1048	.0104**
High	Cognitive	-18.2	(2)	.0001****	2.	____	____	.1501	.6646
Low	Behavioral	-11.0	(3)	.0025**	3.	____	____	____	.2483
Low	Cognitive	-16.1	(4)	.0001****	4.	____	____	____	____

*p ≤ .05
**p ≤ .01
***p ≤ .001
****p ≤ .0001

Table 13

Analysis of Covariance on Difference Scores Using Pretreatment Scores as the Covariate from the Obesity Cognitions Scale Belief Ratings With Least Squares Means

Source	df	MS	F
Pretreatment Belief Rating	1	1302.7	14.06***
Subject Type	1	47.6	0.51
Treatment Type	1	2128.2	22.96****
Subject Type x Treatment Type	1	4.8	0.05
Error	27	92.7	

Least Squares Means

Subject Type	Mean Difference Scores	PROB > |T| HO:LS MEAN=0	PROB > |T| HO: LS MEAN 1=LS MEAN 2
High	-13.2	.0001****	.4799
Low	-10.7	.0002***	

Treatment Type	Mean Difference Scores	PROB > |T| HO:LS MEAN=0	PROB > |T| HO: LS MEAN 1=LS MEAN 2
Cognitive	-20.1	.0001****	.0001****
Behavioral	- 3.8	.1274	

Table 13 (continued)

Subject Type	Treatment Type	Mean Difference Scores		PROB >|T| HO:LS MEANS	PROB I/J	HO:LS MEAN (I) = LS MEAN (J)			
						1	2	3	4
High	Behavioral	- 4.6	(1)	.1833	1.	____	.0015**	.7248	.0079**
High	Cognitive	-21.8	(2)	.0001****	2.	____	____	.0007***	.5141
Low	Behavioral	- 2.9	(3)	.3981	3.	____	____	____	.0032**
Low	Cognitive	-18.5	(4)	.0001****	4.	____	____	____	____

*p ≤ .05
**p ≤ .01
***p ≤ .001
****p ≤ .0001

Table 14

Multivariate Analysis of Covariance on Difference Scores Using Pretreatment Scores as the Covariates from the Five Eating Habit Categories of the Eating Patterns Questionnaire

SOURCE	WILKS' LAMBDA	df	F
Subject Type	.6737	5,19	1.84
Treatment Type	.1720	5,19	18.29**
Subject Type x Treatment Type	.3680	5,19	6.53*
Error			

*$p \leq .001$
**$p \leq .0001$

Table 15

Analysis of Covariance on Difference Scores

from the Eating Topography Category

of the Eating Patterns Questionnaire

With Least Squares Means

Source	df	MS	F
Eating Frequency	1	1.5	.70
Eating Topography	1	15.2	7.22*
Emotional Eating	1	1.8	.84
Eating Areas	1	9.7	4.61*
Eating--no other activity	1	10.8	5.16*
Subject Type	1	.1	.05
Treatment Type	1	36.8	17.53***
Subject Type x Treatment Type	1	3.5	1.65
Error	23	2.1	

Least Squares Means

Subject Type	Mean Difference Scores	PROB > |T| HO:LS MEAN=0	PROB > |T| HO: LS MEAN 1=LS MEAN 2
High	-3.4	.0001****	.8241
Low	-3.5	.0001****	

Treatment Type	Mean Difference Scores	PROB > |T| HO:LS MEAN=0	PROB > |T| HO: LS MEAN 1=LS MEAN 2
Cognitive	-2.3	.0001****	.0004***
Behavioral	-4.5	.0001****	

Table 15 (continued)

Subject Type	Treatment Type	Mean Difference Scores	PROB T HO:LS MEANS	PROB I/J	HO:LS MEAN (I) = LS MEAN (J)			
					1	2	3	4
High	Behavioral	-4.1 (1)	.0001****	1.	____	.0531*	.3392	.0185*
High	Cognitive	-2.6 (2)	.0001****	2.	____	____	.0115*	.5022
Low	Behavioral	-5.0 (3)	.0001****	3.	____	____	____	.0012**
Low	Cognitive	-2.1 (4)	.0012**	4.	____	____	____	____

*p ≤ .05
**p ≤ .01
***p ≤ .001
****p ≤ .0001

Table 16

Analysis of Covariance on Difference Scores from the Eating Areas Category of the Eating Patterns Questionnaire With Least Squares Means

Source	df	MS	F
Eating Frequency	1	4.5	1.34
Eating Topography	1	.3	.09
Emotional Eating	1	21.5	6.45*
Eating Areas	1	115.6	34.72****
Eating--no other activity	1	28.4	8.52**
Subject Type	1	30.7	9.2**
Treatment Type	1	79.9	23.9****
Subject Type x Treatment Type	1	15.6	4.7*
Error	23	3.3	

Least Squares Means

Subject Type	Mean Difference Scores	PROB > |T| HO:LS MEAN=0	PROB > |T| HO: LS MEAN 1=LS MEAN 2
High	-2.6	.0001****	.0059**
Low	-5.1	.0001****	

Treatment Type	Mean Difference Scores	PROB > |T| HO:LS MEAN=0	PROB > |T| HO: LS MEAN 1=LS MEAN 2
Cognitive	-2.2	.0001****	.0001****
Behavioral	-5.5	.0001****	

Table 16 (continued)

Subject Type	Treatment Type	Mean Difference Scores	PROB >|T| HO:LS MEANS	PROB I/J	HO:LS MEAN (I) = LS MEAN (J)			
					1	2	3	4
High	Behavioral	-3.5 (1)	.0001****	1.	____	.0718	.0015**	.4558
High	Cognitive	-1.8 (2)	.0186*	2.	____	____	.0001****	.3606
Low	Behavioral	-7.5 (3)	.0001****	3.	____	____	____	.0001****
Low	Cognitive	-2.7 (4)	.0007***	4.	____	____	____	____

*p ≤ .05
**p ≤ .01
***p ≤ .001
****p ≤ .0001

Table 17

Analysis of Covariance on Difference Scores from the Emotional Eating Category of the Eating Patterns Questionnaire With Least Squares Means

Source	df	MS	F
Eating Frequency	1	6.3	.29
Eating Topography	1	50.6	2.29
Emotional Eating	1	254.3	11.53**
Eating Areas	1	76.1	3.45
Eating--no other activity	1	12.3	.56
Subject Type	1	2.3	.11
Treatment Type	1	367.2	16.64***
Subject Type x Treatment Type	1	115.1	5.21*
Error	23	22.1	

Least Squares Means

Subject Type	Mean Difference Scores	PROB> |T| HO:LS MEAN=0	PROB> |T|HO: LS MEAN 1=LS MEAN 2
High	-8.2	.0001****	.7475
Low	-8.8	.0001****	

Treatment Type	Mean Difference Scores	PROB> |T| HO:LS MEAN=0	PROB> |T|HO: LS MEAN 1=LS MEAN 2
Cognitive	-12.0	.0001****	.0005***
Behavioral	- 5.0	.0003***	

Table 17 (continued)

Subject Type	Treatment Type	Mean Difference Scores		PROB > |T| HO:LS MEANS	PROB I/J	HO:LS MEAN (I) = LS MEAN (J)			
						1	2	3	4
High	Behavioral	- 6.7	(1)	.0011***	1.	____	.2378	.2429	.0080**
High	Cognitive	- 9.6	(2)	.0001****	2.	____	____	.0333*	.0881
Low	Behavioral	- 3.3	(3)	.0966	3.	____	____	____	.0033***
Low	Cognitive	-14.4	(4)	.0001****	4.	____	____	____	____

*$\underline{p} \leq .05$
**$\underline{p} \leq .01$
***$\underline{p} \leq .001$
****$\underline{p} \leq .0001$

Table 18

Analysis of Covariance on Difference Scores from the Eating Frequency Category of the Eating Patterns Questionnaire With Least Squares Means

Source	df	MS	F
Eating Frequency	1	129.5	39.89****
Eating Topography	1	2.5	.76
Emotional Eating	1	3.3	1.00
Eating Areas	1	9.6	2.94
Eating--no other activity	1	1.6	.50
Subject Type	1	13.5	4.2*
Treatment Type	1	3.7	1.3
Subject Type x Treatment Type	1	11.6	3.6
Error	23	3.2	

Least Squares Means

Subject Type	Mean Difference Scores	PROB > |T| HO:LS MEAN=0	PROB > |T| HO: LS MEAN 1=LS MEAN 2
High	-4.7	.0001****	.0534*
Low	-6.3	.0001****	

Treatment Type	Mean Difference Scores	PROB > |T| HO:LS MEAN=0	PROB > |T| HO: LS MEAN 1=LS MEAN 2
Cognitive	-5.8	.0001****	.2990
Behavioral	-5.2	.0001****	

Table 18 (continued)

Subject Type	Treatment Type	Mean Difference Scores	PROB T HO:LS MEANS	PROB I/J	HO:LS MEAN (I) = LS MEAN (J)			
					1	2	3	4
High	Behavioral	-4.9 (1)	.0001****	1.	____	.5198	.7532	.0301*
High	Cognitive	-4.4 (2)	.0001****	2.	____	____	.3849	.0089**
Low	Behavioral	-5.3 (3)	.0001****	3.	____	____	____	.0546*
Low	Cognitive	-7.3 (4)	.0001****	4.	____	____	____	____

*p ≤ .05
**p ≤ .01
***p ≤ .001
****p ≤ .0001

Table 19

Analysis of Covariance on Difference Scores from the Eating--no activity Category of the Eating Patterns Questionnaire With Least Squares Means

Source	df	MS	F
Eating Frequency	1	.01	0.00
Eating Topography	1	2.57	.56
Emotional Eating	1	26.83	5.81*
Eating Areas	1	.02	0.00
Eating--no other activity	1	4.72	1.02
Subject Type	1	5.16	1.12
Treatment Type	1	1.06	.23
Subject Type x Treatment Type	1	4.26	.92
Error	23	4.62	

Least Squares Means

Subject Type	Mean Difference Scores	PROB > |T| HO:LS MEAN=0	PROB > |T| HO: LS MEAN 1=LS MEAN 2
High	-1.9	.0051**	.3016
Low	-2.9	.0001****	

Treatment Type	Mean Difference Scores	PROB > |T| HO:LS MEAN=0	PROB > |T| HO: LS MEAN 1=LS MEAN 2
Cognitive	-2.2	.0005***	.6370
Behavioral	-2.6	.0001****	

Table 19 (continued)

Subject Type	Treatment Type	Mean Difference Scores	PROB T HO:LS MEANS	PROB I/J	HO:LS MEAN (I) = LS MEAN (J)			
					1	2	3	4
High	Behavioral	-1.7 (1)	.0512*	1.	____	.7092	.1786	.6000
High	Cognitive	-2.1 (2)	.0172*	2.	____	____	.2856	.8529
Low	Behavioral	-3.5 (3)	.0006***	3.	____	____	____	.3328
Low	Cognitive	-2.3 (4)	.0093**	4.	____	____	____	____

*p ≤ .05
**p ≤ .01
***p ≤ .001
****p ≤ .0001

Table 20

Intercorrelations Among Dependent Measures

(Weight, Cognitions, Eating Habits) by Type of Treatment

	TREATMENT TYPE					
	BEHAVIORAL n=16			COGNITIVE n=16		
Dependent Measures	WRQ	Obesity Cognitions Scale Frequency	Belief	WRQ	Obesity Cognitions Scale Frequency	Belief
WRQ	-	-	-	-	-	-
Obesity Cognitions Scale						
Frequency	.11	_	_	.33	-	-
Belief	.02	.70***	-	.36	.45*	-
Eating Patterns Questionnaire						
Eating Frequency	.47**	.28	.12	.51***	.48**	.05
Eating Topography	.36	.25	.21	.31	.18	.11
Emotional Eating	.04	.12	.01	.56***	.34	.48*

Table 20 (continued)

Dependent Measures	TREATMENT TYPE: BEHAVIORAL n=16 WRQ	BEHAVIORAL n=16 Obesity Cognitions Scale Frequency	BEHAVIORAL n=16 Obesity Cognitions Scale Belief	COGNITIVE n=16 WRQ	COGNITIVE n=16 Obesity Cognitions Scale Frequency	COGNITIVE n=16 Obesity Cognitions Scale Belief
Eating Areas	.35	.06	.06	.04	.30	.21
Eating--no other activity	.22	.12	.26	.13	.39	.15
Total (All 5 Categories)	.51***	.01	.25	.02	.55***	.37

Note. A ratio change score was calculated for the frequency and belief ratings from the Obesity Cognitions Scale, and for each of the five eating habit scores (and for the total of the five scores) from the Eating Patterns Questionnaire by subtracting the posttreatment score from the pretreatment score, dividing by the pretreatment score and then multiplying by 100. The ratio change score for each dependent measure was used in computing the Spearman rank-order correlation coefficient.

*$p \leq .07$
**$p \leq .06$
***$p \leq .05$

Table 21

Summary Analysis of Ten Weight Control Studies Showing

Weight Changes for Control and Treatment Group Subjects

Study	Length (weeks)	Mean age (years)	Mean % overweight	Treatment and Control Groups	Mean Change in Weight
Ashby & Wilson (1977)	8	40.1	57	Group behavioral treatment (5 groups; N=34)	1. -7.86 lbs 2. -8.93 lbs 3. -8.57 lbs 4. -6.36 lbs 5. -7.92 lbs
Block (1980)	10	37.7	25.1	1. Cognitive restructuring (n=16) 2. Relaxation/ discussion (n=16) 3. NT-Control (n=8)	1. -9.3 lbs 2. -.9 lbs 3. -.5 lbs
Hall, Bass, & Monroe (1978)	10	41.5	63	Group behavioral treatment (3 groups; N=84)	1. -7.97 lbs 2. -7.2 lbs 3. -8.4 lbs

Table 21 (continued)

Study	Length (weeks)	Mean age (years)	Mean % overweight	Treatment and Control Groups	Mean Change in Weight
James & Hampton (1982)	6	37.7	46	1. Group behavioral treatment (n=20)	1. -8.3 lbs
				2. Information only (n=15)	2. -1.85 lbs
				3. NT-Control (n=20)	3. +2.99 lbs
Levitz & Stunkard (1974)	12	45	42	1. Group behavioral treatment (n=73)	1. -9.2 lbs
				2. Nutrition education (n=55)	2. -.5 lbs
				3. TOPS program (n=52)	3. +1.5 lbs
Mahoney, Moura, & Wade (1973)	4	-	48.6	1. Self-monitoring (weight) (n=5)	1. -.8 lbs
				2. Information only (n=16)	2. -1.4 lbs

Table 21 (continued)

Study	Length (weeks)	Mean age (years)	Mean % overweight	Treatment and Control Groups	Mean Change in Weight
Straw & Terre (1983)	10	39.3	-	1. Group behavioral treatment (n=9) 2. Individual behavioral treatment (n=8)	1. -7.25 lbs 2. -9.32 lbs
Wilson & Brownell (1978)	8	-	-	Group behavioral treatment (2 groups) (n=8; n=6)	1. -7.56 lbs 2. -8.16 lbs
Wing & Jeffrey (1979)[a]	4-15 (mean=11.7)	-	-	1. Group behavioral treatment (n=995) 2. Waiting-list Control (n=284)	1. -11.2 lbs 2. -1.1 lbs
Wollersheim (1970)	12	19 (Md)	28.63 (Md)	1. Behavioral group treatment (n=18) 2. NT-Control (n=18)	1. -10.4 lbs 2. +2.39 lbs

Table 21 (continued)

Note. The figures for Mean Age (years) and Mean percentage overweight are for the total sample used in the study.
[a]Review of all outpatient weight control studies published from 1967-1977 including dietary studies, exercise studies, drug studies and behavior therapy studies.

Appendix C

Consent Forms

Appendix C-1

Consent Form 1

I understand that I am answering questions (by completing a questionnaire and being interviewed) to be used in selecting subjects for a research project involving the assessment and treatment of weight problems. I also understand that during this screening session, my height and weight measurements will be taken. I have been informed that I am participating in research and that alternative sources of treatment for my problem are available through physicians, psychologists and nutritionists in clinics and private practice. I understand that agreeing to participate in this screening session does not obligate me to particpate in the research project, and that I may withdraw from this screening session at any time. I also understand that participation in this screening session does not guarantee that I will be accepted for the treatment program offered in this research project.

I understand that treatment will be conducted in group sessions over a ten week period with a follow-up session once a month for three consecutive months after the treatment sessions end. I further understand that in order to participate in the study, I will be asked to keep certain records regarding my eating behavior and my progress in the program, and to answer questionnaires regarding my habits and attitudes about weight and dieting. I understand that if I am eligible for this study, the treatment program will be explained to me more fully before I begin treatment. If eligible for this project, I have agreed to obtain written approval from my physician for participation in a weight reduction program.

I understand that the information I provide during this screening session and during the treatment program, by completing questionnaires and keeping daily records, will be available only to my therapist for the weight control group, the principal investigator and her supervisor, Dr. Rosemery O. Nelson, Professor of Psychology, University of North Carolina at Greensboro, and to a physician who has agreed to serve as consultant to the principal investigator during this project, and that the information will be kept confidential.

I also understand that if I am eligible for this project, I have agreed to make a $32.00 "data deposit" prior to the first group session. I understand that I am not paying for any treatment that I may receive. If I am eligible for treatment, I have agreed to have my money refunded, gradually and fully, if I collect the requested data each week and attend all required sessions. I also understand that I agree to forfeit the money that matches the commitments I fail to keep. Specifically, I understand that if I keep all records requested and attend all scheduled group sessions, my data deposit will be refunded as follows:

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$3.00 at each treatment session
X 8 sessions $24.00
$4.00 at each monthly follow-up session
X 2 sessions $12.00
$32.00

I understand that if I am unable to attend a scheduled session, I may call in advance to schedule a make-up appointment within two days of the original time. I understand that if I follow this procedure, I would still be eligible to have the portion of my data deposit refunded to me for that session.

I understand that if I am not eligible for this study, I will be given a list of referral sources for treatment.

Signed: _____

Witnessed: _____

Date: _____

Appendix C-2

Consent Form II
Consent for Participation in a Research Project

You are invited to participate in a research project investigating ways in which individuals with weight problems differ from one another, and to investigate how these differences may influence the effectiveness of different weight-loss programs.

The Program

The program has two phases: a treatment phase and a follow-up/ maintenance phase.

During the treatment phase you will be expected to attend 10 weekly group sessions. The sessions will last approximately 90 minutes each. A new topic related to weight control (e.g., nutrition, increasing activity) and new techniques for changing maladaptive eating patterns will be presented each week. During the sessions you will have the opportunity to practice new techniques and participate in group discussions. You will be weighed at each session and your weight recorded. Your weight will be kept confidential between you and the therapist.

During the follow-up/maintenance phase you will attend monthly group sessions for two months. The first of these follow-up/maintenance sessions will take place 4 weeks after your last weekly group treatment session. The purpose of these sessions is to check on your progress in continuing your weight loss on your own and to provide assistance for any problems you may encounter in continuing to use the techniques you learned during the treatment phase.

Responsibilities of Participation

In order that we may learn more about the most effective way to help persons like yourself lose weight successfully, as a participant in this project you will be expected to perform certain responsibilities. Your compliance with the requirements of the program will be important to maximize your own weight lose as well as to provide useful data from the project. The responsibilities of participation are described below in detail.

> Attendance. You will be expected to attend all sessions in both the treatment and follow-up/maintenance phases as described above. In the event that valid circumstances make it impossible for you to keep an appointment for your group treatment session, you should call _____ as soon as possible

to cancel your appointment, and to arrange a make-up appointment to be kept within two days of the time your appointment should have been.

If you follow this make-up procedure, your participation in the project will not be jeopardized. However, this can be allowed a maximum of two (2) times during the course of the project. Further cancellations may then require that you be asked to withdraw from the project.

Record Keeping. Throughout your participation in this project you will be asked to answer various questionnaires about your eating habits, thoughts and feelings. As part of the treatment offered in this project you will be taught to keep records about your behavior and your progress in the program. You will be provided with the forms to keep the records requested. Your record keeping will be important to your success in losing weight. Previous research on weight reduction has shown that persons who do not keep the records requested are typically not successful in the program (i.e., do not lose weight).

Data Deposit

As described in Consent Form I, as a participant in this project, you have agreed to make a "data deposit" of $32.00, and have been assured that this is not in any way payment for the group sessions. The purpose of the "data deposit" is to encourage your long-term commitment to the weight-loss program. You have agreed to have your money refunded, gradually and fully, if you keep the requested data each week and attend all required treatment sessions. You have further agreed to forfeit the money that matches the commitments you fail to keep.

Risks and Benefits

The benefits of participation in this project include: (1) learning potentially effective ways to lose weight and maintain the loss, (2) providing information about the nature and treatment of obesity that may benefit other patients in the future by increasing our understanding of the difficulties involved for the individual trying to lose weight.

Should you decide to participate in this project, you will be exposed to certain inconveniences. These include the weekly sessions and the keeping of data as requested by the therapist and answering questionnaires. All efforts will be made to minimize the inconveniences to you

in terms of scheduling and all materials for data keeping will be provided for you. While these inconveniences do exist, the commitment to attending treatment sessions is no more for this project than any serious weight control program in which you might participate (e.g., Weight Watchers). A potential risk for participation is that there is no guarantee that you will lose weight. However, there is no reason to believe that the risk of not losing weight is any greater for participation in this project than in any other weight control treatment. The weight control programs employed in this research project have been shown to be successful in helping people lose weight.

Confidentiality

As a participant in this project, all steps will be taken to insure confidentiality of your data. Any questionnaires that you complete and the data you keep each week will be kept confidential. As previously described, these records will be available to your therapist, the principal investigator and her supervisor, Dr. Rosemery O. Nelson, and to a physician who is serving as a consultant to the therapists for this project.

Rights as a Participant

The goals, requirements, potential benefits, risks and inconveniences have been outlined. You are free to decide whether or not to participate in this project and may withdraw from the project at any time. In any event, your participation will not extend beyond the last follow-up visit. If you prefer not to participate, or in the event you withdraw from treatment, you will be given a list of referral sources for treatment. If you become dissatisfied with this study, withdrawal can be arranged promptly by contacting the principal investigator. At the time of withdrawal, the data deposit allotted for any remaining treatment and follow-up sessions will be refunded promptly.

Before you sign this form, please ask any questions you may have regarding your specific responsibilities as a participant. Specific details regarding the research cannot be given at this time. However, at the last follow-up session, each participant will be given a written debriefing statement which describes the nature and purpose of the research project.

If you have any questions concerning this research project, or your right as a research participant, you should contact:

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Name: Dr. Rosemery O. Nelson

Professor of Psychology

Address: Dept. of Psychology, UNC-G

1000 Spring Garden St., Greensboro,NC 27412

Phone: 379-5013

Consent

Authorization: I have read the above and decide that _____ _____ will participate in the project described above. Its general purposes, responsibilities of involvement, inconveniences, and potential benefits and risks have been explained to my satisfaction. My signature indicates that I have received a copy of this consent form.

(Name of participant)

_____ _____

Witness Participant's Signature

_____ _____

Signature-Principal Investigator Date

_____

Telephone Number

Appendix D

Subject Classification Measures

Appendix D-1

Role-Play Scenes Used For Subject Classification

Scene 1

It's Sunday afternoon. You have just finished a second serving of the cake you baked. You feel stuffed. You catch a glimpse of yourself in the bedroom mirror and do not like what you see. You decide to go on a diet first thing Monday morning. Monday goes well; Tuesday, Wednesday and Thursday do too. You are feeling pleased with the way you have controlled your eating. Thursday evening, your husband (boyfriend, a friend) announces an invitation to a party for Saturday night.

At this point, what might you be thinking? What might you be saying to yourself?

Scene 2

You have been dieting for 4 days and can't believe how good you've been with cutting back on your eating. You decide to weigh yourself and find you have lost one-half pound.

At this point what might you be thinking? What might you be saying to yourself?

Scene 3

You are shopping and have tried on several outfits in your favorite stores. You have found that your usual size is really too small. You decide to leave the mall and return home. On the way out of the mall you pass by the Cookie Factory. You stop and look in.

At this point, what might you be thinking? What might you be saying to yourself?

Appendix D-4

Scoring Criteria for Categories of Role Play Responses

Negative

Thought. Negative thoughts were categorized as those in which the subject described herself as helpless to control her behavior in the presence of food (e.g., "I'll never be able to resist desserts."), made internal attributions for overeating or her weight problem (e.g., "I know I'll blow it, I have no will power."), or were self-defeating in that the logical outcome of acting on the thought would be to overeat (e.g., "I'm so fat now, one cookie won't make any difference.").

Action. Any response given by the subject in which she described what she "would do" (versus what she might be thinking) that would lead to overeating (e.g., "I would go in and buy a cookie.").

Positive

Thought. Any self-statement of the subject that could be categorized as praise, encouragement, or self-instruction to refrain from overeating (e.g., "I would tell myself to keep walking." "OK, Ms. Piggy, eating a cookie won't make your clothes fit any better.").

Action. Any response of the subject saying what she "would do" (versus what she was thinking) in the situation that would lead to the subject controlling an eating situation (e.g., "I would eat less the day of the party." "I would leave the mall.")

Emotional Exclamation

Any response of the subject such as "Oh no!" "Ugh!" "Hoorah".

Appendix E

Dependent Measures

Appendix F

Materials for Behavior Change Treatment

Appendix F-2

Outlines of the Eight Treatment Sessions

Session One: Introduction To Weight Control

I. Presentation of group policies and procedures.

II. Presentation of program description and rationale.

A. Confidentiality for group members.
B. Review of treatment contract (Consent Form II).
C. Rationale for homework assignments.
D. Overview of format for weekly group sessions.

III. New Material: The behavioral model of weight control.

A. Overeating and inactivity are habits.
B. If you are overweight because of a learned habit, the solution is to learn new eating behaviors or habits.
C. This is best done by rearranging our environment so that new habits are more likely to occur than old ones.
D. In this program the main focus will be to increase the strength of appropriate eating skills rather than trying directly to weaken inappropriate ones.
E. Changing long-standing habits is difficult. The way to succeed is to make changes, a small step at a time, and to practice each step until it seems like second nature.
F. Weight reduction is successful only if it lasts indefinitely. Losing weight does not have to be a painful or even a very hungry experience.
G. To make this program work, behavior change and weight reduction must be high on your list of priorities.
H. In behavior modification programs, measurement is extremely important. In this program we emphasize habit awareness: observing and keeping records of all your eating behaviors.

IV. Homework.

A. Fill out your Food Diary according to the instructions provided (subject given handout of written instructions.)

V. Weigh-ins.

A. Introduction of Master Data Sheet.
B. Introduction of personal weight graphs.

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Session Two: Cue Elimination

I. Weigh-in and homework check.

II. Review.

A. Behavioral weight control programs make the assumption that eating, like other behavior, is learned. Our objective in this program is to change your eating behaviors, and to help you lose weight as a result of this change.
B. Behavior therapies are based on observation. Your Food Diary will be your chief source of information during the course. Usually, writing down all food intake and related activities exposes patterns of behavior that are not obvious at first.
C. To be most effective, the Food Diary should be filled out immediately after each meal. If necessary, record your food intake and the associated information on a 3 x 5 card, or in a small notebook you can carry with you.

III. New topic: Cue elimination.

A. Overweight people are often more sensitive than thin people to external stimuli or cues that trigger eating behaviors.
B. The cues that can evoke the sensation of hunger are almost limitless. They include the time of day, place of eating, and activities associated with eating. Any object in your environment, if paired long enough with eating, will acquire the ability to make you feel hungry.

IV. Cue elimination: How to do it.

If you frequently eat in many places, or engage in unassociated activities while eating, you have probably become conditioned to feeling hunger in many situations when your body is not physically hungry. Today's exercise is designed to systematically eliminate some of the environmental or situational controls over your eating.

A. Designate an appropriate eating place at home or work. Eat all of your meals and snacks at this place.
B. Change your habitual eating place at the table.
C. When eating, only eat. No other activities.
D. Remove food from all places in the house which are not appropriate storage areas.

E. Keep junk foods out of sight, hidden, hard to get, or don't buy them.
F. Reduce visual cues for eating. Store food in opaque containers. Remove serving dishes from the table or put them at the opposite end of the table. Mark the last column of the Food Diary "yes" or "no" to indicate whether visual cues were reduced for each meal or snack.

V. Homework.

A. Food Diary.
B. Eating Place Record filled in for each meal and snack during the coming week.

Session Three: Changing The Act of Eating

I. Weigh-in and homework check.

II. Review.

A. Eating behaviors are largely learned, and to change them you must learn competing, more appropriate behaviors.
B. One of the steps in learning to control your eating behaviors is to change or rearrange your environment so that the learned associations do not have a chance to remind you of food.
C. Cue elimination techniques.

III. New techniques: Changing the act of eating.

A. Many overweight people have a habit of eating in almost a continual stream. This is a bad habit for two reasons: it takes time for the food you eat to be absorbed into your system and decrease the hunger you feel, and you do not have time to really enjoy your food.
B. If a delay can be built into the process of eating, both of these problems can be overcome.
C. The best way to learn this behavior is to try systematically to put your utensils down until each bite has been swallowed.
D. If putting utensils down after each bite already is a habit, try the additional technique of introducing a two-minute delay between courses in a meal. Use the time to talk, think, or simply rest.

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IV. Homework.

A. Food Diary.
B. Fill in the eating ratio column on the Food Diary.
C. Fill in the Eating Place Record every day.
D. Cue elimination exercises.

Session Four: Behavior Chains and Alternate Activities

I. Weigh-in and homework check.

II. Review.

A. Self-observation skills.
B. Environmental control. Cue elimination techniques were suggested to disrupt cue or stimulus-controlled eating.
C. Changing the act of eating.

III. New technique: Behavior chains and alternate activities.

A. Substitution of alternate activities can often delay or overcome a hunger response. It is a technique that can be used to eliminate a great deal of snacking; it uses "brain power" rather than "will power."
B. Alternate activities are effective because behaviors usually occur in chains, and it is usually possible to substitute links in a chain. Eating is often at the end of a chain of responses, and is often one of the terminal events. If the chain is broken at any point, the terminal behavior will probably not occur. A behavioral chain is provided on blackboard.
C. Once the behavior chain has been identified, you can select an alternate activity to substitute for one of the links in the chain. The alternate activity should not lead to eating.
D. To break the behavior chain, choose an alternate activity to fit closely with the link you are replacing.
E. Activities that are appropriate substitutions must be:
   1. Readily available.
   2. Able to compete with the urge to eat.
   3. If possible, incompatible with eating, like a nap.
F. Alternate activity can be:
   1. Pleasant activities you have delayed for use as substitutions: hobbies, music, reading, gardening, walking, sports, and sleeping.

2. Necessary activities you have saved to use as substitutions: errands, cleaning, housework, phone calls, bills, washing your hair, taking a bath.

G. Another way to break a behavior chain is to systematically introduce a delay between links in the chain with a timer. Hunger pangs are relatively short-lived and a ten-minute delay may be all you need to prevent an eating episode.

IV. Homework.

A. Food Diary.
B. Complete a behavior chain and your Alternate Activity Sheet.
C. Transfer the information from your Lesson One Food Diary to the places on the Behavioral Analysis Form under Week One.

Session Five: Behavioral Analysis and Problem Solving

I. Weigh-in and homework check.

II. Review.

A. The Food Diary gives you immediate information about the way you eat and the content of your meals.
B. The Eating Place Record.
C. The Eating Ratio.
D. Behavior Chains.

III. New technique: Problem solving or becoming your own therapist.

A. This week we want you to solve behavioral problems that are uniquely yours. We want you to start becoming your own behavior therapist.
B. We have arbitrarily divided the problem solving into five steps:
1. Observation and long-term goal definition.
2. Definition of specific problems or short-term goal setting.
3. Create alternative plans to solve the specific problem you have defined. BRAINSTORM.
4. Decision-making, or choosing the most appropriate plan.
5. Evaluation and feedback.

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IV. Practice problem-solving techniques. (Group exercise).

V. Maintenance:

A. The Daily Behavior Checklist is a way of keeping track of all the behaviors we have covered in the past five weeks.
   1. Rate yourself each evening after dinner on how well you carried out the listed behaviors during the day. Use a scale of 1-3, with 3 indicating the greatest success.

VI. Homework.

A. Food Diary.
B. Daily Behavior Checklist.
C. Problem solving. Solve <u>at least</u> the problem defined on the Behavioral Prescription Sheet during this session.

Session Six: Pre-Planning

I. Weigh-in and homework check.

II. Review.

A. Problem solving was introduced as a general behavioral technique that will continue to be of use when the course is over.
B. The goal of the problem solving exercise was to train you to spot eating problems, to formulate plans to change these problems, and to evaluate your progress once you have carried out your plan.
C. Review of Behavioral Prescription Sheet assignment.
D. Group Exercise: Practice completing a Behavioral Prescription Form.

III. New technique: Pre-planning what you eat.

A. Pre-planning involves thinking ahead about food and the circumstances of eating.
B. Pre-planning can be broken into steps:
   1. Set aside a time to pre-plan.
   2. Write down your planned menu on your Food Diary--use a different color ink. After the meal you planned, correct your Food Diary.

3. Plan ahead for restaurants and parties--work out strategies in advance for drinks and high caloric entrees. Use the skills you have learned here to cope with dinner parties, e.g., slow down and enjoy yourself.
4. Some people find it easier to pre-prepare snacks than to pre-plan them.

D. Pre-planning what you buy.
E. Because pre-planning involves a fundamental change in the way you think about food, insure your success by starting with one meal or snack a day, and increasing the amount of pre-planning when you feel comfortable.

IV. Homework.

A. Food Diary.
B. Daily Behavior Checklist.
C. Pre-plan one or more meals or snacks each day on your Food Diary. Correct the pre-planned menu after you eat the meal. Use a different color ink for correcting. You will receive immediate feedback through the amount of two-color entries in your Food Diary for the week.

Session Seven: Cue Elimination, Snacks and Holidays

I. Weigh-in and homework check.

II. Review.

A. Maintenance of behavior change is fundamental to this weight loss program. The method we have used to build maintenance into the program is a Behavior Checklist which reminds you of your new behaviors every day. When your new eating skills are solidly established, artificial aids like the checklist can fade out of your daily routine.
B. Pre-planning.
C. Changing your food buying behavior.

III. New technique: Cue elimination.

A. The first cue elimination techniques were aimed at your relationship to your whole environment. (Review techniques).
B. Some of the most difficult cues to eliminate are intimately associated with food.

1. For this week, try to use smaller plates for your meals when possible.
2. We are all conditioned to eat everything on our plates. From now on, leave something behind at every meal.
3. If you divide large portions in half, you will be less tempted to finish the second half even though it is available, than if it is all served to you at once. This week, divide large portions or meals into halves; after one is eaten, go back for seconds if you are still hungry.
4. Dispose of leftovers. Throw away leftover food. Clear your plates into the disposal, garbage, or pet cat. If something should be saved, pre-plan it into a snack for the next day.
5. Control your food intake. Don't accept food from others unless you ask for it, either at home or at restaurants.
6. Try to minimize contact with food. Put things away and clean up the mess before you sit down to eat the food you prepare.

IV. New topic: Snacks and holiday control.

A. Snacks are usually the result of impulse, a response to a non-physiologic, non-hunger cue. These cues are situation specific and time limited.
B. Impulse eating is especially a problem under two conditions:
   1. Holidays, where the environment is saturated with eating cues.
   2. During ordinary meals. This includes anything eaten after you cannot answer the question, "Am I hungry" with a "yes."
C. If you can control the impulse to eat when you are not hungry, you will dramatically decrease your daily caloric intake.
D. We have introducted many techniques that can be used to control snacking. These will be your first line of defense during holidays, vacations, and other times when there is an increased probability of snacking or impulsive eating.
   1. Build time delays into snacks--put ten minutes between your urge and your snack.
   2. Slow down, put your food down and take time to enjoy each bite.
   3. Eat at your designated appropriate eating place.

4. Substitute alternate behaviors for eating.
5. Pre-plan your food and drink intake.
6. Do all shopping on a full stomach from a list. Don't buy snack foods.
7. Leave some part of each food type behind. Throw it away. Control your environment, don't let it control you.

E. Food Substitutions.
1. The calorie content of food is not intuitively obvious. Consult a calorie book.
2. In many situations you have a choice of foods, hors d'oeuvres, meals or snacks. If you know how much they are worth, you will make better choices.
3. Group exercise: The Snack Worksheet.

V. Homework.

A. Food Diary.
B. Daily Behavior Checklist.
C. Snack Worksheet.

Session Eight: Social Support and On Your Own

I. Weigh-in and homework check.

II. Program Review.

A. Program rationale.
B. Self-observation and self-awareness.
C. Cue elimination techniques.
D. Changing the act of eating.
E. Behavior chains and alternate activities.
F. Problem solving.
G. Pre-planning.
H. Snacks and holidays: Impulse control.

III. New topic: The social environment--spouse, family, and friends.

A. Interactions with others concerning weight loss tend to follow patterns; some of the negative feelings perceived by people losing weight are:
1. "No one is interested in what I am doing."
2. "No one supports my change."
3. "People discourage me."

4. "My efforts are ignored."
5. "My loss is praised, but maintenance is ignored.
6. "I am being sabotaged."

B. Many reasons can be suggested to explain these interactions. The most probable one is that this is just a way that individuals around you have learned to interact with you when you are losing weight. Any social environment includes many behaviors and habitual interactions that have persisted for a long time, without either person being fully aware of what is occurring between them. The more you can involve others in your weight loss program, the fewer of these negative interactions you will have. Many can be avoided by being prepared for them.

C. To break out of these stereotyped interactions, most of the responsibility must be undertaken by the person losing weight:
   1. Ask for what you want--praise, feedback, cooperation, and reward.
   2. Ask for help with the techniques.
   3. Request that affection and sharing not be associated with food.
   4. Ask people not to offer you food; assure them you will ask for what you want to eat.
   5. Minimize "food talk" when you are with friends; it is a social cue to eat.
   6. Entertain without high-carlorie foods.
   7. Ask people not to snack around you; they will cue you to eat or be hungry.

IV. New topic: Lapse, relapse and collapse.

A. Distinguishing lapse, relapse and collapse.
B. Methods for coping with lapse and preventing relapse.

V. The follow-up/maintenance phase.

A. Description and purpose.
B. Keeping your Food Diary.
C. Maintenance Behavior Checklist.
D. Behavioral Prescription form.

Appendix F-3

Session Summaries Provided to the Subject

Session 1: The Behavioral Model of Weight Control

I. The behavioral model of weight control.

A. Overeating and inactivity are habits.

B. If you are overweight because of a learned habit, the solution is to learn new eating behaviors or habits.

C. This is best done by rearranging your environment so that new habits are more likely to occur than old ones.

D. In this program the main focus will be to increase the strength of appropriate eating skills rather than trying directly to weaken inappropriate ones.

E. Changing long-standing habits is difficult. The way to succeed is to make changes, a small step at a time, and to practice each step until it seems like second nature.

F. Weight reduction is successful only if it lasts indefinitely. Losing weight does not have to be painful or even a very hungry experience.

G. To make this program work, behavior change and weight reduction must be high on your list of priorities.

H. In behavior modification programs, measurement is extremely important. In this program we emphasize habit awareness: observing and keeping records of all your eating behaviors.

II. Homework.

A. The Food Diary.

1. Complete all columns according to the instruction sheet.
2. Make entries <u>immediately</u> after eating.
3. Don't let the records become inaccurate during over-eating.

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Session 2: Cue Elimination

I. Cue Elimination: How to do it.

A. Designate an appropriate eating place at home and work. Eat all of your meals and snacks at this place.

B. Change your habitual eating place at the table.

C. When eating, only eat. No other activities.

D. Remove food from all places in the house which are not appropriate storage areas.

E. Keep junk foods out of sight, hidden, hard to get, or don't buy them.

F. Reduce visual cues for eating. Store food in opaque containers. Remove serving dishes from the table or put them at the opposite end of the table. Mark the last column of the Food Diary "yes" or "no" to indicate whether visual cues were reduced for each meal or snack.

II. Homework.

A. Food Diary.
B. Eating Place Record filled in for each meal and snack during the coming week.

Session 3: Changing the Act of Eating

I. Changing the act of eating.

A. Many overweight people have a habit of eating in almost a continual stream. This is a bad habit for two reasons: it takes time for the food you eat to be absorbed into your system and decrease the hunger you feel, and you do not have time to really enjoy your food.

B. If a delay can be built into the process of eating, both of these problems can be overcome.

C. If you learn to swallow the food in your mouth before putting more on your fork, you will automatically extend the length of time a meal takes.

D. The best way to learn this behavior is to try systematically to put your utensils down until each bite has been swallowed.

E. To develop this behavior, start with an observation of how frequently you put your utensils down during a given time, or an entire meal, and compare this with the total number of bites in the same period of time. A five-minute sample is sufficient to determine your ratio of forks down to swallows. Once this is determined, for example, 1:8 (fork down once for every eight bites swallowed), try to reduce it to once in four bites, then once in two bites, and finally, to putting your utensil down after every bite. Record the ratio of putting utensils down to bites in the last column of this week's Food Diary.

F. If putting utensils down after each bite is already a habit, try the additional technique of introducing a two-minute delay between the courses in a meal. Use the time to talk, think, or simply rest.

II. Homework.

A. Food Diary.
B. Fill in the eating ratio column on the Food Diary.
C. Fill in the Eating Place Record every day.
D. Continue to practice the cue elimination exercises.

Session 4: Behavior Chains and Alternate Activities

I. Behavior chains and alternate activities.

A. Substitution of alternate activities can often delay or overcome a hunger response. It is a technique that can be used to eliminate a great deal of snacking; it uses "brain power" rather than "will power."

B. Alternate activities are effective because behaviors usually occur in chains, and it is usually possible to substitute links in a chain. Eating is often at the end of a chain of responses, and is often one of the terminal events. If the chain is broken at any point, the terminal behavior will probably not occur. A behavioral chain is provided on blackboard.

C. Once the behavior chain has been identified, you can select an alternate activity to substitute for one of the links in the chain. The alternate activity should not lead to eating.

D. To break the behavior chain, choose an alternate activity to fit closely with the link you are replacing.

E. Activities that are appropriate substitutions must be:

1. Readily available.
2. Able to compete with the urge to eat.
3. If possible, incompatible with eating, like a nap.

F. Alternate activity can be:

1. Pleasant activities you have delayed for use as substitutions: hobbies, music, reading, gardening, walking, sports, and sleeping.
2. Necessary activities you have saved to use as substitutions: errands, cleaning, housework, phone calls, bills, washing your hiar, taking a bath.

G. Another way to break a behavior chain is to systematically introduce a delay between links in the chain with a timer. Hunger pangs are relatively short-lived and a ten-minute delay may be all you need to prevent an eating episode.

II. Homework.

A. Food Diary.
B. Complete your own behavior chain on the form provided and develop your list of alternate activities.
C. Continue the Eating Place Record.
D. Complete the Behavioral Analysis form from your Week I Food Diary.

Session 5: Behavioral Analysis and Problem Solving

I. Problem solving.

A. Observation and long-term goal definition. The Food Diary is an example of observation; the long-term goal is losing weight.

B. Definition of specific problems or short-term goal setting. Break the problem into small steps, each of which can be specifically defined and approached with a reasonable chance of success.

C. Create alternative plans to solve the specific problem you have defined. BRAINSTORM--uncritically think of as many solutions to the problem as you can. Write them all down.

D. Decision-making, or choosing the most appropriate plan. Choose a plan that looks like it will solve your problem, that has a good chance of success, but still takes into consideration factors such as pleasure and your life style.

E. Evaluation and feedback. If you don't know where you are, you will never know where you are going. Keep evaluating your progress.

II. Homework.

A. Food Diary.
B. Daily Behavior Checklist.
C. Problem solving exercise using the Behavioral Prescription Sheet.

Session 6: Pre-Planning

I. Pre-planning what you eat.

A. Pre-planning involves thinking ahead about food and the circumstances of eating.

B. Pre-planning is the first step in changing your self-instructions or internal dialogues that determine when, where, and what you eat. As thinking ahead about food becomes a habit, the effect of impulse on eating diminishes.

C. Pre-planning can be broken into steps:

1. Set aside a time to pre-plan.
2. Write down your planned menu on your Food Diary--use a different color ink. After the meal you planned, correct your Food Diary.
3. Plan ahead for restaurants and parties--work out strategies in advance for drinks and high caloric

entrees. Use the skills you have learned here to cope with dinner parties, e.g., slow down and enjoy yourself.

4. Some people find it easier to pre-prepare snacks than to pre-plan them.

D. Pre-planning what you buy.

II. Homework.

A. Food Diary.
B. Daily Behavior Checklist.
C. Pre-plan one or more meals or snacks on your Food Diary (Remember to use a different color of ink for correcting.)

Session 7: Cue Elimination, Snacks and Holidays

I. New cue elimination techniques.

A. Try to use smaller plates for your meals when possible.

B. From now on, leave something behind at every meal.

C. Divide large portions in half. You will be less tempted to finish the second half even though it is available, than if it is all served to you at once.

D. Dispose of leftovers. Throw away leftover food. Clear your plates into the disposal, garbage, or pet cat. If something should be saved, pre-plan it into a snack for the next day.

E. Control you food intake. Don't accept food from others unless you ask for it, either at home or at restaurants.

F. Try to minimize contact with food. Put things away and clean up the mess before you sit down to eat the food you prepare.

II. Snacks and holiday control techniques.

A. Build time delays into snacks--put ten minutes between your urge and your snack.

B. Slow down, put your food down and take time to enjoy each bite.

C. Eat at your designated appropriate eating place.

D. Substitute alternate behaviors for eating.

E. Pre-plan your food and drink intake.

F. Do all shopping on a full stomach from a list. Don't buy snack foods.

G. Leave some part of each food type behind. Throw it away. Control your environment, don't let it control you.

III. Homework.

A. Food Diary.
B. Daily Behavior Checklist.
C. Snack Worksheet.

Session 8: Social Support and On Your Own

I. Maintaining new eating habits.

A. Changing any habit is difficult, especially one as old as eating.

B. Change takes time and careful planning. We have approached the changes one step at a time. It may be that you are only now feeling very confident of changes we introduced in Sessions 1-5. This is to be expected.

C. The follow-up/maintenance period will give you time to master each change introduced during the weekly group sessions.

II. Taking responsibility for breaking out of stereotyped social interactions.

A. Ask for what you want--praise, feedback, cooperation, and reward.

B. Ask for help with the techniques.

C. Request that affection and sharing not be associated with food.

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D. Ask people not to offer you food; assure them you will ask for what you want to eat.

E. Minimize "food talk" when you are with friends; it is a social cue to eat.

F. Entertain without high-calorie foods.

G. Ask people not to snack around you; they will cue you to eat or be hungry.

II. Lapse, relapse and collapse.

A. A lapse is a slight error or slip, an isolated instance of backsliding.

B. Relapse occurs when many lapses string together. Yet, a relapse may be confined to a short period of time (i.e., a day).

C. Collapse is when relapse periods string together over long periods of time.

D. Remember:

1. A LAPSE DOES NOT A RELAPSE MAKE.
2. A RELAPSE DOES NOT HAVE TO LEAD TO COLLAPSE.

III. Preventing and coping with lapses and relapses.

A. Prevention: Continue keeping your Food Diary during the maintenance phase. Set a goal to pre-plan at least one meal or snack each day.

B. Coping with lapse.

1. Stop, look, listen.
2. Stay calm.
3. Renew your vows to change your eating habits.
4. Analyze the lapse situation. (Your Food Diary can be helpful here.)
5. Take charge immediately. (Which of the techniques you have learned would be most helpful?)
6. Ask for help.

C. To help prevent and cope with lapse, read over the summary sheets from the group sessions at least once a week. Keep a notebook of problems you have so you can get feedback at the follow-up sessions.

IV. Homework.

A. Food Diary. Keep your Food Diary each day. Looking back over your Food Diary will help you identify lapses in progress.

B. Complete your Maintenance Behavior Checklist daily.

C. At the beginning of each week, complete a Behavioral Prescription Form. Solve at least one problem each week. If you find yourself "lapsing" into an old pattern, such as eating while watching television, use that as your problem for the week.

Appendix F-4

Food Diary (Sample)

Day of Week _____ Name _____

Time	Minutes Spent Eating	M/S	H	Body Position	Activity While Eating	Location Of Eating	Food Type and Quantity	Eating With Whom	Feeling While Eating
6:00									
11:00									
4:00									
9:00									

Appendix G

Materials for the Cognitive Change Treatment

Appendix G-1

Program Description and Treatment Rationale

This program has two components, a treatment phase, and a follow-up/ maintenance phase.

Treatment Phase

This portion of the program consists of eight weekly sessions. Each session will last one and a half hours and will take place in a group setting. We have found that treating people in groups is more effective than seeing them individually since there are others present with whom to share experiences. Group discussions are an important aspect of the treatment so we encourage you to feel free to assist each other.

During the group sessions the group leaders will present the week's cognitive change techniques and will distribute homework assignments designed to assist you.

A private weigh-in will be held for each group member before each meeting. Records of your weight and other information will be kept strictly confidential.

Follow-up/Maintenance Phase

This phase is perhaps the most important part of the program. The goal of any good weight control program is to train individuals to be their own weight control therapist. Most of you will not reach your goal weight in the 8 weeks of the treatment phase. During the follow-up/maintenance phase you will be able to continue your weight loss on your own using the techniques learned in treatment until you reach your goal weight. During the follow-up/maintenance phase, group sessions will be held monthly. There will be two sessions to this phase. The monthly group sessions will allow you to plot your progress with the group and obtain assistance from the therapist and group members for any problems you encounter in continuing to apply the techniques you learned in treatment.

Rationale

You like all human beings think a lot. You think most of your waking hours and even when you're asleep. These thoughts or cognitions that you have are an important influence on both your emotions and on your behavior. All of us develop certain ways of thinking which come to dominate our lives. These are called cognitive habits. Cognitive habits include your thoughts, attitudes, beliefs and self-statements (what you say to yourself). Your cognitive habits are an important

influence on your eating patterns. On many occasions you eat not because you're hungry but because of what you're thinking or feeling.

Consider the following. How many times per day do you think about or imagine that box of cookies in the cabinet, that casserole you're going to make for dinner, that luscious piece of cake you ate for lunch? Makes your mouth water just to think about it, doesn't it? It certainly does! And how many times per day do those thoughts and images cue you to go to the kitchen for another sliver of cake or just a couple of cookies?

Now, what happens next? You've finished your sliver of cake (which turned out to be three or four). You've gone back to your book and are attempting to get back into that good chapter you're trying to finish before the kids get home from school. But your head keeps returning to that scene in the kitchen. And sure enough, this time your thoughts are on the other side of the fence: "Well, you just blew it, didn't you? You weren't even hungry and you stuffed yourself anyway. You deserve to be fat!" One thought leads to another, and very soon your start to feel bad--frustrated, disgusted, angry at yourself. Within minutes you've talked yourself into feeling depressed and defeated. "I'll never make it anyway; I might as well give up. It's just too much effort; apparently I don't have what it takes." Those relentless thoughts are at it again--and pretty soon you're back in the kitchen!

As you can see from this example, overeating often is initiated and maintained by the ways in which you think about food and evaluate yourself in relation to eating. Overweight people seem to develop cognitive habits by which they think of themselves in relation to food in a negative way. They regard themselves as losers, as people lacking self-control etc. These negative cognitive habits develop as a result of what you tell yourself about eating situations. Thus the way in which you behave or feel develops through telling yourself negative things.

When we talk about <u>self-statements</u> we are not talking about things that you literally tell yourself. Your self-statements are thoughts that have become automatic and involuntary. They seem to just happen so that we are often not really aware of them. The kind of self-statements you make in relation to yourself and eating situations represent negative and faulty appraisals that range from mild distortions to complete misinterpretation. However, because you've been using them for so long they are likely to appear truthful to you. At this point you not only think you can never gain control of yourself enough to lose weight, but you know it is a proven fact!

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They are not facts, however, they are something that you learned sometime in the past, either from having someone say it to you or say it about others. They may also have come from erroneous inferences you made about a situation. What it is important for you to understand is that these negative cognitive habits are something that you learned and as such can be unlearned. Thinking negatively is something you do, the thoughts do not represent who you are. These negative cognitive habits come to interfere with your life. They help to initiate and maintain your overeating. Changes in these cognitive habits have been demonstrated to produce changes in the likelihood of overeating.

Not only must we stress the effort involved but also that frequently there is a lag between changing what we think or say to ourselves and our feelings and behaviors. It takes time for these new ways of thinking to help produce new feelings and behaviors. You should be prepared for this lag, if not you may become easily discouraged.

Note. From Collins (1980). Adapted by permission.

Appendix G-2

Outlines of the Eight Treatment Sessions*

Session One: A Cognitive Approach to Weight Control

I. Group policies and procedures.

- A. Confidentiality for group members.
- B. Review of treatment contract (Consent Form II).
- C. Rationale for homework assignments.
- D. Format for weekly group sessions.

II. Presentation of program description and treatment rationale.

III. New material.

- A. Why are people overweight?
- B. A cognitive model of weight control.
  - 1. Role of negative thought patterns in overeating.
  - 2. Learning to identify negative thought patterns.
    - a. The A-B-C technique.
    - b. Practice identifying negative thoughts.
      - 1. Therapist provides examples.
      - 2. Examples generated by group members.
      - 3. Homework: Keeping a "Thought Diary".

IV. Weigh-ins.

1. The Master Data Sheet.
2. Personal weight graphs.

V. Homework.

- A. Thought Diary. (Client completes time, emotion and thought columns).
- B. Food Record.

Session Two: Negative Cognitions

I. Weigh-in and homework check.

II. Review.

- A. What are the characteristics of negative thoughts?

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B. How are negative thoughts related to overeating?
C. Discussion of thought diaries for week one.

III. New topic: Identifying cognitive distortions.

A. Presentation of cognitive distortions: "Internal traps".
   1. Overgeneralization.
   2. Magnification/Catastrophizing.
   3. Perfectionism, imperatives, and dichotomous thinking.
   4. Immediate gratification.
   5. Selective abstraction.
   6. Negative expectations.
B. Categories of negative thinking related to weight loss. (From Mahoney and Mahoney, 1976).
   1. Pounds lost.
   2. Capabilities.
   3. Excuses.
   4. Goals.
   5. Food thoughts.
C. Identifying and classifying negative thoughts: The Thought Style Form.
   1. Practice identifying negative thoughts using examples of negative thoughts about the program.
   2. Using entries on their Thought Diary Form, have clients identify most frequent type of error and most frequent category of thoughts.

IV. Homework.

A. Thought Diary.
B. Food Record.
C. Complete Thought Style Form each evening.

Session Three: Positive Alternatives to Negative Cognitions

I. Weigh-in and homework check.

II. Review.

A. Identification of negative cognitions.
B. Categories of negative thoughts related to dieting.
C. Group exercises.
   1. Practice identifying negative thoughts using examples of negative thoughts about the program.

2. Using entries on their Thought Diary Form, have clients identify most frequent type of error and most frequent category of thoughts.

III. New technique: Learning to challenge and dispute negative thoughts.

A. Consequences and functions of negative thinking.
B. Techniques for challenging negative thoughts.
   1. Rational disputing.
   2. Distancing.
   3. Generating alternatives.
   4. De-catastrophizing.
   5. Expectation therapy.
C. Evaluating and disputing: Questions to ask.
   1. What is the evidence? What part is fact? What part is fiction?
   2. Is there another way of looking at this?
   3. Even if it is true, is it as bad as it seems?

IV. Homework.

A. Thought Diary. Client completes all columns.
B. Food Record.
C. Client completes Thought Style Form each evening.
D. Client generates alternate positive responses for negative thoughts that she was unable to effectively counter at the time of their occurrence. These are also entered on Thought Style Form.

Session Four: Irrational Beliefs

I. Weigh-in and homework check.

II. Review.

A. Ways to challenge negative thoughts.
B. Discussion of problems.

III. New topic: Identifying and disputing irrational beliefs.

A. Irrational beliefs.
   1. I must have love, appreciation, or approval from all people I find significant, or else I am worthless.

2. I must prove myself perfect (thoroughly competent, adequate and achieving) in controlling my weight.
3. I have to eat whenever I get seriously frustrated, treated unfairly, or rejected.
4. Whenever situations make me anxious or upset, the only way in which I can relieve the anxiety is to eat a lot.
5. I can more easily avoid facing the difficulties of controlling my weight than undertake more rewarding forms of self discipline which lead to weight loss.
6. My past remains all important, and because something strongly influenced my life, it has to keep determining my feelings and behavior today.
7. Things should turn out easier than they do. I must view myself as awful and horrible if I do not find good and easy solutions to controlling my weight.
8. For me to do without a desired object (such as food) is totally unbearable.
9. Life should always be fair. Virtuous individuals who strive and sacrifice should be rewarded. Only those who are thoughtless and terrible go unrewarded, or are punished for their sacrifices.

B. Disputing irrational beleifs.
   1. Is there any evidence that this belief is false?
   2. Is there any evidence that this belief is true?
   3. What is the worst that could happen to me if things did not occur the way I wanted them to?
   4. Are there any good things that I could make happen if I did not get what I wanted?
   5. Therapist provides illustrative examples of disputing each of the nine irrational beliefs.
   6. Client writes questions 1-4 on 3x5 index card to carry with her at all times.

IV. Homework.

A. Thought Diary.
B. Food Record.
C. Thought Style Form.
D. Reminder card for disputing irrational beliefs.

Session Five: Self Instruction and Coping Imagery

I. Weigh-in and homework check.

II. Review.

A. The nature and consequences of irrational beliefs.
B. Disputing irrational beliefs.
C. Group discussion of problems using examples from the homework assignments.

III. New material.

A. Self-instructional training.
   1. Preparation.
   2. Confrontation and handling.
   3. Reward.
B. Rehearsal in imagination.
C. Pre-planning: Identifying "triggers" and "high risk" situations.
   1. Group exercise: (Group members work in pairs). Using last week's Thought Diary, identify "high risk" times/situations for negative thinking that leads to overeating. Fill out the Cognitive Prescription Form.
   2. Homework: Record progress in following cognitive prescriptions.

IV. Homework.

A. Thought Diary.
B. Food Record.
C. Cognitive Prescription Form.

Session Six: Impossible Dream Thinking and Goal Setting

I. Weigh-in and homework check.

II. Review.

A. Self-instructional training.
B. Pre-planning.

III. New topic: Pitfalls of Perfectionism.

A. The problems of perfectionism.
   1. "Cognitive claustrophibia" (Mahoney & Mahoney, 1976).
   2. "When I'm thin, I'll be perfect."
   3. The consequences of perfectionistic goal setting.

B. Guidelines for setting goals.
   1. Set specific goals.
   2. Set reasonable/realistic goals.
   3. Set flexible goals.

IV. Homework.

A. Thought Diary.
B. Food Record.
C. Cognitive Prescription Form.
D. Practice identifying impossible dream thinking and generating realistic goals for the coming week.

Session Seven: Facing Fears and Psychological Ownership of Choices.

I. Weigh-in and homework check.

II. Review.

A. Perfectionsim.
B. Goal setting.

III. New topics: Fears and choices

A. Facing fears. The fear of what will happen to you -- the fear of dissatisfaction.
   1. Guided fantasy technique for facing fears.
B. Psychological ownership of choices.
   1. Ways people disown responsibility for overeating.
   2. Challenging the excuses ("I am in control even when I'm out of control.")
   3. Group exercise: Subjects use Thought Diaries to generate examples of choosing to overeat.

V. Homework.

A. Thought Diary.
B. Food Record.
C. Client completes "Fears and Fantasies" form. (At least two examples).

Session Eight: Social Support and On Your Own

I. Weigh-in and homework check.

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II. Program Review.

A. Program rationale.
B. Negative cognitions.
C. Disputing and generating positive alternative.
D. Identifying and disputing irrational beliefs.
E. Self-instructional training.
F. Pre-planning coping strategies.
G. Goal setting.
H. Psychological ownership of choice.
I. Fears and fantasies.

III. New topics: Social support and on your own.

A. Social support.
   1. Interactions with others: negative patterns.
      a. "No one is interested in what I am doing."
      b. "No one supports my change."
      c. "People discourage me."
   2. Reasons for negative interactions.
      a. They may be uncomfortable eating in front of you.
      b. They may be jealous.
      c. They want to test your determination.
      d. They want to sabotage your efforts.
   3. Breaking out of stereotyped interactions.
      a. Be polite, but firm.
      b. Ask for what you want -- praise, feedback, cooperation, and reward.
      c. Be prepared for negative interactions. Use your new "thinking powers" to counter them.
B. Negative thoughts about maintaining on your own.
   1. Distinguishing lapse, relapse and collapse.
   2. Methods for coping with lapse and preventing relapse.

IV. The follow-up/maintenance phase.

A. Description and purpose.
B. Keeping your Thought Diary.
C. Keeping your Food Record.
D. Cognitive Prescription form.

Appendix G-3

Session Summaries Provided to the Subject*

Session 1: A Cognitive Approach to Weight Control

I. A cognitive model of weight control.

A. I think a lot, even though I am not always aware of what my thoughts are.

B. Over time I've developed certain ways of thinking which come to dominate. These are called "cognitive habits."

C. Cognitive habits involve thoughts, attitudes, beliefs and self-statements (things I say to myself), which I have learned and which have come to influence my behavior and feelings.

D. The typical cognitions of overweight persons contain negative evaluations of themselves in regard to eating situations.

E. The content of these negative cognitions are not valid or true.

F. I can learn to become aware of these negative cognitive habits.

G. I can learn to control the contents of my thoughts by changing what I think about or say to myself.

H. Awareness and change of negative cognitions will lead to adaptive, positive changes in feelings about myself, and behaviors related to eating.

II. Homework.

A. Keep your Thought Diary each day.
B. Keep your Food Record each day.

Session 2: Negative Cognitions

I. Negative cognitions.

*From Collins (1980). Adapted by permission.

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A. My typical automatic cognitions contain negative evaluations of myself in relation to eating situations. I indulge in many different types of these negative ways of thinking, such as the following.

1. Overgeneralization: Making conclusions based on little or no evidence and then using them to make unjustified generalizations.
2. Magnification-catastrophizing: Exaggerating the meaning or significance of a single incident until it becomes a catastrophe.
3. Thinking in extremes-perfectionism: Seeing things in extremes and setting perfectionistic goals ("I will always", "I will never") that set me up for failure.
4. Looking for immediate gratification: Focusing on immediate pleasure and forgetting long-term goals.
5. Selective abstraction: Selecting a negative detail out of context and thereby missing the positive significance of the total situation.
6. Negative expectations: Expecting failure even before any attempt at change is made.

B. My negative thoughts about dieting may fall into any one of the five categories.

1. Pounds lost (e.g., "I'm not losing fast enough.").

2. Capabilities (e.g., "Why should this work, nothing else has?").

3. Excuses (e.g., "It's just impossible to eat right with a schedule like mine.").

4. Goals (e.g., "I always blow it on the weekends.").

5. Food thoughts (e.g., "I can't stop thinking about sweets.").

II. Homework.

A. Thought Diary.
B. Food Record.
C. Complete Thought Style form each evening.

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Session 3: Positive Alternatives to Negative Cognitions

I. Positive alternatives to negative cognitions.

A. Positive cognitions are those which reward the progress I've made so far and which are realistic and gratifying. They help to make me see myself more clearly and objectively.

B. Positive cognitions help me to change my view of myself in relation to food from a negative and self-defeating one to a positive one in which I can gain a sense that I am in control of my overeating. There are a number of ways of learning to think more positively.

1. Distancing: Recognizing my automatic thoughts as being ideas or beliefs and not as facts about reality.

2. Generating alternatives: Learning to evaluate myself or eating situations in a number of ways so that I can see other reasons why I am not a worthless failure.

3. De-catastrophizing: Learning to recognize exaggerations and distortions as being just that and thus being able to put them into a more realistic perspective.

4. Expectation therapy: Getting away from expectations of future failure by looking for the ways in which myself, or the situations I am now experiencing, are different from past situations in which I may have failed.

C. The goal of this program is to change and increase new cognitive habits. My progress is measured in terms of how much my cognitive habits are changing.

II. Homework.

A. Thought Diary. Be sure to complete the rational disputing and outcome columns.
B. Food Record.
C. Thought Style Form. Remember to complete the form each evening. This week you are asked to generate a positive, alternate response for any negative thoughts you were not

able to counter effectively at the time they occurred and record these responses on the Thought Style Form.

Session 4: Disputing Irrational Beliefs

I. Irrational beliefs.

A. Some of the cognitions I have about myself in relation to food are irrational. They are self-defeating ideas that I have unquestioningly accepted as laws and applied to myself. My irrational ideas are the following:

1. I must be loved and appreciated by those I find significant or else I'm worthless.

2. I must be perfect and competent in achieving my goal of weight control.

3. I have to eat whenever I get treated unfairly, feel frustrated or feel rejected.

4. Whenever situations make me anxious or upset, the only way in which I can relieve my anxiety is to eat a lot of food.

5. I can more easily avoid facing the difficulties of controlling my weight than undertake the rewarding experience of disciplining myself in order to lose weight.

6. The influences of my past remain all important and must keep determining my feelings and behavior in the present.

7. Things should turn out easier than they do. I must view myself as awful and horrible if I do not find good and easy solutions to controlling my weight problem.

8. For me to go without something I desire (such as food) is totally unbearable.

9. Life should always be fair. Virtuous individuals who strive and sacrifice should be rewarded. Only those who are thoughtless and terrible are punished for their sacrifices.

B. The way to get rid of my irrational ideas is to question or challenge them in order to show myself just how irrational they are. The questions to ask myself about each of my irrational beliefs are:

1. What evidence exists of the falseness of this belief?
2. Does any evidence exist of the truth of this belief?
3. What are the worst things that could happen to me if I don't get what I think I must (or do get what I think I mustn't).
4. What good things could I make happen if I don't get what I think I must (or do get what I think I mustn't).

II. Homework.

1. Thought Diary.
2. Food Record.
3. Continue to complete the Thought Style Form.
4. Carry your reminder card with you to help dispute irrational beliefs about your eating.

Session 5: Self-Instructional Training

I. Coping techniques.

A. Self-instruction. Talking myself out of eating by:

1. Preparing myself for the situation by asking the questions:
What do I have to do?
What is my plan?

2. Confronting and handling it by reminding myself to relax, to use the techniques I have learned, to see myself as in control.

3. Reward myself: Tell myself how well I did and how it wasn't as bad as I expected. Or, that I'm making progress but still have to work at this difficult problem, (that is, generate positive cognitions).

B. Rehearsal in imagination. Give myself an opportunity to see myself plan and cope with difficult eating situations before they occur, practice using my techniques in my imagination.

C. Pre-planning involves thinking ahead. It is the first step in changing self-instructions or internal dialogues that trigger overeating.

II. Homework.

A. Thought Diary.
B. Food Record.
C. Cognitive Prescription Form.

Session 6: Impossible Dream Thinking and Goal Setting

I. Goal Setting.

A. What kind of goals do I usually set? Are they "never" or "always" statements?

B. Perfectionistic goals leave me one step away from a mistake with no room for human error or gradual improvement.

C. To be most helpful my goals need to be specific and reasonable.

D. A reasonable goal for me is a goal that is relative to my own past actions, not someone else's.

E. My goals are to be flexible. I may not always know what is reasonable when first setting my goals, so I need to be ready to re-evaluate and change.

II. Weight loss can take on "impossible dream" qualities when viewed as the answer to all your problems. Read the article: "When I'm Thin, I'll be Perfect". (It's good food for thought.)

III. Homework.

A. Thought Diary.
B. Food Record.
C. Cognitive Prescription Form.

Session 7: Facing Fears and Psychological Ownership of Choices

I. Overweight may be maintained by mythical fears.

A. What negative things will I find out about myself when I no longer have fat as an excuse.

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B. What will happen without the protection of fat?

II. Technique for facing fears.

A. Close your eyes and imagine a physical barrier or obstacle with as much reality as you can. Keep your eyes closed until later when I tell you to open them.

B. Now notice the details of the barrier you envision. For example, what is its height, thickness, width and color, what might be on the other side of it?

C. Now you must find a way through, around, over or under your obstacle. You created the barrier, and being the creator, you can also create anything you may need to help you to get to the other side of it.

D. After getting to the other side of the barrier, go back and destroy it. Get rid of it completely so that there is no way it can be a barrier to you again.

E. Now go back in time, perhaps when you were younger, recall some incident when you were first made aware of the existence of your weight problem. (You made erroneous conclusions about yourself based on past incidents, now you can look back and see how erroneous and maladaptive these conclusions were.)

F. Remember that you have destroyed the barrier created by these mythical fears. You can see that there is no further need for maintaining your weight problem.

G. Now see yourself as the person you are, an individual in control of their eating. To help you do this, split yourself into two people, one who is negative and overweight and one who is positive and is in control of their eating. Notice that these two images are incompatible. Now do away with the negative, self-defeating image of yourself completely.

H. Now firmly fix an image of you as thinner and as in control of your eating in the front of your forehead.

I. Now that you can see yourself as a person totally in control of your eating integrate or merge that person into

yourself so that you feel and know that the ideal person you imagined is really you now!

III. Psychological ownership of choices.

A. When I overeat, I am choosing to behave irresponsbility.

B. I often attempt to disown this responsibility by labelling myself negatively, as a failure who can never control the amount or type of food I eat and thus lose weight.

C. I must realize that I am totally responsbile for what I eat and that "I am in control, even when I am out of control." (Chamberlain, 1977, p. 77).

D. I must label myself positively, as someone who does have self-control and who can be successful in controlling my weight.

E. I must realize that I am overweight because I choose to overeat and therefore I can lose weight by choosing not to overeat.

F. In order to gain a better sense of self-control I must:

1. Recognize the choices I make to overeat.
2. Catch myself as I am about to act upon my self-defeating choices to overeat.
3. Make an internal choice not to eat in situations in which I previously chose to overeat.
4. Give myself a new positive label and repeat it to myself at least ten times per day.

IV. Homework.

A. Thought Diary.
B. Food Record
C. Complete at least two examples on the Fears and Fantasies form. Use the above technique with each of the fears you recorded.

Session 8: Social Support and On Your Own

I. Social interactions.

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A. Social interactions continue while you are attempting to change your overeating. Remember, those around you have grown accustomed to seeing you overeat.

B. Many times the interactions with others will be negative. These interactions do not necessarily occur because the person involved is mean, or bad.

C. Some of the most common feelings for the person trying to lose weight are:

1. "My attempts to change are not supported; they are even ridiculed. Often people say the wrong things. They do not mean to hurt my feelings, but they do."
2. "I feel like I'm being sabotaged, it is obvious to me, but I can't do anything about it."

D. The responsibility is on you to break out of the effects that negative interactions have on you.

1. Ask for what you want -- praise, feedback, cooperation.
2. Be polite, but firm.

E. Remember, many of the changes you are making are in your cognitive habits and are not visible to others at first.

II. Negative thoughts about leaving the program.

A. Example:
Negative thought: This program and group sessions are the only reason I lose weight. When the program is over, I will have real trouble not reverting back to my old thinking patterns and overeating. I never have been able to stick with a program on my own.

Counter: I am losing weight becasue of my own efforts at controlling my negative thinking. Just because the program ends does not mean my new cognitive habits will vanish. It's really my choice as to whether or not I stop confronting and handling my negative thoughts that allow me to disown responsibility for overeating. The program has helped, but the changes really are "all in my head." I get the credit.

B. Remember, there are no magic answers. At this point, you are probably very aware of your negative thoughts about food, eating, dieting and weight. You will need to continue to practice disputing and countering the negative thoughts daily.

III. Lapse, relapse and collapse.

A. A lapse is a slight error or slip, an isolated instance of backsliding.

B. Relapse occurs when many lapses string together. Yet, a relapse may be confined to a short period of time (i.e., a day).

C. Collapse is when relapse periods string together over long periods of time.

D. Remember:

1. A LAPSE DOES NOT A RELAPSE MAKE.
2. A RELAPSE DOES NOT HAVE TO LEAD TO COLLAPSE.

IV. Preventing and coping with lapses and relapses.

A. Prevention: Identify your "high risk" situations and pre-plan your coping strategies.

B. Coping with lapse.

1. Stop, look, listen.
2. Stay calm.
3. Renew your positive thinking vows.
4. Analyze the lapse situation.
5. Take charge immediately.
6. Ask for help.

C. To help prevent and cope with lapse, read over the summary sheets from the group sessions at least once each week. Keep a notebook of problems you have so you can get feedback at the follow-up sessions.

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V. Homework.

A. Thought Diary. Keep your Thought Diary each day. Looking back over your Thought Diary will help you to continue to identify "high risk" situations for those negative thoughts.
B. Continue to keep your Food Record on a daily basis.
C. At the beginning of each week, complete your Cognitive Prescription Form. Identify "high risk" situations for the coming week and pre-plan your coping strategies. Don't forget to evaluate your progress!

Appendix G-4

Thought Diary Form (Sample)

Day _____ Week _____

Time	Situation	Emotion	Automatic Thought	Response	Outcome

Instructions: When you have an automatic thought relating to food, eating, dieting, or weight, record that thought in the appropriate column. (Remember, it is not unusual for people to have several automatic thoughts in a short period of time). After recording your thought, rate your degree of belief in that thought on a scale of 1-5 where 1 = 0% belief and 5 = 100% belief. Then record the situation (who, what, where) in which the thought occurred, and the emotion(2) you were experiencing at the time. In the response column write out your positive or alternate response and rate your degree of belief in this response using the same 1-5 scale. In the last column (outcome) specify what you did and how you felt after the response you made.

Appendix G-5

Sample Food Record Form

Day of Week _____ Name _____

Time	M/S	Food Type and Quantity
6:00		
11:00		
4:00		
9:00		

Appendix H

Treatment Integrity Measures

Appendix H-1

Treatment Outcome Expectancy Measure

Having heard a description of your treatment program, to what extent do you expect this program to help you lose weight?

1	2	3	4	5	6	7
no help			moderately helpful			very helpful

How well do you think the program as described fits your particular needs?

1	2	3	4	5	6	7
does not fit my needs			fits my needs moderately well			fits my needs very well

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Appendix H-2

Current Exercise Survey

Listed below are a number of some common exercises or sports. The purpose of this survey is to get an accurate measure of the types of exercise in which you currently engage. If you have participated in any of these activities DURING THE PAST 2 WEEKS, please indicate so by recording the number of hours (rounded up to the closest half hour) you have engaged in that activity over the past 2 weeks. For example let's assume you are in a 1 hour dance exercise class which has met 4 times in the last two weeks. Let's say that during an average class you spend 35 minutes doing calisthenic type exercises, 5 minutes dancing, and 20 minutes relaxing, resting, and listening to instructions. You should record on the exercise survey below 2 1/2 hours of calisthenics (35 min. x 4 = 140 min. = 2 hrs., 20 min. = 2 1/2) and 1/2 hour of dancing (5 min. x 4 = 20 min. = 1/3 hr. = 1/2).

Although many activities are listed, one or more of the exercises or sports that you regularly engage in may not be listed. If this is the case, please write these activities in the blanks provided and include the duration of your participation. Some activities are listed more than once because they can be performed at varying degrees of intensity. Please be aware of this and record your response in the appropriate list.

If you have any questions, please feel free to ask the interviewer for help. Thank you.

Light Exercise	Total Hours (During past 2 weeks)
Dancing	_____
Golf	_____
Table Tennis	_____
Volleyball	_____
Bowling	_____
Horseback Riding	_____
Bicycling (5 mph)	_____
Down Hill Skiing	_____
Calisthenics (slow)	_____
Other_____	_____

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Moderate Exercise	Total Hours (During past 2 weeks)
Dancing (fast)	_____
Calisthenics (moderate)	_____
Cycling (9.5 mph)	_____
Weight Lifting	_____
Fencing	_____
Stationary Cycling (moderate)	_____
Swimming (slow)	_____
Tennis	_____
Ice Skating (moderate)	_____
Roller Skating (moderate)	_____
Other _____	_____

Heavy Exercise	Total Hours (During past 2 weeks)
Calisthenics (fast)	_____
Ice Skating (fast)	_____
Roller Skating (fast)	_____
Cycling (12 mph)	_____
Handball	_____
Paddle Ball	_____
Squash	_____
Racketball	_____
Jogging	_____
Skipping Rope	_____
Stationary Cycling (fast)	_____
Swimming (moderate)	_____
Basketball	_____
Other _____	_____

Appendix I

Program Evaluation Questionnaire

Name _____ Date _____

In order to improve this phase of the program in the future we are asking for your evaluation. It is very important that you answer all questions as honestly as possible.

1. How much weight did you lose during the treatment phase of the program?

   _____

2. Did you lose as much weight as you had expected to lose in the weeks of this phase of the program?

   Yes _____ No _____

   If no, was your loss more ____ or less ____ than expected?

3. In general, how satisfied are you with this program right now?

1	2	3	4	5	6	7
not at all			moderately			fully satisfied

4. In general, how effective has this phase of the program been for you?

1	2	3	4	5	6	7
not at all			moderately effective			very effective

5. What about this phase of the program has helped you most with your weight problem?

6. What about this phase of the program has been least helpful to you in respect to losing weight?

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7. How would you rate the following aspects of the treatment phase of the program?

Size of the group.

1	2	3	4	5	6	7
too small			about right			too large

Length of each session (1½ hours).

1	2	3	4	5	6	7
too short			about right			too long

Length of the entire treatment phase of the program (eight weeks).

1	2	3	4	5	6	7
too short			about right			too long

Structure of the group (the way in which the sessions were conducted).

1	2	3	4	5	6	7
no help			moderately helpful			very helpful

Format of the weekly homework assignments.

1	2	3	4	5	6	7
no help			moderately helpful			very helpful

8. How actively did you participate in the group?

1	2	3	4	5	6	7
not at all			moderately			extremely

9. How interested or involved were you during the group meetings?

1	2	3	4	5	6	7
not at all			moderately			extremely

Appendix I, page 3

10. Please rate the therapist in terms of the general atmosphere she provided for you.

1	2	3	4	5	6	7
much lacking			fairly good			outstanding

11. Rate the therapist in terms of the specific information and helpful suggestions that she provided for you.

1	2	3	4	5	6	7
much lacking			fairly good			outstanding

12. Up to now, do you feel this program has differed in any way from what you were told or expected?

Yes ____ No ____

If yes, how has it differed?

13. During the maintenance phase do you expect to

a) continue losing weight ____

b) maintain your current weight ____

c) gain additional weight ____

14. To what extent do you feel that the maintenance phase will help you to maintain control of eating?

1	2	3	4	5	6	7
no help			moderately helpful			very helpful

15. How well do you feel the maintenance phase will fit your particular needs?

1	2	3	4	5	6	7
poorly			moderately well			very well

Appendix J

Debriefing

Medical and psychological research in the area of weight control has flourished in the past 20 years. A major portion of this research and the development of new forms of treatment has come from behavioral psychology. Undoubtedly, the most popularized application of behavioral principles is represented by Stuart's nationally franchised "Weight Watchers'" program. Recently, psychologists have started to investigate the possibility that the same treatment program may not be effective for all people, and that the most effective treatment may result when an effort is made to match characteristics of the individual being treated with the type of treatment used. Knowledge of individual client characteristics that affect the outcomes of different types of treatment approaches would greatly aid clinicians in selecting the most effective treatments for their clients.

Previous research has suggested that overweight persons may differ markedly in the extent to which they have problems with negative and self-defeating thoughts about food, dieting and weight. Some overweight people have indicated that they are plagued by negative and self-defeating thoughts when dieting, and that these thoughts often lead them to "give up" before they reach their goal weight. Other overweight persons do not report being unduly troubled by negative and self-defeating thoughts about food, dieting and weight. Most weight programs focus on teaching new eating habits, and typically do not offer techniques for helping clients cope with negative and self-defeating thoughts about food, dieting, and weight.

In the present study, prior to starting treatment, all participants completed the Master Questionnaire and participated in a role-play task. On the basis of their responses to the questionnaire and the role-play task, some women were found to report a great deal of difficulty with negative thinking about eating, dieting, and weight, while others reported being troubled very little with negative thinking about eating, dieting and weight. All women then participated in an 8 week treatment program followed by a self-governing phase in which monthly treatment sessions were provided for 2 months. During the 8 weeks of treatment, some women participated in a program focusing on changing negative thinking patterns while other women participated in a program focusing on changing eating patterns. Both types of women (those with problems with negative thinking and those showing few problems with negative thinking) were included in both types of treatment. Thus, some women participated in a treatment group that seemed to "match" her individual problem, while others participated in a standard program focusing on changing eating habits. Both treatment programs used have been found to be effective in helping people lose

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weight. The reason that all women reporting problems with negative and self-defeating thoughts about food, dieting, and weight did not receive the treatment focusing on such thoughts was that experimental evidence is needed to demonstrate that matching a person's specific problem to the type of treatment given is, in fact, the most effective.

Your participation in this project investigating whether the effectiveness of weight control treatments can be enhanced by matching the type of treatment approach used to individual characteristics is greatly appreciated. If you would like to pursue further assistance with your weight problem, you may obtain a list of referral sources from the principal investigator.

Appendix K

Figures

Figure 1:
Mean Weight Loss (lbs) by
Treatment Condition

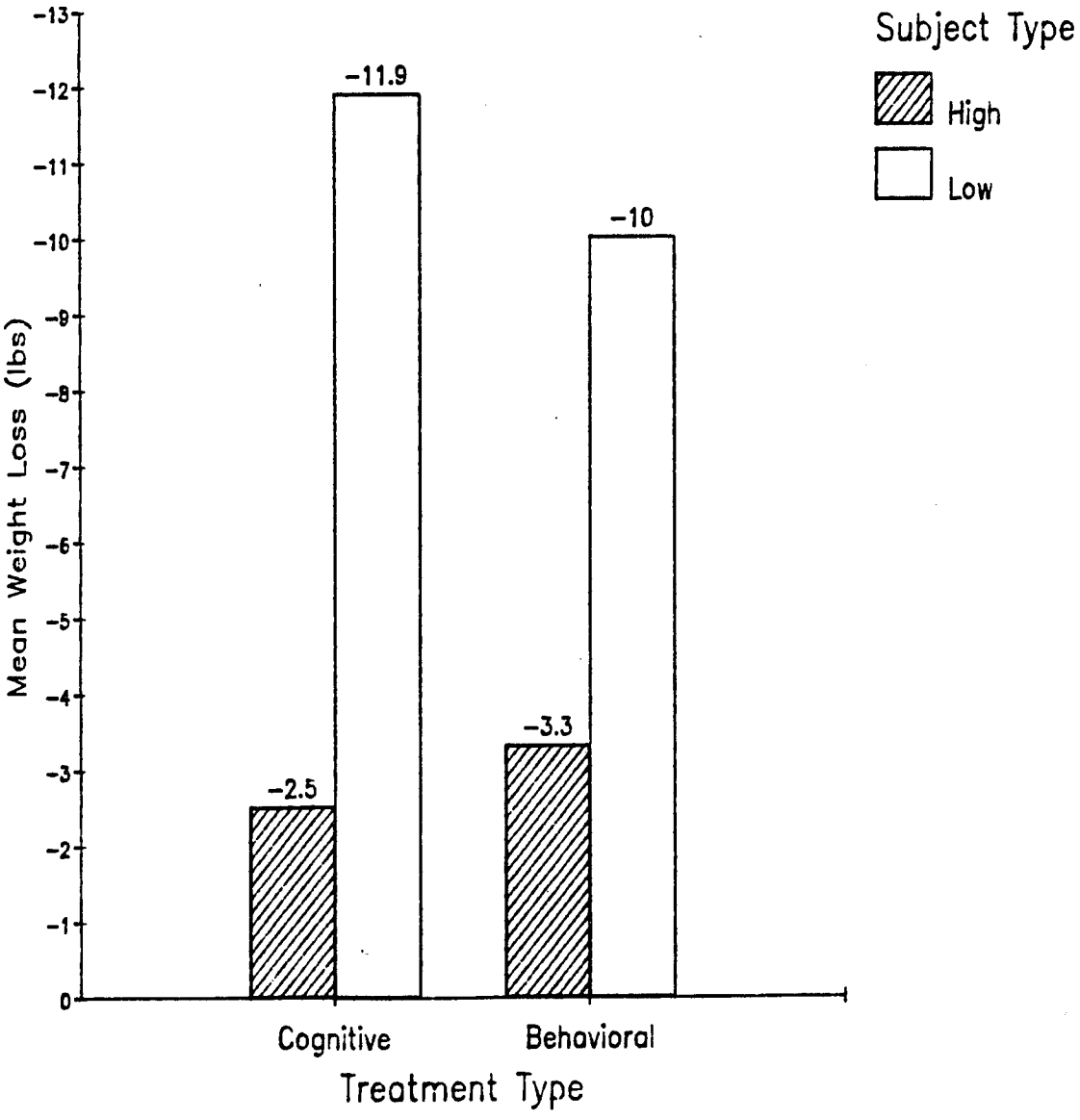

Figure 2:
Change in Pounds
Individual Subject Data

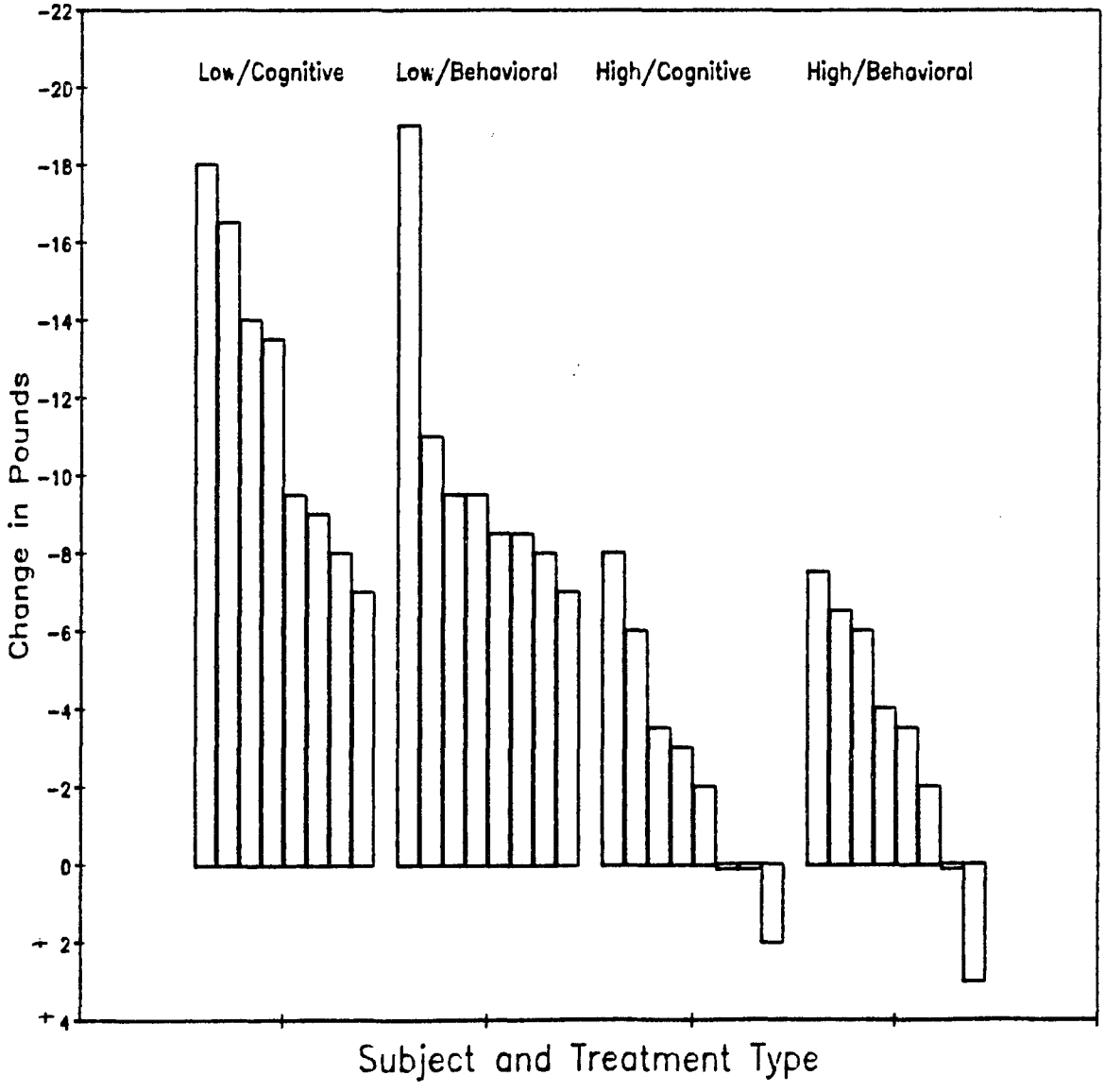

Figure 3:
Mean Decrease in BDI Scores

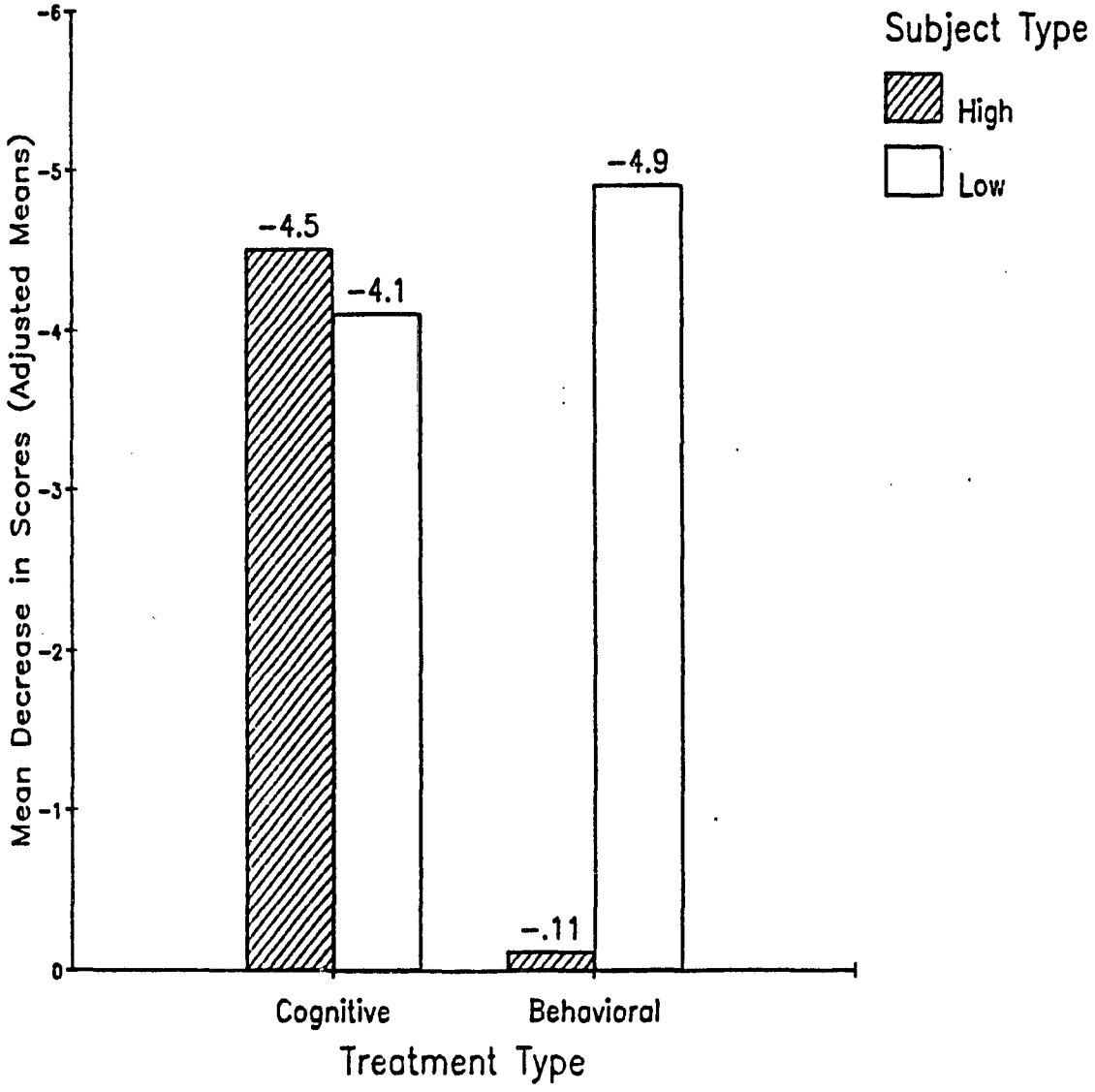

Figure 4:
Mean Increase in Confidence Scale Ratings

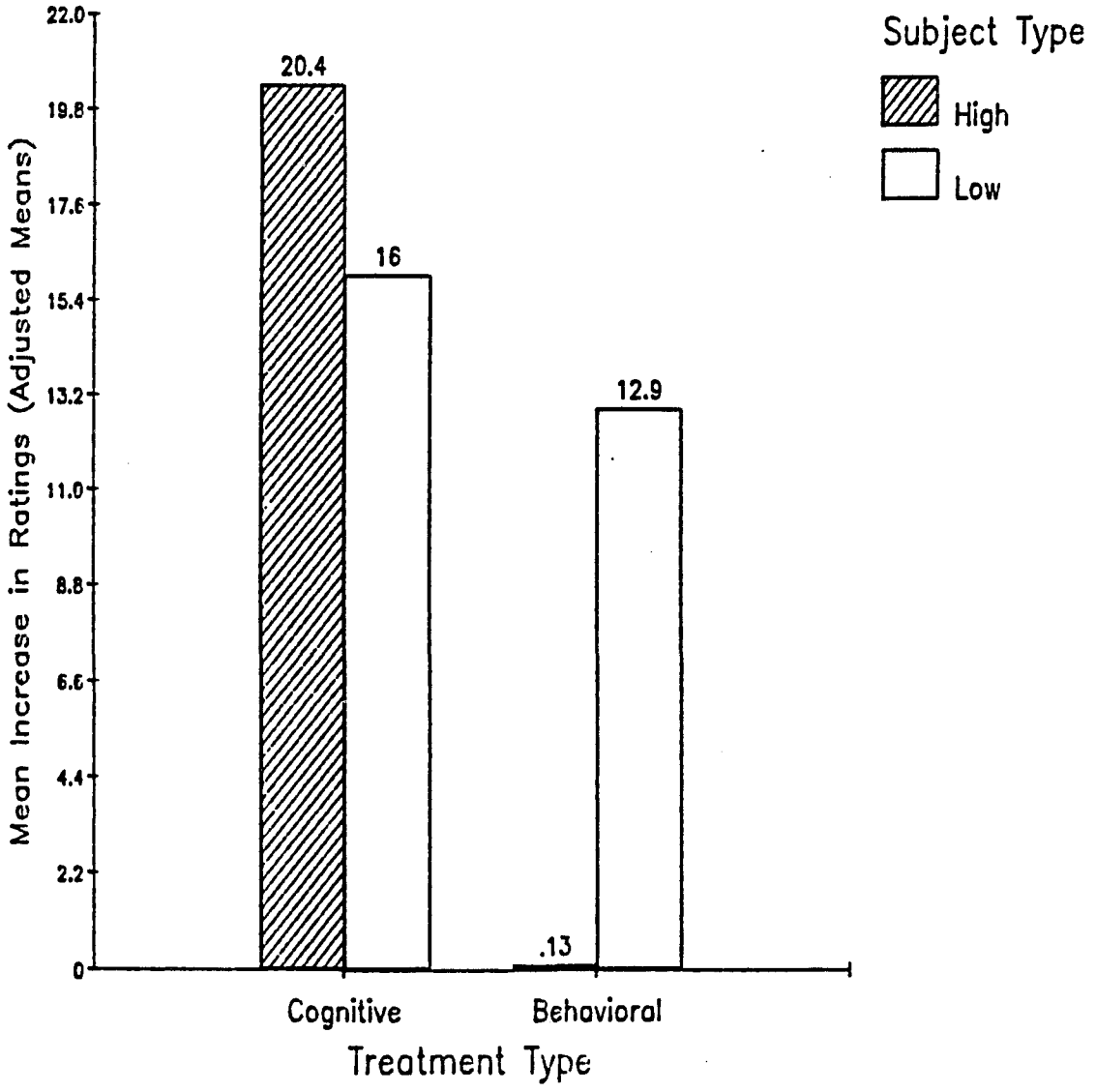

Figure 5:
Mean Decrease in Frequency Ratings
(Obesity Cognitions Scale)

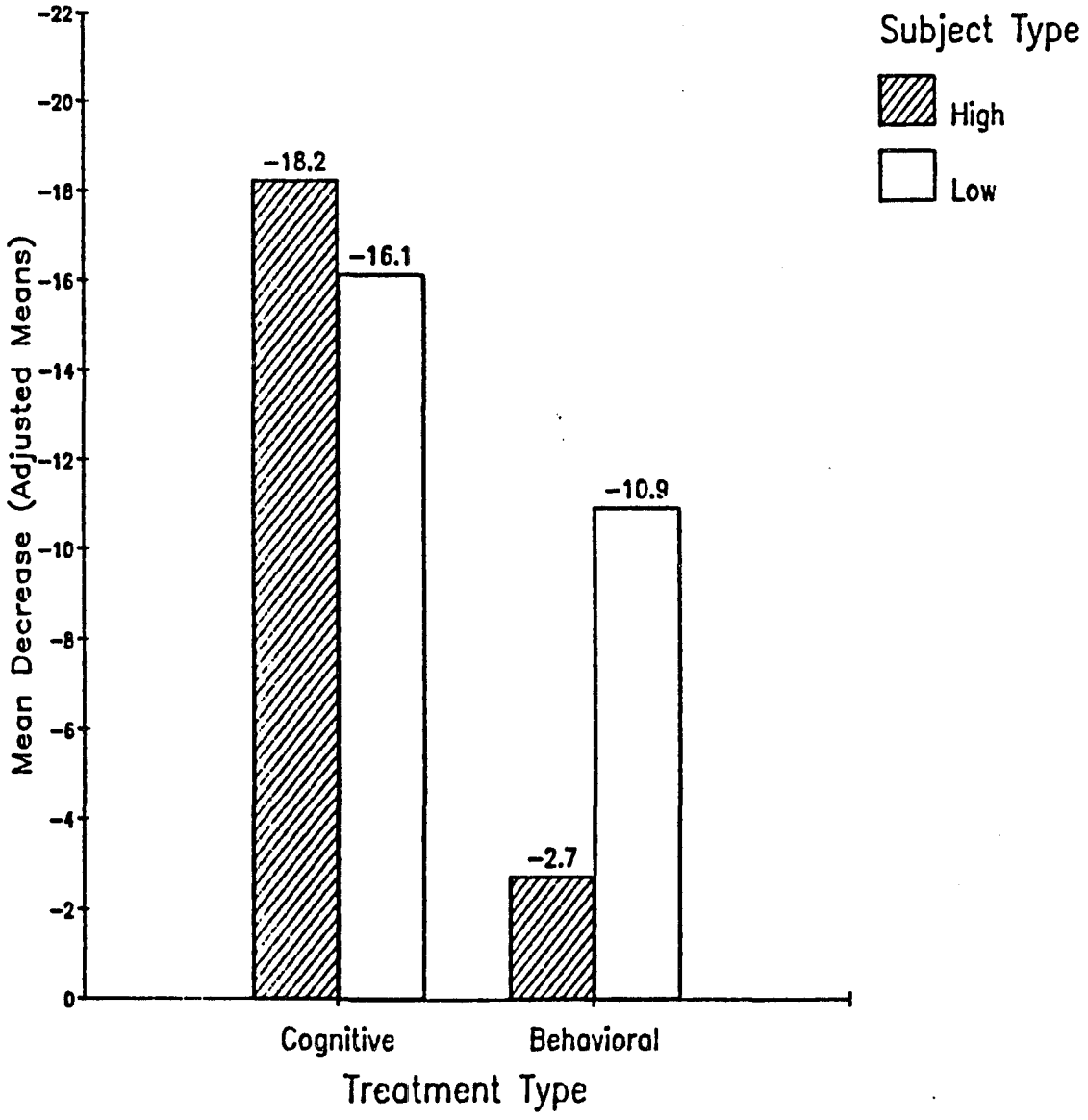

Figure 6:
Mean Decrease in Belief Ratings
(Obesity Cognitions Scale)

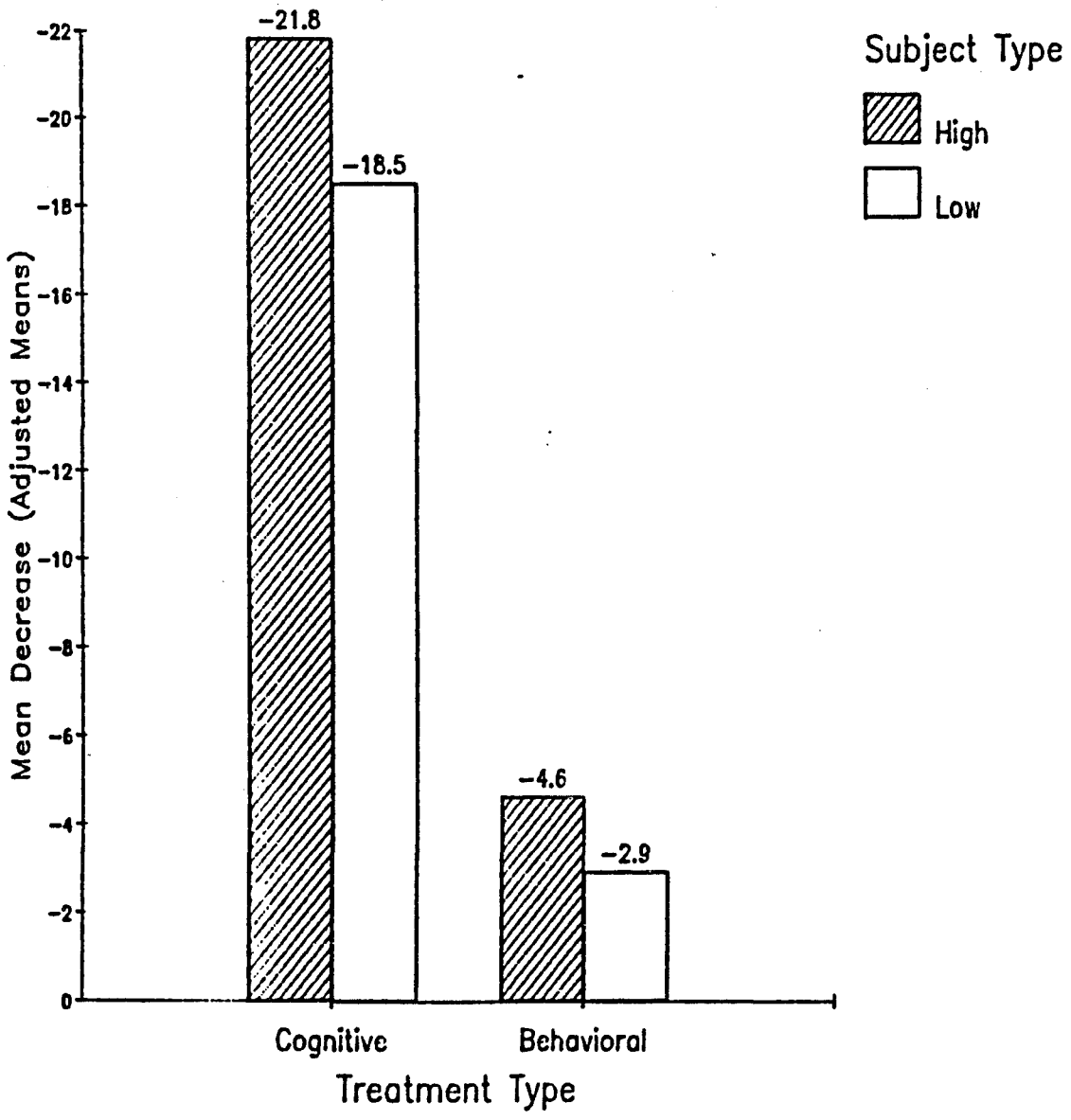

Figure 7:
Mean Decrease in Specific Eating
Habit Categories (EPQ)