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**Success and failure in weight reduction : evaluation of stimulus and affective control, spouse participation, drop-outs and program effectiveness.**

Kathryn Kernodle Loveland  
*University of Massachusetts Amherst*

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SUCCESS AND FAILURE IN WEIGHT REDUCTION: EVALUATION  
OF STIMULUS AND AFFECTIVE CONTROL, SPOUSE  
PARTICIPATION, DROP-OUTS AND  
PROGRAM EFFECTIVENESS

A Dissertation Presented

By

KATHRYN KERNODLE LOVELAND

Submitted to the Graduate School of the  
University of Massachusetts in partial fulfillment  
of the requirements for the degree of

DOCTOR OF PHILOSOPHY

September 1979

Department of Psychology



Kathryn Kernodle Loveland

1979

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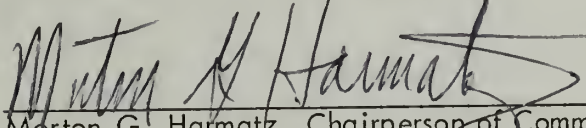
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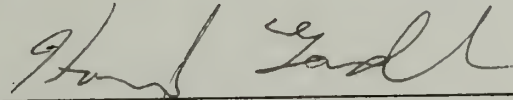
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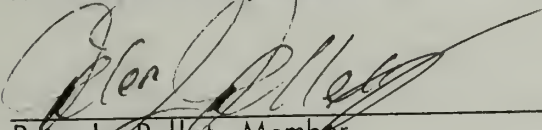
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To my parents, Ruth and Wayne Kernodle

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## ABSTRACT

### Success and Failure in Weight Reduction: Evaluation of Stimulus and Affective Control, Spouse Participation, Drop-outs, and Program Effectiveness

(September 1979)

Kathryn Kernodle Loveland, University of Massachusetts

M.S., Ph.D., University of Massachusetts

Directed by Professor Morton Harmatz

The difficulty in successfully treating overweight individuals has been demonstrated by the lackluster results of research in this area. Although behavioral methods have shown moderate success in recent years, weight losses are usually short-term and often statistically but not clinically significant. Therefore, researchers are presently investigating factors influencing long-term weight loss such as booster sessions and involvement of significant others in the treatment program.

To evaluate the influence of spouse participation and the effectiveness of two treatment programs, 178 overweight women and men were assigned to four experimental conditions:

1. Stimulus Control-Individuals: Participants attended all meetings without their spouse and were trained in standard stimulus control techniques.
2. Stimulus Control-Couples: Participants attended all meetings with their spouse.

3. Affective Control-Individuals: Participants attended alone and were trained in methods for controlling the affective components for over-eating.
4. Affective Control-Couples: Participants attended all meetings with their spouse.

Groups met once a week for nine weeks, every other week for six weeks and once a month for the remainder of the year. At post-treatment all groups displayed significant weight losses, and there were no significant differences between Affective and Stimulus Control Groups. Although at two and eight months of treatment, participants in Couples Groups had lost proportionately more weight as measured by The Reduction Index, no significant differences existed between the groups with respect to pounds lost. By the end of treatment this trend continued but did not reach significance. However, one variable, weight of spouse, which has not been previously investigated, proved to be a potent factor and did affect the performance of participants in Individual or Couples Groups. Overweight participants with overweight spouses lost significantly more weight in Couples Groups than in Individuals Groups. However, in Individuals Groups, overweight participants with non-overweight spouses lost significantly more weight than those with overweight spouses.

Although early in the treatment program males lost slightly more weight than females, by four months this difference was not significant.

Contrary to recent evidence which suggests that juvenile-onset obese are more resistant to weight change than adult-onset obese, in the present study child-

onset participants lost significantly more weight than adult-onset participants by four and twelve months in treatment.

Overall, significant correlations were not found between weight loss and self-reports of eating habits, depression, marital communication or expectancy for success.

Overall, participants who dropped out of treatment were older and scored higher on depression and lower on self-motivation for weight loss, control losing weight, and concern of spouse for the weight problem, than program completers. Early drop-outs scored lower than non-drop-outs on desire for external praise for weight loss efforts. A higher percentage of participants dropped out of Stimulus Control than Affective Control Groups throughout the program, and by the tenth month of treatment, a higher percentage of participants dropped out of Couples Groups than Individuals Groups. Drop-outs lost significantly less weight while participating in the program than non-drop-outs, and by two follow-up weigh-ins had maintained moderate weight losses, but had lost significantly less weight than non-drop-outs.

Self-report information indicated that, overall, self-initiative, self-responsibility, and changing habits and attitudes about food were the most helpful factors, and not completing homework assignments was the least helpful factor in participants' weight loss attempts. Specific techniques of slowing down eating behavior were rated as most helpful by participants in Stimulus Control, and positive self-statements and learning not to eat when emotional were rated as most helpful

by participants in Affective Control Groups.

Self-reports of success, implementation of techniques, body image, improvement in eating habits, and spouse helpfulness correlated significantly with weight loss, and most participants reported feeling at least moderately successful in the program.

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## CHAPTER I

### INTRODUCTION

Americans are fighting the "Battle of the Bulge", and unfortunately, losing it. The U.S. Public Health Service estimates that there are between 40 and 80 million obese Americans, and that 25% to 45% of the adult American population over 30 is at least 20% overweight. With figures like these the conclusion might be made that Americans are not weight-conscious, but a recent poll indicated that about 52 million Americans were either dieting or concerned about their weight (Stuart and Davis, 1972). In 1973 alone, the general public spent over 10 billion dollars to lose weight. This price includes the cumulative expenses of weight doctors, psychologists, health spas, exercise devices, medicines, and dues to various organizations such as Weight Watchers and TOPS. The sale of appetite depressants alone has been reported to reach a high of 80 million dollars in one year (Fee, Wilson and Wilson, 1969).

The assumption might be made that with so many people spending so much money to lose weight, that viable weight loss techniques are readily available. The dismal reality has been that practitioners in the field of obesity treatment have had little to offer the obese person seeking an effective and practical way to lose extra weight and maintain the loss over a long period of time. Researchers in the area of weight control are familiar with the oft-quoted words of Albert Stunkard who in 1958

summarized the results of traditional weight loss methods by stating, "Most obese persons will not stay in treatment for obesity. Of those who stay in treatment, most will not lose weight, and of those who do lose weight, most will regain it" (Stunkard, 1958, p. 79). Stunkard examined the results of numerous obesity studies and concluded that only 25% of treated patients lost 20 pounds or more, and only 5% lost more than 40 pounds. As most patients included in the reports were at least 60% overweight, the results were considered unimpressive (Stunkard and McClaren-Hume, 1959).

In the last ten years, researchers have claimed that promising results from weight loss programs using behavior modification techniques are changing the dismal outlook in the treatment of obesity. The most widely used behavior control procedure for weight loss was first introduced by Ferster, Nurnberger and Levitt in 1962 and includes an assortment of self-control techniques that teach obese people to control their eating by understanding and manipulating the antecedent and consequent conditions of eating behavior. For example, participants in the behavioral programs are taught to shop from lists and put high calorie foods out of sight in the home. The initial behavioral program has been supplemented over the past years so that it may include relaxation training, self-reinforcement and/or punishment, self-monitoring, contracts, cognitive restructuring and various other therapeutic techniques.

Several early studies using behavioral methods reported success, and one researcher proclaimed that the results were "the best ever reported for outpatient treatment of obesity . . ." (Stunkard, 1972, p. 393). In one of the first such studies Stuart (1967) reported that 80% of his clients lost twenty pounds or more, and 40%

lost over 40 pounds over a twelve month period. The importance of the results is diminished somewhat by the fact that he treated only ten women, and all were seen individually, but the results are still impressive. Subsequent controlled investigations by Hagen (1974), Harris (1969), Harris and Bruner (1971), Penick, Filion, Fox and Stunkard (1971), and Wollersheim (1970) consistently demonstrated the superiority of behavioral programs over a number of control and comparison procedures. However, as studies in the area of behavioral treatment of obesity have increased in recent years, so have the questions concerning this method's results. For example, many researchers (Hall, 1972; Harris and Bruner, 1971; Jeffrey, 1974; and Mahoney, 1974) have found that although people do lose weight in behavioral programs, most do not maintain the weight loss over a long period of time (6-12 months). Others (Penick, Filion, Fox and Stunkard, 1971; and Jeffrey, 1976) have found that subject response to behavioral treatment is highly variable with some people losing large amounts of weight and others even gaining. Finally, many researchers and practitioners report high drop-out rates in their weight loss programs (Nash, 1976).

The focus of this introductory chapter will be to address the issues of success and failure in weight loss programs, specifically in behavioral weight loss programs: Why is subject response to treatment so varied? Are there certain kinds of people who can be classified as good potential weight losers before they start a program? Why are treatment results often short-termed, and what is being done in weight loss programs to enhance weight loss maintenance? What are the successful treatment components in complex weight loss programs? After these questions are investigated,



an outline of the present study will be presented and hypotheses examined.

### Success and Failure

Since this paper will be investigating issues concerning success and failure in weight loss and weight loss maintenance, some sort of definition of success and failure is necessary. According to the dictionary (Webster, 1957), success is defined as "a favorable or satisfactory outcome or result, to accomplish something planned or attempted" (p. 1455). Failure is defined as: "lacking or insufficient, to fall short of doing something, not succeeding" (p. 521). Although these definitions appear straightforward, when they are applied to obesity research the terms become vague, multifaceted, and often misused. Psychological research jargon redefines success and failure in a different way. For example, research in weight loss is usually deemed successful if subjects in an experimental group lose significantly more weight than subjects in a control group. One might even go so far as to say that success equals results being greater than .05 or .01, a result that enhances the possibility that the study might be accepted for publication by a psychological journal. This sort of professional bias can make experimental results seem more important than they really are, and researchers must keep in mind the differences between experimental and clinical success. For example, a study in which subjects in the experimental group lost an average of eight pounds and subjects in the control group lost only one pound would probably be considered a success by the researchers and psychological community. However, the participants who had at least 100 pounds to lose may not feel so successful, and the participants who lost weight only to regain

it a few months later may feel like failures. Success, then, may mean one thing to the researcher and another thing to the weight loss participant.

Dependent variables. Many other methodological and definitional problems exist in the area of obesity research, and need to be investigated before a reasonable definition of success or failure in weight loss can be attempted. One of the first, and most important concerns consists of the measurement of weight loss. Early research in obesity used pounds lost as the measure of a program's success or failure. This measure is remarkably precise and simple, especially when compared to the methods of determining therapeutic outcomes employed in other areas of psychological research such as psychotherapy. However, as studies in the area of weight control proliferated, so did the number of measurements used. Today there are numerous ways to measure weight loss: rate of weight loss, percentage of weight loss, and the Weight Reduction Index, to name a few.

The lack of a standardized improvement criteria for measuring weight loss has made it particularly difficult to compare the many different programs in terms of effectiveness. One program may report average losses of ten pounds per person, another states that participants lost an average of 23% of their body weight, and still other programs claim that the average Weight Reduction Quotient for participants was 46.35. Most of the methods that have been used so far have serious drawbacks. In an excellent review article, Feinstein (1959) describes and criticizes some of the more widely used weight loss measurements.

1. Rate of Weight Loss - This measures the rate of weight loss in pounds or grams per day or week. This system has several deficiencies. For example, most dieters lose very rapidly the first few weeks because of water loss, thus, the measurement is not adequate for short-term dieters. In addition, goal weights and the amount of excess weight are not taken into consideration.
2. Actual Weight Loss - This is simply a measurement of the total number of pounds lost. This method does not take into account the initial weight or the desired weight. Very obese patients have more outstanding weight losses, since they would have more to lose. A 20 pound weight loss in a person weighing 150 pounds is proportionally more than a 20 pound weight loss for a person weighing 300 pounds, and probably a more significant loss overall. Using actual weight loss as the measurement would make comparisons difficult between studies using mildly obese and extremely obese subjects.
3. Percentage of Excess Weight Lost - This measurement can create a bias against an obese person. For example, a person weighing 150 pounds who loses 20 pounds to reach a target weight of 130 pounds would be credited with losing 100% of the excess weight. A more obese, 300 pound participant who loses 100 pounds toward the target weight of 150 would only be credited with losing 67% of excess weight, even though his/her accomplishment may have been the greater of the two.
4. Loss Compared to Initial Weight - This technique was first used by

Walsh and Caso (1947) and is a rather arbitrary measure of determining the number of pounds a person of a certain weight must lose to be deemed successful. The scale employed is described below:

<u>Initial Weight (Pounds)</u>	<u>Minimum Weight Loss Required For Success (Pounds)</u>
Less than 150	Over 10
151 - 175	Over 15
176 - 200	Over 20
201 - 225	Over 25
226 - 250	Over 30
Over 251	Over 35

This scale does take initial weights into account, but it does not account for the amount of surplus weight. Using this method there would be no allowances for sex, frame size, or the amount of fat of each individual person. For example, a small-framed woman may be more obese at a weight of 175 than a large-framed man of similar height.

5. Weight Reduction Index - Feinstein (1959) recommends using what he calls the Weight Reduction Index (RI) to determine success in weight loss. The Weight Reduction Index is the percent of excess weight lost times the relative initial obesity. This formula is suggested:

$$RI = \frac{W_l}{W_s} \cdot \frac{W_i}{W_t} \cdot 100$$

Where  $W_l$  = weight loss  
 $W_s$  = surplus weight  
 $W_i$  = initial weight  
 $W_t$  = target weight

The Weight Reduction Index takes into account height, weight, amount

overweight, goal weight, and actual weight loss. For example, if a subject weighed 300 pounds, had a target weight of 150 pounds, a surplus weight of 150 pounds, and a weight loss of 100 pounds, then his Weight Reduction Index would be:

$$RI = \frac{100}{150} \cdot \frac{300}{150} \cdot 100 = 133.33$$

If the participant had failed to lose any weight, the RI would be 0.

To date, while the Weight Reduction Index does seem to be the best single measurement of success and failure in weight loss, it has some problems. First, and perhaps most importantly, there are a few arbitrary decisions that must be made by the researcher before he/she can use the Index. One such decision is choosing standards for goal weights and for making calculations of excess weight. Most researchers, physicians and nutritionists have relied on weight charts such as the Metropolitan Life Insurance Tables (1959). Unfortunately, these charts are based upon non-random samples of the population. They underestimate the average and ideal weights, and provide no criteria about frame size other than making three classifications: small, medium and large (Selzer and Mayer, 1967). As Le Bow (1977) has pointed out, subsequent calculations can be imprecise. A 5-foot 5-inch female weighing 150 pounds would be 30% overweight if labeled small in frame, 22% overweight if medium-framed, but only 12.3% overweight if deemed large-framed.

Another criticism in general of using pounds lost as a measurement is that two equally heavy persons of the same sex, height, and age may be unequally fat because of the differing amounts of lean body tissue. A 250 pound halfback for the Los Angeles Rams probably would not want or need to lose weight, whereas a 250 pound sedentary businessman of the same height could be considered quite obese.



Some experts in the area of obesity argue that measurements of pounds lost in any form are not adequate to determine success or failure, since people can lose fat without losing a significant amount of weight. Lean body tissue can increase to mask weight changes, at least initially (Dressendorfer, 1975). Johnson, Mastropaolo, and Wharton (1972) report that after ten weeks of conditioning, 20 coeds ate less, had significantly reduced skinfolds (triceps, biceps, subscapular and iliac crest), but did not lose a significant amount of weight. Zuti (1972) also claims that subjects who exercised in his groups lost significant amounts of body fat but did not lose more weight than the groups who did not exercise.

Although measurements of body fat might be helpful in determining success in weight loss programs, the difficulties in obtaining accurate measures are numerous. For example, the validity of measuring fat by skinfold calipers presupposes a correlation of skinfold thicknesses with actual body fat. However, direct evidence of body fat, obtained through chemical analysis in autopsy, is rare. Thus, precise information about body fats of individuals of differing ages, body types, and sex is not available (Damin and Goldman, 1964; Mayer, 1968). Other measures to determine body fat include calculations from the underwater weighing method of Buskirk (1961), the total body potassium method, and the total body water method (Damin et al, 1964). These approaches have yielded differing estimations of the body fat content of the same subjects (Forbes, 1952), thereby creating doubts as to their accuracies.

As the emphasis in weight loss programs has been on pounds lost, many behavioral programs have included a system of dispensing rewards for a certain amount



of weight lost each week. Some recent studies (Hall and Hall, 1974; Jeffrey, 1976) have shown that long-term success depends primarily on habit change, and have changed the focus of their treatments so that habit changes rather than weight losses are reinforced. Some researchers (Avereshi, 1976; Schacter, 1968) believe that there is a certain eating style exhibited by overweight people and it includes habits such as eating too quickly, taking second helpings, putting meal food on the table for easy access, leaving snack food around the house, and eating while engaging in other activities. The theory is that if the improper eating style is changed, weight will be lost, therefore rewarding habit change to encourage people to eat slower, take smaller bites, not engage in activities while eating will ensure better long-term results in weight loss and weight loss maintenance.

Unfortunately, most studies have failed to measure the degree of eating habit changes during the weight loss programs, and some researchers (Brownell, Heikerman, and Westlake, 1977) consider this failure to be a major methodological flaw in-treatment studies. Isolating effective treatment components is impossible unless some sort of behavioral change measurement is recorded. Researchers say that teaching behavioral modification techniques for weight loss is a viable treatment method, but there is virtually no research that shows that participants in weight loss programs are actually changing their eating habits or if they do, that certain habit changes are directly responsible for the weight loss.

One reason for the lack of research in the area of eating habit changes is that measurement is difficult. One technique that has been used by several researchers is an Eating Patterns Questionnaire first developed by Wollersheim (1970).

This questionnaire is given to participants before and after the weight loss program and asks questions such as "Do you snack while watching T.V.?" and "Do you store food in hard-to-get-at places?" Positive changes in habits are then correlated with weight loss. A few studies (Hagen, 1974; Wollersheim, 1970) have indicated that weight loss is sometimes correlated with habit change. One problem with this sort of questionnaire is that it is totally self-report, and as such, may be biased and inaccurate. Having someone else monitor eating habits is a possibility, but the presence of such a monitor would probably influence eating habits, unless it was done unobtrusively or by someone who was naturally in the environment, such as a spouse or child.

Even if habit change could be accurately measured and correlated with weight loss, researchers still would not be able to conclude that the habit changes were responsible for the success, or which habit changes were important since most behavioral programs are constructed so that effective individual treatment components are difficult to isolate. A participant may learn 10-20 behavioral techniques during the course of a weight loss program, and may consistently use any number of them. Presently, the best measure of habit change may be to ask each participant what weight loss techniques he or she is using, and which ones they feel have been important factors in their weight loss. Some measurement of habit change is an integral part of the assessment of success and failure in weight loss efforts, and refinement of a technique to obtain accurate information is necessary.

Evaluatory problems. The results of weight loss programs have indicated that there are several problems that make it difficult to effectively evaluate the overall success

or failure of different techniques. Some of these problems are the high variability of individuals' responses to treatment, high percentage of drop-outs, and often poor results with weight loss maintenance over a long period of time.

Differential responses to treatment. One conclusion that most researchers in the area of weight loss have reached is that subject response to treatment programs is highly variable. Some participants in behavioral programs may lose up to 50 pounds in a 15-week program whereas others, in an identical program, may even gain weight. This sort of variability may create problems in the evaluation of a particular weight loss program since a very large loss or gain of one or two individuals can camouflage the more insignificant changes of the group as a whole, especially if the group is small. Some studies (Harris and Bruner, 1971; Penick, Filion, Fox and Stunkard, 1971) discuss this problem and include individual data in the reports, and suggest that all reports include similar data.

Why individual response to treatment varies significantly is not really known. Researchers have suggested that certain groups of people, such as young, motivated college students tend to be more successful in weight loss programs than the older, more chronically obese population (Hall and Hall, 1974), and that people with an early onset of obesity have less chance of success than those with late onset of obesity (Abramson, 1973; Braunstein, 1971; Silverstone and Cooper, 1972). Although no research has conclusively proved the validity of differential potential for weight loss among various populations, researchers should be cautious when comparing the results of weight loss programs, especially when comparing programs in which the participants are young and motivated to programs in which the participants are the older,

chronically obese. Mayer (1969) even goes so far as to say that the results of studies using college students are not generalizable, because the regular clinical population is older and significantly more obese. This criticism may be a bit stringent, but reports should include the necessary information about the subject population so that other practitioners and researchers can knowledgeably compare the results of different programs.

Drop-outs. Another factor affecting how one evaluates the success or failure of a weight loss program is the percentage of participants who drop out. A high number of drop-outs can damage the credibility of experimental results, especially if drop-out rates vary among different programs, but tend to be high. For example, Harris and Bruner (1971) report a 58% premature termination rate. Mahoney, Moura, and Wade (1973) stated that 60% of their participants had dropped out by the four-month follow-up, and Romanczyk et. al., (1973) reported 30% premature termination at post-treatment and over 60% at followup. Not all programs have high rates of drop-outs; in Hagen's (1974) ten week program there was only one drop-out of the total of 90 participants, but the percentage of drop-outs tends to increase with the length of the program.

A high rate of experimental mortality can lead to fallacious experimental results. If the percentage of drop-outs is significantly different among treatment groups, the results may be biased. Jeffrey (1976) cites the example to the Harris and Bruner (1971) study. The results showed that subjects in a contingency contract group lost significantly more weight than the subjects in a self-control group. However, the contract group had a 58% drop-out rate and the self-control group had no



early terminations. Jeffrey calculated that if the weights of the drop-outs had been included in the results, then the self-control group would have been claimed the superior group as far as weight loss.

Reporting data on drop-outs becomes particularly important for studies including long-term follow-ups. For example, Romancyk, Tracey, Wilson, and Thorpe (1973) concluded that the combined techniques of self-monitoring of weight, and caloric intake along with aversion imagery and relaxation therapy was effective for weight loss and weight maintenance over a 12 week period. The researchers interpreted the results to mean that the participants were able to implement the behavioral skills on a continuing basis without the reinforcement of weekly meetings. A plausible rival hypothesis is that the weight loss maintenance was due to the fact that those subjects who were not losing or even gaining weight were the ones who dropped out of the program, and the remaining eleven participants (out of the initial 28) were the ones who were most successful. Unfortunately, data on the drop-outs was not reported in this study, so this hypothesis cannot be tested.

More information on drop-outs needs to be gathered and all studies should, at the minimum, report the number of premature terminations, and, when possible, include follow-up data on weight loss or gain. In addition, results including the final weights of all participants should be presented, and calculations should be made to determine if the rate of drop-outs varies among the different treatment groups.

Long-term maintenance. Although many behavioral obesity studies are reported as being successful after a period of ten to twelve weeks, the real test of a program's success is how long the weight loss is maintained, and whether or not

participants continue to lose weight after the program's end. Most subjects do not reach their weight goals in a twelve week time period and need additional weight loss over a period of months or even years. Stunkard and McLaren-Hume (1959) reviewed the more traditional drug and psychoanalytically oriented treatments used in the past and concluded that most participants did not maintain their weight losses. Behavior Modification Programs seem to offer more hope for maintenance, but a relatively few studies have included follow-ups over a long period of time. Hall and Hall (1974) reviewed 18 behavioral studies, 14 of which included some sort of follow-up. In general, those studies including follow-up periods of 12 weeks or shorter (Harmatz and Lapuc, 1968; Wollersheim, 1970; Hagen, 1970; Hall, 1971; Manno and Marsten, 1972; Janda and Rimm, 1972) found that differences between experimental and control groups remained significant. However, the one study that included a longer follow-up period (Foreyt and Kennedy, 1971) reported that the originally observed differences between experimental and control groups were no longer significant. In more recent years only one study (Hall et. al. 1976) has had participants continuing to lose weight after termination, and most studies that have included follow-up periods of six months or longer have shown a lack of weight loss maintenance. These studies will be discussed in more detail later in this paper.

Clearly, then, behavioral programs cannot assure long-term weight loss maintenance. Although most studies appear to have moderate success after a ten to twelve week treatment period, long-term weight loss and weight loss maintenance is not the result in the majority of studies that include appropriate follow-up periods. In addition, most studies include little more than a brief follow-up period. To



evaluate the success or failure of treatment methods, a follow-up period for at least six months is necessary, and one to two years preferable. Researchers have shown behavioral methods to be successful in the short run, but now it is time to extend the period of evaluation.

Summary. Success and failure in weight loss programs is difficult to define and to measure. The best method so far for measuring changes in weight seems to be Feinstein's Weight Reduction Index. However, overall success in a program may include changes in eating patterns, nutritional intake, and general coping skills. These types of changes are less easily measured and often not investigated or reported by researchers. In addition, many factors can preclude a researcher from labeling his or her weight loss program as a complete success: groups and individuals respond in varied ways to the same treatment program, drop-out rates tend to be high, and long-term follow-ups may show a lack of weight loss maintenance by many participants. Researchers in the area of weight control should at least address these issues when discussing experimental results, and hopefully conduct future studies in a manner that will provide further information to clarify some of these issues.

### Who Succeeds and Who Fails in Weight Loss

The high degree of variation in participant response to obesity treatments leads to some important questions. Perhaps the most puzzling question is who succeeds in losing weight and maintaining the weight loss and who fails? Are there personality or physical attributes that differentiate those who succeed and those who do not? Researchers have shown that many people have great difficulty losing weight and

even more seem to have problems maintaining weight losses. In addition, up to 83% (Hall and Hall, 1974) of all people enrolled in weight loss programs drop out before treatment is completed. For these and other reasons Young (1974) expressed the following plea to practitioners in the field of obesity treatment:

Unless there seems to be a reasonable likelihood of success, there is a question whether treatment should be undertaken. If success seems unlikely, perhaps the greatest kindness to the individual is to help him learn to live with his condition rather than to develop anxiety and a sense of guilt when he is unable to carry out instructions. (p. 67)

Although this statement may be unduly pessimistic, and suggestive that new and better treatments for the treatment of obesity will not evolve, several recent review articles (Abramson, 1973; Jeffrey, 1974; and Leon, 1976) have concluded that now is the time to develop methods to predict individual treatment outcomes in order to avoid wastes in time and effort on the part of weight loss participants and practitioners.

To discuss possible prognostic factors of success and failure in weight loss, an examination of existing research is necessary. This includes a look at the studies that have already been conducted on the prediction of positive and negative outcome in weight loss, as well as an overview of the information available on drop-outs from weight loss programs.

Predicting weight loss. Of those people who complete weight loss programs, some lose weight, and many do not. If certain predictive factors could be isolated to predetermine potential treatment outcome, time and effort on the part of the participant and practitioner could be saved. In addition, if the practitioner could evaluate a potential participant prior to starting of a weight loss program, a matching might be

made between the participant and a certain type of weight loss program. Unfortunately, prediction of weight loss had so far been a discouraging enterprise for researchers in the field of obesity. Several variables have been hypothesized as predictive of successful outcome, but only a few have been empirically supported. Moreover, for the few prognostic factors that have emerged, consistent replication is absent.

Some of the prognostic factors that have been studied are age, sex, history of weight problems and dieting success, marital status, motivation, anxiety, depression and locus of control. For example, Silverstone and Cooper (1972) studied 100 obese patients (at least 20% overweight) whose problem with weight was refractory. Patients with a late onset of obesity (after age 40) and a low neuroticism score as measured by the Eysenck Personality Inventory were most likely to benefit from receiving simple dietary instruction at a weight reduction clinic, but no consistently significant predictor of weight loss was found. Factors that were tested included family history of obesity, age of onset, sex, age, number of prior treatment attempts, occupation, social ease, and personality functioning. Leon and Roth (1977) in their review of obesity research, affirm Silverstone and Cooper's (1972) finding that sex is not a helpful predictor of success in losing weight. However, Hall and Hall (1974) suggest that sex might be a good predictive factor, citing the studies of Stunkard and McClaren-Hume (1959) and Harris (1960) as evidence.

Additional evidence attesting to the difficulty of finding valid weight loss predictors is found in Wollersheim's (1970) extensive study. She pretested subjects on the IPAT Anxiety Scale Questionnaire, the Pittsburgh Social Extraversion-

Introversion Scale, and a modification of the S-R Inventory of Anxiousness which included ten situation specific anxiety scales. Participants also filled out an intensive "Eating Patterns Questionnaire" which provided information on obesity and yielded six factor scores concerning particular eating habits: eating as a response to interpersonal situations, emotional or uncontrollable eating, eating in isolation, eating as a reward, eating as a response to evaluative situations, and snacking. Physical activity during a 24-hour period was also recorded. Of the 38 correlation coefficients, none achieved significance in predicting post-treatment weight loss.

Penick et. al. (1971) also were unable to find any significant prognostic factors. They attempted to show a correlation between pretreatment personality functioning as measured by the MMPI and weight loss of subjects completing behavioral or conventional group therapy treatment for obesity.

A few researchers have investigated the effect of locus of control as predictive of successful weight loss, but results are equivocal. Bulch and Ross (1975), using Rötter's I-E Scale, found that subjects with an internal locus of control were the ones who lost the most weight. However, Vincent, Schiau, and Nathan (1976) report no relationship between locus of control and weight loss. However, the two studies were extremely different. In Bulch's study all subjects attended similar behavioral groups, but in Vincent's study some subjects were in a deposit contract group and others were in a no-deposit contract group. The payment of a contingent contract may have interacted with locus of control in such a way as to diminish the predictive factor of locus of control. A participant whose refund was contingent upon attendance might have felt that his participation and even eventual success or failure was



contingent on the deposit rather than on his/her own motivation.

Although for the most part research in the area of prediction of success and failure in weight loss has been almost futile, one researcher (Quereshi, 1972, 1974, 1977) has been able to distinguish several psychological factors that differentiate between the remedially and irremediably obese. The subjects in all three of his studies were members of the TOPS clubs in the United States and Canada who were refractorily obese (weighed over 200 pounds and were having great difficulty with weight reduction). The participants were flown to Milwaukee where they underwent extensive physical and psychological exams and medical histories. Similar information was gathered from members of KOPS (Keep Off Pounds Sensibly)--women in TOPS who had controlled their obesity so that their weight over a six month period had remained within 5% of their ideal body weight.

In the first study Quereshi (1972) gathered information on 180 members of TOPS who were from the United States and Canada, and 98 KOPS, all who were female and from Chicago. Factors not important to the dependent variables such as age, sex, education, and social class were statistically controlled to make sure TOPS and KOPS were similar in these areas. One of the major questionnaires administered was the Mehril Adjective Rating Scale (MARS) consisting of 48 adjectives such as nervous, ambitious, and selfish, and accompanied by five point ratings ranging from very atypical to typical. Each woman rated herself, her father, her mother, and her spouse or boyfriend on all 48 adjectives. The dependent variables were four personality factors measured by MARS: 1) extraversion, 2) self-assertiveness, 3) productive persistence, and 4) unhappiness.

The TOPS members rated themselves as significantly more unhappy than KOPS, a factor that included nervousness, tenseness, unhappiness, and dissatisfaction. TOPS also rated themselves as significantly more extraverted than did members of KOPS. Quereshi concludes that the findings indicate that obese females, despite attempts to gain approval by friendliness and congeniality, feel lonely and rejected, perhaps because of the stigma society places on fat people. TOPS also rated their mothers more extraverted and productive than did KOPS members, and also felt that their mother's productivity significantly exceeded their own. Other psychosocial factors were not considered significant.

Quereshi's conclusions in this study are not really supported by the data. He seems to be saying that participants who succeed in losing weight are characterized by happiness, but the people who fail are unhappy types of people. What the results may be showing is that people who fail to lose weight in TOPS even after months of effort feel unhappy. The unhappiness may well be a result of their unsuccessful attempts, rather than a part of their personality. Naturally the members of KOPS report feeling happy--they have controlled their weight. The questionnaire really needed to be distributed before the participants began the weight loss attempt to account for this factor, otherwise valid conclusions cannot be made. Perhaps the finding that "irremediably obese" rate themselves as more extraverted has credence, but the participants may have accepted this society's characterization of fat people as jolly people. For this reason, the participants' self-reports may not be entirely reflective of their personalities, but rather of society's image of overweight people. However, this hypothesis has not yet been supported by empirical data.



In a similar study Quereshi (1974) subjected data from 175 chronically obese people to canonical correlational analysis to find factors that predicted successful weight loss. The results indicated that a high preference for cakes, an overweight mother, and a high number of meals eaten in a day were predictive of failure in controlling chronic obesity, whereas a large amount of food eaten for breakfast, liking for chocolate candy, and being married were predictive of success. In addition, remediability of obesity was significantly related to the person's perception of the appropriateness of the culturally stereotyped, sex-related roles of their parents. Unfortunately, Quereshi did not elaborate or interpret this study.

In a third study Quereshi (1977) gathered data on all TOPS chapters within a radius of 40 miles from the City of Milwaukee. Ten chapters with the highest average weight loss and ten chapters with the lowest average weight loss over the 1973-74 year were chosen to represent the most and least successful chapters in the area. In all, 287 adult female TOPS members (168 in the successful chapters and 119 in the unsuccessful chapters) completed questionnaires and provided current weight and biographical data. The total number of groups was actually nine HAWL (Highest Average Weight Loss) and eight LAWL (Lowest Average Weight Loss). The three other chapters had been disbanded because of lack of membership interest.

The primary scale administered to participants was the Rating of Self-Status (ROSS) developed by Quereshi from his previous MARS questionnaire. The ROSS is a psychological instrument that consists of objective, multiple choice items dealing with aspects of behavior and lifestyle of obese individuals and based in part on Schacter's conclusions about the obese personality. Among other things, Schacter

(1968) believes that the obese exhibit finickiness, emotionality, passivity and a high degree of stimulus bonding.

Eight of the 24 independent factors of the ROSS discriminated significantly ( $p < .05$ ) between the remedially and irreducibly obese. For this study, people were defined as remedially obese if their index of obesity control (IOC) was over 100, and irreducibly obese if their IOC was equal to or less than 100. The IOC score was computed by multiplying by 100 the ratio between the base-line weight and the weight after a period of six months. Thus an IOC of over 100 indicated that the person lost weight over a six month period, and an IOC of 100 or less represented no change or gain in weight over the six month period. The following are the eight factors Quereshi found to be prognostic of success and failure in weight loss:

Factor 9. This factor represents the level of activity of a person, the amount of food eaten at lunch time, and the degree of personal commitment to the reduction of weight. Thus persons who are active (spend the least amount of time lying down), do their own house and yard work, and definitely see themselves in control of their weight in the near future obtain high scores and are successful in weight loss efforts.

Factor 12. The item with the largest loading (.73) represents readiness to express one's anger instead of controlling it. Also included is one's perception of being able to cope with life and its circumstances as they affect the individual's course of action. People with high scores are successful weight losers.

Factor 13. This factor represents emotional brittleness (laughing easily and

crying easily), unhappy childhood, peevishness and irritability, inability to resist eating a lot of good-tasting food, and amount of support received from other persons in the immediate family in one's efforts to reduce weight. Those who were able to remedy obesity obtained lower scores.

Factor 19. This factor is indicative of eating rapidly, laughing or crying readily, and being selective about choice of food. A high score is prognostic of failure in weight loss.

Factor 20. This factor represents a preference for bread and meat. The irremediably obese scored higher on this item than the remedially obese.

Factor 22. This factor represents length of TOPS membership, having an overweight father, and lack of familial support for weight loss efforts.

Irremediably obese obtain high scores on this factor.

Quereshi concludes that there are biosocial and behavioral characteristics that reliably and validly distinguish between the remedially and irremediably obese, and that these characteristics are generally, but not entirely, the same as those that distinguish between people of normal weight and those who are obese.

Although Quereshi (1977) does find several prognostic factors for successful weight control, several questions remain about his experimental procedure, especially in the determination of who is remedially and irremediably obese. Although he does test to see if the differences between the two groups were contaminated by age, education, and socioeconomic status (they were not), other pre-existing attitudes and experiences may have influenced the experimental results. As in the previous two studies, all data collected is retrospective. Participants were given the ROSS

after participating in TOPS for at least one year. Many of their answers to questions concerning happiness, ability to succeed and control one's own life, and frustration level may have been contingent upon the success or failure in the TOPS program. However, what Quereshi seems to be saying is that people who feel in control and motivated are the ones who are going to succeed. The difference is subtle but important. What is needed in weight control research are factors that will predict success and failure before a participant even begins a program, not after he or she has completed it.

Another big problem with Quereshi's (1977) study is that data on weight loss were gathered for only a six month period in order to classify participants as remedially or irremediably obese. Six months is definitely not a long enough period of time; weight losses need to be maintained at least one year before a person can be called a successful weight loser. As previously discussed in this paper, most people gain their weight back over a period of time. What Quereshi is actually studying is the differences between people who can lose weight, but not necessarily maintain the loss, and people who do not lose weight over a six month time period.

A third potential problem with all of Quereshi's studies is that they use a limited subject population. All participants were members of TOPS, a commercial weight loss organization based on weight loss through various forms of competition and group reinforcement. This type of organization might attract people who seek out support and competition, so that resulting experimental data may be non-generalizable to other populations. In sum, what Quereshi has provided is retrospective data that shows potential distinguishing features between TOPS members who lost weight over



a six month time period and those who did not lose weight over a six month time period.

A few other researchers have also tried to link psychological factors with successful and unsuccessful weight loss attempts, with variable results. In one study Leon and Chamberlain (1973) investigated the differences between people who successfully maintained weight losses for at least one year and those who regained more than 20% of the weight they had previously lost. The subjects were selected from a membership list of a local weight-reduction club. All of the subjects contacted had successfully dieted and reached their weight goal one year previously. The regainer group consisted of 34 persons (30 females and 4 males), and the maintainer group consisted of 22 persons (19 females and 3 males). A control group of 39 persons (28 females and 11 males) consisted of a group of individuals who were either attending an evening school class or were employed as office workers. They were included in the control group if their age, weight, and height were consistent with the Metropolitan Life Insurance (1969) norms for desirable weights and if they reported no previous weight problems.

Information from each subject was gathered about associations between eating and emotional states and the circumstances when the individual recognized that overeating was a problem. In response to the question, "Were there any special times when you have a tendency to eat?", the regainers were the largest proportion of subjects choosing several arousal states as being related to eating (happy, angry, lonely, bored, excited, and hungry). A response indicating several arousal states occurred for 29.4% of the regainers, 22.7% of the maintainers, and 7.7% of the

controls. The response of highest frequency for the maintainers was that eating was specifically associated with being lonely and bored, and the most frequent response of the control group was that they tended to eat when hungry (48.7%). Only 8.8% of the regainers and 9.1% of the maintainers reported eating primarily when hungry. In response to the question, "Why do you eat?", regainers (50%) listed multiple emotional states, as compared to 27.3% of the maintainers. The control group indicated eating because of enjoyment (41%) and because of hunger (28.2%). Leon and Chamberlain neglect to say whether or not these differences were significant.

Significant differences were found between the three groups on items of food preferences and self-control ( $p < .05$ ). The regainers ranked pastries as their most preferred and dairy foods as their least preferred foods. The maintainers as a group ranked pastries and meat equally as their most preferred foods, and they ranked starches such as bread and potatoes as their least preferred foods. The control group ranked meat as their most preferred food, and dairy foods as their least preferred.

There were no significant differences between the three groups in terms of family interactions related to mealtime patterns, using food as a reward, and amount of verbal encouragement or discouragement of eating behavior. Neither the regainer group nor the maintainer group cited any distortions in body image in comparison to the control group.

Although Leon and Chamberlain's study does point out some differences between "normals" and "obese", the characteristics differentiating people who maintained a weight loss and those who regained weight are vague. Regainers seem to eat in response to a wider variety of emotional stimuli than do maintainers, and the



regainers claimed to prefer the higher calorie foods such as pastries, whereas the maintainers preferred meat and pastries. It is unclear from the results of this study whether maintainers initially reacted to fewer emotions by eating than did the regainers and consequently had an easier time maintaining the loss, or whether the maintainers also at one time responded to many emotions by eating, but learned how to control these responses by acquiring different coping skills throughout the weight loss program. Again we see some of the problems with retrospective studies--they provide biased predictors.

Vincent, Schiavo and Nathan (1976) also conducted a predictive study based in part on Schacter's (1968) theory of stimulus bonding in obese adults, which maintains that obese people are more responsive than normal weight people to external stimuli, including food cues. Vincent and his colleagues hypothesized that responsiveness to external stimuli should distinguish not only the obese from the non-obese, but also the successful weight losers from the non-successful losers.

- Before the actual weight loss program began, all 34 participants took part in a "pre-experiment" in order that a distractibility score could be obtained. Participants were asked to proof-read under conditions of distraction and non-distraction, and the number of mistakes made by each person was recorded for the two situations. The researchers believed that this study, based on a design developed by Rodin (1973) would determine the amount of stimulus bonding for each individual. Those persons who made many more mistakes under conditions of distraction than in non-distraction were considered to be stimulus-bound, that is, they paid more attention to and were less able to ignore, distraction in the environment. In addition to the distractibility

scores, the Rotter Locus of Control Scale, the Eysenck Neuroticism Scale, and the Marlow-Crowne Scale of Social Desirability were administered. A control group of non-overweight night college students also participated in the testing and "pre-experiment".

None of the tested factors, including education, socioeconomic level, age, extraversion, introversion, neuroticism, internability or externality, or stimulus bonding were found to be significant prognostic factors in successful weight loss. The researchers believe that the distractibility task was not really adequate to measure the degree of stimulus bonding. Interestingly, the amount of distractibility did not differ significantly among the normal weight control group and the overweight treatment groups. The study itself is weak in that follow-up data were gathered on only 15 subjects--not quite four subjects per group (there were two deposit groups and two no-deposit groups); this is not really an adequate number upon which to base conclusions.

- Certainly, the data in the area of prediction of success and failure in weight loss are contradictory and confusing. Some of the studies provide evidence that "failures" respond to a wide variety of emotions by eating, have a difficult time expressing anger, feel unable to control their world and prefer to eat pastries. None of the reported studies in the area of prediction have been sound experimentally. Many rely on retrospective studies and use a limited population. The area of prediction merits experimentally sound, detailed research with a large number of subjects, both male and female.

Some of the possible areas for further research in prediction include age of

onset of obesity, duration of obesity, age of subject, motivation, expectancy for success, familial support, and other psychological measures based in part on Quereshi's findings: ability to express anger, eating preferences, and eating habits.

Age of onset. So far, age of onset of obesity has not been conclusively predictive of success or failure in weight loss, but several researchers (Abramson, 1973; Braunstein, 1971) feel there is reason to further assess this factor's potential usefulness. Young (1973) suggests that persons who were obese in childhood are much more difficult to treat than those who had adult onset of obesity. Bruch (1957) agrees that early onset is more difficult to treat and suggests that juvenile obese never developed a true internal sense of hunger awareness.

To support the contention that juvenile obesity is persistent, and therefore difficult to treat, Stunkard and Mahoney (1976) describe two long-term studies that took place in Hagerstown, Maryland. In the first study 86% of a group of overweight boys became overweight men as compared to 42% of average weight boys, and 80% of overweight girls became overweight women as compared to 18% of the average weight girls (Abraham and Nordsieck, 1960). A later study showed that the few overweight children who reduced successfully had done so by the end of adolescence. The odds against an obese child becoming a normal weight adult were 4 to 1 at age 12, and 28 to 1 for those who did not reduce in adolescence (Stunkard and Burt, 1967). Another study that took place over 35 years found that 63% of obese boys became obese men as compared to 10% of the average weight boys (Abraham, Collins, and Nordseick, 1971).

Some researchers believe that the reason for the persistence of juvenile

onset obesity is physiological. For example, Hirsch and Knittle (1971) conclude that people with an early onset of obesity show a marked increase in total number of adipocytes in subcutaneous tissue and other depots, perhaps five times that of a normal person. When adults lose weight these cells shrink but do not disappear; the number of adipocytes an adult possesses is stable. Guss (1966) suggests that juvenile onset obesity is characterized by hyperplasia or overabundance of fat cells, and adult onset obesity is characterized by hypertrophy, obesity due to enlarged adipocytes. The more fat cells a person has, the more difficult it is to lose and maintain weight loss.

Nisbett (1972) explains weight loss difficulties with what he calls a set-point theory; in other words, the hypothalamic feeding center in the brain controls the amount of food eaten to maintain fat stores at a particular level called the set-point level. According to this theory, for some people obesity is a normal state and weight loss would place the person in a state of deprivation. For this reason many obese gain back lost weight. They can remain in semi-starvation for only a short period of time. Perhaps successful losers have adult onset of obesity and have a lower set-point than the failures who might have high set-points and actually need more food to feel full. Empirical evidence from human research is lacking in this area. One problem to be considered in future studies is the delineation of juvenile onset of obesity and adult onset of obesity. Is there an age such as 18 or 21 that can be used as a cutoff point, or is difference totally individual? Perhaps some people cease the development of fat cells earlier or later than others.

From a psychological point of view, researchers have suggested that juvenile onset of obesity is difficult to treat because of the high evidence of emotional problems



associated with early development of obesity (Stunkard and Rush, 1974). Childhood obesity has been said to have a deleterious effect on psychosocial development (Ayd, 1974). Whether or not the obesity precedes the emotional difficulty or results from traumatic episodes is not really known. Kahn (1970), for example, found that children placed in foster care developed significantly more obesity than the controls who had not been separated from their mothers. Whatever the case, some practitioners and researchers believe that the individual who suffers early onset of obesity has only a limited chance of success in losing and maintaining weight loss (Stunkard and Burt, 1967; Stunkard and Mendelson, 1967; Stunkard and Rush, 1974).

There is evidence to support the contention that dieting can have negative psychological side-effects for some people (Bruch, 1952; Gerhardt, Robkertse, Laubscher and DuPlessis, 1974; Stunkard, 1957; Stunkard and Rush, 1974), especially those with juvenile onset of obesity (Grinker, Hirsch, and Levine, 1973). These side-effects such as headaches, giddiness, uncontrollable hunger, and indigestion often herald drop-out from treatment. Mullens (1958) reports that juvenile onset obese with psychological complications were indeed less amenable to treatment. Since people with the early onset of obesity seem to have potential psychological as well as physiological problems with losing weight, it is reasonable to predict that they may not succeed in weight loss programs. This prediction needs to be supported by sound empirical research.

Sex factors. Some previous studies (Harris, 1969; Mahoney and Mahoney, 1976; Stunkard and McLauren-Hume, 1959) have found that men are more successful at losing weight than women, but other studies (Jeffrey, 1976) have found no



significant differences between weight losses of men and women. Very few studies have included large numbers of men, so adequate comparisons cannot yet be attempted.

Expectancy of success. A third prognostic factor may concern the weight loss participant's expectancy for success in the program. Nash (1976) discovered in her study that people most likely to drop out of a program were those who had previously dropped out of another program. Certainly many people have had experience with failure in weight loss. Many people exhibit a yo-yo effect--they lose weight with one program only to regain the pounds after termination, so then they commence a new program. In a recent survey in a popular woman's magazine (*Glamour*, 1978), 30,000 readers responded to questions about weight. Of those respondents, 76% reported an unsuccessful weight-loss experience. Only 24% of the respondents stated that they had been able to lose and maintain weight, and 81% said that they felt like failures in losing weight.

Repeated experiences in failure may lead to what Seligman (1973, 1975) calls "learned helplessness". Simplistically, what learned helplessness means is that if a person's efforts consistently fail to bring about any change, then he/she stops trying to make the change. The theory is more complicated than this brief explanation, but what happens to the obese person may be related. After trying several times to lose weight in various programs, the obese participant gradually makes less and less effort in each new program until he/she finally drops out of treatment altogether. A person attempting to lose weight for the first time is likely to be more motivated than the experienced dieter, and perhaps more likely to succeed.

Steffen and Myszak (1978) conducted a study to determine the effects of a

pretreatment task to enhance general expectancy of success on the participants in self-control weight-loss programs. Prior to treatment half of the 120 participants met individually with an experimenter who discussed self-control and eating patterns and how they relate to weight loss. Subjects who received this information only were called the Pre-treatment Information Group. Half of the 120 subjects were shown by the experimenter how new skills could be acquired to control behavior. The participant engaged in a tolerance task with a hand dynamometer, and learned to increase his or her tolerance by imagining pleasurable scenes. Subjects were then told they had learned to use a new skill to control a behavior which they had felt was not under their control. Parallels were drawn between the experience and the self-control strategies that would be used in the upcoming weight loss program. This group of subjects was called the Pre-treatment Training Group. A third group consisted of participants who received no pre-treatment information or training but attended weight control classes, and the fourth group consisted of a delayed treatment, and served as a control group. All participants were given an expectancy for success questionnaire. Subjects in the first three groups met for seven weeks in groups designed to instigate weight loss using self-control techniques.

In all, forty-four subjects dropped out of treatment, but there were no differential attrition among groups. Further analyses revealed no differences on initial weight or expectancy for success between drop-outs and remainers. Participants in the Pre-treatment Training group and Treatment Only group lost significantly more weight during the weight loss program than those in the Pre-treatment Information Group and Delayed Treatment Group. Only those people in the Pre-treatment

Training Group continued to lose weight after termination of treatment as measured in a follow-up session three months later. Steffen and Myszak concluded that the initial experience with success in self-control helped participants maintain treatment effects by countering previously acquired attributions of failure to self-control weight loss (perhaps acquired in previous non-successful weight loss attempts). This conclusion by the authors is not entirely supported by their data. Had the pre-training actually enhanced the participants' expectancy of success, this enhancement should have been reflected by significantly higher scores on the expectancy of success questionnaire given at the beginning of the study. However, the lack of difference among groups on this measure might have been due to a poor questionnaire--the authors do not report the name of the measure used.

Family support. The amount of support a person receives at home for his weight loss efforts could influence treatment outcome. The involvement of family members has been promoted as a facilitative factor in weight control (Franks and Wilson, 1975; Mahoney and Mahoney, 1976; O'Leary and Wilson, 1975; and Stuart and Davis, 1972), but families might also have a negative influence on weight loss efforts. Stuart and Davis (1972) recorded meal time interactions between overweight women and their husbands and discovered the following: 1) husbands were seven times more likely than their reducing wives to talk about food, 2) husbands were four times more likely to offer food to their spouse, 3) wives were twice as likely to refuse food offers, and 4) husbands were twelve times more likely to criticize their spouse's eating behavior than praise it.

The participants in weight loss programs who have the support and help of

family members may be more successful losing weight than participants who have little or no family encouragement. Those people who participate with their spouses in a weight loss program may have the best chance of all to lose and maintain the weight loss.

Other predictors. Other potential prognostic factors in weight control must be further investigated. Guereshi found that successful losers were able to express anger rather than control it, and felt more in control of their lives than weight regainers. Measures of participants' anger/hostility as well as assertiveness should be gathered. In addition, research correlating emotional arousal and eating behavior would be useful. Failures in weight loss programs may be the people who cannot distinguish hunger from appetite. These people may not be able to react to emotional arousal in other ways besides eating, or they may be more "stimulus bound" than successful losers, that is, they may be extremely sensitive to external cues, including the smells and taste of food. Documentation of these differences would be extremely difficult and time-consuming and would have to include carefully maintained self-reports from each participant describing cues that triggered eating.

#### Drop-outs

One of the most vexing problems facing the physician, psychiatrist, psychologist, or researcher is that many patients drop out of treatment prematurely. The high percentage of drop-outs is not limited to the treatment of obesity. In general, psychiatric clinics, 20 - 57% of the patients fail to return after the first visit (Blenkner, 1954; Dodd, 1971; Aronson, 1963; Weiss and Schare, 1958), and 31 - 56% attend no more than four sessions (Lindsay, 1965). Similarly, in group psychotherapy from 33 - 50% of patients drop out of treatment (Beinne, 1955; Sethna and Harrington,



1971). In the treatment for obesity the percentage of drop-outs ranges widely, from 20% to 80% (Stunkard and McLaren-Hume, 1959), and many studies report at least a 25-50% drop-out rate (Jeffrey, 1976; Shipman and Plesset, 1963; Silverstone and Solomon, 1965; Stunkard, 1959).

Very little has been written about the drop-out in weight loss programs. Some of the major questions to be discussed are 1) Who is the drop-out? 2) Is the drop-out a treatment failure, and 3) What can be done about high drop-out rates?

Who is the drop-out. For the purpose of this paper a drop-out will be defined as a person who fails or refuses to return to treatment before it is completed. However, this definition encompasses several different types of drop-outs such as the person who comes only to the initial meeting and a person who attends the first ten or twelve meetings and misses the last two. People in these categories might be very different from each other, and this must be kept in mind when characteristics of premature terminators are discussed.

- Several researchers have reported that a high percentage of participants in weight loss programs drop out after the initial visits. In a study of 100 obese out-patients at a nutrition clinic Stunkard and McLaren-Hume (1959) found that 39% of the participants did not return to the clinic after the initial visit, and Seaton and Rose (1965) reported that 24% of the clients at a weight reduction clinic did not return after the initial visit. Shipman and Plesset (1963) discovered that a third of 151 obese out-patients dropped out of treatment after two visits, and another third after five visits. Researchers of behavioral programs for the treatment of obesity have also reported high drop-out rates (Jeffrey, 1976; Nash, 1976), and those programs



with long-term follow-up periods generally have a very high drop-out rate by the end of the program. For example, Romancyk et. al. (1973) reported a 30% post-treatment drop-out rate, and a 60% drop-out rate at the follow-up twelve weeks later. Mahoney, Moura, and Wade (1973) also report a 60% drop-out rate at the end of the four month follow-up period.

Unfortunately, very little research has been attempted to investigate characteristics of obesity program drop-outs, and what research has been done is not conclusive. In addition, comparing the results of studies with information on drop-outs is difficult since weight loss programs are so varied. Drop-outs from a nutritional guidance program may be very different from drop-outs of a behavior modification weight loss program. Even comparing information from behavioral programs alone would not provide definitive data since participants in various programs may be reacting to group leaders, style of presentation, ease of transportation in a particular city and other variables. However, if patterns begin to appear from program to program that were predictive of weight loss drop-outs, perhaps these people could be isolated before starting a program and given special attention or incentives to help them succeed with their efforts.

The research that has been done so far in the area of weight loss drop-outs has not been conclusive. Seaton and Rose (1965) reported on 239 patients who did not return to a weight reduction clinic after the initial visit and found no significant differences between them and remainers in terms of sex, age, occupation, or level of activity. Bolding and Willcut (1970) found no statistically significant differences in MMPI profiles of 28 weight loss program completers and 22 drop-outs. Unfortunately,

both of these studies lumped all drop-outs into one category and compared them with remainers. As stated previously, people who drop out after the initial meeting may be very different from people who complete most of the program, yet the above studies made no allowances for these differences.

One study (Nash, 1976) attempted to investigate differences between early and late drop-outs, as well as characteristics of weight loss program drop-outs in general. She studied 1000 individuals belonging to a commercial weight reduction program and found that there were significant trends for earlier drop-outs to rate emotions ( $p < .01$ ) and eating habits ( $p < .05$ ) as more importantly involved in their weight problem. No such trends were found for scores on nutrition information or on social support needs. Nash (1976) also found that over a treatment period of 24 weeks, the individual most likely to drop out of treatment was the one who had been involved in treatment previously. Over this time period, the individual who was new to treatment tended to stay in treatment longer. These individuals who were new to treatment indicated that their lack of knowledge about food and nutrition appeared to be more importantly involved in their weight problems than did "rejoins". Nash (1976) feels that previous drop-outs repeat their behavior in new programs because they have labeled themselves as failures, and when weight loss success is not immediate, hope quickly fades. This conclusion was supported by the results of her study that showed the most likely treatment drop-out was a person who had previously dropped out of a program, especially if the participant had a large percentage of weight to lose. However, the study found no differences in terms of age, onset of obesity, amount overweight, and different measures of emotionality between drop-outs and remainers.

The results of Nash's study cannot be easily generalized to all weight loss programs. She used participants already involved in a commercial organization that used nutritional guidance and group support as main treatment components, and reported on only 24 weeks of treatment, thus participants were at various stages of the treatment program. The person who dropped out from this kind of program may be very different from drop-outs in other forms of treatment, such as behavior modification which usually has a finite number of sessions and is focused toward changing eating habits.

Other findings on the characteristics of drop-outs include the results of a study by Balch and Ross (1975) who conclude that a person's locus of control orientation can be predictive of program completion. They administered the Rotter I-E Scale to 34 female obese subjects who were enrolled in a nine week behavioral group therapy for the treatment of obesity. The fifteen subjects who dropped out had significantly higher scores in externality than the 19 women who remained in treatment. Vincent, Schiavo, and Nathan (1976) report that drop-outs have fewer years of education than remainers, and Silverstone and Cooper (1972) note that middle-age subjects were less likely to drop out than younger participants. Other researchers (Vincent et. al., 1976) argue that drop-outs report a greater intake in calories and less exercise during the time they were in the program than the program completers. None of these studies attempted to delineate various categories of drop-outs, and there have not been enough studies to replicate any of the findings.

Overall, the research on drop-outs is minimal and ambiguous. Prior failure or attrition might be conducive to dropping out of treatment again, and a person who is very external may not have the inner conviction or control that completing a weight

loss program requires. Further research of both of these hypotheses would be beneficial. Some other questions to ask about drop-outs is whether or not they were pressured into treatment, how much support they were given for their weight loss efforts by family and friends, psychological and physiological side effects of dieting experienced during the treatment program, expectancy of success, and various other emotional indicators of depression, anxiety, and self-image. Further investigation of how various categories of drop-outs (early vs. late) differ from each other would also be beneficial. If personality variables and reasons for premature termination could be isolated, perhaps certain changes could be made in treatment programs to enhance full participation from more people, and practitioners could counsel high risk subjects before they begin a program.

Are drop-outs really failures? The person who drops out of treatment is tacitly assumed to be a treatment failure. To assume that a drop-out is a failure relative to people who remain in treatment, there must be empirical evidence showing that remainers actually lose more weight. Perhaps people who terminate weight loss programs early are able to use what methods they have already learned in the program to construct their own successful weight loss techniques. This might be particularly true for participants who drop out late in the program.

Only a few studies have included data on drop-outs. In a study conducted by Jeffrey and Christensen (1976) drop-outs lost less weight than remainers at the end of 18 weeks. The program was designed to test the relative effectiveness of behavior therapy vs. will power. The behavior therapy subjects who completed treatment had a mean weight loss during treatment of 16.31 pounds. The behavior therapy subjects



plus the six drop-outs had a mean weight loss of 13.25 pounds; thus the drop-outs had an average weight loss of 6.5 pounds. In this case the remainers did lose more, but the drop-outs were not total failures; some weight had been lost by them.

Morton (1974) reports on a quasi-experimental analysis completed 18 months after 26 obese clients started a behavioral weight control program that met once a week for 6 weeks. After the initial six weeks, classes were combined and clients met and were monitored once a week for 16 weeks, then once a month for the remainder of the year. Six clients dropped out during the first six weeks, averaging three weeks of treatment. None of these clients had lost or maintained a 20 pound weight loss at the time of the 18 month evaluation. Of the eight participants who completed the initial six weeks of the program and up to three months of follow-up before dropping out, only one lost and maintained a 20 pound weight loss. Of the 12 clients who completed all phases of the program, eight clients (67%) lost and maintained a 20 pound weight loss, seven (58%) lost and maintained a 40 pound weight loss, five (42%) lost and maintained a 40 pound weight loss, and two (17%) lost and maintained a 50 pound weight loss. Further analysis of the reported data on individual treatment outcomes show that the first set of drop-outs with an average of three weeks of treatment lost an average of 4.3 pounds by the time of the 18 month follow-up, the second set with 12 weeks of treatment lost only an average of 1.7 pounds, but those individuals completing treatment lost an average of 31.83 pounds. In this study then, even 12 weeks of treatment was not sufficient to ensure a large weight loss. Those participants who dropped out of the program prematurely did not fare nearly as well as those who completed the entire program.



Although the results of this study are striking, the conclusions are limited by experimental flaws. Participants in the study were in no way screened prior to the study. Family members were urged, but not required to attend meetings, and there were no control or experimental groups. Participants who dropped out prematurely may have had less familial support for their weight loss efforts, or may have been those with early onset of obesity. A conclusion cannot be made that the length of treatment was the sole contributing factor to amount of weight loss.

A third study that reports some statistics on drop-outs (Hagen, Foreyt, and Durham, 1976) concludes that treatment completers did not lose significantly more weight than terminators. Those who completed the behavioral program lost an average of 5.74 pounds, and those who dropped out lost an average of 4.36 pounds at the end of eight weeks. The researchers did not give any reasons for lack of significance between the two groups, nor did they report any long-term follow-up data to show how the groups fared over a period of time.

The data on people who drop out of weight loss programs is limited. There is some evidence that people who complete all phases of their program are the most successful in terms of weight loss, and people who drop out prematurely usually do not lose a great amount of weight. However, very little is known about how drop-outs fare after they leave a weight loss program. Some may be able to continue their weight loss efforts successfully using the information from the sessions they attended. On the other hand, people who drop out may be the participants who are not losing weight and are feeling discouraged. Future research should attempt, at least, to gather some follow-up data on premature terminators: when they dropped out of the

program, weight at the time of dropping out, and weight at additional follow-up periods. This data, as well as information on why people drop out of weight loss programs, could potentially lead to some alterations in the conduction of programs to enhance complete participation by all participants.

What can be done about drop-outs? One promising procedure for minimizing attrition is a deposit contract contingent upon program completion, attendance, and/or completion of homework assignments. Typical deposits have included amounts of \$5.00 (Foreyt and Hagen, 1973), \$10.00 (Abrahms and Allen, 1974; Bellack, Rozensky, and Schwartz, 1974; Romancyk, Tracey, Wilson and Thorpe, 1973), \$15.00 (Manno and Marston, 1972), \$20.00 (Heran, Baker, Hoffman, and Shute, 1975), and even \$150.00 (Brownell, Heckerman, and Westlake, 1976).

In the Brownell et. al. study (1976) a large deposit of \$150.00 was required prior to treatment. A refund of \$50.00 was given if all sessions were attended. For maintenance, participants were required to deposit \$160.00 with \$30.00 refunded for attendance. Out of the 29 subjects beginning the program, none terminated prematurely. However, the study did not include a control group that paid no deposit, therefore the conclusion cannot be made that the large deposit was the only factor contributing toward the full participation by all subjects. In fact, in a review of obesity programs, Hagen, Foreyt and Durham (1976) claim that there does not seem to be any systematic relationship between the amount of deposit required and amount of attrition. They cite the example of Hagen (1974) who required no deposit and had only one subject out of 90 drop out of his ten week program, whereas Romancyk (1974) who required a \$10.00 deposit had nine out of 70 subjects drop out of a four

week program.

To more systematically study the effect of deposits on attendance in obesity programs, Hagen et. al. (1976) divided a population of overweight females into three groups. All groups received treatment of covert sensitization and a written weight reduction manual. Each participant paid a \$20.00 deposit prior to the program's commencement. Subjects in one group were returned the entire deposit before the start of the first sessions with the explanation that the deposit was only a proof of commitment, and since they had shown up for the program they must be motivated. The second group was returned \$15.00 with a similar explanation, and the third group received no return. A complete refund of the \$20.00 and \$5.00 was contingent upon attendance of 80% of the sessions. Subjects who had deposited the entire \$20.00 for the length of the program attended significantly more sessions than those with no deposit and \$5.00 deposit. Only one subject dropped out of the \$20.00 deposit group, whereas six dropped out of the partial deposit returned group, and nine from the complete deposit returned group. Although the researchers had initially hypothesized that deposits would make subjects more likely to drop out because the money forfeited would assuage guilty consciences, the results show that the deposits did reduce attrition significantly, and the larger the deposit, the more the effect. Interestingly, the researchers collected data on the drop-outs at the end of the program and found that the actual weight loss of the subjects who remained in treatment was not significantly different than the weight of those who dropped out. As far as losing weight, continued attendance at the program did not seem to be beneficial. No follow-up data was supplied.

Overall, more information is needed on the people who drop out of weight loss programs: why do they drop out, what kind of people are they, do early drop-outs differ from later drop-outs, are drop-outs able to continue to lose weight after terminating a program prematurely, and finally, what can be done to reduce participant attrition.

Summary. Who succeeds and who fails in weight loss programs? Are there any reliable predictive factors of outcome in the treatment for obesity? These questions and many others remain, for the most part, unanswered. People who fail to lose weight or who drop out of treatment may have failed to lose weight in previous programs, feel unhappy, less able to express anger, feel less in control of their lives, and prefer high calorie foods. Other prognostic factors that have been examined but not conclusively proved to be viable predictors are age, sex, locus of control, expectancy of success, and several other psychosocial and psychological factors. The research that has been conducted in this area has often been retrospective in nature and experimentally unsound. Perhaps one of the best ways to begin research on why some people are successful weight losers and others are not is to talk to people who have been participants in weight loss programs and ask them to what they attribute their success and failures, as well as to gather accurate data on each participant before he or she enters a program on personality profile, eating habits, family support for dieting, motivation and other relevant factors. From this type of data valid predictors may eventually be constructed. Ideally, the researcher or practitioner would be able to administer an evaluation to a potential weight loss candidate, and if the person appeared to be a poor risk for weight loss, he or she could be given special attention, and special



techniques, such as requiring a deposit, could be used to ensure participation or even completion of all "homework" assignments.

### Success in Weight Loss Programs

With the advent of behavior modification programs for the treatment of obesity, practitioners and researchers began to believe that there was truly hope for those people who needed to lose a great deal of weight. Recently, in a major review of treatment programs Stunkard and Mahoney (1976) concluded that "in an unprecedentedly short time . . . (behavioral) techniques have been shown to be superior to all other treatment modalities for managing mild to moderate obesity" (p. 54). Study after study has reported "significant" weight losses with the use of behavior modification techniques.

As with most new and exciting treatment modalities, after the initial period, questions began to arise about the complete success of behavioral techniques for weight loss purposes. First, some researchers began to question the actual clinical significance of the weight losses reported in studies using behavioral methods. Weight losses in most programs averaged from five to eleven pounds over a six to twelve week treatment period (Abramson, 1973; Leon, 1977; Bellack, 1975). Although the weight losses are usually statistically significant when compared to control groups, they are hardly ever clinically significant. Most subjects in obesity research are at least 15% overweight, and a five to ten pound weight loss, in most cases, is almost negligible. Only a handful of studies have claimed median weight losses of over 15 pounds, and no programs have reported on the percentage of participants who reach their weight



goal.

Secondly, most initial programs claiming success with behavior modification techniques for weight control include only brief follow-ups to check for weight loss maintenances, usually about four to twelve weeks. Of the 19 controlled studies reviewed by Hall and Hall (1974) only two reported follow-ups of more than six months. Of those, one (Harris and Bruner, 1971) found that weight losses were not maintained at a ten month follow-up, and the other (Foreyt and Kennedy, 1971) reported continued superiority of the behavioral treatment group over a no-treatment control group nine months after treatment termination. However, the latter study is flawed in several areas, including the fact that treatment subjects were significantly younger than the no-treatment controls and some researchers (Hall, 1972; Silverstone and Cooper, 1972) believe that age might be a determinant of success in weight loss efforts.

Since Hall and Hall's (1974) review, several additional studies have included long-term follow-ups, and most report that not only do weight losses cease after treatment ends, but subjects tend to regain weight over a period of time. At the end of a year, treatment groups are usually no different than controls as far as total amount of weight lost or weight reduction indexes. Indeed, this is a dismal picture. Even though most participants in a behavioral program may lose a few pounds, chances are they will regain even this moderate amount within the year.

However, a few studies have reported significant successes--participants have lost clinically significant amounts of weight, continued to lose after treatment, and maintained the losses. Why and how have these few studies succeeded while most

others have failed? What are the actual effective treatment components in successful weight loss programs? Are the programs that have claimed unmitigated success and been proclaimed as outstanding studies in the field misleading? The remainder of this paper will examine some of the most successful weight loss programs as well as compare the different kinds of behavioral programs in order to determine, if possible, their most effective treatment components.

### Treatment Programs

Aversive conditioning. There are several reports in the literature on the application of aversive conditioning to modify eating behaviors and weight. Perhaps the earliest example of aversive conditioning used to modify eating behaviors was a brief study by Moss (1924) in which a clicking noise was paired with vinegar consumption. After a few such pairings, the subject refused orange juice when it was also presented with a clicking noise. Meyer and Crisp (1964) described the treatment of two hospitalized obese patients who were placed on a diet and were shocked whenever they approached a craved favorite food. One patient remained on the diet and continued to lose weight even 20 months after treatment, but the second patient gained weight upon release from the hospital. Stollack (1967) found shock procedures ineffective in producing weight loss. However, he administered the shocks when subjects spoke about the high calorie foods they had eaten during the week, not when they were actually eating the food. Since the aversive procedures were not contingent on eating behaviors, it is unlikely that weight would have been lost.

Two studies (Foreyt, 1968; Foreyt and Kennedy, 1971) claimed successful

weight reductions with aversive conditioning techniques. A closer look at these two studies reveals several experimental flaws. In the first study, Foreyt (1968) reported a 30 pound weight loss in a hyperobese woman over a 22 week period when her favorite foods were paired with the odor of butyric acid. Although the subject did lose 30 pounds, treatment had the effect of increasing the consumption of non-target foods. Because a long-term follow-up was not included in the study, we do not know whether or not the weight loss was maintained, especially since the patient had increased her intake of some foods. In addition, the therapist attributed the woman's weight loss to other factors such as increased exercise.

In the second study, Foreyt and Kennedy (1971) used a similar avoidance conditioning procedure and found that persons in the treatment group lost significantly more weight (average loss of treatment group 13.33 pounds) in comparison to a no-treatment control group at the end of the nine week treatment period. The behavioral group was still superior to the control seven months after termination.

Several problems render the results of this study questionable. Control subjects were older than those in the treatment group, and one study (Hall, 1972) has provided evidence that younger participants are apt to lose weight more easily than older participants. In addition, persons in the treatment group were asked to limit their caloric intake and were instructed to keep a record of their eating behavior which was reviewed each session. The success of the participants may have been due to the self-monitoring rather than to the aversive techniques. Some researchers (Bellack, Rozensky, and Schwarz, 1974; Romanczyk, 1974; Stuart, 1971) have claimed that self-monitoring is a viable weight reduction procedure in and of itself.

Perhaps most importantly, the authors did not control for contact with the subjects. Subjects in the treatment group received therapeutic attention whereas control subjects received no therapeutic contact. This weight loss may have been influenced by amount of contact with therapists. Only the control group failed to receive any ongoing contact, and the authors themselves felt that the relationship developed with the therapist by members of the treatment group was "vital in achieving the initial weight loss" (p. 33).

In a review of the literature, including respondent and operant approaches to the treatment of obesity, Abrahms (1973) examines 16 studies appearing between 1959 and 1973. Four of the studies utilized operant conditioning techniques based upon reinforcement principles, five used self-control technique, and three used a combination of techniques. From her review Abrahms makes the following conclusion:

In terms of producing and maintaining weight loss both during and after treatment, weight reduction programs which combine aversive conditioning and self-control procedures are no more effective than self-control procedures alone and generally less effective than operant conditioning methods based upon reinforcement principles.

She also presents evidence that shows attrition is lower in studies using self-control techniques than in those utilizing aversive conditioning, and points out that aversive procedures usually are only carried out in a contrived laboratory session, whereas operant techniques can be self-administered and are more easily applied in real eating situations.

In sum, despite some initial superficial successes, there is insufficient evidence to indicate that aversive procedures are effective treatments for obesity. One reason for the failure might be that obese people tend to overeat many foods and



just eliminating the consumption of a few favorite high calorie foods may act as only a temporary weight loss measure with the effect of increasing non-target food consumption.

Covert sensitization. Cautela (1966, 1967) developed a method for treating maladaptive behaviors which he called covert sensitization, and applied the techniques to the treatment of obesity. The patient is taught to relax, and then develops an avoidance response to eating by imagining an undesirable stimulus. For example, the person might imagine approaching the forbidden food, becoming nauseous, and vomiting. In addition the patient is taught to imagine scenes in which he approaches the food, feels nauseous, retreats, and immediately feels relief.

Most studies (Harris, 1969; Meynen, 1970; Lick and Bootzin, 1971) have found negligible and insignificant results using covert sensitization for the treatment of obesity. More encouraging results are described by Janda and Rimm (1972) who assessed the weight reduction of persons in covert sensitization, realistic attention control (weight monitoring and relaxation), and a no-treatment control group. There were no significant differences in weight losses between the groups at the end of treatment. However, at the six week follow-up, the covert sensitization group had lost a mean of 11.7 pounds, which was a significantly greater weight loss than the other two groups. A significant relationship ( $r = .53$ ) was found between subjective distress and weight loss, suggesting that covert conditioning rather than other factors were responsible for weight reduction. Manno and Marston (1972) also found that covert sensitization and overt reinforcement were equally more effective than the



control group immediately after treatment and at the three month follow-up.

Neither of the "successful" studies included a long-term follow-up, therefore, we have no way of knowing whether or not the weight losses were maintained. Weight losses in both studies were moderate at best, 11.7 pounds in the Janda and Rimm (1972) study and 8.9 pounds in the Manno and Marston (1972) study. Further research to determine the long-term effects of covert sensitization is necessary before conclusions about its effectiveness can be made.

Coverant control. The application of coverant conditioning to the treatment of obesity involves the extension of the Premack Principle (Premack, 1965) to thoughts, images and reflections. Negative thoughts about being overweight are followed by positive coverants about weight reduction which are in turn reinforced by highly probable, positively reinforcing behavior (Homme, 1965).

Little research has been done in the area of coverant control as a weight control technique. Studies reported by Tyler and Straughan (1970) comparing coverant control, breath holding, and relaxation, and Johnson (1971) comparing coverant control to a control group, yielded discouraging and insignificant results.

Stimulus control. The initial development in the treatment of weight problems with stimulus control techniques derived from learning theory occurred when Ferster, Nurnberger and Levitt (1962) reported on an operant method for developing self-control of eating. Their techniques were based on the theory that lengthening the chain of responses leading to food consumption would weaken the tendency to start the chain. The goal of treatment was also to make the negative consequences of eating more

immediate so they would influence eating behavior. Participants were taught to record food consumption, manipulate the environment to aid in self-control, and also discussed the unpleasant consequences of overeating and obesity. Results were not reported, but Ferster was quoted in Penick et. al.'s study (1971) as saying that the outcome was disappointing. Nevertheless, the study was a beginning of a plethora of studies using stimulus control procedures to treat obesity problems. Most of the following studies used Ferster's techniques either alone or added more techniques to form a more refined treatment package. Some of the more common stimulus control procedures are presented below:

#### Stimulus Control Procedures

1. Eat slowly; gradually increase minimal time allowed for each meal.
2. Take small bites.
3. Put eating utensil (or food item) down while chewing.
4. Take one helping at a time.
5. Leave table for a brief period between helpings.
6. Eat one food item at a time.
7. Serve food from kitchen rather than placing platter on table.
8. Use small cups, plates, and utensils.
- 9.- Leave some food on plate at end of meal.

#### Modification of Meal Frequency

1. Do nothing else while eating.
2. Eat in only one place, sitting down (preferably not in kitchen) and not where you engage in other activities.
3. Eat only at specified times.
4. Set the table with a complete place setting whenever eating.
5. Wait a fixed period after urge to eat before actually eating.
6. Engage in an activity incompatible with eating when urge to eat appears.
7. Plan a highly-liked activity for periods when the urge to eat can be anticipated.

### Modification of Types of Foods Eaten

1. Do not buy prepared foods or snack foods.
2. Prepare lunch after eating breakfast, and dinner after lunch.
3. Do grocery shopping soon after eating.
4. Shop from a list.
5. Eat a low calorie meal before leaving for a party.
6. Do not eat while drinking coffee or alcohol.

(Bellack 1975)

In what was perhaps one of the most successful weight loss programs to date, Stuart (1967) made use of many stimulus control techniques described by Ferster. The success of the study has not been replicated; therefore, a close examination of possible effective treatment components seems necessary.

Stuart treated ten patients individually who weighed from a low of 172 pounds to a high of 224 pounds, who were all judged by their physicians to be obese. Two patients dropped out of treatment during the twelve month period; the other eight remained in therapy for at least twelve months. Initial treatment sessions were scheduled three times per week, usually lasted for 30 minutes, and extended over a four to five week period. Subsequent sessions occurred as needed, but usually at intervals of two weeks for the following three months. Maintenance sessions were also scheduled as needed, while follow-ups were on a planned monthly basis.

Stuart's program consisted of all the typical stimulus control procedures including food and weight monitoring (four times a day), and keeping charts of time and circumstances surrounding eating behavior. However, the program also included cognitive control techniques, covert sensitization and help in developing new hobbies and skills. For example, all patients were instructed to repeat the phrase, "I can control my eating behavior by engaging in other activities which I enjoy,"

when they were tempted to overeat. This is a type of cognitive restructuring. Two patients were specifically instructed in techniques of covert sensitization. One patient had great difficulty controlling her urges to eat a particular kind of cookie at specific times during the day. She was trained in vivid imagery and then instructed to imagine eating the cookie and then immediately switch to a detailed image of her husband seducing another woman. The same technique was used with a second woman. Stuart claimed that the "process proved highly successful in reducing between meal eating without any disturbance of normal food intake. Two other patients who were having difficulty with overeating were helped to develop intense interests in caged birds and growing violets.

Over the twelve month period, patients lost between 26 and 47 pounds for an average weight loss of 37.75 pounds. Treatment sessions were a low of 16 and a high of 41 for an average of about 26 treatment sessions.

Because so many different types of treatment were included in the Stuart study, it is impossible to ferret out the actual change factors. Perhaps the combination of stimulus control, cognitive restructuring, covert sensitization, and nutritional information is necessary for successful weight reduction. Stuart was also careful to allow most suggestions to come from the patients. Changes (were) rarely suggested by the therapist, as self-closing is an important prerequisite for complete self-control. The therapeutic relationship, especially since treatment was on an individualized basis, was probably quite important. Stuart noted that "more occurred in the interaction between therapist and patients than curriculum" (p. 12). He points out that before each new technique was tried the therapist offered reassurance and



after techniques were attempted the therapist offered praise. Stuart stated that at several points in treatment he was always available by phone since initial and immediate success was important to treatment success.

Some differences between Stuart's (1967) study and later stimulus control studies include the number of hours spent with patients as well as treatment content. Most stimulus control programs last about ten to twelve weeks, with participants attending a group session once a week, for a total of about 10-20 hours of instruction or therapy. Some studies have included booster sessions once a month for an additional year making a total of 20-40 hours of group attendance. On the other hand, Stuart met individually with each patient an average of 26 times. If each session lasted approximately 30 minutes, then he spent a total of approximately 136 hours treating eight patients, whereas a therapist leading a behavior modification group would spend an average of 10-20 hours with a group of about eight people. Thus, comparing the outcome of Stuart's study to the outcomes of studies based on groups seems unfair. However, one thing that Stuart's study may point out is the need for attention to individual differences even in behavioral programs. Some participants may need some sort of cognitive restructuring whereas others would profit from strict stimulus control. The results may also indicate the need for extensive treatment for obesity problems rather than short-term group meetings.

Stuart's twelve month weight loss figures are remarkable; every patient lost clinically significant amounts of weight. No other study can make that claim. However, true follow-up data is not presented. All patients were still in treatment at the end of the study. The real test of success in a weight loss program is whether or not



the weight loss is maintained after treatment and therapeutic contact ceases. Another test of success in a program is how many patients reach their goal weights. Stuart does not report these data. We do not know how much weight the patients still had to lose. A recent study by Kingsley and Wilson (1977) suggests that whereas participants learning behavior modification techniques in individual therapy do better than those persons learning the same techniques in group therapy, the superiority is not maintained over a long period of time (9 and 12 months). In fact, subjects in the individual therapy treatment groups who received booster sessions continued to lose weight, whereas the subjects who did not receive the booster sessions showed a weight gain over the same period. Following the completion of the booster sessions, subjects in the individual treatment booster session group, like their no-booster counterparts, began to regain the weight they had lost. Thus Stuart's patients may have regained their weight once treatment was completed.

- A second well-known study considered to be one of the more successful in the area of stimulus control was conducted by Penick, Filion, Fox and Stunkard (1971). The treatment took place at a day-care program for the treatment of obesity, and lasted for three months: once a week for four and one-half hours each session. Activities consisted of an exercise period, preparation and eating of a low calorie lunch, and group therapy. Thirty-two patients participated in either a control group which consisted of supportive psychotherapy, dietary and nutritional information, and upon demand, appetite suppressants or in a behavioral group in which subjects were instructed in stimulus control techniques and a reinforcement system. Punishment was also

used by doctoring favorite foods with aversive tastes and the taking away of points (which were converted to money) for failure to exercise control in eating habits. Separate reinforcements for self-control and for weight loss were established.

At the end of treatment, 13% of the participants in the behavior modification groups had lost more than 40 pounds, and 53% had lost more than 20 pounds, whereas in the control groups none of the subjects had lost over 40 pounds and 24% had lost more than 20 pounds. The differences between the behavior modification and control groups for weight losses over 20 and 40 pounds were statistically insignificant as were overall differences; however, the difference for the percentage of those losing 30 pounds in each group was significant. Penick et. al. report that overall differences in weight loss were not significant due to the great variability of weight loss in the behavior modification group which contained the study's five best performers as well as an individual who even gained weight. The median weight loss for the behavioral group was 18.5 (24 for one cohort and 13 for the other) and for the control 14.5 (18 for one cohort and 11 for the other).

Penick and his colleagues claim that follow-ups at three and six months provide evidence of continuing influence of treatment, in contrast to the usual experience of rapid weight regain. They support this statement by noting that the number of persons in the behavior modification group who lost more than 40 pounds doubled after termination of treatment (from two to four), and three of those lost more than 50 pounds. However, this analysis is somewhat misleading. A closer look at the statistics reveals that the continuing effect of treatment is questionable. By follow-up 27% of the behavioral group had lost more than 40 pounds as compared to

the 13% at the end of treatment, 40% had lost more than 30 pounds as compared to 33% at the end of treatment, but only 53% had lost more than 20 pounds as compared to the same figure of 53% at the end of treatment. Thus the percentage of participants losing over 20 pounds did not increase from post-treatment to follow-up. However, in the control therapy groups the percentage of participants losing over 40 pounds went from 0% to 12%, over 30 pounds from 0% to 18%, and over 20 pounds from 24% to 29%. Overall, at follow-up, differences between behavior therapy groups and control therapy groups were not significant.

Effective treatment factors cannot be isolated in Penick et. al.'s (1971) study since many types of treatment were used: stimulus control, physical activity, preparing meals, and negative and positive reinforcement. The study also contains a few flaws which make treatment analysis difficult. Different therapists led the behavioral and control groups, and the therapists leading the supportive therapy groups had "greater experience in the treatment of obesity and as a group therapist than the leaders of the behavior modification groups". The study contained no analysis for differential effect of therapists. The statistical analyses reported in the study make interpretations difficult. We do know that some participants fared poorly in the behavior modification groups, but it seems that almost half of the participants of the study lost less than 20 pounds. The study used pounds lost as a measurement of success and failure, as well as percentage losing over a certain amount of weight. A re-analysis of the study using weight reduction indices might give a clearer picture

of the study's real success or failure. Nevertheless, the weight losses reported in Penick et. al.'s study are among the best in the literature, especially at the six month follow-up period. A truer test of weight loss maintenance would have been a one-year follow-up, but these figures are not reported.

A third important study in the area of obesity treatment and stimulus control conducted by Wollersheim (1970) is well-known, not for the overwhelming weight losses, but for the excellent experimental design and control. This study is important because it was the first major study attempting to determine effective treatment components in obesity programs. Following an eight week baseline, 79 overweight female college students were assigned from stratified blocks based on percent overweight to one of four experimental conditions: 1) Positive Expectation-Social Pressure (SP). This group was similar to commercial weight loss groups, such as TOPS, that use social pressure to encourage weight loss. Each subject weighed in before meetings and announced the weight. Differential reinforcement was given based on weight gain or loss. 2) Nonspecific Therapy (NSP). The main purpose of this group was to control for nonspecific factors such as increased attention, faith, and positive expectation. Subjects learned relaxation techniques so that they could develop insight and also discussed the underlying causes for the eating problems. Therapy procedures utilized a psychoanalytically oriented game model somewhat similar to Berne's (1964). 3) Focal Therapy (F). This treatment emphasized learning principles and modification of eating habits by the use of typical stimulus control procedures. In addition, participants were taught to relax and told that they should learn to relax when tense and anxious rather than eat. 4) No-Treatment Control, using subjects who had applied for



the program but told it was full.

Each of four therapists treated one group from each of the three treatment groups. In addition to the specific treatment, subjects were given information on health and nutrition and urged to decrease caloric intake to 1000-1500 a day.

At post-treatment and the eight week follow-up the focal group was superior in weight reduction. All three groups experienced significant weight reduction in contrast to the no-treatment control group. Mean weight losses were 10.33 pounds for the Focal Therapy, 6.90 pounds for the Nonspecific Therapy, 5.40 pounds for the Social Pressure, and a gain of 2.39 for the No-Treatment Control. However, further analyses showed a slight increase in weight from post-treatment to the eight week follow-up.

Although Wollersheim's (1970) study is basically well-controlled and experimentally sound, effective treatment components still cannot be isolated. We do know there were no therapists differences accounting for differential treatment results, and that mere attention and social support are not as effective as stimulus control and relaxation. We cannot be certain how much the relaxation aided the Focal Therapy Groups in their weight loss and how much the stimulus control techniques added to their success. In any case, the overall weight losses were moderate at best, did not continue after treatment ended, and were not checked at a long-term follow-up of more than six months. Eight weeks is not enough time to ascertain the long-term effectiveness of weight loss procedures.

A series of studies conducted after Wollersheim (1970) attempted to isolate effective components of stimulus control treatment packages. Williams, Martin and



Foreyt (1976) undertook a comparison of two behavioral weight loss programs conducted by nutritionists. The two treatments were: 1) a multi-principle, multi-technique treatment based on the self-control treatment model and fashioned after Wollersheim's (1970) study. This group included social pressure, aversive conditioning, self-monitoring, and relaxation, and 2) a self-control treatment package based almost exclusively on stimulus control, and 3) a No-Treatment Control Group. The groups did not receive nutritional information and calorie counting was optional.

After 16 weeks of treatment, subjects in the Stimulus Control Groups lost an average of 18.6 pounds, and those in the Multi-Treatment Group lost 16.1 pounds; the difference was not significant but both groups lost significantly more weight than the No-Treatment Control Group. The treatment groups were also equivalent in terms of mean percent of desired weight reduction achieved and mean percentage of total excess weight lost. At the time of the three month follow-up, subjects in the Stimulus Control Group had extended their weight loss to 22 pounds, and by six months the weight loss had settled down to a mean of 20.4 pounds. The Multi-Treatment Group had lost 17 pounds at the end of three months and 14.6 at the end of six months. The differences between the two groups were significant at both three and six months. Follow-ups also occurred at the end of 9, 12 and 18 months, but complete analysis was not reported. Williams and his colleagues point out that the significant differences between the two treatment groups was no longer evident at 18 months, even though large mean differences in weight losses still existed. After 18 months the Stimulus Control Group had lost about 15 pounds, and the Multi-Treatment Group had lost about eight pounds.

The authors (Williams, Martin and Foreyt, 1976) felt that the Stimulus Control Group performed better than the Multi-Treatment Group because, in the long run, it was simpler and easier to carry out instructions at home. Participants could really concentrate on practicing certain techniques and changing eating habits. In any event, this study seems to suggest that the additions of relaxation and social pressure to the stimulus control package is unnecessary. Since this study reports success equivalent to or better than most other stimulus control studies, the use of nutritionists as therapists seems feasible.

Therapist variable. To further determine effective components of behavioral treatment packages, several researchers have tested for the influence of the therapist by using various forms of bibliotherapy. In the first study investigating the use of written materials, Hagen (1974) randomly assigned obese participants to a bibliotherapy condition in which subjects received a weight control manual by mail, a standard multi-treatment behavioral group, a third group that received the manual and attended a group, and a no-treatment control. Hagen found no differences in weight loss among the behavioral groups which all lost significantly more than the no-treatment control group. However, the Hagen study has some experimental flaws. The follow-up period was only four weeks after treatment, certainly not an adequate amount of time to judge weight loss maintenance. In addition, participants were non-chronic, mildly obese, college age students as were the subjects in Wollersheim's (1970) study. As previously discussed, some researchers believe that the younger overweight persons have a better and easier time losing weight than chronically obese.

A later study (Hanson, Borden, Hall, and Hall, 1976) attempted to refine Hagen's (1974) study. Subjects (mean of 62% overweight) were assigned to one of five treatment conditions: 1) Conventional Self-Management, 2) Programmed Text and Group Therapy (received manual and met in a group once a week with a therapist), 3) Programmed Text (met with a therapist only three times to weigh in and ask questions about manual), 4) Placebo Group (met each week, learned relaxation and discussed dieting), and 5) No-Treatment waiting list control.

At the end of treatment all three behavioral treatment groups lost significantly more weight than the No-Treatment Control and Placebo Groups. Treatment effects were still significant at ten weeks following treatment, but not at one year.

As with most of the studies discussed so far, Hanson et. al.'s (1974) program contains some experimental problems. First, the weight losses were very small in all groups, only four out of 38 participants attained even 50% of their weight loss goal. Drop-out rates were high (21.8%) and not evenly distributed among the five groups making the validity of experimental results questionable. Although a one year follow-up is included, the weights were reported over the telephone, and there is no reason to assume these weights were valid, especially since bathroom scales are notoriously inaccurate.

To further evaluate the efficacy of bibliotherapy, Brownell, Heckerman and Westlake (1976) randomly assigned obese females to one of three experimental conditions: 1) a standard behavioral treatment group modeled after Wollersheim's (1970) most effective group. These subjects were given a treatment manual and also attended group therapy meetings weekly for ten weeks and monthly for six months; 2) a group

receiving the manual through the mail and meeting with a therapist during weeks one, five and ten of the treatment phase, and during months one, three and six of the follow-up phase. Thus subjects in the first group met a total of 16 times and those in the second group six times. Subjects in the low contact group received portions of the manual in the mail each week so that subjects in both treatment groups received identical written material each week. Subjects in the low contact group mailed records of food consumption, caloric intake, and habit change to the therapist each week and received feedback regarding their performance in the mail. Participants in the high contact group deposited \$150 for the treatment phase and were refunded \$50.00 if all sessions were attended, and those in the low treatment group deposited \$50.00 for the treatment phase and were refunded \$25.00 if all sessions were attended. Money was also deposited by participants for follow-up sessions and they received partial refunds if sessions were attended. The study also included a Waiting List Control Group.

Using pounds lost, change in percent overweight, and the Weight Reduction Index as dependent measures, the self-management group that met with the therapist each week and received the manual did significantly better than the group receiving the manual through the mail and meeting only a few times with the therapist both at post-treatment and at a three-month follow-up. Differences between the treatment groups were not statistically significant by the six-month follow-up, due to wide variations in weight loss and a slight improvement by the low contact subjects. Six months after treatment the weight loss for the high contact group was 7.24, and for the low contact group 2.20 pounds. Although overall differences were insignificant,



the authors point out that the high contact group continued its superiority on all measures. They conclude that bibliotherapy is not a viable treatment for obesity.

There are several problems with Brownell et. al.'s study that must be considered when interpreting the results. First, subjects in the high contact group paid three times as much money for treatment than the low contact subjects, who in turn paid more than the waiting list participants. Possibly, the amount of money expended and returned for attendance influenced the treatment results. Secondly, the researchers do not report attendance rates for the different groups. Participants in the low contact group may have missed the few meetings they were supposed to attend, but we have no data on this matter. The low and high contact groups were differentiated also by the fact that different therapists conducted each treatment group; hence, potential bias from this factor cannot be eliminated. In addition, it is hard to compare the results of this study to previous studies (Hagen, 1974; Hanson, 1974) where follow-up sessions were not used.

- A few other studies (Bellack, Schwartz, Rozensky, 1974; Fernan, 1973; and Bellack, 1976) have evaluated the potential use of bibliotherapy with inconsequential results. In no cases were the weight losses achieved by the use of a manual alone clinically significant or longlasting. To date, the success of bibliotherapy as a weight loss and weight loss maintenance technique is minimal. Some sort of therapeutic contact seems essential.

Self-monitoring. So far, very little research has been done to test for the effectiveness of each individual component of stimulus control packages. One technique that has received some individual attention is self-monitoring of food intake. Mahoney,



Moura, Wade (1973) and Mahoney (1974) reported that the process of monitoring eating urges or eating habits did not result in significant weight losses. Romanczyk, Tracey, Wilson and Thorpe (1973) and Romanczyk (1974) compared self-monitoring of calorie intake with self-monitoring of weight, with stimulus control. Self-monitoring of weight was no more effective than a No-Treatment Control Group, and self-monitoring of calories was as effective as Stimulus Control. However, treatment duration was only four weeks, and Stuart (1971) and Mahoney (1974) have both reported that self-monitoring is only effective for the initial few weeks and then loses its effectiveness. Even more effective than recording is pre-recording (Bellack, Rozen, Rozensky, and Schwarz, 1974), even when contact with the therapist is through the mail. Weight losses with recording or pre-recording are extremely modest, only a few pounds at best, and follow-up data are not available to test for long-term maintenance. As part of a treatment package self-monitoring seems to play an important role.

Nutrition and exercise counseling. Evaluations of the impact of nutritional counseling and exercise management on weight loss have shown them to be insufficient factors for long-lasting, clinically significant weight losses (Jongmans, 1969, 1970; Stuart, 1971; Levitz and Stunkard, 1972; Harris and Hallbauer, 1973).

One study (Harris and Hallbauer, 1973) does claim that behavior modification groups that engage in exercise lost more weight than similar behavior modification groups that did not exercise. In this study, subjects were divided into three groups: 1) Eating Behavior Only, 2) Eating Behavior and Exercise, and 3) Psychotherapy. Participants in the Eating Behavior Only group learned self-control

procedures to control eating in conjunction with a contract that set up financial rewards and punishments for weight loss. Subjects in the Eating and Exercise Group participated in identical treatment, but were also given instructions about the importance of exercise in weight loss and weight loss maintenance. These participants were asked to commit themselves to some sort of daily exercise program. A third group consisted of group discussion of dieting problems and individual counseling with the therapist. Other than weight recording and encouraging subjects to keep diet records, no specific recommendations were given.

At the end of 12 weeks, none of the differences in pounds lost between treatment groups were significant, but data from the seven month follow-up shows that all participants lost more weight than non-participants, participants in the behavior modification groups lost more weight than the pseudo-therapy group, and subjects in the eating modification and exercise lost more weight (-8.7) than subjects in the eating modification alone group (-6.3). The differences in weight losses are not large, and the weight losses themselves are not overwhelming. As in most studies, all participants stopped losing weight once treatment was completed, but in this study weight losses were maintained for at least seven months. There are several criticisms of this study. Although participants in the exercise program were asked to participate in physical activity, no records were reported as to how much they did increase physical activity. In addition, members of other groups may have increased or decreased their exercise as well. The number of subjects who completed treatment was small (21) with only five participants in the control group.

Summary. The research in the area of stimulus control seems to indicate that no one treatment factor is an effective weight loss procedure in and of itself. The results of most studies suggest that a combination of stimulus control techniques, exercise, nutritional counseling and cognitive procedures is most effective; however, there is a possibility that the simple presentation of stimulus control procedures without additional techniques is more effective in long-term weight loss. Overweight people tend to lose a moderate amount of weight when they participate in programs offering stimulus control, but generally the weight loss is not maintained over a long period of time. Researchers are now beginning to question the efficacy of stimulus control techniques, and have embellished these programs with various other procedures such as financial contingencies, contingent contracts, and booster sessions in an effort to develop programs resulting in long-term weight losses.

### Reward Systems

Weight-contingent rewards. Many behavioral studies have used some sort of contingency system to provide incentive to weight loss participants. Early studies had therapists reinforcing subjects for weight loss with money or tokens (Bernard, 1968; Steffy, 1968; Mann, 1972; Harris and Bruner, 1971; and Harmatz and Lapuc, 1968). Later, researchers hypothesized that a system of self-rewards would lead to better weight loss maintenance, or at least rewards given by a significant other person who would continue to be part of the participant's environment even when the weight loss program terminated. In addition, some studies (Mahoney, 1974; Saccone and Israel, 1976) suggested that rewards for a change in eating habits was more effective than

rewards for weight losses.

One of the earliest experimental studies using therapist reinforcement for weight loss was conducted by Harmatz and Lapuc (1968) who compared the effectiveness of behavior modification, group therapy and diet-only procedures using hospitalized male patients. Those patients in the behavior modification group were placed on an 1800 calorie diet as were participants in the other two groups, and also began with the \$5.00 weekly allotment that was given to all participants. However, if they gained weight or stayed at the same weight from week to week, his allotment was decreased \$1.00 each time until he was able to lose enough weight to put him below the original weigh-in weight. Participants in group therapy were required to attend one group session a week where they were weighed and talked about some of the underlying causes for overeating. Subjects in the diet-only condition attended no meetings but were also weighed once a week. Treatment lasted for six weeks, and all patients were weighed weekly for four weeks after treatment. At the end of the six week treatment, participants in the group therapy and behavior modification groups had a higher percentage of weight loss than did those in the diet-only group. At the end of the four week follow-up participants in the behavior modification group had a higher percentage of weight loss than either of the other two groups, and members of the group therapy treatment had regained weight they had previously lost.

Although treatment had officially ended at the end of the six-week period, the weight losses gathered after an additional four weeks may not have been true follow-up data since patients were weighed weekly during that time. No long-term follow-up data on participants was presented, and later studies have indicated that



a follow-up period of at least six to twelve months is necessary when investigating the permanence of weight loss. The generalizability of the Harmatz and Lapuc (1968) study is questionable. Patients were in a controlled hospital environment and were served an 1800 calorie diet at the cafeteria. In addition, money was used as a reinforcer, and in this environment was probably even more potent than in a non-hospitalized setting, since in the hospital it is representative of "a generalized reinforcer for all pleasurable stimulation other than that supplied by the hospital" (p. 584). In addition, it is not clear from the study if participants had any sort of group meeting or learned any behavior modification techniques other than the fact that they could get money if they lost weight and would not get as much money if they gained weight. If indeed this is all they learned, then they may have well seen the therapist as a powerful reward giver, and his mere presence at the weigh-ins during the follow-up session may have been enough to ensure their continued weight loss efforts. Interestingly, participants in the behavior modification group rated the therapist's potency much higher than did members of the other two groups.

Hall (1972) compared the relative effectiveness of a self-control or experimenter controlled behavioral program; each program was in effect for a five week period in a reversal experimental design. In the self-control group, participants learned to modify their eating patterns. In the experimenter control group, the experimenter controlled the dispensing of the reinforcers and told each individual how much weight to lose. The mean weight loss during the experimenter controlled conditions was greater than during the self-control conditions, but there was no report of whether these group differences were statistically significant (1.01 pounds



per week as compared to .56 pounds a week). The participants in the program were members of TOPS, and returned to this program after the experimental period. Therefore, long-term effects of the treatments could not be independently assessed.

Another problem with the study is that each treatment was only in effect for five weeks, which may not have been long enough for participants to learn and practice self-control techniques. In addition, subjects in Hall's (1972) study were older than most experimental subjects, and she believes that older subjects may not respond as well to self-control techniques.

Hall, Hall, DeBoer and O'Kulitch (1976) believed that external reinforcement of self-control techniques would lead to better learning of new eating behavior and in turn lead to better maintenance of weight loss. Seventy-four obese TOPS members were assigned to one of five conditions: delayed treatment control, insight psychotherapy, self-management training plus external reinforcement (money rewards contingent upon weight loss and quiz performance), self-management training only, and external reinforcement only. The latter four groups met once a week for ten weeks, and at follow-ups at three and six months after treatment ceased. At the end of treatment, participants in the groups of self-management plus external reinforcement, self-management only, and external reinforcement only, did not differ from each other in mean body weight, but they did differ significantly from the control and insight psychotherapy conditions. At the six month follow-up, differences between all four treatment conditions were no longer significant. The authors concluded that "although behavior modification training does produce significant results for the short-term, by six months these differences are no longer different from other treatments generally

considered less effective . . ." (p. 95). They also noted that external reinforcement does not seem to add to the effectiveness of self-control techniques in the treatment of obesity. Certainly, the results of Hall et. al. study (1976) demonstrate the need for long-term follow-up data. However, the researchers' statements that behavior modification programs are no more effective from other treatments in the long run may be premature. What the results may be indicating is the need for longer treatment or booster sessions. The participants in this particular study were all members of TOPS, a group that is conducted on the principles of self-support and competition. The people who join such a program might be more in need of a supportive environment for effective weight loss efforts than the average weight loser, and may have been especially sensitive to the lack of support when the treatment ceased. A similar study with a more random mix of participants might have had different results.

Self-reward. Based on theories of motivation and attribution theory, Jeffrey hypothesized that self-reinforcement and external reinforcement would produce equal amounts of weight loss during treatment, but that self-control and self-administered rewards for weight loss would result in superior weight loss maintenance. Jeffrey (1974) supported his contention with the theories of both De Charms (1968) and Kanfer (1971). De Charms was one of the first researchers to suggest that external rewards damage self or intrinsic motivation:

. . . we propose that whenever a person perceives himself to be the locus of causality for his own behavior (to be an Origin), he will consider himself to be an intrinsically motivated person. Conversely, when a person perceives the locus of causality for his behavior to be external to himself (that he is a Pawn) he will consider himself to be extrinsically motivated. (p. 328)

De Charms argued that the introduction of extrinsic rewards for a behavior may decrease overall motivation rather than enhance it, because the rewards decrease the perception of intrinsic motivation. A person would change his perception of the locus of causality from internal to external. This theory was supported by experimental studies by Deci (1971a, 1971b, 1972a, 1972b) when he showed that monetary rewards negatively affected intrinsic motivation in college students. Theories of external rewards and their effects on intrinsic motivation are certainly relevant to obesity research. If participants in weight loss programs are rewarded by therapists for weight loss, they are apt to see their behavior as controlled by external forces (the therapist), and their intrinsic or self-motivation for losing weight may decrease. When the program terminates and external rewards are no longer available, the previously rewarded behaviors are apt to decrease. For this reason weight may be regained. On the other hand, if participants reward themselves for weight losses and/or appropriate behaviors, they may still see themselves as controlling the situation, and intrinsic motivation will remain intact.

In Jeffrey's (1974) study, obese adults were randomly assigned to: 1) an external control group which combined external reinforcement and an external-attribution set. Participants were told that research had shown that weight loss was optimal if the therapist dispensed financial rewards for reaching goals, and that the therapist was primarily responsible for weight loss. 2) A self-control group which combined self-reinforcement with a refundable contingency and an internal-attribution set; subjects were told that research had shown that weight loss was optimal when participants learned to reward themselves for reaching goals, and were reassured

that they had complete control to reward themselves or not reward themselves (money). The therapist had no part in the reinforcement system. 3) A self-control group which combined self-reinforcement with a non-refundable contingency and an internal-attribution set. This group was identical to the second group except they were told if they did not reward themselves during a given week they would not receive any remaining money at the end of the program.

As hypothesized, self-control subjects did as well as the external control subjects during treatment, and maintained better during the follow-up six weeks after the end of treatment. The average weekly weight loss during treatment was .7 pounds for the external-control group and .9 pounds for the combined self-control groups. Subjects in the self-control groups maintained their weight losses, but subjects in the external-control group significantly increased in weight from post-treatment to follow-up. Interestingly, the self-control subjects made more self-attribution statements and a shift toward a more internal orientation (measured by Rotter's 1966 Internal-External locus of control scale) at the end of treatment than the external-control subjects.

Jeffrey's (1974) study raises more questions than it answers. First, we do not know why the self-reward groups maintained their weight losses. Perhaps they continued using the self-control behaviors even after treatment ceased, but this type of information was not collected. Secondly, the follow-up period included in the study was only six weeks. As we have already seen, this is not an adequate amount of time to determine long-term maintenance results. The experimental results only show that the self-control groups maintained their weight over a short period of time.



Third, the weight losses of all groups were moderate and not clinically significant, averaging about nine pounds for the best group. Despite the above reservations, the results of the study suggest that behavioral self-control procedures offer a promising approach to the treatment of obesity.

A study of Mahoney, Moura and Wade (1973) more thoroughly investigated the effectiveness of self-reward, self-punishment, self-reward and self-punishment, self-monitoring and information only. All participants were given information on effective stimulus control techniques for weight loss and made a \$10.00 deposit. This made up the entire treatment for the information-only group. Participants in the self-monitoring group were asked to weigh-in twice a week for four weeks and record their weight and eating habits. Participants in the self-reward group were asked to deposit an additional \$11.00 with the experimenter. This money was self-rewarded during weigh-ins for weight loss and for practicing adaptive behaviors (thin thoughts and restraints. No external constraints were placed on subjects' standards or execution of self-reward). Participants in the self-punishment group were instructed to fine themselves for lack of weight loss and/or lack of behavior improvement, and those people in the self-reward and self-punishment group could either reward or punish themselves in the same manner contingent on behavior and weight loss.

After four weeks of treatment, self-reward subjects lost significantly more weight than either self-monitoring or controls. At the four month follow-up, subjects who used self-reward (self-reward group and self-reward and self-punishment groups) continued to show greater improvement than either the self-punishment or the control subjects. Since only 31 out of the initial 53 subjects showed up for the follow-up,



the number of subjects per group was somewhat small, and since only two subjects appeared in the self-monitoring group, this information had to be deleted from the results. Over the entire four months, participants in the self-reward group lost 11.5 pounds, those in the self-punishment group lost a mean of 7.3 pounds, self-reward plus self-punishment lost a mean of 12.0 pounds, self-monitoring lost a mean of 4.5 pounds, and controls lost a mean of 3.2 pounds.

The authors concluded that the results provide information that self-reward strategies are more effective than self-punishment, and that they provide effective incentives in weight loss attempts. However, they realized certain limitations of the study. Differential amounts of money were deposited by participants depending on which group they were assigned, therefore some pre-treatment motivational variations might have occurred. Also, there were no controlling factors included in the study to account for frequency of self-rewards and self-punishment, especially since participants often missed sessions. If subjects in the reward condition rewarded themselves more than the subjects in the punishment condition punished themselves, then results would not be contingent upon the technique alone but on frequency of administration. However, the study does provide some interesting information about the efficacy of various self-control techniques.

In a subsequent study, Mahoney (1974) compared self-reward for improvements in eating habits, self-reward for weight loss, self-monitoring, and a delayed treatment control. All subjects deposited \$35.00 with the experimenter. Participants in the three treatment groups were given information on basic stimulus control techniques for weight loss and monitored their weight and eating habits for a two-week

baseline. Then, subjects in the Self-Monitoring group continued the recording and received standardized weight loss and habit change goals at individual weekly weigh-ins. Self-Reward subjects awarded themselves portions of their own deposit for habit improvement or weight loss. Analyses showed brief and variable losses during the baseline, and the addition of goal setting did not add to the weight losses. However, when self-reward was added, substantial weight loss improvements occurred, and the improvements were better for subjects who rewarded themselves for habit change rather than weight loss. A one year follow-up indicated marked superiority in maintenance on the part of habit change subjects. In this group, 70% of the participants maintained or improved their weight losses as compared with 40%, 37.5% and 40% on the part of Self-Reward for Weight Loss, Self-Monitoring, and subsequently treated controls, who rewarded themselves for weight loss and habit change. According to daily recording charts of the participants, those subjects who rewarded themselves for habit change exhibited fewer inappropriate eating habits than other groups during the follow-up, and was the only group to significantly reduce the frequency of negative eating habits. Further analyses indicated that subjects' weight losses were inversely related to their success in eliminating inappropriate eating habits. Subjects in the Habit Reward and Weight Loss Reward Groups did not differ significantly in the frequency of rewards administered, and near perfect attendance was obtained in all four groups. The authors conclude that self-reward for eating habit change is an effective supplementary measure to add to the stimulus control package.

Although the study sounds very successful and the use of self-rewards for habit change is promising, the facts are that the most successful group, the habit

change group, lost only a mean of 8.3 pounds after the eight week treatment, and as a group did not continue to lose significant amounts of weight after treatment, although they did maintain weight losses. Considering that subjects had to be at least 20% overweight to participate in the study, the results are not all that encouraging.

A study by Saccone and Israel (1976) supported Mahoney's (1974) findings that reinforcement for habit change was more effective in inducing weight loss than reinforcement for pounds lost, and participants who were rewarded for habit change by a significant other tended to lose more weight than those rewarded by the therapist ( $p < .06$ ); however, treatment was for only nine weeks and no follow-up data is reported. The most effective group (reward by significant other of habit change) lost a mean of 13.06 pounds, a weight loss somewhat better than most studies. Unfortunately, we know nothing about how well these subjects maintained their weight loss.

Making conclusions about the comparative effectiveness of externally administered rewards versus rewards administered by the participant himself or by a significant other, and rewards for weight loss versus rewards for habit changes are difficult. Experimenter rewards seem to be effective during the actual treatment sessions, but the one study that included a long-term follow-up (six months) (Hall et. al., 1976) indicated that weight losses were not maintained. A few studies (Jeffrey, 1974; Mahoney, Moura and Wade, 1973) have indicated that self-reward strategies are more effective than external rewards or self-punishment, especially in terms of weight loss maintenance, and other studies (Mahoney, 1974; Saccone and Israel, 1976) have suggested that rewarding habit changes rather than weight loss results in marked superiority in weight loss maintenance, and that participants who

were rewarded for habit change by a significant other tended to lose more weight than those rewarded by a therapist. However, all of these studies have some experimental flaws and some deficits concerning the reliability of self-report data, short follow-up periods, or the use of a population not easily generalizable to the wider range of obese people.

### Enhancement of Weight Loss Maintenance

Booster sessions. Recently, researchers have been concentrating on methods to enhance weight loss maintenance. One method of maintaining any kind of therapeutic change is a booster session where the client meets with a therapist infrequently to review techniques. One of the first studies using booster sessions with overweight people was by Hall, Hall, Borden and Hanson (1974). Obese participants attended a 12 week course in typical self-management training for obesity problems and then divided into three 12-week follow-up conditions: 1) Booster-continued contact with the therapist every two weeks for 30 minutes for a review of techniques. Half of the subjects had a new therapist for these sessions, and half remained with their original therapist. 2) Monitoring-only control--these subjects were told to return monitoring data in the mail at two-week intervals. 3) No-contact controls--these subjects were not seen again until the end of the twelve-week follow-up period.

At the end of the twelve-week treatment period, subjects in all three treatment groups lost more weight than the no-treatment control group. At the end of the second twelve-week period, monitoring only subjects continued to lose weight, and differed significantly from the no-contact subjects. Booster subjects did not differ



from either of the other two groups. However, those participants who continued with the same therapist for the follow-up period lost significantly more weight than the no-contact group. Weight losses for all participants were moderate, with only 9.52% losing 40-59.9% of their initial overweight (two participants), 14.28% losing 60.79% of their initial overweight (three participants). The authors conclude that post-treatment weight gains can be allayed, and continuing losses can be produced by measures "which enhance the probability of continued self-monitoring on the part of the subject" (p. 171).

In another study testing for the effects of booster sessions, Polly and Keenan (1976) evaluated different types of booster sessions using female subjects from a commercial weight loss organization who had already lost an average of 24 pounds and needed to lose an additional 10 pounds to reach their goal. Subjects were randomly assigned to either a behavioral self-management group or a more traditional weight loss treatment consisting of weigh-ins, group support, and nutritional information. Following seven weeks of treatment, the behavioral groups were assigned to one of three booster treatments: self-reward training with continued meetings on a bi-weekly basis; a group in which subjects learned self-reward procedures through the use of a manual with bi-weekly weigh-ins; re-use of self-management techniques where participants learned no additional techniques but were told to continue using self-management methods and report for a bi-weekly weigh-in. The traditional treatment subjects continued the same type of treatment on a bi-weekly booster basis. Boosters were held every other week for two months, but during the last month of the study, no boosters were held.



No significant differences were found at the end of treatment or at the end of the booster treatments between groups. However, at the final follow-up, three months after termination of the original treatment, the traditional treatment group had lost significantly less weight than the combined behavioral groups. By the final follow-up, participants in the traditional treatment began to gain weight back, in contrast to the behavioral groups which continued to lose weight. The group that lost the most weight was the self-management group that continued using the same techniques throughout the entire program. This group lost the desired ten pounds by the end of the three month follow-up even though they had only lost about seven pounds at the end of treatment. Polly and Keenan (1976) also point out that this group had the strongest internal attribution, and suggest that their success was because these participants had to depend upon themselves instead of the therapist during the follow-up period. However, it is important to note that the self-management group all had a greater emphasis on habit training and had a longer time to practice their skills.

Booster sessions to enhance weight loss maintenance may be effective, but research in the area is limited. Even if weight losses are maintained by booster sessions, what will happen when these sessions cease? Evidence indicates that weight might be gained. Recently, some researchers have investigated the possibility of using "significant others" in the weight loss participant's life to participate in and enhance weight loss efforts. This approach seems reasonable since the significant other would remain in the participant's life even after termination of the weight loss program and would give reinforcement and support.

Participation of significant others. Influences outside actual weight reduction

programs may exert important effects on weight loss and weight loss maintenance.

One of the most important extra therapeutic variables is the influence of people living with the dieter such as spouse, children, and relatives. Involving such a person in the actual treatment program might significantly effect weight loss, and more importantly, might mitigate against weight regain.

The first researcher to investigate the potential effects of familial interaction with the dieter was Stuart (Stuart and Davis, 1972), who studied dinner-table interactions between women in his weight reduction program and their husbands. On the basis of interviews with 55 husbands of overweight women, Stuart concluded that many husbands exert a negative influence on their wives' weight loss efforts by nagging, tempting, and testing of wives' willpower along with negative reinforcement. Some husbands did not want their wives to lose weight because they did not want them to appear more attractive to other men. Stuart concludes that the "influences mediated by husbands on the eating behavior of their wives is subtle, found in apparently inconsequential verbal exchanges, and quite profound" (Stuart and Davis, 1972).

Mahoney and Mahoney (1976) were among the first to include family members of obese subjects in the treatment program. Families of subjects were invited to attend meetings to learn how to help dieters, and the authors calculated a social support index based on attendance and amount of cooperation received from the family member. The correlations between treatment outcome and social support were .92 at post-treatment, .33 at six months, .34 at one year, and .63 at two years. These results are suggestive that family support does help with weight loss and weight loss maintenance, but there are several problems with the study. First, the "social support

engineering" was only one component of a complex treatment program and was not isolated from other treatment factors. Families were only invited to come to meetings, and there were no appropriate control groups. Secondly, the social support index was based on therapists' subjective impressions of family encouragement, and might have been incorrect; and thirdly, the two-year follow-up weights were obtained by mail and may have been inaccurate.

In the first study to systematically investigate the influence of family participation on a weight loss program, Wilson and Brownell (1976) failed to replicate Mahoney and Mahoney's (1976) finding that the "support" of a significant other can be beneficial in the weight loss process. Obese women ( $n=32$ ) were randomly assigned to one of two conditions: family member present vs. absent. The same family member, the spouse (in all but three cases), was required to attend each session and participate in the treatment in order to learn the principles of behavior change and the philosophy underlying the weight reduction program, cease criticism of their partners' weight and learn to use positive reinforcement for improved eating habits, and finally, to help monitor the partner's eating activities and restructure some of the conditions and consequences of eating. Treatment lasted for eight weeks, and following this time period each subject was assigned to either a booster session or no-booster session group. The booster sessions met once a month for six months, and were an extension of the initial treatment sessions. Subjects in the no-booster session groups attended follow-up weigh-ins at three and six months after treatment.

There were no significant differences in terms of weight loss or weight reduction quotient among the groups at post-treatment, the three month follow-up or

at the six-month follow-up. The authors believe that it is difficult to interpret the findings in the absence of an independent assessment of the degree to which the family members cooperated with the program. Data on attendance and spouse helpfulness was not collected. Interestingly, as far as mean weight loss, the superior group at the three and six month follow-ups was the family-member-absent-no-booster-session group which lost a mean of 7.56 pounds at the end of eight weeks; 21.31 pounds at the end of three months, and 17.14 pounds at the end of six months. The group with the least mean weight loss was the family-member present/booster session group which, by the six month follow-up, had a mean weight loss of 0.31 pounds.

One problem with Wilson and Brownell's (1976) study is that substantive behavioral changes were not required from family members, and there was no way to measure the changes that were made. In addition, the number of subjects per cell was small at the end of the study with a minimum of five participants in the smallest group and a maximum of eight in the largest group.

To answer some of the questions raised by Wilson and Brownell (1976) study, Brownell, Heckerman and Westlake (1977) conducted a study that systematically examined spouse cooperativeness and couples training in the treatment of obesity. The participants were 10 males and 19 females who were married, 15% or 15 pounds overweight, and at least 21 years of age. Subjects were assigned to one of three experimental conditions: 1) cooperative spouse-couple training (CS-CT), 2) cooperative spouse-subject alone (CS-SA), and 3) noncooperative spouse-subject alone (NCS). A noncooperative spouse was defined as one refusing to participate in the program, and



a cooperative spouse was one who agreed to attend sessions and be involved in the weight loss attempt. Each subject agreed to deposit \$150.00 for the treatment phase, \$50.00 of which was refunded if all sessions were attended. Subjects also deposited \$60.00 for the maintenance phase and were refunded \$30.00 for attendance. Each of the three therapists conducted two sessions for a particular group, and then rotated to another group for two sessions so each had equal exposure to subjects in each experimental condition.

Spouses attending sessions were instructed to model appropriate behaviors such as putting the eating utensil down between bites, to reward habit change, (for example, giving the spouse flowers for putting her fork down at meals for one week) and monitor the spouse's eating behavior. Records were checked each week and feedback given. The spouse had his or her own manual on how to help the dieting partner.

At the ten week post-treatment assessment, mean weight losses were 19.5 pounds for CS-CT subjects, 14.8 pounds for CS-SA subjects, and 11.5 pounds for NCS subjects. Although these are large weight differences, they were not statistically significant. At the three-month follow-up, mean weight losses were 30.2 pounds for CS-CT subjects, 18.9 pounds for CS-SA subjects, and 14.6 pounds for NCS subjects. Participants in all conditions continued to lose weight between the post-treatment and this first follow-up, and those participants in the CS-CT group lost significantly more weight than participants in the other two groups who did not differ from each other.

At the six-month follow-up, the significant differences remained among



conditions: mean weight losses were 29.6 pounds, 19.4 pounds and 15.1 pounds for CS-CT, CS-SA and NCS conditions, respectively. Participants in the CS-CT group lost significantly more weight than those in the NCS group, but there were no significant differences between CS-CT and CS-SA. However, when the weight reduction quotient was used as a measure of weight change, no significant differences existed among groups at any time during the study. Reporting yet another measure of weight change, the authors state that at the six-month follow-up, 44.8% of all subjects lost more than 20 pounds, 24.1% lost more than 30 pounds, and 10.3% lost more than 40 pounds. Of the couples training subjects, 66.7% lost more than 20 pounds, 44.4% lost more than 30 pounds, and 22.2% lost more than 40 pounds.

The authors conclude that spouse involvement may be a potent facilitative factor in weight control, since "the magnitude of weight loss for this group (spouse participation) is the best reported in the literature for any well-controlled study, and is nearly triple the 10-12 pound losses reported in most successful studies" (p. 20). In addition, spouse participation is seen as important to weight-loss maintenance, especially since subjects in this group continued to lose weight after treatment terminated. In the spouse participation group weight losses ranged from 13 pounds to 54 pounds; the least successful subject in this group lost more weight than the average subject in most studies.

Although the Brownell et. al. (1977) study is experimentally sound, there are a few problems. First, sample size was relatively small, with only nine subjects in the couples training condition and 29 participants in the entire study. Ten of these subjects were males and 19 were females. Fortunately, there were no drop-outs,

but the small sample size must be taken into account when considering the results. Secondly, the follow-up period was only six months. Even the authors admit that for a true test of weight loss maintenance, a longer follow-up period is necessary. Finally, differences between groups as measured by the weight reduction quotient failed to reach significance at any of the measurement periods, although significant differences were found for absolute weight change and change in percentage overweight. The authors believe the discrepancy might be due to subject selection or placement in groups. With the small sample size, "successful but moderately obese subjects may not have been distributed evenly across conditions thus differentially biasing the reduction quotient" (p. 22). However, an analysis of this kind of data was not performed.

Rosenthal (1976) further investigated the effect of spouse participation on weight loss by assigning overweight females to one of three treatment conditions: 1) Husband Involvement (HI), 2) Partial Husband Involvement (PHI), and 3) No Husband Involvement (NHI). In the Husband Involvement Group, both husband and wife attended all eight treatment sessions together over the 16-week period (groups met every two weeks). In the Partial Husband Involvement Group, husbands and wives attended the first four sessions together, then wives alone attended the last four sessions. In the No Husband Involvement Group, wives attended all sessions alone. Mean weight for all subjects was 168.2, with an average of 34.2% over their ideal weight, and the mean age was 34.53, and a total of 37 subjects participated in the study.

During the treatment program, subjects in the Husband Involved groups lost

significantly more weight and at a faster rate than did subjects whose husbands did not attend. Between pre-treatment and post-treatment weight-ins, subjects in the HI group lost an average of 10 pounds each, subjects in the PHI group an average of 11 pounds, and NHI subjects, an average of 7 pounds. Subjects in the Husband Involvement group continued to lose weight after treatment, and by the six-week follow-up had lost an average of 13 pounds, whereas the wives who attended alone averaged a loss of only 8 pounds. Thus the results showed that while husband involvement in a wife's efforts to lose weight is helpful, full-scale participation is not necessary. Husbands can attend sessions for only a portion of the program and still be effective in their spouse's reducing efforts.

Unfortunately, a major drawback of Rosenthal's (1976) study is that it does not include a long-term follow-up. Weight loss maintenance over a six-week period is certainly not an adequate measure of long-term treatment effects. Several studies already discussed have reported this kind of short-term maintenance, only to find that the effects dwindle away after a more substantial period of time. In addition, the subjects treated in Rosenthal's study are younger and less obese than the typical chronic obese patient. Some studies have shown that younger, less obese patients lose weight easier than the heavier, older person. Keeping this in mind, the weight losses reported in Rosenthal's study are not large; over a 26-week period the average person in the most successful group lost 13 pounds -- one-half pound a week. This is a modest weight loss compared to the one to two pounds a week recommended by several researchers (Stuart, 1967; Jeffrey, 1976).

Although the reported data is somewhat contradictory about the effect of

spouse participation in weight loss programs, the results of Brownell et. al. (1976) lend credance to the hypothesis that spouse involvement may be an important and potent facilitative factor in weight control. Their program, which involved strict spouse monitoring of eating habit changes and active participation of the spouse in setting up and administering rewards, reported larger weight losses than most behavioral programs.

### Summary and Rationale for the Present Study

Research in the area of weight control has proliferated in the past years, but results have often been ambiguous and contradictory. In addition, numerous methodological problems in obesity research are still unsolved, and add to the inconclusiveness of research in this area. Because different dependent variables are used in studies, comparing the results of research projects is difficult; some researchers report outcomes in terms of pounds lost, others in percentage of weight lost or percentage of excess weight lost. Recently, Feinstein's Weight Reduction Index, which takes into account initial weight, target weight, and surplus weight, has been used as a dependent measure. For the present, researchers need to include each of these measures to enable others to compare studies, but the Weight Reduction Quotient seems, so far, to be the best measure.

The short-term and moderate success of behavioral programs is well documented. However, the initial success of behavior therapy in the treatment of obesity has been challenged by preliminary investigation of weight loss maintenance. While existing behavioral programs produce significant short-term weight loss, follow-up



evaluations have indicated that these results are often temporary (Hall, Hall, Borden and Harris, 1974; Harris and Bruner, 1971). In addition, individual response to behavioral treatment programs is highly varied, and weight losses are moderate (10-12 pounds) and although statistically significant, not clinically relevant for the typical obese subject. Therefore, research today should focus on the development of specific strategies to enhance weight loss and weight loss maintenance. In particular, alternative weight loss techniques, the participation of a significant other, and the use of booster sessions are viable areas for further research.

### Affective Control

Whereas proponents of typical behavioral programs involving stimulus control techniques for the treatment of obesity rely heavily on Schacter's theory of external control, other researchers argue that successful programs for the treatment of obesity must focus on changing internal or affective factors that lead to overeating. The so-called "psychosomatic" hypothesis of obesity (Bruch, 1952) proposes that food consumption is an attempt to cope with anxiety, fear, anger, depression or other emotional disturbances. This causal relationship holds primary significance for the treatment of obesity.

Psychosomatic theory. As somatic studies ruled out many organic disorders in the etiology of obesity (Newburgh, 1942; Hetenyi, 1936; Dubois, 1936; Rony, 1940), various investigators in the field of psychosomatic medicine became increasingly aware of psychological factors contributing to obesity (Alexander, 1934; Bruch, 1952). Psychosomatic theorists generally agree that obesity most often results from overeating,



which is caused largely by emotional disturbances that abnormally increase the intake of food. There is no endocrine or metabolic abnormality in most obese persons, but instead a disturbance of appetite. Appetite, while influenced by physiological factors, is a learned phenomenon determined to a great extent by emotional factors (Kaplan & Kaplan, 1959). Kaplan and Kaplan describe hunger as a "learned drive" which is highly conditionable. In the same way that sensory cues, auditory cues, and olfactory cues can evoke hunger, it is believed that cognitive and affective cues can initiate the desire to eat. In other words, emotional states such as fear or loneliness can constitute hunger drive states if such distressing situations in the past have been associated with hunger. Kaplan and Kaplan use the example of a poor child's associations of hunger and the tension in the family when the mother or the father was out of work. In later life, this child may "feel hungry" when faced with anxiety-provoking situations. This individual is unable to differentiate the need for food from other sensations and feelings of discomfort.

- Another closely related assumption underlying the psychosomatic theory is that eating reduces anxiety. It is believed that in much the same way that hunger constitutes a drive state, fear or anxiety can also. These emotional tensions can motivate an individual to act in a number of ways. Anxiety may be reduced through normal as well as psychopathological behaviors, including overeating. Once an individual has learned to diminish anxiety with food, anxiety can then motivate the person to eat. Eating which is followed by a reduction in tension is reinforced and learned. The compulsive eater overeats without experiencing unusual physiological hunger because this individual eats to reduce anxiety resulting from emotional

conflict.

Psychosomatic theorists concede that the mechanism by which eating reduces anxiety is poorly understood. Kaplan and Kaplan (1957) speculate that conditioning through the association of pleasurable non-anxious situations with feeding, as well as a physiological incompatibility between eating and intense anxiety, may account for the anxiety-reducing effects of eating.

Similarly, the question of why certain individuals choose eating to diminish anxiety cannot be determined. Bruch (1961) emphasizes the influence of early emotional experiences and speculates that the potentially obese child was fed when it cried for reasons other than hunger, eventually producing the tendency to overeat when anxious. However, studies of family type and personality characteristics (Bruch, 1953; Schloppack & Matthews, 1945; Shorvon & Richardson, 1949) do not seem to differentiate individuals who choose to eat in the face of anxiety.

Others have studied the source of anxiety as a distinguishing factor. It has been found that acute stresses may precipitate obesity (Shorvon & Richardson, 1939). Factors including illness, surgical operations, attendance at a new school, marriage, childbirth (Conrad, 1952), financial reverses and death of a parent (Hochman, 1938) may precipitate acute obesity. Burton and Paul (1951) point to sibling rivalry, hospital experience, fear of an amorous suitor, menopause and situations involving social or intellectual failure as other precursors to anxiety. However, all of these various stresses may be considered traumas which likely precipitate other disorders as well. The factors contributing to the onset of acute obesity seem to be non-specific; the source of tension seems to have no consistent relationship to the choice of symptoms

of overeating. In summary, the specific choice of obesity as a symptom has not been clearly explained.

Experimental evidence. Until recently, much of the evidence in support of the psychosomatic theory came from case studies described in the literature. Stunkard (1976) cites a number of case studies associating overeating with clearly defined periods of stress and anxiety. In Bruch's case studies (1973), distinctions are made between various developmental patterns. She describes overeating precipitated by traumatic experiences as "reactive obesity", while overeating patterns learned in early childhood she labels as "developmental obesity".

Lately, several investigators have experimentally studied the psychosomatic concept of obesity. Research has originated from Schacter's externality theory in attempts to discount the psychosomatic theory. As mentioned previously, Schacter and his colleagues have shown that during presumably experimentally-induced anxiety states, obese individuals did not eat significantly more than non-obese. In this study, two internal variables, hunger and fear, were manipulated. In an experimental comparison of the externality and psychosomatic theories, McKenna (1972) varied external cues (appearance and taste of food) and internal state (high or low anxiety). Contrary to Schacter's findings, he reports that overweight Ss did, in fact, eat significantly more under high anxiety than under low anxiety conditions. Moreover, McKenna found no differences in external variables as Schacter's theory would predict. These results were consistent with the psychosomatic hypothesis and with the findings of Meyer and Pudal (1972) who reported that obese Ss increased their intake of a liquid diet under conditions of stress.

McKenna also measured anxiety reduction and found that while there was a decrease in reported anxiety for the obese Ss given the opportunity to eat, there were no significant differences between obese and non-obese. McKenna suggests two ways in which eating may serve to reduce anxiety: first, by distracting the individual from the anxiety-producing stimuli by focusing attention on eating, and second, by providing a more lasting sense of relaxation following the consumption of food. He notes that his study could only test the latter alternative and recommends that studies must also measure anxiety throughout an eating situation to correctly assess changes in anxiety.

Slochow (1976) investigated the effect of labeling of the emotional state on eating behavior. She points out that studies thus far have employed manipulations that could easily allow Ss to label and interpret their emotional state. However, from a psychosomatic perspective of obesity, the anxiety state which is diffuse and little understood by the overeater may trigger eating. In a test of the notion that grossness of an emotional reaction results in overeating for the obese, Slochow found that aroused obese Ss ate more than three times as much food in an unlabeled condition and showed a significant affect reduction following eating. Non-obese were not responsive to the manipulation of the label. She concludes that obese Ss respond by overeating when anxiety is not specifically labeled.

Little is known about what effect different kinds of anxiety states may have on eating behavior. Leon and Chamberlin (1973) studied two groups of women who had reached their target weight. One group had maintained this weight over a one-year period and one group had failed to maintain the loss. The weight maintainers



reported that they tended to eat when lonely and bored. The weight regainers indicated a significantly greater variety of environmental stimuli and emotional states associated with eating.

Clinical evidence. In contrast to the ambiguous results of experimental studies, findings from the clinical literature (case reports) are more consistent. Various researchers and clinicians report an association between states of emotional arousal and increased food intake (Alkinson & Rinquette, 1967; Bruch, 1964; Clancy, 1965; Holland, Maslery and Copley, 1976; Leckie and Withers, 1967; Leon and Chamberlain, 1973b; Silverstone, 1968; Weintraub & Aronson, 1969).

More specifically, Bruch (1952, 1973) contends that eating in response to emotional arousal is a very important factor in obesity. She argues that obese persons have difficulty distinguishing between internal stimuli signaling hunger and stimuli related to emotional and interpersonal experience such as anxiety or depression. Therefore, obese persons may come to associate emotion feelings with a desire for food.

In summary, there appears to be more current research which supports the psychosomatic view of obesity than has been acknowledged recently. Systematic investigation of various affective control procedures for the treatment of obesity have been few in number and limited mostly to procedures involving sensitization, covert control and systematic relaxation. Initial results suggest that these procedures may be effective techniques to and in the control of overeating. For example, Cautela (1967) developed the method of covert sensitization in which the participant is placed in a state of relaxation and develops an avoidance response by imagining



the undesirable stimulus (eating) paired with an aversive stimulus. Experimental results using this technique have provided ambiguous findings. For example, Harris (1969) employed a covert sensitization condition on one of the behavioral weight control groups she evaluated and no additional weight losses were noted in the covert sensitization group compared to standard behavioral control groups. On the other hand, Janda and Rimm (1972) compared the weight loss of subjects in three groups: covert sensitization, realistic attention control (weight monitoring and relaxation) and a no-treatment control group. There were no statistically significant differences between the groups at the end of the treatment period. However, at the six-week follow-up the mean weight loss of the covert sensitization group was significantly greater than that of the other two groups.

Some other affective and cognitive control procedures have been included in weight loss programs, but treatment effects of these components are often difficult to determine because they are used in conjunction with standard behavioral techniques. For example, Williams, Martin and Foreyt (1976) compared a self-control treatment package based exclusively on stimulus control to a multi-principle multi-technique treatment based on a self-control treatment model including social pressure, aversive conditioning, self-monitoring and relaxation. At the end of 16 weeks of treatment there were no significant differences between the two treatment groups; however, they both lost significantly more than the control group. However, at the end of the three and six month follow-up, the stimulus control group had lost significantly more weight than the multi-technique group.

Other studies, Hall, et. al., 1977, have included a placebo group to

assess the effects of expectation and attention and have labeled these groups supportive psychotherapy. Participants were instructed that the rationale of this method involves developing insight into problems in order to facilitate weight loss. However, specific techniques for affective control of overeating are not included and may even be discouraged. For example, in Wollersheim's (1970) non-specific therapy group discussions frequently strayed from weight loss and emotional problems to such topics as "movies seen or an experience one had with a grade school teacher" (p. 465). Historical elaboration was encouraged rather than emphasizing current problems. Other programs (Renich, et. al., 1971) include a so-called supportive psychotherapy as a treatment group, but the authors fail to report specific procedures used.

Overall, the research in the area of affective control has been ambiguous and limited by problems with experimental design, short-term treatments and follow-up, and non-specific treatment components. However, there seems to be sufficient evidence from theoretical and clinical reports that interventions focusing on controlling the emotional aspects of overeating are warranted.

### Spouse Participation

The results of recent research previously discussed suggest that the participation of a significant other in a weight loss program along with the overweight subject may enhance both weight loss and weight loss maintenance. This result is not surprising since involvement of a significant other allows immediate monitoring, support, and reinforcement of target behaviors throughout the program and often on a

permanent basis. For example, Brownell, Heckerman and Westlake (1977) reported that participants who attended the program with their spouse lost significantly more weight by the three and six month follow-up period than did participants whose spouses did not attend; weight losses averaged approximately 30 pounds for the couples group at the two follow-up periods as compared to 19.4 pounds and 15.1 pounds for the two individual groups. This is one of the largest mean weight losses reported in experimental literature. The study is limited by some methodological problems including: 1) Small sample size - there were only nine subjects in the couples in the couples training condition and 29 participants in the entire study. 2) Limited follow-up period - although participants were followed for six months, at least a year is necessary to examine weight loss maintenance. 3) Finally differences between couples and individuals groups were only significant for pounds lost, and not for the weight reduction quotient which takes into account target weight and initial percentage overweight.

- Nonetheless, these results as well as results of a few other recent studies (Wilson and Brownell, 1976; Rosenthal, 1977) indicate that couples' participation in weight loss programs may be a powerful influence on weight loss and weight loss maintenance.

Furthermore, the effects of an overweight husband and wife participating together in a weight reduction effort has not been investigated. Inclusion of the overweight husband would also permit study of males' performance in weight loss programs, a subject area that has limited research. Weight control may be most positively affected by couples working together as a team toward similar goals. On

the other hand, the possibilities for competition and sabotage may offset this potential benefit.

Spouse participation may be an important and potent facilitative factor in weight control, however, only a few studies, limited in scope and experimental design, have documented this effect. Therefore, further investigation in the area seems warranted.

### Length of Program and Follow-up

As mentioned previously, one significant problem with weight control research has been the short-term nature of the programs and the limited amount and scope of follow-up. Research in the behavioral treatment of obesity has shown that behavioral methods are effective for producing moderate short-term weight loss. Research needs now to focus on the long-term aspects of weight loss and weight loss maintenance and data should be collected for at least a twelve month period.

- In addition, recent research has shown that the inclusion of booster sessions in weight reduction programs may enhance maintenance (Hall, Hall, Borden & Hanson, 1974; Polly & Kunan, 1976).

### Description of the Study

Taking into account the need for weight control research in the area of stimulus versus affective control, spouse participation and long-term collection of data, the present study was formulated. The investigation studies the involvement of a spouse in a stimulus control versus an affective control weight loss program.

Participants in the stimulus control groups were taught standard behavioral techniques for controlling the antecedents, behavior and consequences of eating. In addition, topics concerning reinforcement procedures and contracting were discussed. In the affective control group, participants learned coping skills to replace eating which may have resulted from depression, anxiety, fear, anger, etc. Also, group members were instructed in positive self-talk and effective communication skills as techniques to aid in the handling of emotions. Both groups used the same diet plan and received the same information on nutrition and exercise management.

Thus, participants were randomly assigned to one of four treatment conditions: Stimulus Control-Couple (SCC), Stimulus Control-Individual (SCI), Affective Control-Couple (ACC), and Affective Control-Individual (ACI).

Couples' groups and individuals' groups received the same information according to treatment group and performed similar homework assignments. However, couples were encouraged to participate together as a team, both during meetings and at home. Individuals were encouraged to practice with a significant other of their choice.

The program consisted of twenty one meetings over a year's period. Subjects met once a week for nine weeks, on a every-other-week basis for six weeks and once a month for the remainder of the year. This structure was instigated to effect a gradual shift in the focus of the program from learning techniques at group meetings to taking individual responsibility for implementing and evaluating the procedures at home.



## Hypotheses

Hypotheses for the present study are divided into three sections: Section 1 addresses major weight related results, Section 2, the performance of dropouts in the weight loss program, and Section 3, program and participant evaluations.

Section 1: Weight related hypotheses. Based on the review of the literature and theoretical rationale previously discussed, the following major hypotheses are posited:

### Weight loss.

1. Participants in Stimulus Control Groups will lose significantly more weight than participants in Affective Control Groups. Although theoretical analyses and case reports suggest that affective control for weight loss may be a viable treatment method, there is still little empirical evidence to support the contention that affective control is as effective as stimulus control methods.
2. Participants in Couples Groups will lose significantly more weight than participants in Individuals Groups.

The differential performance of overweight participants with overweight spouses (OP-OS) and overweight participants with non-overweight spouses (OP-NS) will also be explored. One expectation is that subjects with overweight spouses may lose significantly more weight in Couples Groups than in Individuals Groups since both members of the couple will be learning to change their eating habits and attitudes about food. Similarly, subjects with non-overweight spouses may

lose significantly more weight than subjects with overweight spouses in Individuals Groups. The member of the couple not attending group sessions would be normal weight and not as likely as overweight spouses to model and encourage poor eating habits.

3. Male participants will lose significantly more weight than female participants. There have been few reported weight control studies that have included large numbers of both males and females. Some studies which have included males indicate that men are more successful at losing weight than women (Stunkard and McClaren-Hume, 1959; Harris, 1969; Mahoney and Mahoney, 1976; Brownell et. al., 1976). Other studies (Hall et. al., 1974; Jeffrey, 1976, 1978) report no male-female differences in weight loss. However, two recent studies including couples, both report that male participants lost significantly more than females (Brownell et. al., 1978; O'Neil, Currey, Hersch, Riddle, Taylor, Malcolm and Sexauer, 1979).
4. Participants with child-onset of obesity will lose less weight than those participants with adult-onset.

Although empirical support for this hypothesis is lacking, many practitioners and researchers (Hersch and Knittle, 1971; Nesbett, 1972; Grinker, Hirsch and Levine, 1973; Stunkard and Rush, 1974) believe that juvenile onset of obesity is more difficult to treat for various physiological and psychological reasons, including the theory that juvenile-onset obese have more fat cells and more negative reactions to

dieting than adult-onset.

No hypotheses are made concerning adolescent-onset, since little research has explored this age group.

5. Two other factors investigated in the present study are age and prior attempts at dieting. No hypotheses are made concerning these variables since neither has proven to be a reliable prognostic factor in the past.

#### Eating patterns.

6. Participants reporting a significant positive change in eating habits (as measured by the Eating Patterns Questionnaire (Wollersheim, 1970)) will lose significantly more weight than participants who do not report a change in eating habits. Both Wollersheim (1970) and Hagan (1974) found significant correlations between weight loss and scores from the Eating Patterns Questionnaire.

Other measures. Three additional questionnaires (Beck Depression Inventory, Beck, 1972; Communication Inventory, Bienvenu, 1970; and General Expectancy for Success, Hold and Fibel, 1976) were administered to participants to measure changes in depression, communication skills and expectancy for success from the beginning of the program to four months into treatment.

No hypotheses are made concerning these measures, since there is little research relating these factors to weight control.

Section 2 - Drop-outs. Although drop-out rates tend to be high in weight loss programs, information on the factors which lead participants to drop out of treatment is

very limited. Information about drop-outs is important for many reasons including program evaluation and interpreting experimental results. For example, Jeffrey (1976) states that weight information must be presented since differential drop-out rates among treatment groups could bias experimental results. In addition, factors predicting a high potential for premature termination could help the practitioner to screen for high risk participants and take precautionary measures to enhance the possibility of full participation.

The present study attempts to answer three overall questions about drop-outs: 1) Who are the dropouts? 2) Are there differential drop-out rates among treatment groups? and 3) Are drop-outs really treatment failures?

Factors predicting drop-outs. The following factors are tested for prognostic capability in differentiating drop-outs from non-drop-outs: age, spouse attitude toward dieting, depression, self-motivation for weight loss, self-control in losing weight, expectancy for success, marital communication, prior attempts dieting, change in depression, change in marital communication, and change in expectancy for success.

Since research on drop-outs is so limited, there is negligible empirical evidence to support formal hypothesis concerning prognostic factors. Expectations based on logical reasoning would suggest that drop-outs might report less motivation to lose weight, less self-control for dieting, and poorer spouse attitudes than program completers. In addition, drop-outs may experience higher depression than non-drop-outs, perhaps related to failure in losing weight. Predictions will not be presented related to the remaining factors, but the data will be analyzed and reported in Results.

Frequency of drop-outs in treatment groups. To thoroughly analyze experimental results and evaluate the treatment groups, differential drop-out rates must be assessed. The present study compares the drop-out rates of Stimulus Control and Affective Control Groups, Couples and Individuals' Groups, males and females, child, adolescent and adult onset of obesity, and overweight participant, overweight spouse and overweight participant-nonoverweight spouse.

Since empirical data to support hypotheses are not available concerning drop-out frequencies among the groups, no formal hypothesis will be presented. A differential drop-out rate for Stimulus and Affective Control Groups is not anticipated, but Couples Groups may have lower drop-out rates than Individuals Groups since spouses will be participating in the weight loss effort as a team. Although some theories, previously discussed in literature review, concerning onset of obesity might support the prediction that child onset would have a higher drop-out rate than adult onset due to difficulties losing weight and emotional side effects of dieting, Nash (1976), in her study, found no differential drop-out rates for child and adult onset. Other expectations concerning drop-out rates by sex or weight of spouse are not presented.

Are drop-outs really treatment failures. Hypotheses about the success or failure of drop-outs can be divided into two parts. First, are drop-outs failures in terms of weight loss, while they are still participating in the treatment program? Second, at follow-up periods, how does the weight loss performance of drop-outs compare to that of participants still in treatment?

Hypothesis 7. While participating in the weight loss program, drop-



outs will lose less weight than program completers over the same time period.

Although no reported studies have investigated the weight loss performance on drop-outs while they are still in the program, many researchers and practitioners have tacitly assumed that many people drop out of treatment because they are not losing weight. This assumption appears to be logical, but people also drop out for other reasons such as illness, pregnancy or transportation problems. The present study retrospectively examines the performance of drop-outs while they participated in the program and compares their weight loss to program completers over the same period of time. For example, the weight losses from Sessions 1-9 of participants who drop out after Session 9 are compared to the weight losses from Sessions 1-9 of participants who complete the entire program.

Hypothesis 8. At the time of the eighth month of treatment, and at the end of the program, participants who have dropped out of treatment will have lost less weight than program completers.

- In contrast to Hypothesis 7, this hypothesis predicts the performance of drop-outs after they leave the weight loss program. Participants who complete the year-long weight loss program are expected to lose more weight than drop-outs, but empirical support for the hypothesis is mixed. Both Morton (1974) and Jeffry (1976) reported that by program completion drop-outs had lost less weight than non-drop-outs, but one study (Hayer, Foreyt and Durham) concludes that treatment completers did not lose significantly more than terminators. As the literature review points out, behavioral programs for the treatment of obesity often provide short-term weight losses, but results of several studies (Harris and Bruner, 1971; Hall and Hall, 1974) indicate

that over a longer period of time, weight may be regained. If over the treatment period, program completers regain the weight they lose, then by the end of the year significant differences in weight losses between drop-outs and non-drop-outs may be nonexistent. However, Brownell et. al.'s (1976) recent study involving spouses indicated that for couples, weight losses were maintained and increased over the eight month program. Overall, then, participants completing the weight loss program are expected to lose more weight than drop-outs.

Section 3 - Program evaluation. Although the success and failure of weight loss programs is usually assessed by weight measurements, an equally important evaluation concerns the self-reports of participants about their feelings of success and failure. In the present study, participants are asked to evaluate the treatment and methods and components of the weight loss program, as well as their own performances in the program. Participant's ratings of their performance in areas such as weight loss and improvement in eating patterns are correlated with weight loss in order to see if self-reports correlate with actual performance.

Only one study has included a Weight Factors Questionnaire (Rosenthal, 1976) to determine participants' self-report of affective treatment components. In Rosenthal's study, participants rated attending group meetings as most helpful in weight loss efforts, then the exchange plan diet, being allowed to eat some "miscellaneous foods" and commitment to self.

The Weight Factors Questionnaire used in the present study is divided into four sections. Part I includes questions for participants in all groups about general treatment methods, Part II is different for Stimulus and Affective Control Groups and

asks questions specifically relating to the treatment methods; Part III contains questions for all participants about difficulties losing weight, and Part IV is answered by Couples Group only and concerns the effect of working together in the program as a husband-wife team.

No hypotheses will be presented concerning which treatment components will be assessed as most effective. However, a recent presentation (Mahoney and Mahoney, 1976) makes the statement that Recording and Exercise were evaluated by weight loss participants as most helpful, and both of these methods were encouraged in the present weight loss program.

Clients' ratings of their own success or failure and performance in the weight loss program are expected to correlate with actual weight loss and the following hypotheses are presented:

Hypothesis 9. Self-report of adherence to the exchange plan diet will correlate significantly with RI and weight loss, with participants reporting adherence to the plan losing the most weight.

Hypothesis 10. Self-report of amount of recording of food intake will correlate significantly with RI and weight loss. Participants who report recording most often will have the largest weight losses.

Hypothesis 11. Self-report of completion of homework assignments will correlate significantly with RI and weight loss. Participants who report completing assignments will lose the most weight.

Hypothesis 12. Self-report of usage of weight control techniques will correlate significantly with RI and weight loss. Participants who report using the

weight control technique most often will lose the most weight.

Hypothesis 13. Self-report of improvements in eating habits will correlate significantly with RI and weight loss. Participants who report the greatest improvements will also have the largest weight losses.

These five hypotheses are self-explanatory, and are based on general knowledge from clinical experience rather than empirical evidence. Participants will be aware of their adherence to the exchange plan and amount of recording since recording sheets are handed in to the group leaders during the first 12 sessions. Assessment of completion of homework assignments, use of weight control techniques, and improvement of eating habits are arbitrarily made by each participant. The hypotheses must be viewed and interpreted with these qualifications in mind.

## CHAPTER II

### METHOD

#### Overview

Subjects participated in a year long weight control program, and were randomly assigned to one of four treatment conditions: Stimulus Control-Individual (SC-I); Stimulus Control-Couple (SC-C); Affective Control-Individual (AC-I) and Affective Control-Couple (AC-C). All overweight subjects followed a 1200 calorie exchange diet and received nutrition and exercise information. Subjects in Stimulus Control Groups were taught to control the stimuli that induce overeating and techniques were similar to typical behavioral weight control programs (Stuart & Davis, 1972). Subjects in Affective Control Groups were taught to control the affective reasons for overeating such as anxiety, depression, poor self-esteem, irrational self-beliefs and negative self-talk.

Participants in Couples groups worked together with their spouse as a team by discussing class material and doing homework assignments together. Although some spouses were not overweight, they still participated together with their spouses with the exception of following the diet. Participants in the Individuals groups received the same information but practiced classroom activities with each



other and performed similar homework with a person of their choice.

Although Ss in the individual group were similar to those in the couples groups in that spouses were willing to attend, they were asked to attend all sessions without their spouses.

### Subjects

#### Recruitment

Recruitment was conducted over a six-week period by various methods: posters distributed throughout the city of Atlanta, newspaper articles, and a radio talk show program.

Potential participants contacted experimenters by telephone or letter. A telephone interview was then conducted to see if the participant met the following requirements: (1) married with a spouse willing to attend all weight loss sessions for one year; (2) fifteen percent over ideal body weight according to the 1970 Metropolitan Life Insurance Company forms for desirable weight; (3) plans to reside in Atlanta area for at least one year.

If so, participants were informed that a thirty dollar deposit was required and would be returned contingent upon program attendance. Approximate weights of both spouses were obtained. Other familial and socioeconomic data were collected and recorded on the Telephone Interview Data Sheet (Appendix 1).

If Subjects met the above criteria, they were recontacted and scheduled, with their spouses, for a prescreening appointment. Potential Ss were interviewed and responded to a set of questionnaires in groups of ten to sixteen to screen out: (1) those Ss who planned to receive another type of therapy for weight reduction during their participation in the program; (2) those Ss who had a serious medical problem connected with weight and could not obtain a doctor's permission form; (3) subjects who were pregnant or planning pregnancy; and (4) subjects with obvious severe psychiatric problems.

Subjects were told that weight loss groups would consist of twelve to sixteen participants and would meet once a week for a period of nine weeks, every other week for a period of six weeks and once a month for eight months. [Other general information was given concerning the program. (Appendix 2)]

Subjects and their spouses were weighed and measured and filled out an index card listing possible meeting times for themselves as an individual and as a couple. Subjects then completed the Weight History Questionnaire (Appendix 3).

Subjects were told that if they qualified, they would be called and assigned to either a couples group or an individuals group. They were asked to bring a doctor's consent form to the first meeting stating that they had no health problems that would be negatively affected by using a 1200 calorie nutritionally balanced exchange diet.

Those Ss who met the above criteria and indicated that they would like to

participate were contacted by telephone and randomly assigned to one of the four experimental conditions: Stimulus Control-Individual (SC-I); Stimulus Control-Couple (SC-C); Affective Control-Individual (AC-I); and Affective Control-Couple (AC-C).

### Description of Subjects

A total of one hundred ninety-seven Ss participated in the study: one hundred fourteen (57.9%) females and eighty-three (42.1%) males. Of these participants, one hundred seventy-eight were at least 15% overweight. The other nineteen Ss were non-overweight individuals who attended the program with their spouse. There were one hundred six overweight females, and eight non-overweight females. There were seventy-two overweight males and eleven non-overweight males.

Participants were categorized in terms of the weight of their spouse. One hundred seventy-seven overweight participants had spouses who were at least 15% overweight (OP-OS). Fifty-one overweight participants had spouses who were not overweight (OP-NS).

Participants were also categorized by age of onset of obesity according to their self-report on the Weight History Questionnaire. There were eighty-five adult, twenty-four adolescent, and forty-five child onset (Fourteen participants did not report this information).

The mean age of Ss was 40.2 years (range - 20 years to 69 years). Mean age of females was 38.2; of males was 42.6.

The mean initial weight for overweight participants was 194.95 pounds.

Mean initial weight for females was 179.0 and for males it was 217.6.

Overweight participants averaged 42.5% excess weight. Mean percentage overweight for females was 44.4% and males 39.7%.

The mean Reduction Coefficient (RC) for overweight participants was 3.35; mean RC for females was 3.8 and for males 2.7.

#### Description of Ss in Groups

There were a total of thirteen weight control groups, six Stimulus Control Groups (2I, 4C) and seven Affective Control Groups (2I, 5C). One hundred fifty-two subjects (77.2%) participated in couples groups and forty-five subjects (22.8%) in individuals groups.

Participant distribution over the four groups was as follows:

	SC	AC	
C	66	86	152
I	20	25	45
	86	111	

Overweight subject distribution over the four groups was:

	SC	AC	
C	61	72	133
I	20	25	45
	81	97	

Sex distribution of overweight subjects in groups was as follows:

	SC	AC	
C	M = 30 F = 28	M = 5 F = 20	M = 35 F = 48
I	M = 3 F = 17	M = 35 F = 40	M = 38 F = 57
	M = 33 F = 45	M = 40 F = 60	



OP-OS and OP-NS distribution in groups was as follows:

	SC	AC	
C	OP-OS = 50 OP-NS = 8	OP-OS = 64 OP-NS = 11	OP-OS = 114 OP-NS = 19
I	OP-OS = 7 OP-NS = 13	OP-OS = 6 OP-NS = 18	OP-OS = 13 OP-NS = 31
	OP-OS = 57 OP-NS = 21	OP-OS = 70 OP-NS = 29	

Distribution of participants according to age of onset was as follows:

	SC	AC	
C	Adult = 38 Adolescent = 8 Child = 15	Adult = 40 Adolescent = 10 Child = 27	Adult = 78 Adolescent = 18 Child = 42
I	Adult = 10 Adolescent = 3 Child = 4	Adult = 5 Adolescent = 5 Child = 8	Adult = 15 Adolescent = 8 Child = 12
	Adult = 48 Adolescent = 11 Child = 19	Adult = 45 Adolescent = 15 Child = 35	Adult = 93 Adolescent = 26 Child = 54

Mean age of overweight subjects in groups was as follows:

	SC	AC	
C	40.69	41.2	41.02
I	38.71	35.7	37.08
	40.27	40.18	

Mean weight of overweight subjects in groups was as follows:

	SC	AC	
C	190.2	200.4	196.1
I	198.7	185.8	191.5
	192.5	196.8	

Mean percentage excess weight of overweight subjects in groups was:

	SC	AC	
C	37.6	43.3	40.9
I	54.6	41.6	47.1
	42.0	42.9	

Mean Reduction Coefficient of overweight subjects in groups was as follows:

	SC	AC	
C	5.4	3.3	4.23
I	3.0	3.0	3.0
	3.5	3.2	

#### Therapists

Therapists were two female, clinical psychology doctoral candidates. Each has previous experience with various weight control procedures from conducting groups and through research projects. Each therapist was present at all group meetings. Responsibility for groups meetings across conditions was alternated to minimize individual therapist treatment effects. All client contact, including pre-screening, treatment and follow-up was handled by the therapists.

#### Experimental Setting

Prescreening sessions took place at the Atlanta Psychological Center in Atlanta, Georgia. All other meetings were held at the Georgia Mental Health Institute.

### Procedure

#### Materials

An Ellman's Doctor's Scale was used for all weigh-ins. Therapist manuals contain the information covered and procedures followed during each session. The manuals also include handouts to subjects and homework assignments.

#### Basic Treatment Components

All overweight participants, regardless of treatment group, followed the same program for nutrition and exercise. The program involved a food exchange program (Stuart & Davis, 1972) in which dieters decreased their caloric intake to 1200 calories and an exercise program in which dieters increased their daily energy expenditure. Nutrition information and methods for recording food intake were presented.

Sessions were held once a week for nine weeks, every other week for six weeks and once a month for nine months for a total of twenty-one sessions. Sessions lasted either sixty or ninety minutes depending on material covered and questionnaires answered. All groups met for the same amount of time each week.

#### Procedure for all Groups

In the beginning of each group meeting therapists weighed each participant privately and the weight was recorded. Positive comments were made for weight loss and neutral comments for weight gain. Each subject's weight change was recorded

on a poster board which could be seen by all group members, but was not discussed.

During the beginning of each session, the dietary management plan, exercise and nutrition were discussed.

Participants learned how to calculate the number of calories expended by various physical activities and were instructed to increase their caloric expenditure by at least 100 calories daily. Various systems were outlined to record physical activity levels. Information about types of exercise, energy expended in specific activities, positive effects of exercise, and overcoming barriers to exercise were presented. Subjects were encouraged to participate in exercise activities which they enjoyed and to use an exercise companion. They were also told to check with their physician before engaging in any strenuous activity.

Elements of nutrition and its role in weight control were outlined. Areas discussed included nutritional needs, vitamin and mineral functions and requirements, and basic food groups. Participants were encouraged to learn about the nutritional value of the foods they eat by reading and comparing food labels in the meetings and at home. Quizzes in the form of group games were employed throughout the program to present and review information about both nutrition and exercise.

A major principle stressed for all groups was that weight control is the responsibility of each individual person and therefore, dependency on the group or leaders was not encouraged. Methods of group and leader support typically used by some commercial weight loss organizations (hand clapping for weight loss) were not employed. Instead, participants were encouraged to rely primarily on



their own social support and systems.

Another important component of the treatment program concerned the detrimental effects of deprivation as opposed to flexible and healthy diet management. Subjects were encouraged to include in their diet foods which they planned to continue eating even after reaching their ideal weight.

Subjects in couples and individuals groups received the same information, and they participated in similar group meetings. The difference between these groups was that couples were encouraged to work together as a team both during group meetings and at home; whereas, individuals worked with another participant during meetings and were encouraged to work with a person of their choice at home.

At the first meeting, all subjects completed a Participant Consent Form and a Deposit Contract (Appendices 4 and 5). The Deposit Contract stipulated that all participants agreed to make a thirty dollar deposit which would be returned at the end of the one year program provided no more than a total of two sessions were missed and all questionnaires were completed. The contract also stated that drop-outs from the program would receive a refund of five dollars if they participated in a follow-up weigh-in and interview at the end of the program.

### Outline of Sessions

Stimulus control group. The following outline summarizes the new material presented for sessions of the Stimulus Control Groups. Each meeting also included a review of

homework assignments and group discussions of new topics presented. Exercise and nutrition information was provided as described above in the Procedure for all Groups.

Session 1. As mentioned in the preceding outline of Procedure for all Groups, the dietary management plan was presented and discussed in detail. Participants were instructed to record daily food intake according to the exchange plan.

Discussion focused on factors contributing to obesity (e.g., increase in high calorie "fast foods" consumed) and myths of dieting (e.g., certain foods have negative caloric values). Each participant shared past experiences with dieting and evaluated their success or failure in each.

Session 2. The rationale for the behavioral techniques involved in the Stimulus Control method was presented. It was explained that in this model, behavior leads to consequences which in turn lead to thoughts and feelings. Therefore, focusing on changes in behavior (eating patterns), we can effect changes in consequences and influence our feelings. Participants were told that this behavioral approach is based on making changes in the immediate environment which will lessen the likelihood of overeating occurring. To initiate an assessment of present environmental influences, participants were asked to record situational factors surrounding eating. Specific instructions were given concerning the procedure for recording.

Session 3. The model of managing the antecedents, behaviors and consequences of eating was presented and principles of shaping behavior were explained.

The remainder of the meeting focused on techniques to alter the antecedents of eating. These included:

#### Buying Food

1. Prepare a balanced food list which includes low calorie foods.
2. Shop from your list only. To avoid the trap of attractively displayed food you don't want to eat, buy from your list only.
3. Buy quantities of food which you need; do not buy extra amounts.
4. Shop when you're not hungry. Go shopping after you've eaten a meal to avoid impulsive buying. If you are beginning to feel hungry, drink a glass of water or have a low calorie snack.
5. Make problematic eating difficult by purchasing foods which require elaborate preparation (thawing, baking) if you must buy high-calorie foods for others.
6. Buy sufficient quantities of low-calorie foods.

7. If you are used to buying a lot of "junk foods", start changing the pattern by eliminating the number of items you buy.  
Remember to shape behavior.

### Storing Food

1. Store food "out of sight". Use inaccessible containers and place them in difficult-to-reach locations.
2. Store food only in the kitchen. Remove food from any other location. Also, remove all food from counter-tops. This will help stop automatic eating.
3. If you must have high-calorie foods available, keep them in a least accessible location (freeze them; store them in the highest cupboard).

Session 4. A game was played to review the techniques presented in the previous session concerning buying and storing food.

The following new weight control techniques for managing antecedent conditions were outlined:

### Preparing Food

1. Prepare meals which are high in nutrition and low in calories.
2. Prepare moderate quantities only; make a single serving for each person present.
3. Don't eat while preparing the food. Use chewing gum or celery if you must have food in your mouth.
4. Take responsibility for the preparation of your food. Take steps to prepare it properly or ask those who prepare it for you to keep within the guidelines we have established.

### Serving Food

1. Serve just enough food to meet your caloric needs for that meal, a small or medium helping.
2. Don't go back for seconds unless you have planned to do so and keep within your caloric plan.
3. Don't serve "family style"; leave food in the kitchen and serve food on your plate. Put extra food away before eating.

Session 5. The group participants worked to develop ideas for controlling the behavior of eating. The following techniques were covered.

### Eating Controls

1. Eat more slowly. Many overweight people eat so fast their bodies do not have time to register "full" and their minds don't focus on enjoying the food.



- A. Slow down the action of your jaws to about two bites per second. Chew the food slowly, being aware of taste, texture and smell. This can help allow the saliva in your mouth to start digesting the food so it can be absorbed into your body quicker, promoting a sense of fullness before you feel like overeating.
  - B. Put a small quantity of food on your utensil.
  - C. Put your utensil down between bites and pause about thirty seconds. Use this delay to converse and be aware of what you're eating.
- 2. Stop eating as soon as you feel full. Remember that the body needs approximately thirty minutes to register "full". If you eat very quickly, you may eat beyond the level you need. Try to relax and enjoy eating, focusing on your body and signals of satiety.
  - 3. Leave some food on your plate by choosing one portion of food at the start of the meal which will be left.
  - 4. When you eat, do not engage in other activities such as reading, talking on the telephone or watching television. This will help to break any automatic connections between one activity and eating. For example, if you watch

television while eating, you are more likely to eat while watching television.

In a discussion of binge eating, participants described their behavior and explored the environmental controls of bingeing. Therapists offered these suggestions to control bingeing:

1. Eat three meals a day. Surveys of overeaters who binge show that three out of five binged on days they skipped breakfast and lunch. Do not deprive your body of food during the day.
2. If you feel like bingeing, change the environment (get out of the house; engage in a new activity).
3. If you cannot change the environment, limit the binge by:
  - A. waiting at least ten minutes to eat after getting the urge to eat;
  - B. if you do eat, choose food that is not your most preferred;
  - C. take small amounts, put the food away and then eat with utensils very slowly and enjoy the food. Do not engage in other activities while eating;
  - D. eat food which takes time to prepare;
  - E. try to "shape" your binge behavior by making gradual changes in the number of binges and amount of food eaten.

Session 6. Participants engaged in a structured practice meal in order to rehearse new eating behaviors (putting utensil down between bites). Experiences were discussed and comparisons made between eating behavior during the practice meal and at home.

Group participants were asked to develop ideas for controlling behaviors during clean-up and snacking. The following techniques were included:

#### Cleaning Up

1. Clear the table immediately after completing the meal. If you want to talk with others at the table, do so after the table is clean. This will help you to avoid nibbling or taking second helpings.
2. Clear the food from plates directly into storage containers or the garbage can. If you find you are often discarding food, serve smaller portions in the first place. If you choose not to clear the table immediately, go to another room to continue a conversation or activity.
3. If eating leftovers during clean-up is a particular problem for you, have someone else do the cleaning up or at least the food storage.

4. Plan another activity for after mealtime. Many times meal-times can be the only pleasurable activity planned for the day or evening. To take the emphasis off food and eating, plan another enjoyable activity (a conversation with a friend, a hobby, going out for a walk, etc.) for after the meal.

### Snacking

As you know, we recommend planned snacks to avoid trying never to snack and experiencing failure. If you find yourself hungry quite often, eat more protein at meals to cut down on snacks.

Plan low-calorie nutritional snacks. List low-calorie snacks you would enjoy. Make sure to have these foods available by preparing them ahead of time. Store these foods in a convenient place.

- Session 7. This session focused on problematic eating situations including drinking, eating out and holidays or vacations. All of the following techniques were presented briefly and participants were told that each specific area would be discussed in detail at one of the next four meetings. However, each member chose one problematic situation to focus on for the next week. A procedure for pre-planning and evaluating methods to overcome the problem was introduced.

### Drinking

1. Order low-calorie drinks (low calorie sodas or dry wines rather than beer).

2. Mix drinks with sugar-free beverages.
3. Alternate a sugar-free drink with an alcoholic beverage.
4. Sip drinks slowly putting your glass down between sips.
5. If you're at a party and don't want to call attention to the fact that you're not drinking, hold a glass of soda water.
6. Mix your own drinks to know exactly what you're consuming.  
Don't order beer by the pitcher or wine by the bottle.

#### Eating Out

When eating out, it is easy to forget many of the techniques you may be doing regularly at home since your routine is disrupted.

1. Try to avoid high calorie appetizers.
2. Move the bread basket to the other end of the table, or have the waiter remove it.
3. Order a la carte or ask the waiter to leave off any high calorie foods.
4. Order salad dressing on the side or take low-calorie dressing with you.
5. Try splitting a dessert or ordering fruit (or splitting a meal).
6. Use the techniques for eating slowly (serve yourself small quantities, take small bites, chew slowly, put your utensil



down between bites and stop eating when you feel full).

7. Ask the waiter to clear your plate as soon as you've had enough.
8. Use "doggie bags". If you know a restaurant serves portions which are too large, plan when your dinner comes what you will take home with you.
9. Choose restaurants wisely so that you will have choices of fresh vegetables, fresh lean meats and low calorie foods.

#### Holidays and Vacations

During holidays and vacations, it is easy to rationalize and overeat because "we're supposed to celebrate". If you plan ahead, you can still enjoy your favorite foods without gaining weight.

1. First, be aware of what events and which foods are problematic. For example, if you're going to a friend's house, decide if it will be appetizers, drinks, potatoes or dessert that you will be likely to overeat. Then plan how much you will eat by pre-recording. Give your list to your spouse or someone going with you and let them get the food for you.
2. Don't starve beforehand. Have light meals so you will not be so hungry that you will eat too much too fast.
3. Plan a vacation around exercise rather than eating.

4. Remember to take low-calorie foods with you or fill your plate with them before you add other items.
5. Be aware of everything you eat. Take small bites, savor and enjoy it.
6. Avoid fast food temptations. Plan to stop at a restaurant to eat.
7. Control eating while driving by preparing low-calorie foods and planning times to eat.

#### In General

1. Make a list of enjoyable behaviors to do when you get the urge to eat (shop, read, call a friend, write a letter, sew, take a walk).
2. Plan your day around times you'll likely be hungry. Plan to be doing something else at the time. For example, if you tend to overeat at 10:00 P.M., plan to take your shower then.

Session 8. Each participant's attempts at controlling a problematic eating behavior or situation were reviewed and ideas were shared for alternative solutions. Each member chose a new problematic behavior to evaluate and planned a method for change.

The remainder of the meeting focused on discussions of plateaus. A plateau was defined as a period of time when, after losing weight steadily, there is

no weight loss for a week or two. Some major causes of plateaus were mentioned: weighing under different conditions, water retention, decreased exercise or increased food intake. The group members shared their own experiences with plateaus and ways to overcome them.

Suggestions for handling plateaus included weighing on the same scale under similar conditions, limiting salt intake, and recording physical activities and food intake.

Session 9. A method of incorporating favorite foods into daily diet plans was presented. Participants were asked to substitute a favorite food for appropriate exchanges from the various food groups. Instructions were to eat the favorite food every day and to record the procedure.

A discussion of handling problematic eating situations was continued and alternatives explored.

Finally, the schedule change was discussed (groups would now meet every other week) and anticipated problems related to this change were explored. Participants were instructed to have a weekly weigh-in and meeting with their spouse (significant other for individual groups), to review material and to evaluate progress.

Session 10. The principles concerning control of the consequences of eating were presented. The immediate consequences (satisfaction of physiological sensations, pleasant experiences of taste) were contrasted to the long-range consequences (weight loss or gain, being physically awkward, etc.).

The importance of establishing immediate positive consequences for controlled eating was stressed. Therefore, participants were asked to develop ideas to bring the consequences of appropriate eating behavior into awareness regularly. For example, some participants agreed to put a picture of themselves at their ideal weight on the refrigerator. Others chose to hang an article of clothing which they would like to fit in comfortably in the front of the closet.

Session 11. The session focused on reward systems and principles for using positive reinforcers to strengthen behaviors. Methods for shaping new behaviors were reviewed and participants were instructed to:

- A. use rewards immediately following the desired behavior;
- B. reinforce habit change and not merely weight loss;
- C. vary reinforcers and use them frequently.

Each participant developed a list of self-rewards and rewards desired from others which they would use to bring immediate positive consequences to healthy and controlled eating behavior. Each individual established a specific reward system for daily, weekly and bi-weekly goals.

Finally, the new schedule (groups would now meet monthly) was discussed and participants were encouraged to continue to have their own weekly weigh-in and meeting.

Session 12. Principles of Contracting were discussed and participants completed a contract with a weight control partner. The contract made various rewards contingent upon completion of daily, weekly and bi-weekly goals. A system to record and evaluate experiences with contracting was outlined. Principles for effective use of rewards were reviewed.

Session 13. Experiences with contracting were reviewed. Principles for the use of extinction were presented and participants were taught to instruct significant others to ignore negative eating behaviors.

The remainder of the meeting focused on problematic eating patterns during weekends. These suggestions were offered:

1. Pre-plan meals.
2. Record.
3. Plan your weekend around exercise, not eating.
4. Make sure to have three planned meals at planned times to avoid continual snacking.
5. Remember the suggestions for controlling behavior when eating out.
6. Choose one problematic time, work on it conscientiously and evaluate your plan.
7. Contract for a reward if you reach your weekend goal.



Session 14. The use of the reward system and contract agreement was reviewed and individual experiences shared.

Participants were then instructed to make graphs of weight loss thus far and of minimal expected weight loss for upcoming weeks (one-half pound a week). These graphs were used at home and at sessions during the remainder of the program to record progress.

Subjects were also instructed to implement a spouse (significant other for individuals groups) monitoring process for specified behaviors. Each participant chose two behaviors which they would practice during the week and spouses chose "secret" times to monitor the behavior. Spouses also chose one behavior to monitor which the other member had not mentioned. A method of rating the behaviors was provided and participants were instructed to discuss the results at their weekly weigh-in and meeting.

Session 15. Graphs of progress and experience with the spouse monitoring system were reviewed.

A tape of interviews concerning eating behaviors of normal weight people was presented. Some people interviewed had a history of overweight and had overcome the problem while others interviewed had always been normal weight. Reactions to the interviews were discussed and comparisons made between participants' eating behaviors and interviewed persons' habits.

Session 16. Subjects participated in a "practice meal" in which various techniques were rehearsed. These included recording pre-planning, eating slowly leaving food on plate, spouse monitoring and reward contracting. Recipe books (collated from recipes donated to the book by group members) were distributed during the meal to serve as a delay in eating. Experiences with the techniques practiced were discussed and compared to experiences at home.

Session 17. The antecedent, behavioral and consequential components of weight control were reviewed. Each participant rated his/her progress by outlining the techniques which were presently used. A list was then made of techniques which each subject believed would assist them in weight control efforts. A discussion of what had prevented participants from implementing these procedures was held. Each participant chose one new technique to try and a specific system of evaluation was outlined.

Session 18. The session focused on problematic eating behaviors during holidays. The antecedents, behaviors and consequences of overeating experiences for Halloween and Thanksgiving were determined. Each participant formulated a specific plan for Thanksgiving which included pre-recording, recording food intake and specific individual techniques to overcome targeted problem behaviors.

Session 19. Each participant's progress in controlling problematic eating during holidays was shared. Discussion focused on difficulties of recording food intake and how each persons avoids doing so. A new system of recording was presented in which various colored pieces of construction paper represented

different exchanges. Participants were instructed to use this "banking" system to keep track of food intake and practice examples were given.

Session 20. Subjects participated in a practice holiday party in which various techniques were rehearsed. These included recording, pre-planning, eating more slowly, and techniques to control snacking. A game was played to review nutrition and exercise information and provide a delay in eating. Experiences were discussed and compared to other holiday party experiences.

Session 21. Each participant was asked to assess their progress in the program and to compare it to expectations. Group members were asked to evaluate what techniques have been most helpful as well as what factors have prevented them from moving closer to their goal. Expectations for continued weight loss and weight loss maintenance were explored and techniques for weight maintenance were reviewed.

Evaluation of the program was also discussed and feelings about program termination were explored.

Affective control group. The following outline summarizes the new material presented for sessions of the Affective Control Group. Each meeting also included a review of homework assignments. Exercise and nutrition information was provided as described above in the Procedure for all Groups.

Session 1. As mentioned in the preceding outline of Procedure for all Groups, the dietary management plan was presented and discussed in detail.

Participants were instructed to record daily food intake according to the exchange plan. Discussion focused on factors contributing to obesity (e.g., increase in high caloric "fast foods" consumed) and myths of dieting (certain foods have negative calorie values). Each participant shared past experiences with dieting and evaluated their success or failure in each.

A general overview of the weight loss program was presented and the connections between emotions and overeating were discussed.

Session 2. An overview of affective control weight loss program was presented in this session. The "viscious circle" of negative emotions, overeating, and negative self-talk was explained. Intervention can occur at various points on the circle and the first intervention focused on changing negative self-talk to positive self-talk. Participants were asked to familiarize themselves with their own self-talk. This process was initiated by examination of self-image and body-image through various discussions and exercises during the session and methods for changing negative self-talking, irrational self-beliefs, to positive self-talk were described and practiced.

Session 3. The importance of positive self-talk and the results of negative self-talk and irrational self-beliefs were further discussed in this session. Theoretical explanations for the origin of negative self-talk were given and the point was stressed that learned behavior can be changed with practice. Some of the topics relating to self-talk covered in this session were:

1. The uselessness of overweight people comparing their appearance and eating habits to non-overweight friends and family.
2. The attempt to blame a weight problem on family, friends, metabolism or "glands".
3. Using an overweight condition as a "cop out" or excuse.
4. The significance and effects of "fat jokes".

Several exercises to practice changing negative self-talk to positive self-talk and irrational self-beliefs to rational self-beliefs were conducted.

Session 4. For many people, states of emotional arousal can trigger overeating. Sometimes food can be used as a pacifier or as compensation for negative emotions such as depression and anxiety. In Session 4, participants discussed how they used food and how they learned to use food as a substitute for love, companionship or facing problems. Possible ways of handling emotions in ways other than turning to food were presented:

1. acquiescing to the emotion and suffering;
2. changing the situation that causes the negative emotion and breaking the cycle of negative feelings (overeating, feeling guilty for overeating;
3. deal with the emotion in an appropriate way.

A skill that was often helpful in changing "offending situations" was assertiveness. A modified course in assertiveness training was presented and the



participants practiced their skills by role playing situations common to dieters. Also discussed were reasons family and friends sometimes hinder weight loss efforts.

Session 5. The relationship between emotions and overeating was further examined in this session. In particular, the relationship of anxiety, overeating and bingeing was examined. Bingeing, or overeating without control, can be a by-product of anxiety and sometimes anxiety can be mistaken for appetite or hunger. Causes and symptoms of anxiety were discussed and various methods of controlling bingeing and dealing with anxiety, such as positive self-talk, exercise, confronting the problem and relaxation, were presented. As a prelude to the introduction of systematic muscle relaxation, participants were asked to focus on the tense parts of their bodies and the relationship between anxiety and muscle tension was explained.

Session 6. Participants were asked to focus on their bodies and rate, on a scale of one to ten (where one is very relaxed and ten very tense) how they were feeling. They were then taught and took part in systematic muscle relaxation and again rated their feelings of relaxation. Problems with the exercise were discussed and a schedule for practicing the skills was implemented. In addition, ways to use relaxation to aid in diet efforts, feelings of anxiety and other negative emotions were examined.

Session 7. In this session, participants were taught how to use visual imagery and cognitive reinforcement and punishment as weight control techniques. First, participants were asked to describe negative aspects of being overweight (such as low self-esteem, health risks, etc.) and the positive aspects of being at a normal weight. They were asked to visualize themselves as overweight and to experience the accompanying negative feelings; then, they were asked to visualize themselves at a normal weight and associate that image with feelings of relaxation and positive self-statements. Visual imagery and cognitive reinforcement and punishment were practiced using the following scenes:

1. a buffet dinner;
2. binging;
3. a "hard to resist" food.

In addition, participants were cautioned not to eat when tired and to continue distinguishing between eating because of emotions and eating because of hunger.

Session 8. At this point in the program, participants were asked to reassess their motivation for losing weight. Reasons for discouragement were examined and the reasons for weight loss plateaus were discussed. Participants role played techniques such as positive self-talk to overcome times of discouragement and plateaus. (In the couples groups spouses learned how to support and help each other through difficult times.) During the last half of the session, participants practiced systematic muscle relaxation.

Session 9. The concept of "favorite foods" was introduced.

In addition individuals participated in the "Nutrition Bowl", a game based on facts of nutrition, diet and exercise.

Session 10. A modified communication workshop was presented and the differences between positive and negative communications was discussed. Participants were taught the aspects of good communication and constructive criticism and role played weight related situations using communication and assertive skills. In addition, participants gave their own examples of positive and negative statements they received in the past week about their appearance or eating habits and these situations were role played focusing on how to deal with both negative statements and compliments.

Session 11. Competition and sabotage of weight loss were the main topics of this session. Participants were asked to discuss their feelings of competition with others (other individuals in the group, spouses, etc.) in their weight loss efforts. Some suggestions for handling feelings of competition were:

1. Using communication and assertive skills to open talk about feelings.
2. Remembering that people lose weight at different speeds and to use positive self-statements about your own weight loss.

Individuals related their experiences of sabotage of weight loss efforts by spouse and friends and discussed how to change this type of interaction. In addition, how and why individuals can sabotage their own weight losses or conspire with a friend or a spouse to overeat together was examined. Role play was used as a technique to change and understand this self-defeating behavior.

The second part of the session reviewed skills of positive self-talk and further stressed the importance of changing body-image as weight was lost. Suggested ways to accomplish a change in body-image were giving away or altering clothes that were too large, shopping for clothes that fit, trying on clothes as weight was lost, looking in full length mirrors and beginning to "act and think thin".

Session 12. Many people state that they overeat or binge when they feel depressed, lonely or just slightly "blue". In this session causes and symptoms of depression were discussed and special attention was paid to depression centering around weight problems and overeating. Ways of coping with depression without overeating were presented. Suggestions included exercising, finding the cause of depression, appropriately expressing feelings, examining lifestyle, adding something new to life, and seeking professional help. Participants were also given a bibliography on depression.

Session 13. Discussion of the causes and methods of coping with depression was continued. Major topics presented were:

1. Differences between chronic and acute depression.
2. Difficulties in living with someone who is depressed.
3. How to help a spouse or friend who is depressed.

Participants were asked to divide themselves into two groups: those people who tended to overeat when they were feeling sad or depressed and those who handled depression in other ways. The first group discussed the question, "Did you start overeating because of depression and sadness, and/or do you presently overeat when you are feeling depressed?" The second group discussed the question, "How do you deal with depression; do you consciously avoid food when feeling down?"

Session 14. Review sheets were distributed and examined. Participants were asked to choose two techniques to practice each week and the technique of monitoring was explained. Each participant asked their spouse (in couples group) or significant other (in individuals group) to monitor the chosen techniques at least twice a week.

Review of imagery techniques and the use of negative imagery (imagining eating and feeling bloated) was also covered in this session.

Session 15. A tape of interviews concerning eating behaviors of normal weight people was presented. Some people interviewed had a history of obesity and had overcome the problem, while others had always been normal weight. Reactions to the interviews were discussed and comparisons made between



participants' attitudes about food and the interviewees' attitudes about food.

Session 16. For this session, participants brought a low-calorie "covered dish" and dinner was eaten. Everyone recorded what was eaten and practiced techniques learned in the program such as positive self-talk, assertiveness, visual imagery and cognitive reinforcement and punishment.

Session 17. In this session participants talked about their commitment to weight loss and how they were feeling about the program and their own success or failure. An assessment of problem eating was made by each individual by writing down their initial problems with overeating (such as eating when anxious; negative self-talk, etc.) and what they had done about these problems so far. Participants then divided into small groups to discuss suggestions for further handling eating problems.

Session 18. A "problem solving technique" to be used over the holidays was introduced. The plan was explained by asking volunteers to describe incidents of overeating in the past month in the following method:

1. General mood during the day.
2. Emotions experienced before overeating.
3. Self-talk before overeating.
4. Emotions and self-talk while eating.
5. Emotions and self-talk after eating.

The volunteers role played the situation by substituting positive self-talk for negative self-talk, using assertive and communication skills where applicable and describing ways, other than eating, to deal with emotions triggering "binges".

Participants were asked to gather data for two weeks to become aware of their problems, situations, and talk with a spouse or friend on ways to change inappropriate behavior. A plan was then to be written on how to handle "danger times".

The second part of the session was devoted to talking about how to eat sensibly at Thanksgiving and participants role played how to refuse seconds from their mothers-in-law and how to resist the second helping of dressing and pie. Some participants made a contract to record on Thanksgiving.

Session 19. Weight loss maintenance was the focus of this session. Some difficulties of weight loss maintenance were mentioned, for example:

1. The difficulty of not working toward a well defined goal.
2. The panic of gaining any weight back.
3. Knowing how much to eat to maintain goal weight.
4. Motivation.
5. Appropriate change in body-image.

Some suggestions to help with maintenance were:

1. Set a goal of never gaining more than two pounds.
2. If two pounds are gained, immediately begin the 1200 food exchange.

3. Practice techniques to change body-image.
4. Maintain exercise program.

People who had not reached goal talked about how they felt about progress in the program and problems they had experienced related to weight loss.

Session 20. A practice holiday party took place during this session. Participants brought low-calorie cocktail food and drinks (non-alcoholic). Various techniques learned during the program were practiced and a game was played with questions about calorie content of holiday food.

Session 21. During this final session, individuals evaluated their own success in the program as far as changing attitudes about food, learning to deal with emotions without eating, changing negative self-talk to positive self-talk and weight loss. Evaluation of the program also took place and initial results of the research were given. Weight loss maintenance was again covered and good-bys were said.

#### Procedure for Drop-Outs

As mentioned in the explanation for the deposit contract, drop-outs agreed to be weighed and complete a questionnaire. Three months after treatment began, drop-outs were called by the therapists and asked to attend the next session (Session 12) for weigh-in purposes only. They were reminded that they would receive a \$5.00 deposit refund for weighing-in according to the initial contract.

Only a few drop-outs came to the session, consequently the therapists decided to change the data collection procedure so that information on more drop-outs could be obtained.

Therefore, eight months after treatment began (Session 16), drop-outs were selected randomly to be weighed. A research assistant contacted the drop-outs and set up an appointment to weigh them at their homes. Drop-outs were weighed on the program's Ellman's Doctor's Scale and also completed the drop-out questionnaire. All data was collected within one week of initial contact and the regular program meeting.

At the end of the treatment program (Session 21) all drop-outs were contacted by a therapist and asked to weigh in one of two methods:

1. If a Doctor's Scale was readily available, they were asked to weigh that day with their spouse present and to report back together on the same day to the therapist.
2. If a Doctor's Scale was not available, they were asked to weigh on their own scales with their spouse present while the therapist was on the telephone. Drop-outs were questioned as to the reasons they dropped out.

#### Measures and dependent variables

Weights were obtained at each session and analyzed over the following times:

Initial Weight	Session 1
Two Months	Session 9
Four Months	Session 12
Eight Months	Session 16
Ten Months	Session 18
One Year	Session 21

Drop-out weights were obtained at eight months and one year.

Based on weights taken at these times, the following measures were calculated:

1. Reduction Coefficient (Feinstein, 1959). This measure was calculated to determine initial differences in mean weight among groups according to the following formula:

$$\frac{\text{initial weight}}{\text{surplus weight} \times \text{ideal weight}} \times 100$$

Ideal weights were obtained from the normative tables published by the Metropolitan Life Insurance Company (1969).

2. Reduction Index (Feinstein, 1959). This was calculated according to the following formula:

$$\frac{\text{weight loss}}{\text{surplus weight}} \times \frac{\text{initial weight}}{\text{ideal weight}} \times 100$$



3. Percentage of Excess Weight Lost. Percentage of excess weight lost was calculated as follows:

$$\frac{\text{initial weight} - \text{ideal weight}}{100}$$

Percentage of excess weight lost was then calculated by:

$$\frac{\text{weight loss}}{\text{percentage of excess weight}}$$

4. Pounds Lost

### Questionnaires

Eating Patterns Questionnaire (Appendix 6). A modification of Wollersheim's Eating Patterns Questionnaire (1970) included information on daily eating habits, eating during specific situations, eating when emotional, and spouse helpfulness during specific situations. Participants completed the following questions:

1. In which of the following specific situations do you eat?  
(1 = almost never to 5 = almost always.) Examples include watching television, playing cards and reading. Scores were summed over the fifteen questions to give a total score for eating during specific situations (ESS) with a range of 1 - 75.

2. During which of the following emotional times do you eat?  
(1 = almost never to 5 = almost always.) Examples include when depressed, angry or anxious. Scores were summed over the seven questions to give a total score for eating during emotional times (EET) with a range of 1 - 35.
3. How helpful is your spouse in your attempts to reduce weight in the following situations? (1 = almost never helpful to 5 = almost always helpful.) Examples include at meal time and at a restaurant. Scores were summed over the nine questions to give a total score for spouse helpfulness during specific situations (SHS) with a range of 1 to 45.

The Eating Patterns Questionnaire was administered at Sessions 1, 13, and 21.

Beck Depression Inventory. This instrument, developed by Beck (1972), is an objective self-report measure of depression. The inventory was designed to include all symptoms related to depression. Items are scored from zero to three, a higher score indicating a higher depression rating. A total is gained by summing all responses. The scoring takes into account the number of symptoms as well as the intensity of each. This questionnaire has been standardized and checked for internal reliability, concurrent validity and construct validity (Beck and Beamesderfer, 1974). This questionnaire was administered at Sessions 1 and 12.

Communications Inventory. The Communications Inventory is a slightly revised version of the Marital Communication Inventory (MCI) developed by Bienvenu (1970). The revisions were made by Stanley Witken and Sheldon Rose (1976) to reflect the high incidence of unmarried cohabitating couples. Thus words referring to marriage were changed to relationship and husband and wife to partner or mate. This revision also permitted the use of one inventory form for both males and females rather than the separate ones developed by Bienvenu.

The inventory consists of forty-six items describing various aspects of couple communication. The items were designed to measure various communication processes such as the ability of a couple to express themselves and their style of expression. It considers nonverbal as well as verbal modes of communication.

Items are scored from zero to three, a higher score indicating a favorable response, and the total score is obtained by summing all responses. Several studies have validated this inventory (Bienvenu, 1970; Murphy and Mendelson, 1973; Larsen, 1974; Witken and Rere, 1976).

Participants completed the questionnaire at Sessions 1, 12, and 21.

Generalized Expectancy for Success Scale. This scale measures an individual's expectancy for success including the ability to obtain positive reinforcement and to reach desired goals. Hale and Fibel (1976) assessed the scale for internal consistency and construct validity and concluded that the instrument is psychometrically sound and of predictive utility.

Each item is scored from one to five with a positive score indicating a higher expectancy for success. A total score is obtained by summing all responses.

The scale was administered at Sessions 1, 13, and 21.

Weight History Questionnaire (Appendix 3). The weight history questionnaire assesses weight gain since marriage, onset of obesity -- child, adolescent or adult, and number of family members who have been or are overweight. Spouse's attitude toward the participant's weight problem is rated from one to six (1 = very concerned; 6 = very unconcerned). Spouse helpfulness in past weight loss attempts is assessed in the same method. The Weight History Questionnaire was answered by participants at the Screening Session.

Weight Reduction Program Questionnaire (Appendix 7). A modified Weight Reduction Program Questionnaire (Christenson, Jeffrey and Pappai, 1976) was completed by participants at Session 1 of the weight loss program. This questionnaire assesses number and type of previous weight loss attempts and participant's desired weight and weight loss. Self-motivation to lose weight is assessed by a sum total of five questions rated from one to seven for a total possible score of 1 to 35. Control in losing weight is rated on a scale of one to seven and desire for external praise for weight loss efforts is represented by a total possible score of 1 - 56 calculated from responses to eight questions rated on a scale of one to seven.

Weight Factors Scale (Appendix 8). This questionnaire is a modified and extended version of Rosenthal's (1976) Weight Factors Questionnaire. Participants were asked to rate, on a scale of 1 - 5, effectiveness of weight loss methods and treatment components. Part 1 is answered by all participants and is concerned with common treatment components of both Affective and Stimulus Control Groups such as group meetings, weighing in before meetings, and exercise. Part 2 is different for the two groups and asks questions about components of the specific treatment groups. Part 3 consists of questions pertaining to factors negatively influencing weight loss, and Part 4 is answered by couples groups and investigates the factors of couples participating in the weight loss program. The Weight Factor Scale was administered at Session 12 (four months).

Self-Evaluation Questionnaire (Appendix 9). At Session 12 (4 months) participants were asked to rate, on a scale of 1 - 5, six questions concerning their performance in the weight loss program.

Self-Evaluation Questionnaire (Appendix 10). At the final session (one year) participants were asked to rate, on a scale of 1 - 5, eight questions concerning their performance in the year long weight loss program.

Drop-Out Questionnaire (Appendix 11). This questionnaire was administered to drop-outs who were asked to rate, on a scale of 1 - 5, factors influencing premature termination from the weight loss program.



## CHAPTER III

### RESULTS

The results of this study are divided into three parts corresponding to the hypotheses. Preceding each section will be a summary of the results to be presented. Section One includes analysis of weight measures for the major treatment groups and various sub-groups, analyses of eating patterns, and analyses of various other self-report questionnaires. Section Two examines the performance of drop-outs versus non-drop-outs including weight measures and questionnaire data. Section Three assesses the effectiveness of various treatment components and overall success or failure of the weight loss program.

#### Section One

The analysis of data was undertaken with these goals in mind: a) To examine the possible pre-treatment differences among groups; b) to examine the general and comparative effectiveness of Stimulus Control versus Affective Control for the treatment of obesity; c) to assess the general and comparative effectiveness of spouse participation in weight control; d) to determine overall treatment effects for females only; e) to assess the effect of spouse's weight on participant's performance; f) to compare the performance of males and females; g) to investigate the relationship

between age of onset of obesity, age, and prior attempts at dieting with weight loss; h) to analyze changes in eating patterns; i) to evaluate the overall changes and correlation with weight loss for depression, communication skills and expectancy for success.

### Measurements of Weight: Major Treatment Effects

Pre-treatment differences. There were no significant pre-treatment differences between Stimulus Control and Affective Control Groups with respect to RC ( $F = .177$ ;  $df = 1, 166$ ), mean percentage overweight ( $F = .713$ ;  $df = 1, 166$ ) and mean body weight ( $F = .041$ ;  $df = 1, 166$ ). Similarly, there were no significant pre-treatment differences between Couples and Individuals Groups with respect to RC ( $F = 1.017$ ;  $df = 1, 166$ ), mean percentage overweight ( $F = 3.325$ ;  $df = 1, 166$ ) and mean body weight ( $F = .205$ ;  $df = 1, 166$ ).

Explanation of analyses. Repeated measures analysis of variance of RI, percentage of excess weight lost and pounds lost were conducted over the following times:

TABLE 1  
REPEATED MEASURES ANALYSIS OF VARIANCE  
FOR WEIGHT MEASURES

<u>Analyses</u>	<u>Number of Subjects</u> (Initial N = 178)	<u>Sessions</u>	<u>Months</u>
1	N = 148	1-9	Initial Weight (1) - 9
2	N = 137	1-9-12	1-2-4
3	N = 80	1-9-12-16	1-2-4-8
4	N = 71	1-9-12-16-18	1-2-4-8-10
5	N = 69	1-9-12-16-18-21	1-2-4-8-10-12

Due to a high number of drop-outs at different times during the year-long program, repeated measures analyses of variance were conducted at various stages for a more accurate assessment of treatment effects over time.

In the following reports of results, these five repeated measures will be referred to as Analysis 1 through 5.

Overall treatment effects. For each analysis all treatment groups (SC-I; SC-C; AC-I; AC-C) lost a significant amount of weight according to RI, percentage excess weight lost and pounds lost. There were no significant differences for any of these measures between Stimulus Control Group and Affective Control Group for any of the five time periods. However, there were significant differences between Couples and Individuals Groups.

Analysis 1 (Session 1-9, 1-2 months). The mean RI, percentage excess weight lost and pounds lost for the four treatment groups (SC-I; SC-C; AC-I; AC-C) are shown in Table 2. Couples RI, 33.66, was significantly higher than Individuals RI, 24.83 ( $F = 4.31$ ;  $df = 1, 144$ ;  $p < .04$ ). The repeated measures analysis of variance is summarized in Table 3. No significant differences were found for percentage of excess weight lost or pounds lost.

Analysis 2 (Session 1-9-12, 1-2-4 months). The mean RI, percentage excess weight lost and pounds lost for the treatment groups are shown in Table 4. There were no significant differences for these three measures; however, there was a trend for Couples RI, 42.05, to be higher than Individuals RI, 33.04 ( $F = 3.02$ ;  $df = 1, 133$ ;  $p < .08$ ).

Analysis 3 (Session 1-9-12-16; 1-2-4-8 months). The mean RI, percentage excess weight lost and pounds lost for the treatment groups are shown in Table 5.

TABLE 2

MEAN RI, PERCENTAGE EXCESS WEIGHT LOST AND POUNDS  
LOST FOR ANALYSIS 1 (SESSION 1-9; 1-2 MONTHS)

	<u>Session</u>	<u>SC-I</u> ( <u>N=15</u> )	<u>SC-C</u> ( <u>N=42</u> )	<u>AC-I</u> ( <u>N=24</u> )	<u>AC-C</u> ( <u>N=67</u> )
RI	1-9	24.9	32.5	24.8	34.4
Percent Excess Weight Lost	1-9	15.9	20.8	19.8	25.7
Pounds Lost	1-9	11.8	10.1	9.1	11.4

TABLE 3

REPEATED MEASURES ANALYSIS OF VARIANCE FOR  
RI FOR ANALYSIS 1 (SESSION 1-9; 1-2 MONTHS)

<u>Source</u>	<u>SS</u>	<u>DF</u>	<u>MS</u>	<u>F</u>
Mean	92391.10	1	92391.10	197.41
B	22.94	1	22.94	0.05
I	2015.56	1	2015.56	4.31*
BI	24.22	1	24.22	0.05
Error	67393.83	144	468.01	

\* $p < .04$

TABLE 4

MEAN RI, PERCENTAGE EXCESS WEIGHT LOST AND POUNDS  
LOST FOR ANALYSIS 2 (SESSION 1-9-12; 1-2-4 MONTHS)

	<u>Session</u>	<u>SC-I</u> (N=13)	<u>SC-C</u> (N=36)	<u>AC-I</u> (N=22)	<u>AC-C</u> (N=66)
RI	1-9	24.7	33.5	27.3	34.6
	1-12	35.0	42.1	31.9	42.0
% Excess Weight Lost	1-9	15.5	21.0	21.7	25.9
	1-12	21.5	26.9	24.7	33.9
Pounds Lost	1-9	12.2	10.2	10.1	11.4
	1-12	16.9	12.7	11.9	14.2

TABLE 5

MEAN RI, PERCENTAGE EXCESS WEIGHT LOST AND POUNDS LOST  
FOR ANALYSIS 3 (SESSION 1-9-12-16; 1-2-4-8 MONTHS)

	<u>Session</u>	<u>SC-I</u> (N=10)	<u>SC-C</u> (N=20)	<u>AC-I</u> (N=16)	<u>AC-C</u> (N=34)
RI	1-9	21.7	39.1	31.0	39.3
	1-12	34.5	49.9	35.8	52.5
	1-16	38.1	58.4	37.5	54.5
% Excess Weight Lost	1-9	13.2	22.3	22.3	31.4
	1-12	20.5	29.7	25.3	43.9
	1-16	23.6	38.6	25.5	45.6
Pounds Lost	1-9	11.6	10.6	11.6	12.9
	1-12	17.8	13.3	13.9	17.2
	1-16	21.6	17.3	16.3	18.9



Couples RI, 55.93, was significantly higher than Individuals RI, 37.70 ( $F = 5.11$ ;  $df = 1, 76$ ;  $p < .03$ ). The repeated measures analysis of variance is summarized in Table 6, and mean RIs are illustrated in Figure 1. No significant differences were found for percentage of excess weight lost or pounds lost.

Analysis 4 (Session 1-9-12-16-18; 1-2-4-8-10 months). The mean RI, percentage excess weight lost and pounds lost for the treatment groups are shown in Table 7. The means for these three measures are higher at the time of this analysis than at any other point in the program except for AC-C treatment group which had its highest means at Analysis 3. No significant differences were found between Couples and Individuals for any of the three measures.

Analysis 5 (Session 1-9-12-16-18-21; 1-2-4-8-10-12 months). The mean RI, percentage excess weight lost and pounds lost for the treatment groups are shown in Table 8.

Mean RI for the 69 participants who completed the entire program were: SC-I, 43.68; SC-C, 55.23; AC-I, 39.27; AC-C, 62.25. Mean RI for Couples was 59.70, and for Individuals was 40.86. The mean RIs are illustrated in Figure 2. There was a trend ( $F = 3.61$ ;  $df = 1, 65$ ;  $p < .06$ ) for Couples RI to be larger than Individuals RI.

Mean percentage excess weight lost were: SC-I, 24.23; SC-C, 39.20; AC-I, 26.84; AC-C, 52.32. Mean percentage excess weight lost for Couples was 47.55 and for Individuals was 25.89. The mean change in percentage excess weight lost are illustrated in Figure 3. There was a trend ( $F = 3.20$ ;  $df = 1, 65$ ;  $p < .08$ ) for Couples to lose a greater percentage excess weight than Individuals.

TABLE 6

REPEATED MEASURES ANALYSIS OF VARIANCE FOR RI FOR  
ANALYSIS 3 (SESSION 1-9-12-16; 1-2-4-8 MONTHS)

<u>Source</u>	<u>SS</u>	<u>DF</u>	<u>MS</u>	<u>F</u>
Mean	334086.47	1	334086.47	136.93
B	105.32	1	105.32	0.04
I	12468.42	1	12468.42	5.11*
BI	172.32	1	172.32	0.07
Error	185433.76	76	2439.92	
R	7245.27	2	3622.63	10.31**
RB	416.50	2	208.25	0.59
RI	278.57	2	139.28	0.40
RBI	228.16	2	114.08	0.32
Error	53407.55	152	351.37	

\*  $p < .03$

\*\*  $p < .0001$

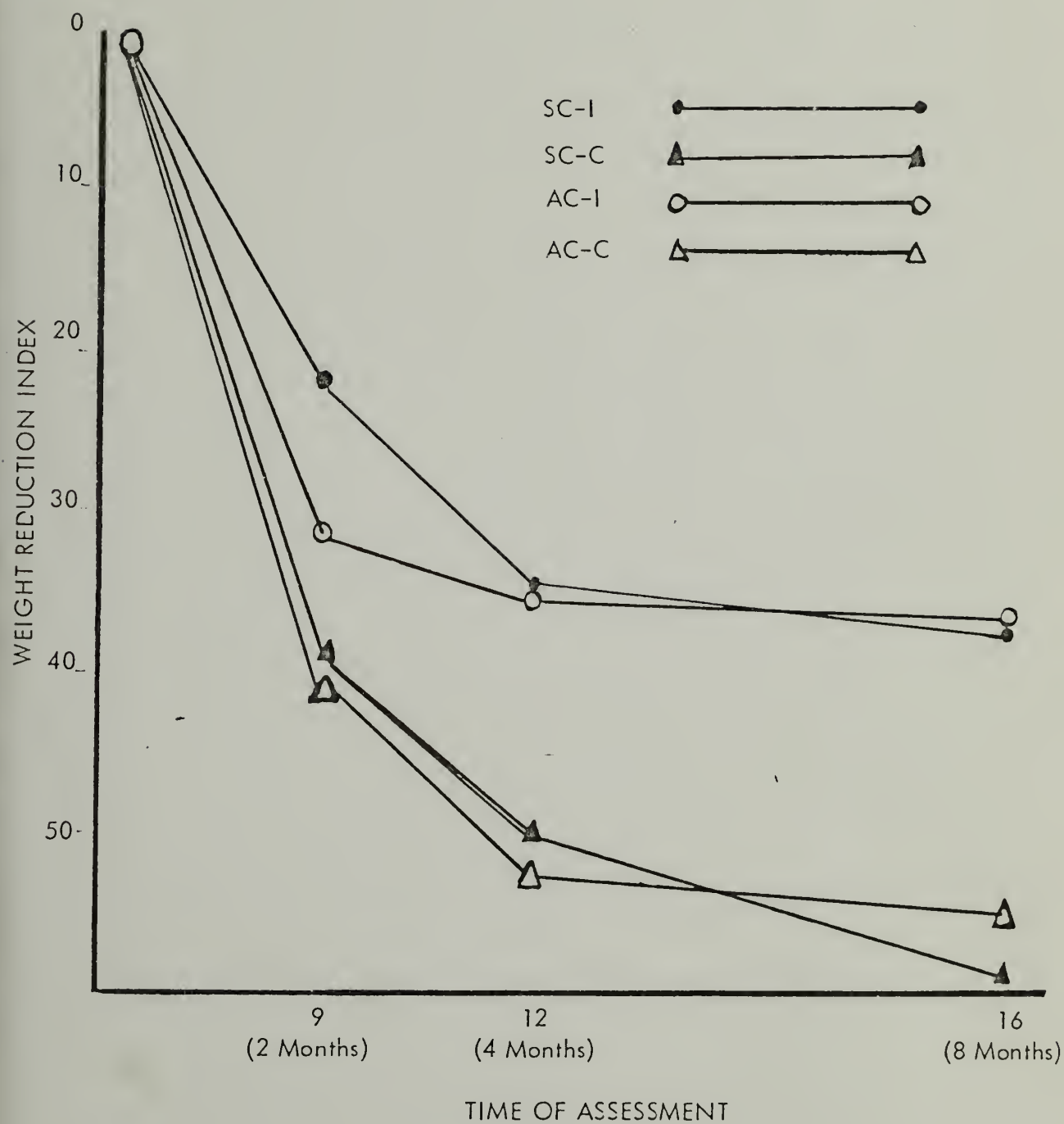


Figure 1. Mean RI By Treatment Group For Analysis 3 (Session 1-9-12-16)

TABLE 7

MEAN RI, PERCENTAGE EXCESS WEIGHT LOST AND POUNDS LOST  
FOR ANALYSIS 4 (SESSION 1-9-12-16-18; 1-2-4-8-10 MONTHS)

	<u>Session</u>	<u>SC-I</u> <u>(N=9)</u>	<u>SC-C</u> <u>(N=16)</u>	<u>AC-I</u> <u>(N=16)</u>	<u>AC-C</u> <u>(N=30)</u>
RI	1- 9	21.0	36.3	31.0	40.5
	1-12	34.6	44.2	35.8	55.0
	1-16	39.6	50.8	37.5	63.4
	1-18	54.1	57.9	43.6	59.9
Percent Excess Weight Lost	1- 9	12.5	26.7	22.3	33.3
	1-12	20.2	32.3	25.3	47.4
	1-16	24.3	36.3	25.5	58.5
	1-18	30.5	41.2	29.3	54.8
Pounds Lost	1- 9	11.7	10.7	11.6	13.3
	1-12	34.6	44.2	35.8	55.0
	1-16	39.6	50.8	37.5	63.4
	1-18	25.8	17.8	18.7	20.7

TABLE 8

MEAN RI, PERCENTAGE EXCESS WEIGHT LOST AND POUNDS LOST FOR  
ANALYSIS 5 (SESSION 1-9-12-16-18-21; 1-2-4-8-10-12 MONTHS)

	<u>Session</u>	<u>SC-I</u> <u>(N=9)</u>	<u>SC-C</u> <u>(N=16)</u>	<u>AC-I</u> <u>(N=16)</u>	<u>AC-C</u> <u>(N=28)</u>
RI	1- 9	21.0	36.3	31.0	42.2
	1-12	34.6	44.2	35.8	57.6
	1-16	39.7	50.8	37.5	67.7
	1-18	54.1	57.9	43.6	64.2
	1-21	43.7	55.2	39.3	62.2
Percent Excess Weight Lost	1- 9	12.5	26.7	22.3	34.9
	1-12	20.2	32.3	25.3	49.9
	1-16	24.3	36.3	25.5	62.4
	1-18	30.5	41.2	29.3	58.6
	1-21	24.2	39.2	26.8	52.3
Pounds Lost	1- 9	11.7	10.7	11.6	13.6
	1-12	18.2	13.0	13.9	18.4
	1-16	22.9	15.6	16.3	22.1
	1-18	25.8	17.8	18.7	21.6
	1-21	20.7	16.3	16.5	21.3



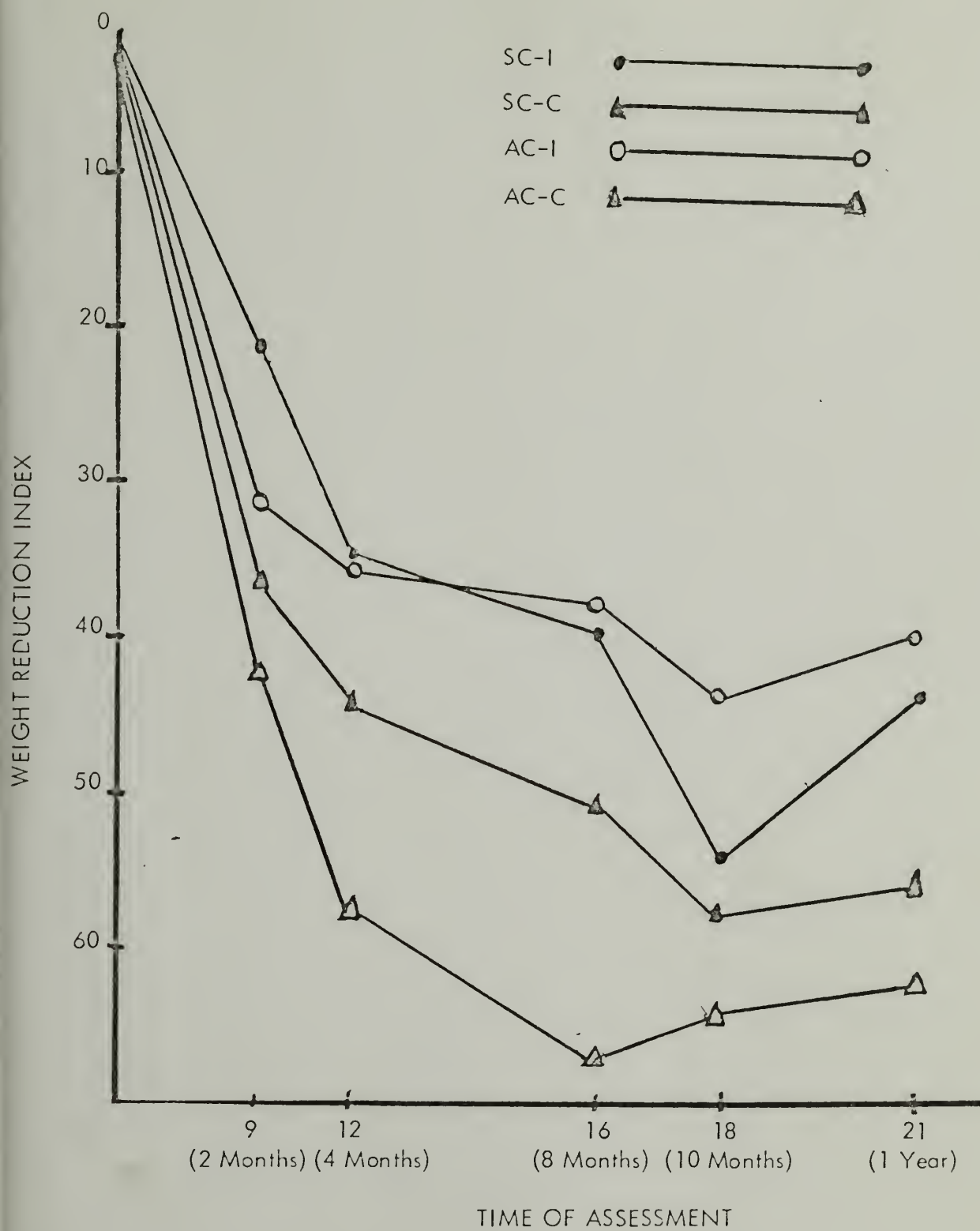


Figure 2. Mean RI By Treatment Group for Analysis 5 (SESSION 1-9-12-16-18-21)

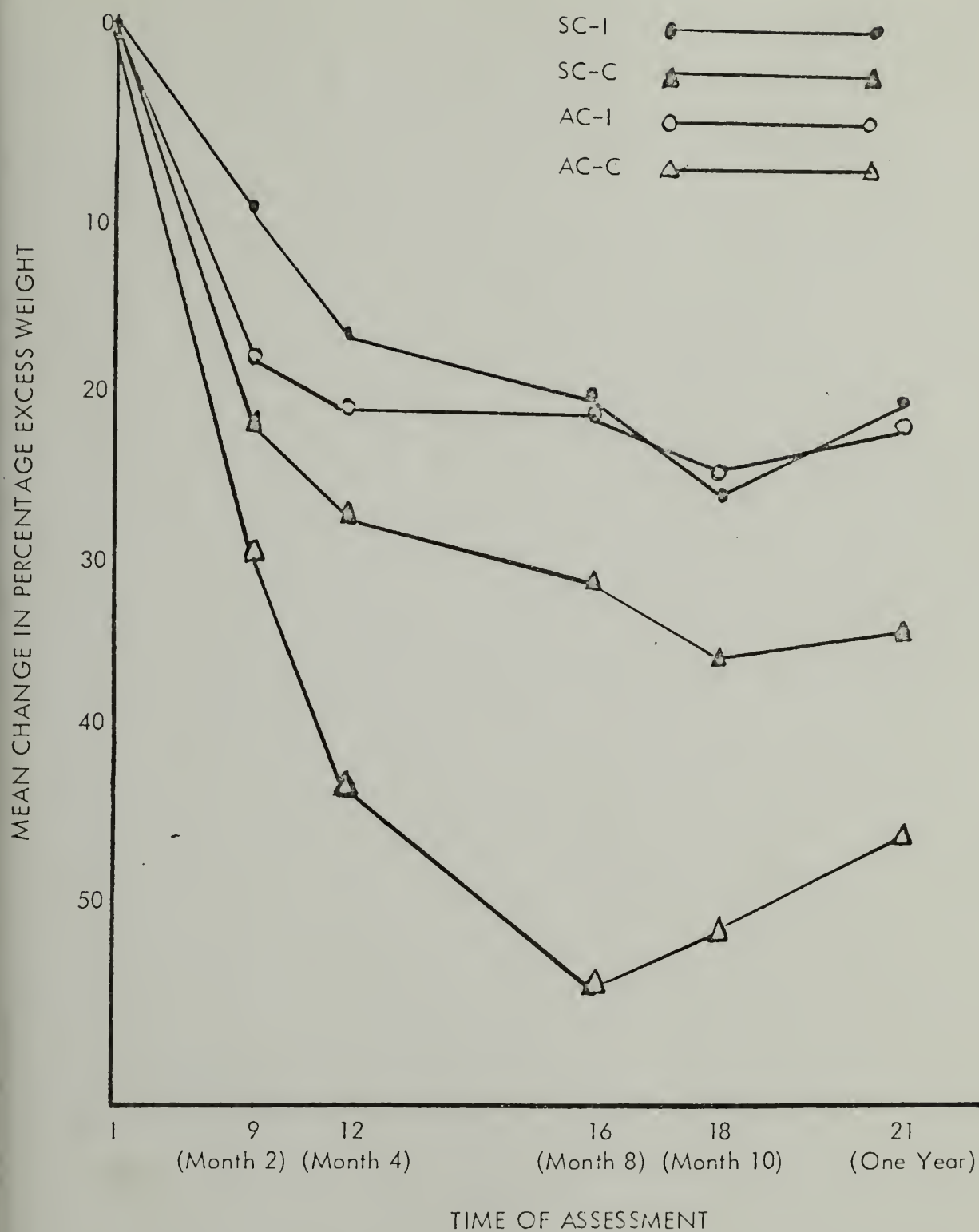


Figure 3. Mean Change in Percentage Excess Weight Lost Among Treatment Groups for Analysis 5 (Sessions 1-9-12-16-18-21)

Mean pounds lost were: SC-I, 20.67; SC-C, 16.32; AC-I, 16.52; AC-C, 21.30. Mean pounds lost for Couples was 19.49 and for Individuals was 18.00.

The mean weight change in pounds lost is illustrated in Figure 4. There were no significant differences between Couples and Individuals.

Results show that from Session 18 to 21 (10 months to 12 months) there were no overall additional increases in weight loss.

Summary. There were no significant differences for weight loss measures between Stimulus and Affective Control Groups; however, all groups lost a significant amount of weight from Session 1 to each time of analysis. For Analyses 1 and 3 (2 months and 8 months), Couples RI was significantly greater than Individuals RI and for Analyses 2 and 5 (4 months and 12 months), there was a strong trend in the same direction. However, there were no significant differences between Couples and Individuals for pounds lost or percentage excess weight lost.

The discrepancy in these results may reflect the fact that the initial RC for Couples was higher (though not significantly so) than for Individuals. Therefore, similar weight losses for Couples and Individuals would yield a higher RC for Couples.

Females only. Since most research in weight control has been conducted with females only, the following repeated measures analyses of variance were conducted to provide comparative data.

Initial analyses revealed no significant pretreatment differences between females in Couples Groups and females in Individuals Groups with respect to RC ( $F = 3.88$ ;  $df = 1, 95$ ).

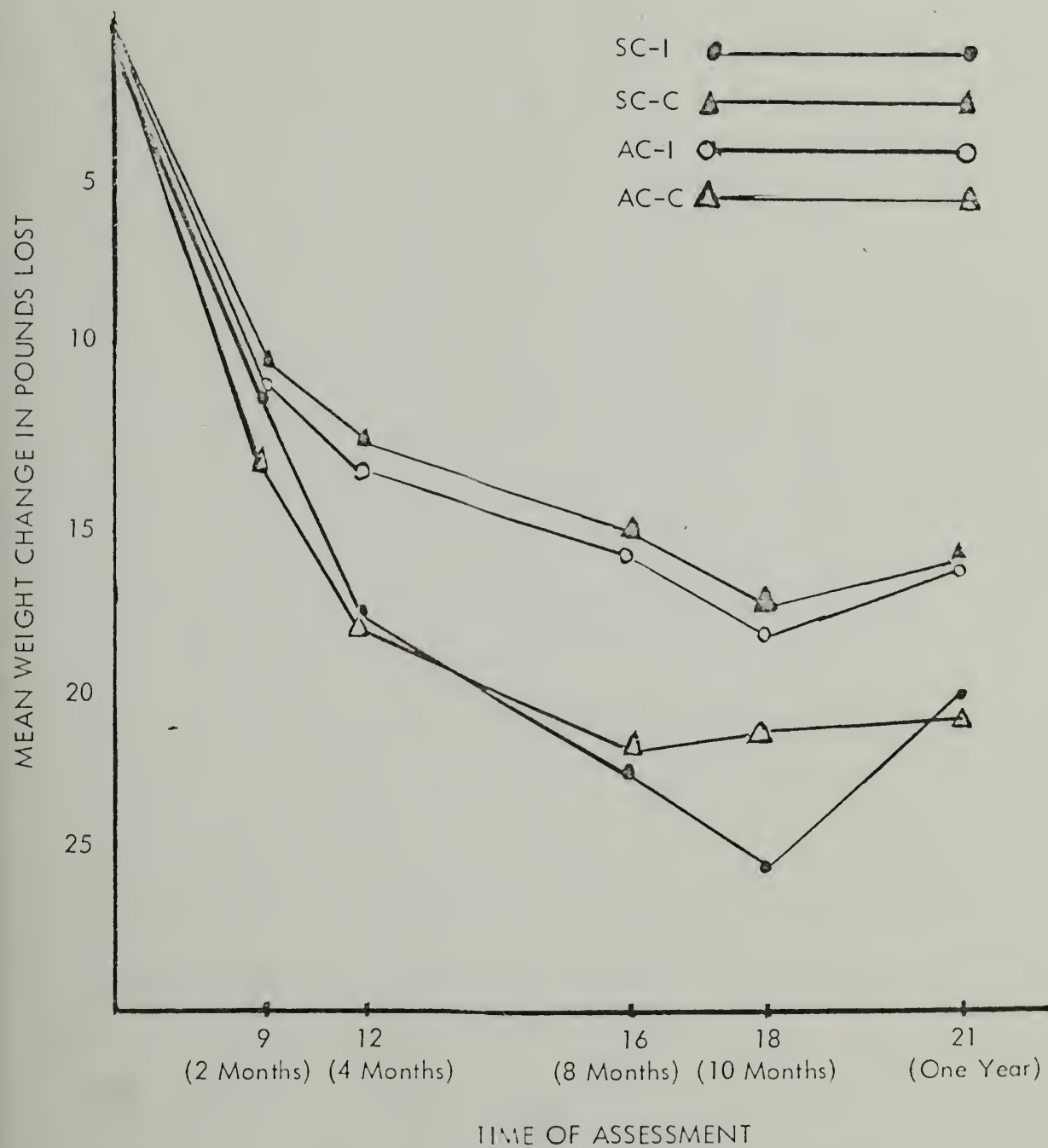


Figure 4. Mean Weight Change in Pounds Lost By Treatment Group For Analysis 5 (Sessions 1-9-12-16-18-21)

Potential differences between females in Couples and Individuals Groups were significant at the following times:

Analysis 2 (Session 1-9-12, 1-2-4 months). The mean RI and pounds lost for the four treatment groups are shown in Table 9. Females in Couples RI, 46.27, was significantly larger than females in Individuals RI, 32.70 ( $F = 5.66$ ;  $df = 1, 76$ ;  $p < .02$ ). However, there were no significant differences in pounds lost. The repeated measures analysis of variance is summarized in Table 10.

Analysis 5 (Session 1-9-12-16-18-21; 1-2-4-8-10-12 months). The mean RI and pounds lost for the treatment groups are presented in Table 11. The mean RI for females in Couples Groups who completed the year-long program was 65.60, and for females in Individuals Groups, 43.76. The RI for females in Couples was significantly higher than the RI for females in Individuals ( $F = 5.26$ ;  $df = 1, 40$ ;  $p < .03$ ). The repeated measures analysis of variance is shown in Table 12 and the mean RIs for females only are illustrated in Figure 5.

- Other analyses. Mean pounds lost did not differ significantly among treatment groups at any time during the program. In addition, there were no significant differences among SC and AC Groups in pounds lost or RI at any time.

Summary. The analyses for females only parallel the overall results of weight analyses for all participants. Females in Couples Groups had a significantly larger RI than females in Individuals Groups for Analyses 2 and 5. However, there were no significant differences in pounds lost.

Overweight participant-overweight spouse (OP-OS) and overweight participant-non-overweight spouse (OP-NS).



TABLE 9

MEAN RI AND POUNDS LOST FOR FEMALES ONLY,  
ANALYSIS 2 (SESSION 1-9-12; 1-2-4 MONTHS)

	<u>Session</u>	<u>SC-I</u> <u>(N=10)</u>	<u>SC-C</u> <u>(N=17)</u>	<u>AC-I</u> <u>(N=18)</u>	<u>AC-C</u> <u>(N=35)</u>
RI	1- 9	19.4	40.7	29.1	37.8
	1-12	30.0	49.3	34.2	44.8
Pounds Lost	1- 9	8.8	9.9	10.2	10.3
	1-12	13.6	11.9	12.3	12.5

TABLE 10

REPEATED MEASURES ANALYSIS OF VARIANCE FOR RI FOR FEMALES  
ONLY, ANALYSIS 2 (SESSION 1-9-12; 1-2-4 MONTHS)

<u>Source</u>	<u>SS</u>	<u>DF</u>	<u>MS</u>	<u>F</u>
Mean	167476.37	1	167476.37	129.15
B	88.25	1	88.25	0.07
I	7343.90	1	7343.90	5.66*
BI	933.18	1	933.18	0.72
Error	98557.13	76	1296.80	
R	2014.48	1	2014.48	11.08**
RB	104.22	1	104.23	.57
RI	0.13	1	0.13	.00
RBI	30.86	1	30.86	.17
Error	13819.35	76	181.83	

\*  $p < .02$ , \*\*  $p < .001$

TABLE 11

MEAN RI AND POUNDS LOST FOR FEMALES ONLY, ANALYSIS 5  
(SESSION 1-9-12-16-18-21; 1-2-4-8-10-12 MONTHS)

	<u>Session</u>	<u>SC-I</u> ( <u>N=8</u> )	<u>SC-C</u> ( <u>N=9</u> )	<u>AC-I</u> ( <u>N=13</u> )	<u>AC-C</u> ( <u>N=14</u> )
RI	1- 9	16.2	42.5	32.6	46.7
	1-12	28.7	51.1	39.1	65.9
	1-16	35.0	60.1	38.9	70.6
	1-18	53.1	69.4	47.5	67.9
	1-21	45.8	65.9	42.5	65.4
Weight Loss	1- 9	8.5	10.4	11.5	12.3
	1-12	14.1	12.0	14.5	17.0
	1-16	19.8	14.0	16.1	19.1
	1-18	24.1	16.6	19.7	18.7
	1-21	21.1	15.1	17.3	18.1

TABLE 12

REPEATED MEASURES ANALYSIS OF VARIANCE FOR RI FOR FEMALES ONLY,  
ANALYSIS 5 (SESSION 1-9-12-16-18-21; 1-2-4-8-10-12 MONTHS)

<u>Source</u>	<u>SS</u>	<u>DF</u>	<u>MS</u>	<u>F</u>
Mean	505719.29	1	505719.30	99.10
B	1317.43	1	1317.43	0.26
I	26841.89	1	26841.89	5.26*
BI	22.59	1	22.59	0.00
Error	204133.47	40	5103.34	
R	15301.86	4	3825.47	13.84**
RB	2214.49	4	553.62	2.00
RI	712.79	4	178.20	0.64
RBI	624.63	4	156.16	0.56
Error	44225.13	160	276.41	

\*  $p < .03$

\*\*  $p < .0000$

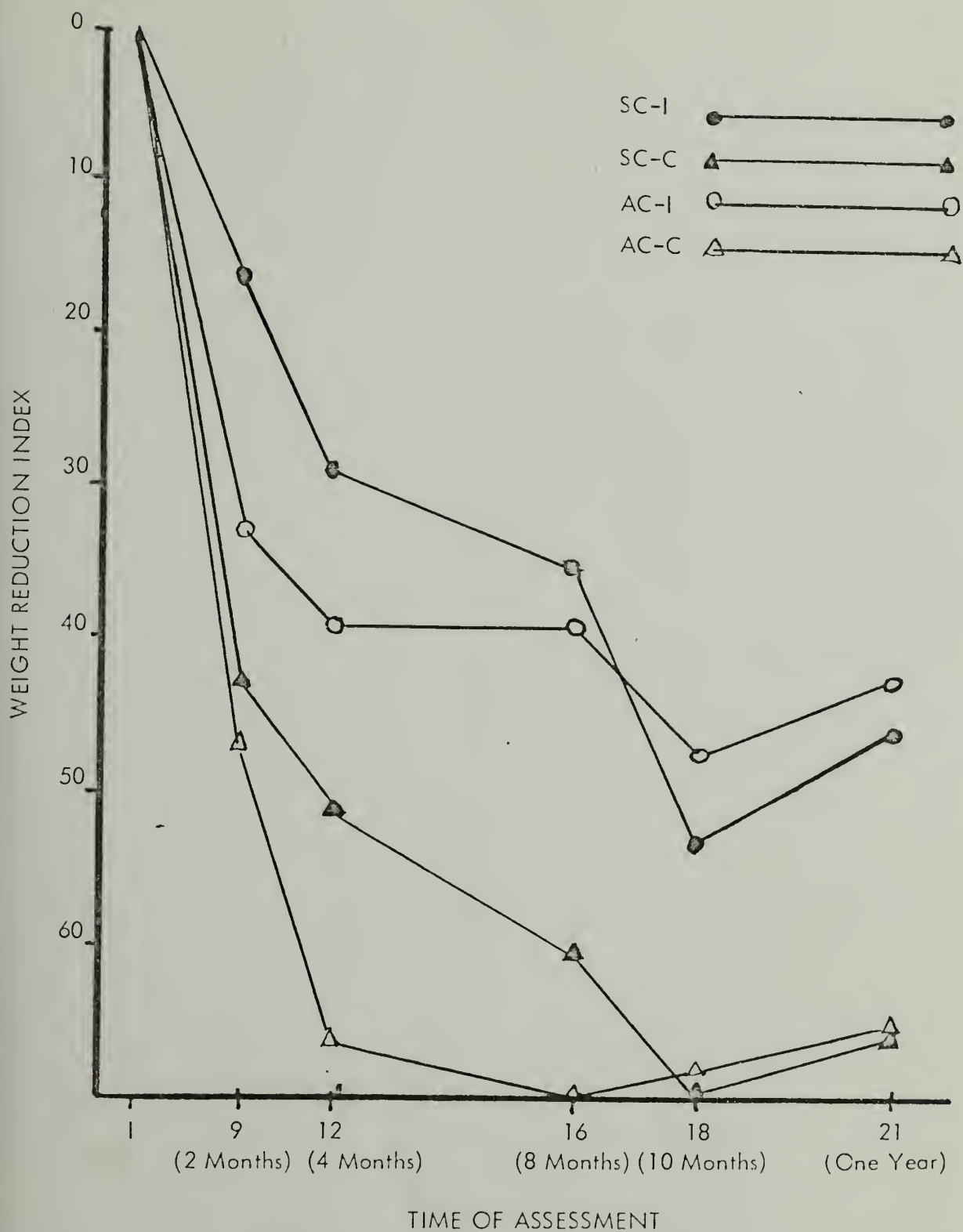


Figure 5. Mean RI by Treatment Group for Females Only, Analysis 5, Sessions 1-9-12-16-18-21

OP-OS vs. OP-NS: Overall results. A repeated measures analysis of variance (Session 1-9-12-21; 1-2-4-12 months) was conducted to examine the effect of an overweight spouse on treatment. There were no significant pretreatment differences between mean RC for OP-OS (3.34) and OP-NS (3.39) ( $F = .152$ ;  $df = 1, 168$ ). In addition, there was not a differential drop-out rate for OP-OS and OP-NS. The mean RI for each treatment group is shown in Table 13 and the mean pounds lost in Table 14.

There were no significant differences in either RI or pounds lost among treatment groups.

Due to a small number of OP-NS in Couples Groups, analyses comparing OP-NS and OP-OS were conducted only for Individuals Groups.

OP-OS vs. OP-NS: Individuals only. Pretreatment differences in mean RC were not significant among groups: OP-OS, SC-I = 3.9; OP-OS, AC-I = 3.6; OP-NS, SC-I = 2.5; OP-NS, AC-I = 2.8; OP-OS, overall = 3.76; OP-NS, overall = 2.68.

An analysis was conducted over three times during the program: Session 9-12-21 (2 months-4 months-1 year). Therefore, the analysis included only those participants who completed the year-long program. For purposes of clarification this analysis will be labeled Analysis 6 since other data reported later in the study were analyzed in this manner.

The mean RI for each treatment group are shown in Table 15 and the repeated measures analysis of variance in Table 16. OP-NS had a significantly larger RI over time than OP-OS ( $F = 7.05$ ;  $df = 2, 40$ ;  $p < .002$ ). Figure 6 illustrates the



TABLE 13

MEAN RI FOR OP-OS AND OP-NS ACROSS TREATMENT GROUPS,  
ANALYSIS 6 (SESSION 1-9-12-16; 1-2-4-12 MONTHS)

	<u>Session</u>	SC OP-OS (N=17)	AC OP-OS (N=29)	SC OP-NS (N=5)	AC OP-NS (N=15)
Pounds Lost	1- 9	30.31	41.22	31.04	33.78
	1-12	39.77	54.20	45.50	42.60
	1-21	44.75	56.58	70.58	44.88

TABLE 14

MEAN POUNDS LOST FOR OP-OS AND OP-NS ACROSS TREATMENT  
GROUPS, ANALYSIS 6 (SESSION 1-9-12-16; 1-2-4-12 MONTHS)

	<u>Session</u>	SC OP-OS (N=17)	AC OP-OS (N=29)	SC OP-NS (N=5)	AC OP-NS (N=15)
Pounds Lost	1 - 9	13.34	13.26	15.60	12.78
	1 - 12	13.71	17.36	22.90	16.33
	1 - 21	14.12	19.72	35.92	18.93

TABLE 15

MEAN RI FOR OP-OS AND OP-NS, INDIVIDUALS ONLY, FOR  
ANALYSIS 6 (SESSION 1-9-12-21; 1-2-4-12 MONTHS)

	<u>Session</u>	SC	SC	AC	AC
		OP-OS (N=5)	OP-NS (N=4)	OP-OS (N=3)	OP-NS (N=12)
RI	1- 9	18.0	24.7	36.2	31.3
	1-12	29.7	40.6	33.5	38.4
	1-21	22.4	70.3	12.4	45.4

TABLE 16

REPEATED MEASURES ANALYSIS OF VARIANCE FOR OP-OS AND  
OP-NS, INDIVIDUALS ONLY, FOR ANALYSIS 6  
(SESSION 1-9-12-21; 1-2-4-12 MONTHS)

<u>Source</u>	<u>SS</u>	<u>DF</u>	<u>MS</u>	<u>F</u>
Mean	62457.78	1	62457.78	29.72
B	27.38	1	27.38	0.01
O	3719.53	1	3719.53	1.77
BO	406.40	1	406.40	0.19
Error	42025.24	20	2101.2625	
R	1041.81	2	520.90	1.79
RB	2092.33	2	1046.17	3.60
RO	4095.43	2	2047.72	7.05*
RBO	47.07	2	23.53	0.08
Error	11616.63	40	290.42	

\* $p < .0024$

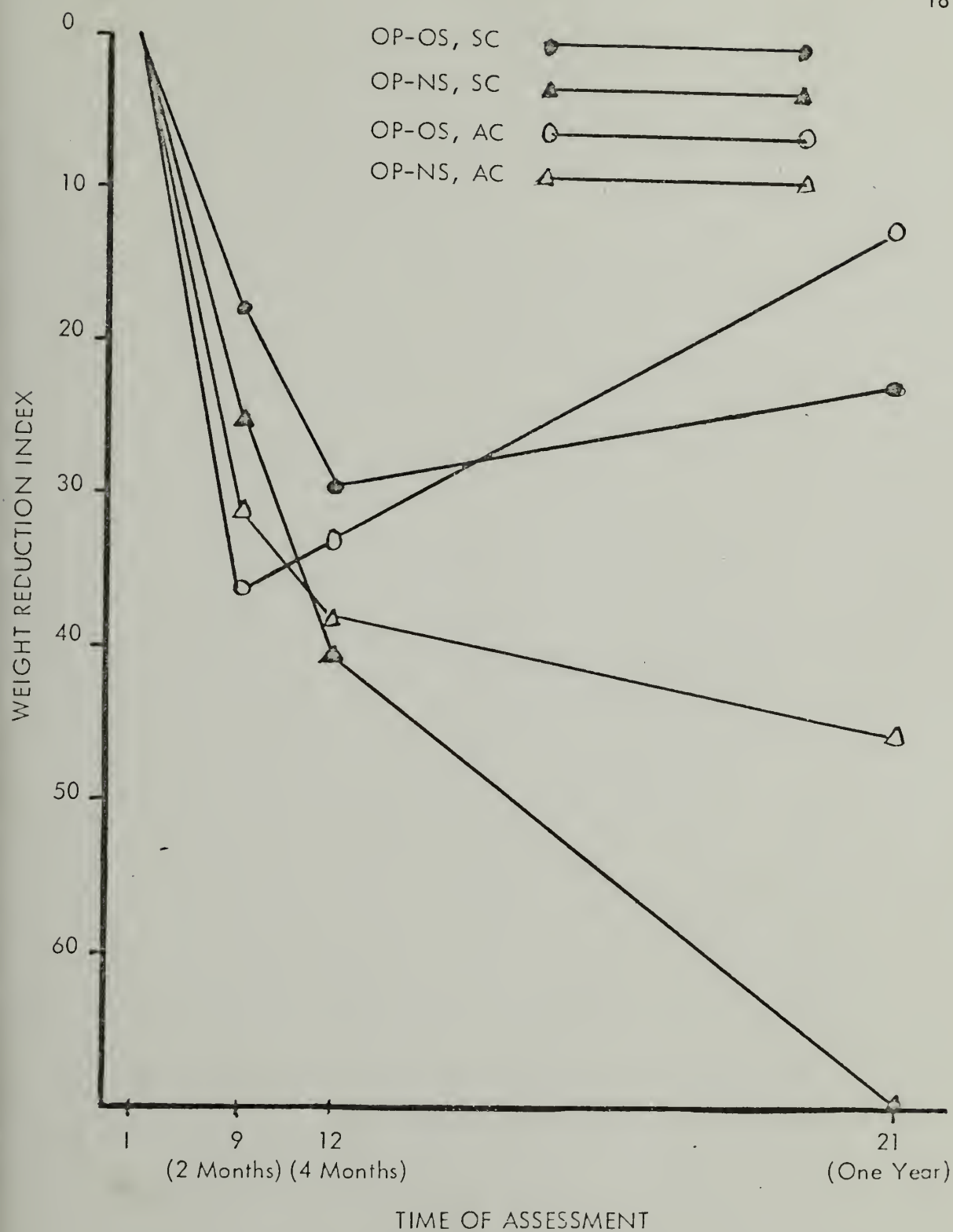


Figure 6. Mean RI for Overweight Participant-Overweight Spouse and Overweight Participant-Non-Overweight Spouse for Stimulus and Affective Control, Individual Groups Only, Analysis 6 (Session 1-9-12-21)

mean RIs for OP-OS and OP-NS.

Mean pounds lost for each treatment group are shown in Table 17 and the repeated measures analysis is summarized in Table 18.

Over this time period, OP-NS and OP-OS responded differently to treatment with OP-NS losing a significantly greater amount of weight ( $F = 8.61$ ;  $df = 2, 40$ ;  $p = .0008$ ). Participants in OP-NS lost weight from Session 1-9, 9-12 and from Session 12-21. Participants in OP-OS also lost weight from Session 1-9 and 9-12; however, they regained weight from Session 12-21. The mean pounds lost are illustrated in Figure 7.

Summary. According to Analysis 6 (Session 9-12-21, 2 months-4 months-1 year), participants of OP-NS in Individuals Groups had a significantly larger RI over time than participants in OP-OS Individuals Groups. In addition, participants in OP-NS lost weight consistently over the year-long program, whereas participants in OP-OS began to regain weight after Session 12.

- OP-OS: Couples vs. individuals. Initial analyses revealed no significant pretreatment differences between mean RC for OP-OS, Couples (3.27) and for OP-OS, Individuals (3.76).

Repeated measures analysis of variance (Analysis 6, Session 1-9-12-21; 1-2-4-12 months) were conducted. Mean RIs overall for OP-OS, Couples and OP-OS Individuals are shown in Table 19. Mean RIs for the four treatment groups are shown in Table 20.

As expected, RI was significantly larger over time for OP-OS in Couples versus Individuals ( $F = 5.32$ ;  $df = 1, 44$ ;  $p < .03$ ). A summary of the repeated



TABLE 17

MEAN POUNDS LOST FOR OP-OS AND OP-NS, INDIVIDUALS ONLY,  
FOR ANALYSIS 6 (SESSION 1-9-12-21; 1-2-4-12 MONTHS)

	<u>Session</u>	<u>SC OP-OS (N=5)</u>	<u>SC OP-NS (N=4)</u>	<u>AC OP-OS (N=3)</u>	<u>AC OP-NS (N=12)</u>
Pounds Lost	1- 9	10.6	13.0	11.3	12.5
	1-12	15.9	21.1	10.4	15.7
	1-21	7.9	36.6	4.3	20.3

TABLE 18

REPEATED MEASURES ANALYSIS OF VARIANCE FOR OP-OS  
AND OP-NS, INDIVIDUALS ONLY FOR ANALYSIS 6  
(SESSION 1-9-12-21; 1-2-4-12 MONTHS)

<u>Source</u>	<u>SS</u>	<u>DF</u>	<u>MS</u>	<u>F</u>
Mean	12427.87	1	12427.87	22.35
B	360.68	1	360.69	.65
O	1327.22	1	1327.22	2.39
BO	74.06	1	74.06	.13
Error	11123.17	20	556.16	
R	288.25	2	144.12	2.22
RB	234.40	2	117.20	1.80
RO	1117.99	2	559.00	8.61*
RBO	115.85	2	57.93	0.89
Error	2598.42	40	64.96	

\*p &lt; .0008

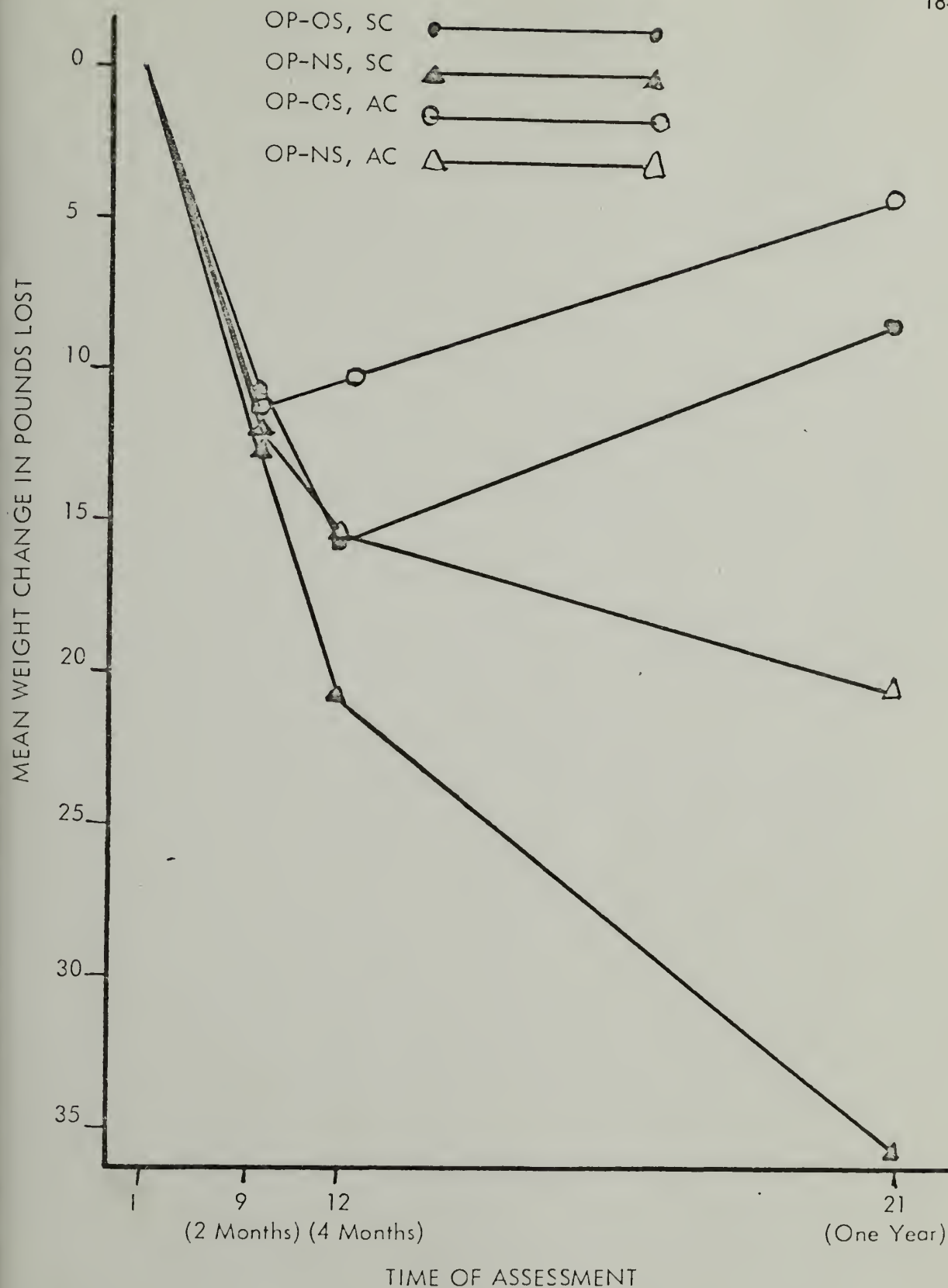


Figure 7. Mean Pounds Lost for Overweight Participant-Overweight Spouse and Overweight Participant-Non-Overweight Spouse for Stimulus and Affective Control Groups, Individuals Only, Analysis 6 (Session 1-9-12-21).

TABLE 19

MEAN RI FOR OP-OS: COUPLES AND INDIVIDUALS, ANALYSIS  
6 (SESSION 1-9-12-21; 1-2-4-12 MONTHS)

	<u>Session</u>	<u>OP-OS Individuals (N=8)</u>	<u>OP-OS Couples (N=38)</u>
	1- 9	24.83	39.79
RI	1-12	31.15	52.59
	1-21	18.67	59.27

TABLE 20

MEAN RI FOR OP-OS: COUPLES AND INDIVIDUALS FOR  
ANALYSIS 6 (SESSION 1-9-12-21; 1-2-4-12 MONTHS)

	<u>Session</u>	<u>OP-OS SC-C (N=12)</u>	<u>OP-OS AC-C (N=26)</u>	<u>OP-OS SC-I (N=5)</u>	<u>OP-OS AC-I (N=3)</u>
	1- 9	35.43	41.80	18.00	36.20
RI	1-12	43.96	56.57	29.72	33.52
	1-21	54.05	61.67	22.41	12.45

measures analysis of variance is given in Table 21. The mean RI for OP-OS in Couples Groups increased consistently over the entire time period. However, the mean RI for OP-OS in Individuals Groups increased only from 1-9 and began decreasing after Session 12. However, this interaction did not reach significance. The mean RIs are illustrated in Figure 8.

TABLE 21  
REPEATED MEASURES ANALYSIS OF VARIANCE FOR OP-OS:  
COUPLES AND INDIVIDUALS FOR ANALYSIS 6  
(SESSION 1-9-12-21; 1-2-4-12 MONTHS)

<u>Source</u>	<u>SS</u>	<u>DF</u>	<u>MS</u>	<u>F</u>
Mean	112816.70	1	112816.71	45.99
I	13058.55	1	13058.55	5.32*
Error	107942.52	44	2453.24	
R	1269.41	2	634.71	1.14 0.3231
RI	2348.00	2	1174.00	2.12 0.1265
Error	48804.15	88	554.59	

\*p .0258

Mean pounds lost over Analysis 6 for overall OP-OS Couples versus Individuals means are as shown in Table 22. Mean pounds lost for the four treatment groups can be seen in Table 23.

Results parallel RI findings with a differential performance in pounds lost for participation Couples or Individuals over the time period ( $F = 3.23$ ;  $df = 2, 82$ ;  $p < .04$ ). Participants in OP-OS couples lost weight from Session 1-12 and

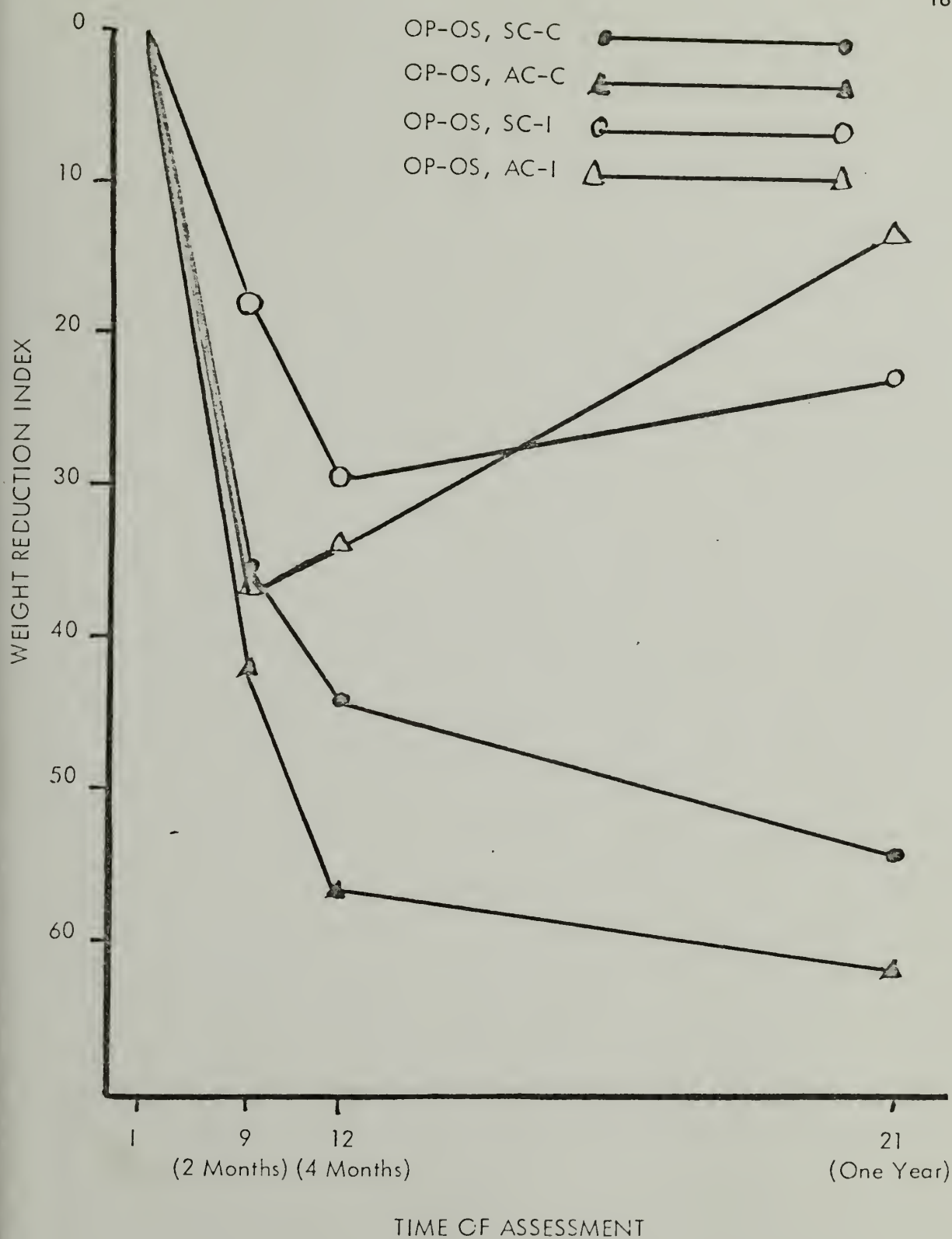


Figure 8. Mean RI for OP-OS Couples and Individuals for Stimulus and Affective Control Groups, Analysis 6 (Session 1-9-12-21).



TABLE 22

MEAN POUNDS LOST FOR OP-OS COUPLES AND INDIVIDUALS  
FOR ANALYSIS 6 (SESSION 1-9-12-21; 1-2-4-12 MONTHS)

	<u>Session</u>	<u>Individuals (N=8)</u>	<u>Couples (N=38)</u>
Pounds Lost	1- 9	10.90	12.44
	1-12	13.84	16.47
	1-21	6.56	19.99

TABLE 23

MEAN POUNDS LOST FOR OP-OS: COUPLES AND INDIVIDUALS  
FOR ANALYSIS 6 (SESSION 1-9-12-21; 1-2-4-12 MONTHS)

	<u>Session</u>	<u>OP-OS SC-C (N=12)</u>	<u>OP-OS AC-C (N=26)</u>	<u>OP-OS SC-I (N=5)</u>	<u>OP-OS AC-C (N=3)</u>
Pounds Lost	1- 9	10.21	13.48	10.64	11.33
	1-12	12.79	18.17	15.90	10.40
	1-21	16.71	21.50	7.90	4.33

continued to lose weight from Session 12-21; however, participants in OP-OS Individuals lost weight from Session 1-12 but began to regain weight from Session 12-21. Bonferroni comparisons of the means show a significantly larger ( $p < .01$ ) weight loss for OP-OS Couples than OP-OS Individuals at Session 21. A summary of the repeated measures analysis of variance is presented in Table 24 and the mean pounds lost are illustrated in Figure 9.

TABLE 24

REPEATED MEASURES ANALYSIS OF VARIANCE FOR OP-OS:  
COUPLES AND INDIVIDUALS FOR ANALYSIS 6  
(SESSION 1-9-12-21; 1-2-4-12 MONTHS)

<u>Source</u>	<u>SS</u>	<u>DF</u>	<u>MS</u>	<u>F</u>
Mean	14170.06	1	14170.06	36.81
I	682.57	1	682.57	1.77
Error	16938.47	44	384.97	
R	160.34	2	80.17	0.91
RI	569.97	2	284.98	3.23*
Error	7769.65	82	88.29	

\* $p < .0444$

Summary. As expected, participants with overweight spouses had a significantly larger RI over time and lost significantly more weight by Session 21 in Couples Groups than in Individuals Groups. Participants whose overweight spouses were not involved in the program did lose weight initially (Session 1-12), but then began to regain weight.

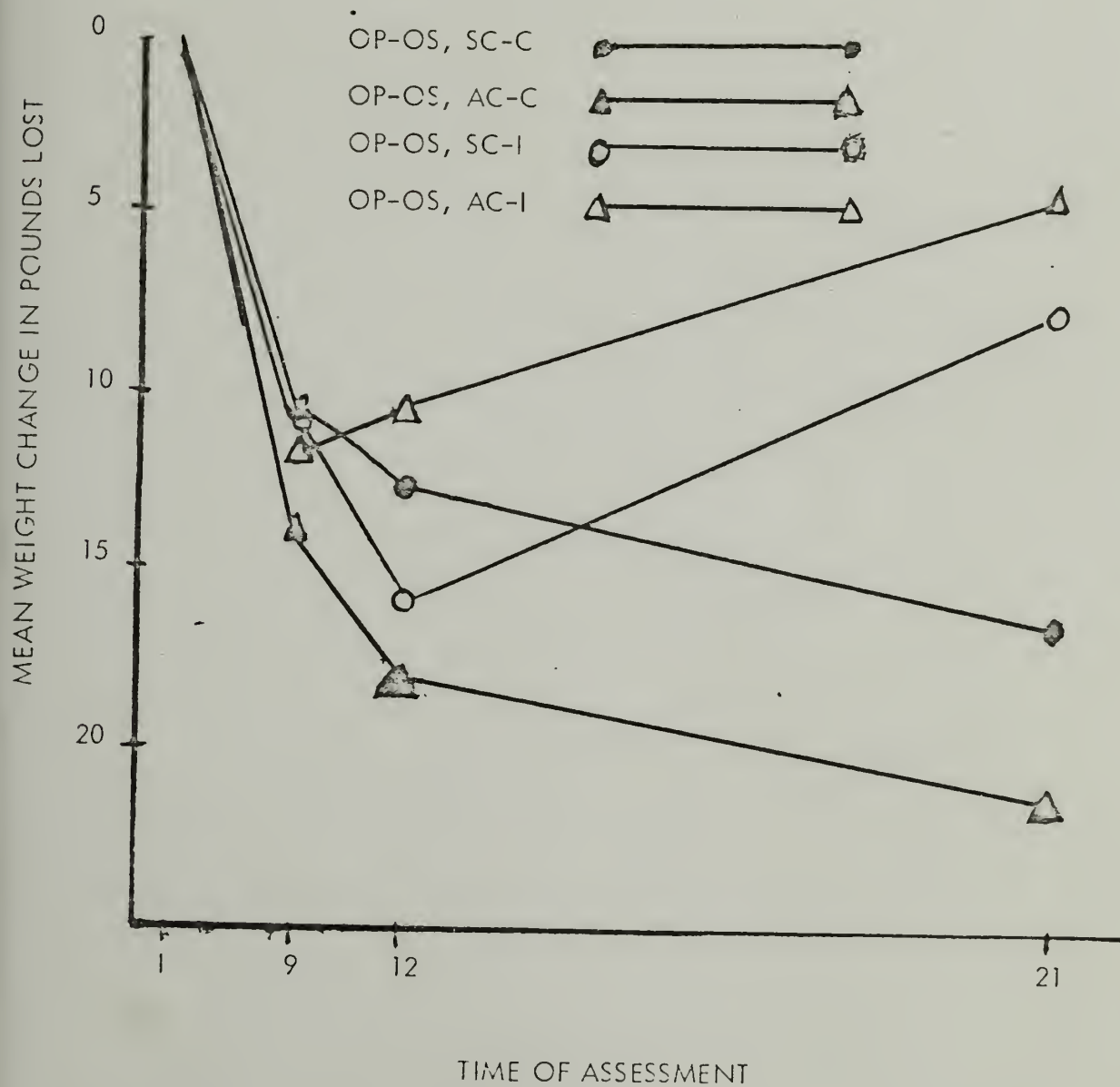


Figure 9. Mean Pounds Lost for Overweight Participant-Overweight Spouse for Couples and Individuals Across Treatment Groups.

Males versus females. Initial analyses show a significant pretreatment difference in mean RC for males (2.68) and for females (3.84) ( $F = 7.360$ ;  $df = 1, 166$ ;  $p < .007$ ) indicating males were significantly more overweight initially. Although repeated measures analysis of variance indicate some significant differences in pounds lost between males and females in the initial part of the program, no significant differences in RI were evident at any time. This discrepancy may be partially explained by the initial RC difference.

Analysis 1 (Session 1-9; 1-2 months). Mean pounds lost for males and females in Stimulus and Affective control treatment groups are presented in Table 25.

TABLE 25

MEAN POUNDS LOST FOR MALES AND FEMALES IN STIMULUS  
AND AFFECTIVE CONTROL GROUPS FOR ANALYSIS  
1 (SESSION 1-9; 1-2 MONTHS)

	SC-Female (N=32)	SC-Male (N=25)	AC-Female (N=56)	AC-Male (N=35)
Pounds Lost	9.37	12.10	9.81	12.34

Mean pounds lost for males was significantly larger than for females ( $F = 4.90$ ;  $df = 1, 144$ ;  $p < .03$ ). The summary of the analysis of variance is presented in Table 26. It is, however, important to note that the differential weight loss was only 2.56 pounds and significance was enhanced by a large N.

Other analyses (2, 3, 4 and 5). No significant male-female differences in pounds lost occurred for any of these analyses. A summary of male-female mean weight loss differences is presented in Table 27.

TABLE 26

REPEATED MEASURES ANALYSIS OF VARIANCE FOR MALES  
AND FEMALES IN STIMULUS AND AFFECTIVE CONTROL  
GROUPS FOR ANALYSIS 1 (SESSION 1-9; 1-2 MONTHS)

<u>Source</u>	<u>SS</u>	<u>DF</u>	<u>MS</u>	<u>F</u>
Mean	16170.71	1	16170.70831	336.51
B	4.06	1	4.06	.08
S	235.38	1	235.38	4.90*
BS	.36	1	.36	0.01
Error		144	48.05	

\*  $p < .0285$

TABLE 27

MEAN POUNDS LOST FOR MALES AND FEMALES  
FOR ANALYSES 1 THROUGH 5

<u>Analysis</u>	<u>Session</u>	<u>Males</u>	<u>Females</u>	<u>Difference In Pounds Lost</u>	<u>P</u>
1 (N = 148)	1-9	12.20	9.64	2.56	$p < .03$
2 (N = 137)	1-9-12	15.45	12.44	3.01	$p < .07$
3 (N = 80)	1-9-12-16	23.37	15.26	8.11	$p < .07$
4 (N = 71)	1-9-12-16-18	24.30	17.82	6.48	$p = NS$
5 (N = 69)	1-9-12-16-18-21	21.31	17.80	3.51	$p = NS$



Although the largest weight loss difference occurred for Analysis 3 (Session 1-9-12-16), the 8 pound difference did not reach significance. This weight loss difference, although larger than the significant difference which occurred for Analysis 1, is not significant due to a smaller N and a larger variance.

For participants who completed the entire program, male-female differences were slight and not significant by the final session. Mean RI and pounds lost for these participants are presented in Table 28 and illustrated in Figures 10 and 11.

TABLE 28

MEAN RI AND POUNDS LOST FOR FEMALES AND MALES IN  
STIMULUS AND AFFECTIVE CONTROL GROUPS FOR  
ANALYSIS 5 (SESSION 1-9-12-16-18-21;  
1-2-4-8-10-12 MONTHS)

	Session	SC-Females (N=17)	SC-Males (N=8)	AC-Females (N=27)	AC-Males (N=18)
RI	1- 9	30.2	32.1	39.9	35.5
	1-12	40.6	41.1	53.0	44.4
	1-16	48.3	43.5	55.9	58.1
	1-18	61.7	45.4	58.1	54.6
	1-21	56.4	39.6	54.4	53.0
Pounds Lost	1- 9	9.5	14.2	11.8	14.5
	1-12	13.0	18.8	15.8	18.3
	1-16	16.7	21.5	17.6	23.8
	1-18	20.1	21.8	19.1	22.8
	1-21	17.9	17.8	17.7	22.5

Summary. Although there was a small initial significant difference in pounds lost at Analysis 1 and other trends for males to lose more pounds at some points in the program, overall RI differences for males and females were not

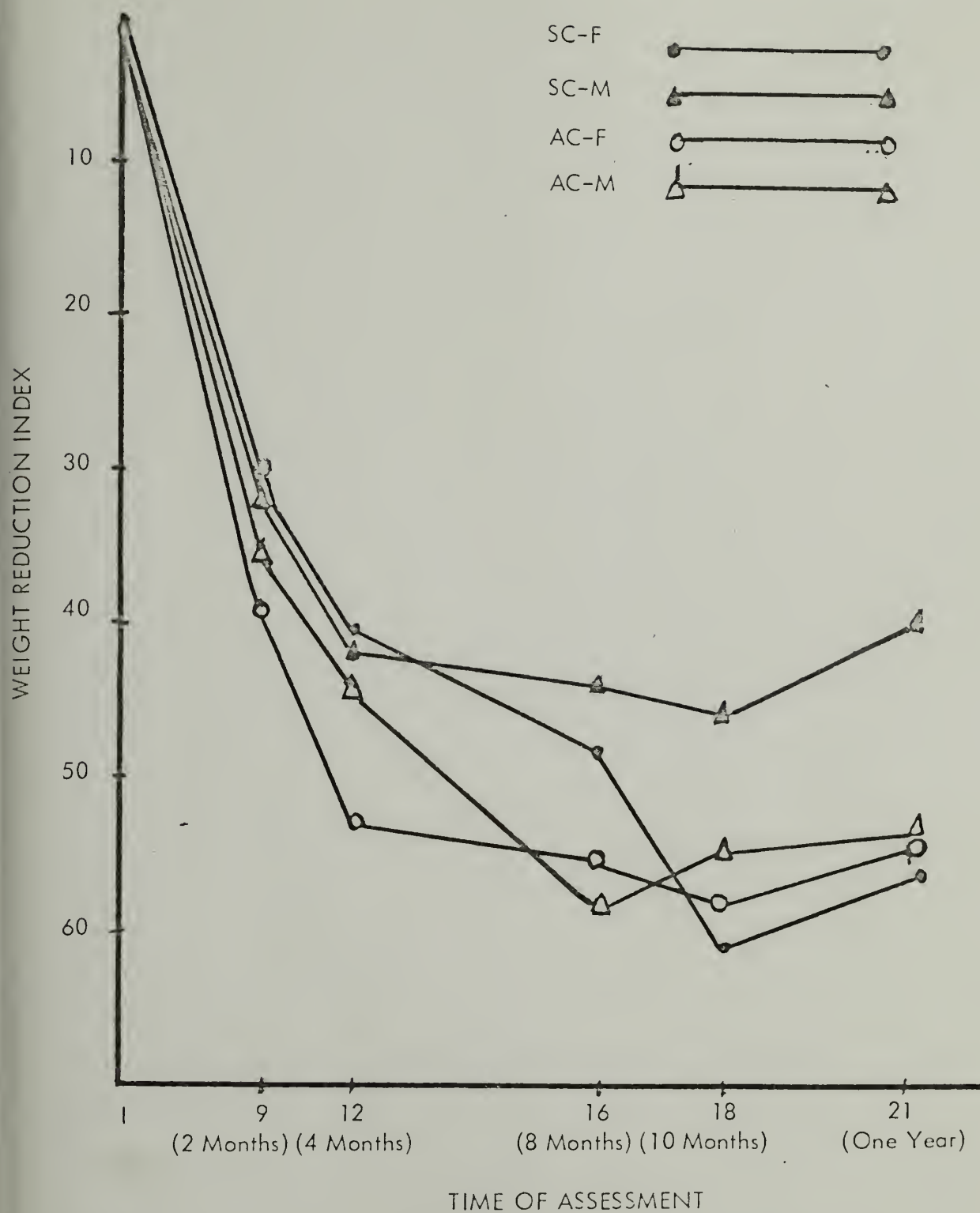


Figure 10. Mean RI By Sex for Analysis 5 (Session 1-9-12=16-18-21)

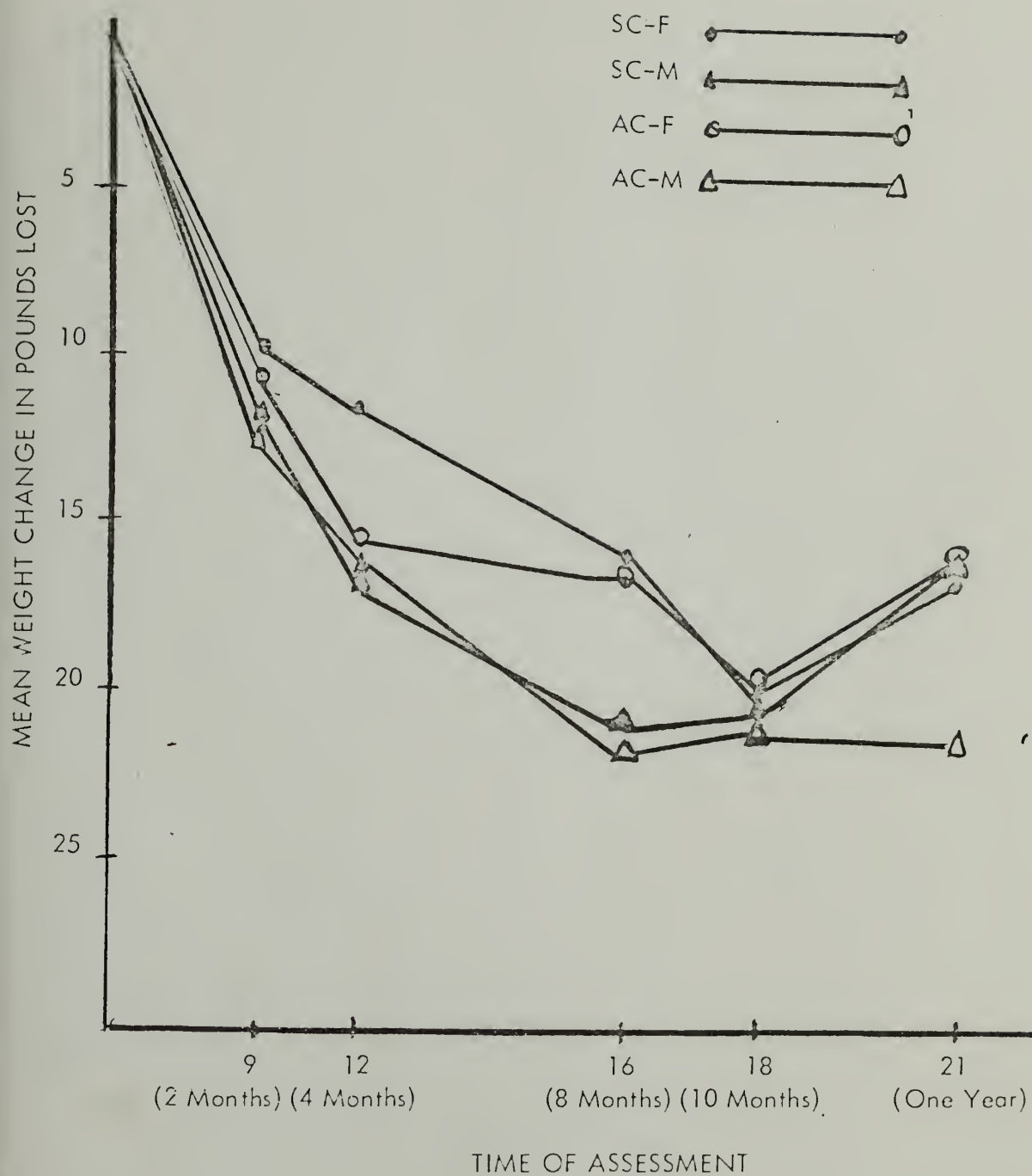


Figure 11. Mean Weight Change in Pounds Lost By Sex for Analysis 5 (Session 1-9-12-16-18-21)

significant. Due to the significantly higher initial pretreatment variance in RC and weight for males, the results are somewhat ambiguous.

Age of onset: Child, adolescent and adult. Initial analyses revealed no significant pretreatment differences in mean RC for the three groups: Child, 3.03; Adolescent, 3.36; Adult, 3.17 ( $F = .221$ ,  $df = 2$ , 153). Data were analyzed for Analysis 2 and Analysis 6.

Analysis 2 (Session 1-9-12; 1-2-4 months). Mean RI and pounds lost for the three groups are shown in Table 29. There were no significant differences in RI across the time period; however, the three groups did perform differently with respect to pounds lost over the time period ( $F = 3.08$ ;  $df = 2$ , 120;  $p < .05$ ). The repeated measures analysis of variance is summarized in Table 30.

Bonferroni comparisons of the means revealed a significantly higher weight loss for child versus adult at 1-9 ( $p < .01$ ) and 1-12 ( $p < .01$ ) as well as child versus adolescent at 1-9 ( $p < .05$ ) and 1-12 ( $p < .01$ ). The mean pounds lost are illustrated in Figure 12.

Analysis 6 (Session 1-9-12-21; 1-2-4-12 months). Mean RI and pounds lost for the three groups are shown in Table 31. There were no significant differences among groups in RI across the time period and all groups lost a significant amount of weight. However, the three groups did perform differently with respect to amount of pounds lost ( $F = 4.01$ ;  $df = 2$ , 57;  $p < .02$ ). The repeated measures analysis of variance is summarized in Table 32 and the mean pounds lost are illustrated in Figure 13. By Session 21 adult onset had lost a mean weight of 14.05 pounds, adolescent onset, 16.75 pounds, and child onset had lost the most, 28.5 pounds.

TABLE 29

MEAN RI AND POUNDS LOST FOR ADULT, ADOLESCENT AND CHILD ONSET, ANALYSIS 2 (SESSION 1-9-12; 1-2-4 MONTHS)

	<u>Session</u>	<u>Adult (N=67)</u>	<u>Adolescent (N=16)</u>	<u>Child (N=40)</u>
Pounds Lost	1- 9	10.71	9.86	12.63
	1-12	12.65	12.22	16.76
RI	1- 9	30.18	35.72	34.37
	1-12	35.31	44.01	44.22

TABLE 30

REPEATED MEASURES ANALYSIS FOR POUNDS LOST: AGE OF ONSET, ANALYSIS 2 (SESSION 1-9-12; 1-2-4 MONTHS)

<u>Source</u>	<u>SS</u>	<u>DF</u>	<u>MS</u>	<u>F</u>
Mean	27289.73	1	27289.73	206.38
O	545.36	2	272.68	2.06
Error	15867.28	120	132.28	
R	352.45	1	352.45	35.60
RO	61.03	2	30.51	3.08*
Error	1188.12	120	9.90	

\* $p < .0495$



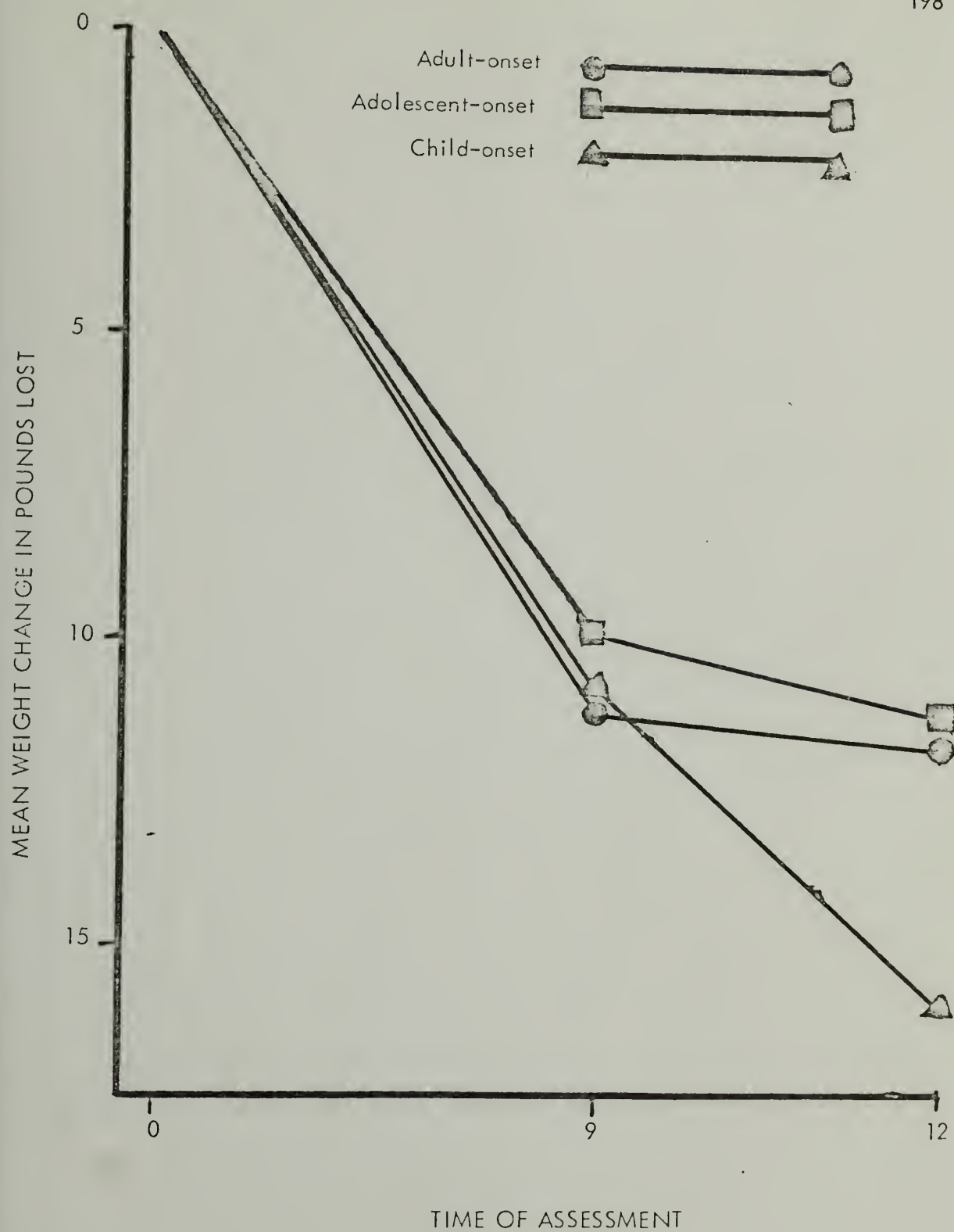


Figure 12. Mean Pounds Lost for Adult, Adolescent and Child Onset Obese for Analysis 2 (Session 1-9-12).

TABLE 31

MEAN RI AND POUNDS LOST FOR ADULT, ADOLESCENT AND CHILD  
ONSET, ANALYSIS 6 (SESSION 1-9-12-21; 1-2-4-12 MONTHS)

	<u>Session</u>	<u>Adult (N=32)</u>	<u>Adolescent (N=6)</u>	<u>Child (N=22)</u>
RI	1- 9	31.41	48.53	40.51
	1-12	40.51	61.40	54.66
	1-21	42.10	64.61	66.96
Pounds Lost	1- 9	10.93	10.53	15.45
	1-12	13.57	14.32	21.46
	1-21	14.05	16.75	28.50

TABLE 32

REPEATED MEASURES ANALYSIS OF VARIANCE: POUNDS LOST FOR AGE  
OF ONSET, ANALYSIS 6 (SESSION 1-9-12-21; 1-2-4-12 MONTHS)

<u>Source</u>	<u>SS</u>	<u>DF</u>	<u>MS</u>	<u>F</u>
Mean	29019.27	1	29019.27	71.57
O	3251.41	2	1625.70	4.01*
Error	23112.87	57	405.49	
R	1033.30	2	516.65	5.73**
RO	666.99	4	166.75	1.85
Error	10271.19	114	90.10	

\*  $p < .0235$

\*\*  $p < .0042$

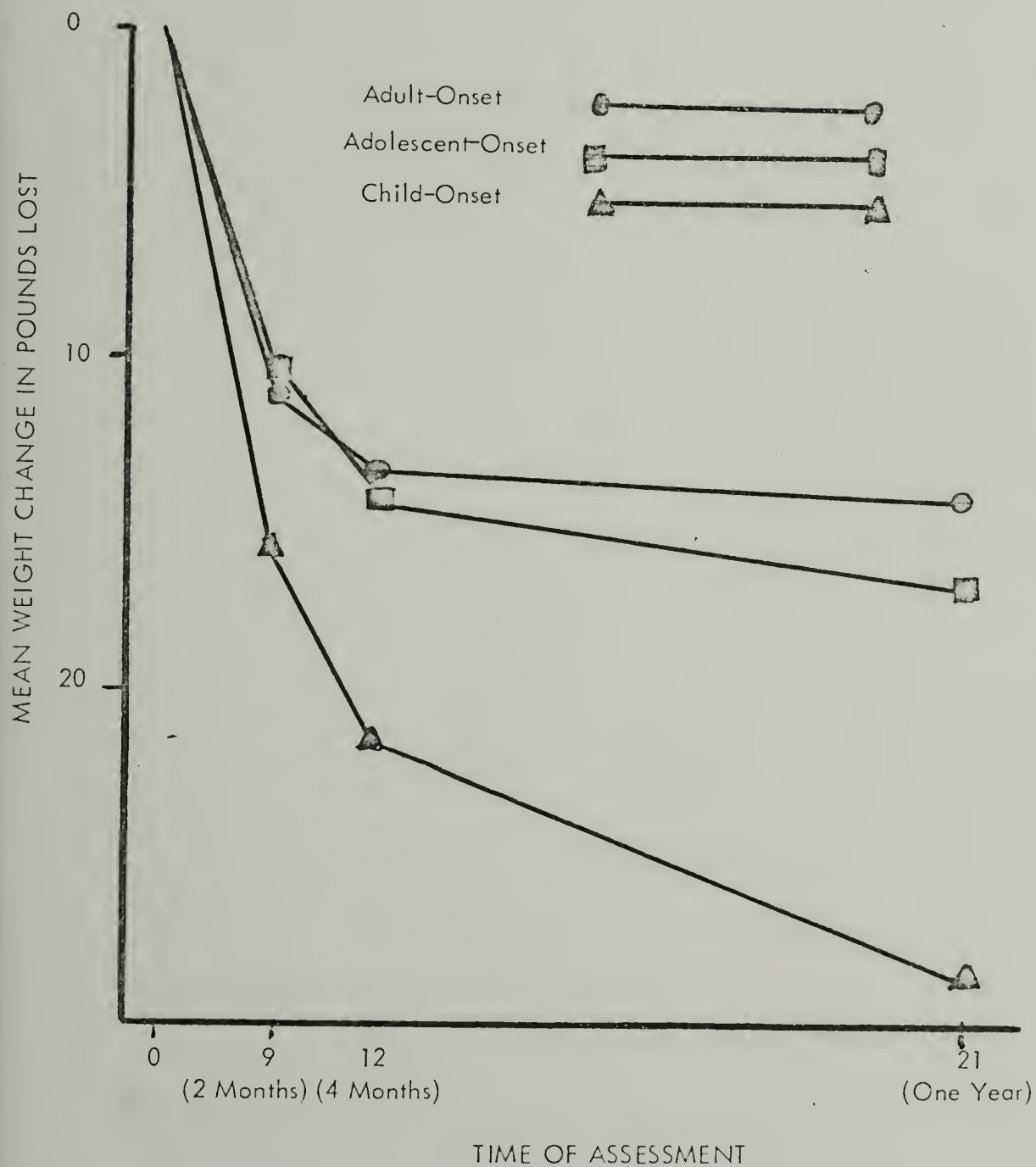


Figure 13. Mean Pounds Lost for Adult, Adolescent and Child Onset of Obesity for Analysis 6 (Session 1-9-12-21)

Summary. Contrary to expectations, child onset obese lost significantly more pounds than both adolescent and adult onset obese. Results indicate a significant interaction among the groups over time for Analysis 2 showing that child-onset participants lost significantly more pounds at both Session 9 and 12 than either adolescent or adult onset participants.

For participants remaining in the entire program there was an overall difference in weight loss for the three groups with child onset losing the most weight from Session 1-12-21. Although the RI difference did not reach significance, the trend was in the same direction ( $p < .08$ ).

Other factors. Results indicate that age was not a significant factor in determining weight loss.

Analyses of prior attempts at dieting indicated that all groups lost a significant amount of weight in terms of RI and pounds lost for Analysis 2 (Session 1-9-12; 1-2-4 months) and Analysis 6 (Session 1-9-12-21; 1-2-4-12 months). There was a significant difference ( $F = 3.06$ ;  $df = 3, 40$ ;  $p < .04$ ) for RI among groups, Analysis 6. However, Bonferroni comparisons of the means did not reach significance for any of the primary comparisons.

#### Measurement of Eating Patterns

An Eating Patterns Questionnaire (EPQ) which examined perceived changes in eating habits was administered to participants at the initial session, Session 12 (4 months) and Session 21 (1 year).

Administration 1-2 (Session 1-12; 1-4 months). Mean scores and difference scores for administrations 1 and 2 for Eating Patterns Questionnaire are presented in Table 33.

Overall groups reported a significant decrease in eating during specific situations (ESS) ( $F = 5.57$ ;  $df = 1, 88$ ;  $p < .02$ ), in eating during emotional times (EET) ( $F = 13.99$ ,  $df = 1, 88$ ;  $p = .0003$ ), and an increase in spouse helpfulness during specific situation (SHS) ( $F = 12.37$ ;  $df = 1, 88$ ;  $p < .0007$ ).

SC groups did not show a significantly greater decrease than AC groups for eating during specific situations, and AC groups did not show a significantly greater decrease than SC groups for eating during emotional times.

Spouse helpfulness during specific situations as reported by this questionnaire increased significantly more for participants in Couples Groups than for participants in Individuals Groups ( $F = 4.47$ ;  $df = 1, 88$ ;  $p < .04$ ). A summary of the repeated measures analysis of variance is presented in Table 34.

Administration 1-2-3 (Session 1-12-21; 1-4 months-1 year). Mean scores for administrations 1, 2 and 3 for Eating Patterns Questionnaire are presented in Table 35 and difference scores in Table 36.

Examination of the means indicates that all groups exhibited a similar pattern: while ESS and EET decreased from 1-12, the scores increased from 12-21; SHS increased from 1-12 and decreased from 12-21.

Correlations with weight loss. The scores of the three administrations of the Eating Pattern Questionnaires were correlated with weight loss and RI at Session 12 (4



TABLE 33  
 MEAN SCORES AND DIFFERENCE SCORES FOR  
 ADMINISTRATION 1 AND 2 (SESSION 1-12;  
 1-4 MONTHS) OF EATING PATTERNS  
 QUESTIONNAIRE

	SC-I (N=9)	Treatment Group		AC-C (N=46)
		SC-C (N=20)	AC-I (N=7)	
<u>Eating During Specific Situations (EES)</u>				
Initial Score	32.00	31.35	35.94	33.04
Session 12	28.89	29.90	33.00	30.29
Difference (1-12)	-3.11	-1.46	-2.94	-2.75
<u>Eating During Emotional Times (EET)</u>				
Initial Score	19.11	20.95	25.94	24.87
Session 12	15.88	16.25	20.47	18.70
Difference (1-12)	-3.23	-4.70	-5.47	-6.17
<u>Spouse Helpfulness (SHS) During Specific Situations</u>				
Initial Score	30.67	26.35	27.65	27.70
Session 12	32.11	37.55	31.24	36.67
Difference (1-12)	+1.44	+11.2	+3.59	+8.97

TABLE 34

REPEATED MEASURES ANALYSIS OF VARIANCE FOR CHANGE IN SPOUSE  
 HELPFULNESS DURING SPECIFIC SITUATIONS AMONG TREATMENT  
 GROUPS FOR ADMINISTRATIONS 1 AND 2

<u>Source</u>	<u>SS</u>	<u>DF</u>	<u>MS</u>	<u>F</u>
Mean	129233.83	1	129233.83	606.41
B	24.28	1	24.28	0.11
I	90.38	1	90.38	0.42
BI	39.42	1	39.42	0.18
Error	18753.92	88	213.11	
R	1314.98	1	1314.98	12.37*
RB	0.01	1	0.01	0.00
RI	474.58	1	474.58	4.47**
RBI	39.43	1	39.43	0.37
Error	9351.26	88	106.26	

\*  $p < .0007$

\*\*  $p < .04$

TABLE 35

MEAN SCORES FOR EATING PATTERNS QUESTIONNAIRE  
FOR TREATMENT GROUPS, ADMINISTRATION 1-2-3  
(SESSION 1-12-21; 1-4-12 MONTHS)

	SC-I (N=5)	SC-C (N=10)	AC-I (N=12)	AC-C (N=25)
<u>ESS</u>				
Initial	34.60	28.60	35.83	32.36
Session 12 (4 Months)	30.60	29.50	29.00	30.84
Session 21 (12 Months)	37.40	32.00	35.33	33.64
<u>EET</u>				
Initial	22.60	21.00	25.25	23.52
Session 12 (4 Months)	18.40	15.30	18.00	19.48
Session 21 (12 Months)	23.00	24.90	18.58	24.28
<u>SHS</u>				
Initial	24.40	27.70	24.50	27.04
Session 12 (4 Months)	32.40	42.80	29.25	39.04
Session 21 (12 Months)	27.20	27.30	25.00	28.28

TABLE 36

MEAN DIFFERENCE SCORES FOR EATING PATTERNS QUESTIONNAIRE  
FOR TREATMENT GROUPS, ADMINISTRATION 1-2-3  
(SESSION 1-12-21; 1-4-12 MONTHS)

	<u>SC-I</u> (N=5)	<u>SC-C</u> (N=10)	<u>AC-I</u> (N=12)	<u>AC-C</u> (N=25)
<u>ESS</u>				
Session 1-12	-4.00	+0.	-6.83	-1.52
Session 12-21	+6.80	+2.50	+6.33	+2.8
Session 1-21	+2.80	+3.40	- .53	+1.28
<u>EET</u>				
Session 1-12	-4.20	-5.70	-7.25	-4.04
Session 12-21	+4.60	+9.60	+ .58	+4.80
Session 1-21	+ .40	+3.90	-6.67	+ .76
<u>SHS</u>				
Session 1-12	+8.00	+15.10	+4.75	+12.0
Session 12-21	-5.20	- 5.50	-4.25	-10.76
Session 1-21	+2.80	- .40	+ .50	- 1.24

months) and Session 21 (1 year). Significant correlations were found only for Change in eating during specific situations and pounds lost at Session 12 ( $r = .3019$ ;  $p < .004$ ). The same correlation was found to be significant for Couples at Session 12 ( $r = .3006$ ;  $p < .01$ ), but not for Individuals. No other significant correlations occurred.

Summary of eating patterns questionnaire. Results suggest that participants reported improvement in eating patterns and spouse helpfulness from Session 1-12 but a tendency to revert to initial habits from Session 12-21. There were no significant differences among treatment groups.

Although it was expected that weight loss and RI would correlate significantly with positive changes in eating habits and spouse helpfulness, the only significant correlation that did occur was between a decrease in eating during specific situations and pounds lost from Session 1-12 for the groups overall and for Couples Groups only.

#### Other Measures

The following questionnaires were administered and differences analyzed: Beck Depression Inventory, Communications Inventory, and Generalized Expectancy for Success.

The mean initial scores and change in scores from Session 1-12 (1-4 months) can be found in Table 37.

Significant overall improvements were found over this time for the following questionnaires: Beck Depression Inventory ( $F = 16.97$ ;  $df = 1, 108$ ;  $p < .0001$ ); Communication Inventory ( $F = 5.72$ ;  $df = 1, 115$ ;  $p < .02$ ); Generalized Expectancy



TABLE 37

MEAN INITIAL SCORES AND CHANGE OF SCORES FOR BECK DEPRESSION INVENTORY, COMMUNICATION INVENTORY AND EXPECTANCY FOR SUCCESS, ADMINISTRATION 1-2 (SESSION 1-12; 1-4 MONTHS)

	SC-I	SC-C	AC-I	AC-C
<u>Beck Depression Inventory</u>	(N=10)	(N=33)	(N=16)	(N=53)
Session 1	6.60	7.03	9.43	8.43
Session 12	4.00	4.87	7.56	5.41
<u>Communication Inventory</u>	(N=10)	(N=34)	(N=18)	(N=59)
Session 1	93.90	93.53	86.61	95.19
Session 12	98.40	95.41	94.39	95.68
<u>General Expectancy for Success</u>	(N=9)	(N=20)	(N=17)	(N=48)
Session 1	122.22	117.40	118.47	117.25
Session 12	123.89	124.30	120.12	120.56

for Success ( $F = 3.87$ ;  $df = 1, 90$ ;  $p < .05$ ).

No significant differences occurred among the various treatment groups.

### Summary of Results for Section One

Measurements of weight: Major treatment effects. Repeated measures analysis of variance on RI, excess weight lost, and pounds lost were conducted at five times during the program. All groups lost a significant amount of weight over the time period covered by each analysis. There were no significant differences for weight loss measures between Stimulus and Affective Control Groups. However, for Analyses 1 and 3 (2 months and 8 months), participants in Couples Group had a significantly larger RI than Individuals RI and for Analyses 2 and 5 (4 months and 12 months) there was a strong trend in the same direction.

The analyses for females only parallel those overall results. Females in Couples Groups had a significantly larger RI than females in Individuals Groups for Analyses 2 and 5. However, in overall analyses, and for females only, there were no significant differences in pounds lost. The discrepancy in these results, compared to RI, may reflect the fact that the initial RC for Couples was higher (though not significantly so) than for Individuals. Therefore, similar weight losses for Couples and Individuals would yield a higher RC for Couples.

Overall, there were no significant differences between OP-OS and OP-NS for Stimulus versus Affective Control. However, for participants in Individuals Groups, results indicate that overweight participants with non-overweight spouses lost significantly more pounds and have a larger increase in RI than overweight

participants with overweight spouses. On the other hand, results indicate that overweight participants with overweight spouses performed significantly better in terms of pounds lost and RI in Couples rather than Individuals Groups.

For females versus males, there was a small initial significant difference in pounds lost at Session 9 (2 months) and other trends for males to lose more pounds at some points in the program; however, overall differences between males and females were insignificant.

Analysis of onset of obesity indicates that contrary to expectations, child-onset obese lost significantly more pounds than both adolescent and adult-onset obese. There were no significant differences, however, between performance for adolescent and adult-onset.

Neither age nor prior attempts at dieting were significant factors in weight loss.

Measurements of eating patterns. An Eating Patterns Questionnaire was administered at three points in the program: Session 1, 12, 21 (1-4 months-1 year). Results suggest that participants reported improvement in eating patterns and spouse helpfulness from Session 1-12 but a tendency to revert to initial habits from Session 12-21. Treatment groups showed no significant differences in change of eating patterns or spouse helpfulness.

Although it was expected that weight loss and RI would correlate significantly with positive changes in eating habits and spouse helpfulness, the only significant correlation that did occur was between a decrease in eating during specific situations and pounds lost from Session 1-12 for the groups overall and for Couples Groups only.

Other measures. Three questionnaires were administered to measure depression, marital communication, and general expectancy for success.

Significant overall improvements were found from Session 1-12 (1-4 months) for all three measures; however, no significant differences occurred among the various treatment groups, and overall there were no significant correlations between any of these measures and weight loss.

### Section Two - Dropouts

Results concerning drop-outs are divided into four areas. The first area of results discusses factors that differentiated between drop-outs and non-drop-outs; the second pertains to frequency of drop-outs among treatment groups and various categories of participants; the third investigates the weight loss performance of drop-outs over periods of time when they were participating in the program, and the fourth area compares overall weight losses of non-drop-outs and program completers.

Prognostic factors. Fifteen factors were investigated as possible predictors of dropping out of treatment. Of these, one factor differentiated drop-outs from non-drop-outs for Sessions 1-12, and six factors significantly differentiated drop-outs at any time during the program (Session 1-21) from program completers. Table 38 presents the means of each factor for drop-outs and non-drop-outs, the T-test, and level of significance.

The six factors differentiating drop-outs from non-drop-outs were:

1. Desire for external praise: On the Weight Reduction Program Questionnaire (see Appendix 7), participants were asked to rate from 1-7 (where

TABLE 38

MEAN SCORES AND T-TESTS FOR FACTORS DIFFERENTIATING  
DROP-OUTS FROM NON-DROP-OUTS

	<u>N</u>	<u>Mean</u>	<u>T</u>	<u>df</u>	<u>2-Tail Probability</u>
<u>SESSION 1-12</u>					
<u>Desire for External Praise</u>					
Drop-outs	14	26.71	-2.19	109	.03
Non-Drop-outs	97	34.34			
<u>SESSION 1-21</u>					
<u>Age</u>					
Drop-outs	99	42.07	2.26	159	.02
Non-Drop-outs	62	38.22			
<u>Spouse Attitude</u>					
Drop-outs	96	4.58	-2.14	158	.03
Non-Drop-outs	64	5.06			
<u>Depression - Initial</u>					
Drop-outs	84	9.0	2.44	148	.02
Non-Drop-outs	66	6.2			
<u>Depression - 2nd Adm.</u>					
Drop-outs	56	7.5	3.13	117	.002
Non-Drop-outs	63	3.5			
<u>Self Motivation for Weight Loss</u>					
Drop-outs	66	27.7	-2.06	109	.04
Non-Drop-outs	45	29.6			
<u>Self-Control in Losing Weight</u>					
Drop-outs	66	4.1	-2.04	109	.04
Non-Drop-outs	45	4.8			



1 = none and 7 = very much) how much they would like to receive congratulations for losing weight from each of eight sources (including spouse, family, etc.). People who stayed in the program from Session 1-12 scored significantly higher on their desire for external praise than did people who dropped out from 1-12 ( $t = -2.19$ ;  $df = 109$ ;  $p < .03$ ).

The following five factors differentiated drop-outs at any time in the program (Session 1-21) from non-drop-outs.

2. Age: Overall, the mean age of drop-outs was significantly higher than program completers ( $t = 2.26$ ;  $df = 159$ ,  $p < .02$ ).
3. Spouse attitude: Spouse attitude (Weight Reduction Questionnaire, Appendix 7) was measured by participant's response to this question:  
What has your spouse's attitude been toward your weight problem?

Very Concerned	Moderately Concerned	Slightly Concerned	Slightly Unconcerned	Moderately Unconcerned	Very Unconcerned
1	2	3	4	5	6

Participants who dropped out of the program reported significantly less concern by their spouse for the weight problem than did participants who completed the program ( $t = -2.14$ ;  $df = 158$ ;  $p < .03$ ).

4. Depression: Depression was measured by the Beck Depression Inventory which was administered to participants at the initial session and again at Session 12 (4 months). Drop-outs scored significantly higher than non drop-outs on both the initial ( $t = 2.44$ ;  $df = 148$ ;  $p = .02$ ), and second administration ( $t = 3.13$ ;  $df = 117$ ;  $p = .002$ ). Thus drop-outs reported more depression at the beginning of the program, and those

people who did not drop out until after Session 12 also reported more depression at the time of the second administration than did program completers.

5. Self-motivation for weight loss: Self-motivation for weight loss was measured as total score of five questions on the Weight Reduction Program Questionnaire (Appendix 7). Each question could be scored from 1-7 for a total possible score of 1-35. Questions concerned commitment to losing weight, readiness to participate in the present study, self-responsibility for losing weight, motivation for weight loss, and control for losing weight. A high score indicates high self-motivation for weight loss. Drop-outs scored significantly lower on self-motivation for weight loss than program completers ( $t = -2.06$ ;  $df = 109$ ;  $p < .04$ ).
6. Self-control losing weight: Control losing weight was scored from 1-7 by each participant where 1 was no control losing weight and 7 was total control losing weight (Weight Reduction Program Questionnaire Appendix 7). Drop-outs scored significantly lower in self-control for losing weight than program completers ( $t = -2.04$ ;  $df = 109$ ;  $p < .04$ ).

Factors that did not differentiate drop-outs from non drop-outs either at Session 12 or overall were expectancy for success, marital communication, prior attempts dieting, eating patterns, change in depression (Session 1-12), change in expectancy for success (Session 1-12) or change in marital communication (Session 1-12, or Session 1-12-21).

Drop-out questionnaire. Only 20 drop-outs completed the Drop-out Questionnaire (Appendix 11), but responses of these participants lend some support to the prognostic factors isolated in the present study. The five responses rated as the most important reasons for dropping out were: 1) other problems in my life make it hard to diet now; 2) I did not feel motivated enough to carry out diet techniques; 3) now is not a good time to be on a diet; 4) transportation problems; and 5) the meetings did not fit my schedule.

Frequency of drop-out rates. The drop-out rates for Stimulus and Affective Control Groups, Couples and Individuals Groups, males and females, and adult, adolescent and child onset of obesity were calculated and subjected to a chi-square test of significance. The drop-out rates for each group were examined for Session 1-9 (2 months), Session 1-12 (4 months), Session 1-16 (8 months), Session 1-18 (10 months) and Session 1-21 (one year).

Stimulus control and affective control groups. For four out of the five time periods analyzed, the percentage of drop-outs was significantly higher for Stimulus Control Groups than Affective Control Groups:

1. Session 1-9: By Session 9, 30% of the participants in Stimulus Control Groups (SC) had dropped out whereas only 7% of the participants in the Affective Control Groups (AC) had dropped out (chi square = 13.3;  $df = 1$ ;  $p < .0003$ ). The total drop-out rate for Session 1-9 was 17%.
2. Session 1-12: By Session 12, 42% of the participants in SC had dropped out, whereas only 21% of the participants in AC had dropped out (chi square = 6.97;  $df = 1$ ;  $p < .008$ ). The total drop-out rate for

Session 1-12 was 30.6%.

3. Session 1-16: By Session 16, 62% of the participants in SC had dropped out as compared to 48% of the participants in AC (chi square = NS). Total drop-out rate for Session 1-16 was 54.7%.
4. Session 1-18: By Session 18, 67.6% of the participants in SC had dropped out as compared to 51% of the participants in AC (chi square = 4.04; df = 1;  $p < .04$ ). Total drop-out rate for Session 1-18 was 58.2%.
5. Session 1-21: By Session 21 (end of the program), 70% of the SC participants had dropped out as compared to 51% of the AC participants (chi square = 5.63; df = 1;  $p < .02$ ). Total drop-out rate for the entire program was 59.4%.

Couples and individuals groups. For two out of the five time periods analyzed, Couples Groups had a significantly higher drop-out rate than Individuals Groups. No significant differences between the groups was evident for Session 1-9, Session 1-12, or Session 1-16. By Session 18, Couples Groups had a drop-out rate of 63% as compared to 44% for Individuals Groups (chi-square = 3.93; df = 1;  $p < .05$ ). At the end of the entire program (Session 1-21) Couples Groups had an overall drop-out rate of 64.5% which was significantly higher than the Individuals Groups' drop-out rate of 44% (chi square = 4.72; df = 1;  $p < .03$ ).

Other factors. No significant differences occurred at any time for drop-out rates of males and females, adult, adolescent or child onset of obesity, or overweight and non-overweight spouses.

Are drop-outs treatment failures? Analyses revealed no significant pretreatment differences in RC or percentage excess weight for drop-outs and non-drop-outs.

Weight losses during program participation. The performance of drop-outs in terms of RI and pounds lost was compared to the performance of non drop-outs in the following manner. RI and weight loss were calculated for Session 1-9 for all participants, and a comparison was made for that time period between participants who dropped out of the program after Session 9 (anytime from Session 12-20) and participants who continued to complete the entire program. Similarly, RI and weight loss was calculated for Session 1-12 for all participants, and a comparison made for that time period between participants who dropped out after Session 12 (anytime from Session 12-20) and those who completed the program. Thus the performance of drop-outs while participating in the program was compared to the performance of non drop-outs over the same time period.

Session 1-9. Mean RI and pounds lost for Session 1-9 for participants who dropped out after Session 9 and participants who completed the program are shown in Table 39. Overall, the future drop-outs were losing significantly less weight than the program completers ( $F = 5.43$ ;  $df = 1, 143$ ;  $p < .021$ ). By Session 9, program completers had lost a mean of 12.4 pounds, but participants who dropped out after Session 9 had lost only 9.2 pounds. RI did not differ significantly at this time. The analysis of variance for pounds lost for future dropouts and program completers is presented in Table 40.

Session 1-12. Mean RI and pounds lost by treatment group for Session 1-12 for participants who dropped out after Session 12 and participants who completed



TABLE 39

MEAN RI AND POUNDS LOST BY TREATMENT GROUP FOR  
SESSION 1-9 FOR PARTICIPANTS WHO DROPPED OUT  
AFTER SESSION 9 AND PROGRAM COMPLETERS

<u>Treatment Group</u>	<u>RI</u>	<u>Pounds Lost</u>	<u>N</u>
SC - Overall	31.15	10.7	53
SC - Drop-outs	31.64	10.0	31
SC - Non-Drop-outs	30.47	11.5	22
AC - Overall	31.86	10.7	91
AC - Drop-outs	24.61	8.7	44
AC - Non-Drop-outs	38.64	12.8	47

TABLE 40

ANALYSIS OF VARIANCE FOR MEAN POUNDS LOST BY SESSION 9  
FOR DROP-OUTS AFTER SESSION 9 AND NON-DROP-OUTS IN  
STIMULUS (S) AND AFFECTIVE (A) CONTROL GROUPS

<u>Source -</u>	<u>SS</u>	<u>DF</u>	<u>MF</u>	<u>F</u>
Main Effects	261.515	2	130.758	2.74
SA	0.168	1	0.168	0.004
Drop 9	259.147	1	259.147	5.43*
2-Way Interactions	57.669	1	57.669	1.21
SA Drop 9	57.669	1	57.669	1.21
Explained	416.977	3	138.992	2.91
Residual	6679.176	140	47.708	
Total	7096.152	143	49.623	

\*p < .02

the program are presented in Table 41. Overall, participants who dropped out after Session 12 had a significantly lower RI ( $F = 6.45$ ;  $df = 1, 134$ ;  $p = .004$ ) and had lost significantly less weight ( $F = 8.201$ ;  $df = 1, 134$ ;  $p < .005$ ) by Session 12 than participants who completed the entire program. By Session 12 program completers had a mean RI of 47.00 and a mean weight loss of 16.3 pounds, whereas participants who dropped out of the program between Session 12-20 had a mean RI of 32.5 and a mean weight loss of only 11.1 pounds. The analysis of variance for mean RI is found in Table 42 and for pounds lost in Table 43.

Summary. As hypothesized, drop-outs lost significantly less weight (Session 1-9, Session 1-12) and had a lower RI (Session 1-12) during their participation in the weight loss program than did program completers over the same time period.

Overall RI and weight loss of drop-outs and non-drop-outs. In contrast to comparing weight measures of future drop-outs and program completers while drop-outs were participating in the program, the next measure assesses the overall performance of the drop-out even after program termination.

Mean RI and pounds lost were compared for drop-outs and non-drop-outs for two periods during the weight loss program. During the eighth month of treatment (Session 16), a research assistant called (at random) 60 drop-outs. She was able to make appointments with 47 drop-outs to visit their homes and weigh them on the program's "Doctor's Scale." Appointments were made for the same week as the initial telephone call. Thirteen of the sixty drop-outs selected were unable or unwilling to be weighed-in at their homes. Weights were also collected on 82 of the drop-outs at the end of the entire program by telephone in the manner previously described in

TABLE 41

MEAN RI AND POUNDS LOST BY TREATMENT GROUP FOR SESSION 1-12  
FOR PARTICIPANTS WHO DROPPED OUT AFTER SESSION 12  
AND PROGRAM COMPLETERS

<u>Treatment Group</u>	<u>RI</u>	<u>Pounds Lost</u>	<u>N</u>
SC - Overall	39.42	13.6	50
SC - Drop-outs	38.13	11.8	28
SC - Non-Drop-outs	41.07	15.8	22
AC - Overall	40.18	13.9	85
AC - Drop-outs	28.35	10.7	38
AC - Non-Drop-outs	49.74	16.5	47

TABLE 42

ANALYSIS OF VARIANCE FOR MEAN RI AT SESSION 12 FOR  
 DROP-OUTS (AFTER SESSION 12) AND NON-DROP-OUTS IN  
 STIMULUS (S) AND AFFECTIVE (A) CONTROL GROUPS

<u>Source</u>	<u>SS</u>	<u>DF</u>	<u>MS</u>	<u>F</u>
Main Effects	4622.359	2	2311.180	3.239
SA	9.646	1	9.646	0.012
Drop 12	4600.172	1	4600.172	6.448*
2-Way Interactions	2643.019	1	2643.019	3.704
SA Drop 12	2643.019	1	2643.019	3.704
Explained	9740.688	3	3246.896	4.551
Residual	93465.250	131	713.475	
Total	103205.930	134	770.193	

\* $p < .01$

TABLE 43

ANALYSIS OF VARIANCE FOR MEAN POUNDS LOST BY SESSION 12  
FOR DROP-OUTS (AFTER SESSION 12) AND NON-DROP-OUTS IN  
STIMULUS (S) AND AFFECTIVE (A) CONTROL GROUPS

<u>Source</u>	<u>SS</u>	<u>DF</u>	<u>MS</u>	<u>F</u>
Main Effects	744.277	2	372.113	4.126
SA	0.943	1	0.943	0.010
Drop 12	739.541	1	739.541	8.201*
2-Way Interactions	24.455	1	24.455	0.271
SA      Drop 12	24.455	1	24.455	0.271
Explained	899.316	3	299.772	3.324
Residual	11813.590	131	90.180	
Total	12712.906	134	94.872	

\*p < .005



the Method section.

Drop-outs and non-drop-outs: weight comparison at 8 months (Session 16). By eight months of treatment (Session 16) participants who remained in the program had a significantly larger mean RI ( $t = -3.04$ ;  $df = 113$ ;  $p = .033$ ) and a significantly greater weight loss ( $t = -3.33$ ;  $df = 113$ ;  $p < .001$ ) than participants who had dropped out from Session 1-16. Mean RI and pounds lost are presented in Table 44.

Drop-outs and non-drop-outs: weight comparisons at program termination (Session 21). Mean RI and pounds lost were compared at the end of the program (Session 21) for 1) participants who had dropped out from Session 1-12 (1-4 months) and non-drop-outs, and 2) participants who had dropped out at any time during the program (Session 1-21, 1-one year) and non-drop-outs.

1. Drop-outs and non-drop-outs: (Session 1-12). By the end of the program (Session 21) participants who had completed Session 1-12 had a significantly larger RI ( $t = -2.51$ ;  $df = 146$ ;  $p < .01$ ) and had lost significantly more weight ( $t = -3.52$ ;  $df = 146$ ;  $p < .001$ ) than those participants who had dropped out of the program from Session 1-12 (1-4 months). Mean RIs and pounds lost are shown in Table 45.
2. Drop-outs and non-drop-outs: (Session 1-20, overall). By the end of the treatment program (Session 21) non-drop-outs had a significantly larger RI ( $t = -4.85$ ;  $df = 146$ ;  $p < .001$ ) and had lost significantly more weight ( $t = -4.34$ ;  $df = 46$ ;  $p < .001$ ) than participants who

TABLE 44

MEAN RI AND POUNDS LOST FOR DROP-OUTS AND  
NON-DROP-OUTS (SESSION 1-16; 1-8 MONTHS)

	<u>N</u>	<u>df</u>	<u>Mean RI</u>	<u>Pounds Lost</u>
Drop-outs	47	113	25.43	8.27
Non Drop-outs	68	113	50.33	19.18
			T= -3.33*	T= -3.04**

\*  $p < .001$

\*\*  $p < .003$

TABLE 45

MEAN RI AND POUNDS LOST BY SESSION 21 FOR DROP-OUTS  
SESSION 1-12, AND NON-DROP-OUTS, SESSION 1-12

	<u>N</u>	<u>RI</u>	<u>Pounds Lost</u>	<u>df</u>
Drop-outs	37	14.38	6.62	146
Non Drop-outs	111	41.33	14.59	146
		T= -3.52*	T= -2.51**	

\*  $p < .001$

\*\*  $p < .01$

had dropped out at any time during the program. Mean RI and pounds lost by Session 21 are presented in Table 46.

Summary of drop-outs and non drop-outs. Of the 15 factors investigated, six significantly differentiated drop-outs from non-drop-outs. One factor, desire for external praise, was scored significantly lower by participants who dropped out from Session 1-12 than those who remained in the program during that time period. Overall, drop-outs were older, reported less spouse concern for their weight problem, scored significantly higher on depression at two times during the program, and reported less self-motivation and less self-control for weight loss than did participants who completed the program.

A higher percentage of participants dropped out of Stimulus Control Groups than Affective Control Groups (from Session 1-9, 1-12, 1-16, 1-21), and a higher proportion of participants in Couples Groups dropped out than in Individuals Groups (Session 1-18, Session 1-21). Drop-out rates did not vary for males and females, adult, adolescent and child onset of obesity, or overweight and non-overweight spouses.

While participating in the Weight Loss Program, drop-outs had significantly lower RIs (Session 1-12) and lost significantly less weight (Session 1-9, Session 1-12) than program completers over the same time period.

By eight months of treatment (Session 16) drop-outs (Session 1-16) had a significantly lower RI and smaller weight loss than non-drop-outs, and by the end of the Weight Loss Program (Session 21, one year) participants who had dropped out from Session 1-12 had significantly smaller RIs and had lost significantly less weight than

TABLE 46

MEAN RI AND POUNDS LOST BY SESSION 21 (ONE YEAR) FOR NON-DROP-OUTS AND PARTICIPANTS WHO DROPPED OUT AT ANY TIME DURING THE WEIGHT LOSS PROGRAM

	<u>N</u>	<u>RI</u>	<u>Pounds Lost</u>
Drop-outs	82	20.63	7.2
Non Drop-outs	66	51.93	19.3
		$T = -4.85^*$	$T = -4.34^{**}$

\*  $p < .001$

\*\*  $p < .001$

non-drop-outs from Session 1-12. In addition, at the end of the program, participants who dropped out at any time during the program (Session 1-20) had significantly smaller RIs and weight losses than program completers.

### Section Three: Program Evaluation

Results pertaining to program evaluation are divided into two areas. In the first area, weight factors, participants' evaluations of various weight loss techniques and treatment components are analyzed. In the second part, results pertaining to participants' self-evaluation of their weight loss performance and behavior changes are discussed, and correlations between the self-evaluations and actual weight loss measures are reported.

Weight factors. At the end of Session 12 (4 months), all participants completed The Weight Factors Scale (Appendix 8). The questionnaire was divided into four parts. Part I (Questions 1-37) was completed by participants in Stimulus and Affective Control Groups and contained questions concerning the effectiveness of general techniques and common components of the Weight Loss Program such as the "exchange plan diet" and "weighing in before group meetings." Part II of the questionnaire (Questions 38-75) was different for the two treatment groups. Participants were asked to rate techniques and components of their own weight loss program. For example, participants in Stimulus Control Groups were asked to rate the effectiveness of "putting your fork down between bites" and participants in Affective Control were asked to rate the helpfulness of "relaxation techniques". Part III (Questions 76-121) was identical for both groups and contained questions concerning negative influences



on weight loss such as difficulty controlling bingeing or feelings of deprivation.

Part IV (Questions 133-144) was completed only by Couples Groups and participants were asked to evaluate the effect of working with their spouse in the Weight Loss Program.

Part I. The following factors, applicable to both Stimulus and Affective Control Groups, were rated as having the most important positive influence in helping weight loss efforts. All factors were rated 1-5, with 1 being some negative influence-hindered weight loss efforts, and 5 being very important positive influence in helping weight loss efforts. Out of the 37 factors, those receiving the highest mean scores are, in order of rank:

1. Desire to please yourself by losing weight (4.68).
2. Concentrating on changing habits and attitudes about food rather than just on weight loss (4.53).
3. Being weighed in before group meetings (4.466).
4. Accepting responsibility for your own weight loss (4.31).
5. Attending group meetings (4.414).
6. Your own self-initiative (4.384).
7. Accepting that watching your weight will be a life-long endeavor (4.308).
8. Accepting that a slow steady weight loss will help weight loss maintenance (4.288).
9. Increasing your exercise (4.253).
10. The encouragement and support of your spouse (4.212).

The factors that were rated as least helpful in the weight loss efforts were the thirty dollar commitment to the program (2.671) and time of the year (2.74).

## Part II.

Stimulus control. Participants in the Stimulus Control Groups were asked to rate, on the same score of 1-5, which weight loss techniques used in their program were the most positive influences on weight loss. The ten factors with the highest mean score are as follows:

1. Eating more slowly (4.60).
2. Chewing more slowly (4.511).
3. Putting my fork down between bites (4.333).
4. Putting small quantities of food on the eating utensil (4.222).
5. Not going back for seconds (4.200).
6. Not buying high calorie foods (4.159).
7. Serving just enough food to meet calorie needs for meals (4.156).
8. Stopping eating when full (4.156).
9. Preparing low calorie, high nutrition meals (4.114).
10. Not serving family style - putting food on the plate and leaving the rest in the kitchen (4.111).

Techniques rated as least helpful were buying high calorie foods for other members of the family that you don't like (2.12) and storing food in hard-to-see, hard-to-get-at places in cabinets (2.13).

Affective control. Participants in the Affective Control Groups also rated on a scale of 1-5 which of 39 weight loss techniques used in their program were

most helpful in their weight loss efforts. The ten factors rated by participants as most helpful were:

1. Realizing that you can control your own eating habits (4.417).
2. Saying to yourself "I choose to eat this food" or "I choose not to eat this food" (4.262).
3. Positive compliments and praise from your family and friends about your weight loss and new attitudes about food (4.238).
4. Positive compliments and praise from your spouse about your weight loss and new attitudes about food (4.214).
5. Learning to eat favorite foods by saying "I can have some now - a moderate portion - and can have some again tomorrow or the next day (4.167).
6. Learning to associate not overeating with ideal weight, a state of relaxation, and good feelings (4.083).
7. Learning to associate overeating with being overweight (4.048).
8. Learning to deal with emotions in ways other than eating (4.036).
9. Learning what emotions trigger overeating (4.024).
10. Learning to be assertive about new eating habits (4.024).

Factors which were rated as least helpful by participants were asking others to help with new eating habits (3.12), and relaxation (3.35).

Part III: Factors negatively influencing weight loss. All participants were asked to rate on a scale of 1-5, 47 factors that may have had negative influences on weight loss efforts. A score of 1 = some positive influence helped you to lose

weight; 2 = no influence; 3 = slight negative influence on weight loss; 4 = moderate negative influence on weight loss, and 5 = very important negative influence on weight loss. The five factors rated by participants as having the most negative influence on weight loss were:

1. Didn't do "Homework Assignments" (3.097).
2. Overeating on weekends (3.090).
3. Poor self-control (3.021).
4. Overeating when eating out (3.021).
5. Not enough exercise (2.924).

Part IV: Couples groups. In the same rating system used in Parts I and II, Couples Groups only were asked to rate 11 factors pertaining to participation in the Weight Loss Program as a couple. The following factors were considered most helpful in weight loss:

1. Having your spouse involved in losing weight too (4.371).
- 2. Working in general as a husband/wife team (4.208).
3. Participation in a Couples Group rather than by yourself (4.138).

Rated as least helpful were exercising jointly (3.231) and doing homework assignments together (3.394).

Summary. For all participants, the acceptance of self-responsibility, self-initiative, and desire to please self were important factors in weight loss efforts. In addition, participants found helpful the concept of changing eating habits and attitudes about food as well as accepting the notion that weight maintenance would be a life-long endeavor. The thirty dollar deposit appeared to have little influence on

weight loss and the effect of time of year was negligible.

Participants in Stimulus Control rated four factors highest that concerned the behavior of eating: eating and chewing more slowly, putting the fork down between bites, and taking small bites. Techniques oriented towards the storing of food were rated as least helpful.

Participants in Affective Control rated techniques related to positive self-talk and positive talk from others as most important, as well as learning not to overeat when emotional. Relaxation techniques alone were not considered helpful, but learning to associate not overeating with ideal weight, a state of relaxation, and good feelings was considered helpful.

For couples, having a spouse who was also involved in losing weight was most important, and working in general as a husband/wife team was also rated as very helpful. Exercising jointly and completing homework assignments together was not seen as a strong positive influence on weight loss.

Participants' self-evaluations. As discussed in the Introduction, evaluation of success and failure of a weight loss program is typically measured by pounds lost and change in RI, and sometimes by changes of various behaviors such as eating patterns. Equally as important, however, are the feelings of success and failure of the participants, whose idea of success may differ from that of the researcher.

Participants of the present study were asked to evaluate their success or failure two times during the year-long program: Session 12 (4 months) and Session 21 (one year). These evaluations were correlated with actual weight losses and change in RI to see if self-evaluation of success correlated with weight loss



measurements, and to investigate the correlation between weight loss and adherence to program techniques such as recording and following the exchange plan.

Session 12 (4 months). Participants were asked six questions concerning their own success and performance in the weight loss program (see Appendix 9, Self-Evaluation Questionnaire, Session 12):

Question 1 - in general, how successful do you feel this program has been so far? 1 = not at all, 2 = slightly, 3 = moderately, 4 = mostly, 5 = extremely.

Of the 124 participants who responded, 1 (.8%) rated the program not at all successful; 5 (4.0%) slightly successful; 20 (16.1%) moderately successful; 45 (36.3%) mostly successful; and 53 (42.7%) extremely successful. Overall, 95.1% of the participants rated the program as at least moderately successful. These ratings correlated significantly at Session 12 with mean number of pounds lost ( $r = .40, p < .001$ ) and RI ( $r = .38, p < .001$ ). Participants who rated the program as extremely successful lost a mean of 17.6 pounds, and those who rated the program as slightly or not at all effective lost a mean of only 5.9 pounds. The mean weight losses for responses to each question of the Session 12 self-evaluation can be found in Table 47.

Question 2 - how successful do you feel this program has been for you so far? 1 = not at all, 2 = slightly, 3 = moderately, 4 = mostly, 5 = extremely.

Of the 124 participants who responded to this question, 2 (1.6%) rated the program as not at all successful for them, 14 (11.3%) slightly successful, 29 (23.4%) moderately successful, 34 (27.42%) mostly successful, and 45 (36.30%)

TABLE 47

MEAN POUNDS LOST BY RESPONSES ON SELF-EVALUATION  
QUESTIONNAIRE - SESSION 12 (4 MONTHS)

	Mean Pounds Lost	N		Mean Pounds Lost	N
<b>Question 1: In general, how successful do you feel this program has been so far?</b>					
1 - Not at all	6.5	1	<b>Question 4: How often have you recorded your food intake during this program?</b>		
2 - Slightly	5.7	5	1 - Never	8.4	4
3 - Moderately	9.0	20	2 - Rarely	9.5	43
4 - Mostly	11.9	45	3 - About Half the Time	13.4	59
5 - Extremely	17.6	53	4 - Usually	21.3	15
			5 - Always	24.8	8
<b>Question 2: How successful do you feel this program has been for you so far?</b>					
1 - Not at all	5.2	2	<b>Question 5: How often have you completed assignments during this program?</b>		
2 - Slightly	5.3	14	1 - Never	4.0	1
3 - Moderately	8.7	29	2 - Rarely	7.6	22
4 - Mostly	12.3	34	3 - About Half the Time	13.0	48
5 - Extremely	20.5	45	4 - Usually	15.7	50
			5 - Always	21.1	8
<b>Question 3: How often have you followed the exchange plan during this program?</b>					
1 - Never	8.1	6	<b>Question 6: How often have you used the weight control techniques presented?</b>		
2 - Rarely	8.7	20	1 - Never	9.0	3
3 - About Half the Time	10.9	41	2 - Rarely	6.0	4
4 - Usually	15.2	50	3 - About Half the Time	10.6	49
5 - Always	26.0	12	4 - Usually	16.0	63
			5 - Always	26.7	5

extremely successful. Overall, 87.11% rated the program as at least moderately successful for them. The ratings correlated significantly with mean number of pounds lost ( $r = .5912$ ,  $p < .001$ ) and RI ( $r = .5710$ ,  $p < .001$ ) by Session 12. Participants also rated the program as most successful by them lost the most weight ( $r = .5912$ ,  $p < .001$ ) and had the largest RI ( $r = .5710$ ,  $p < .001$ ) by Session 12.

Question 3 - how often have you followed the exchange plan during this program? 1 = never, 2 = rarely, 3 = about half the time, 4 = usually, 5 = always.

Of the 129 participants who responded, 6 (4.6%) reported they never followed the exchange plan, 20 (15.5%) rarely, 41 (31.8%) about half the time, 50 (38.76%) usually, and 12 (9.3%) always. These ratings correlated significantly with weight loss ( $r = .44$ ,  $p < .001$ ) and RI ( $r = .39$ ,  $p < .001$ ). Mean pounds lost for participants who reported always following the exchange plan was 25.99, but for participants who reported never following, the mean weight loss was only 8.08 pounds.

Question 4 - how often have you recorded your food intake during this program? 1 = never, 2 = rarely, 3 = about half the time, 4 = usually, 5 = always.

Of the 129 participants who responded, 4 (3.1%) reported never recording, 43 (33.33%) rarely recording, 59 (45.74%) recording about half the time, 15 (11.63%) usually, and 8 (6.2%) always recording. These reports correlated significantly with weight loss ( $r = .47$ ,  $p < .001$ ) and RI ( $r = .55$ ,  $p < .001$ ). Mean pounds lost for participants who reported always recording was 24.74, and for those who reported never recording, 8.38.

Question 5 - how often have you completed assignments during this

program? 1 = never, 2 = rarely, 3 = about half the time, 4 = usually, 5 = always.

Of the 129 respondents, 1 (.7%) reported never completing assignments, 22 (17.05%) rarely completing assignments, 48 (37.21%) completing assignments half the time, 50 (38.76%) usually completing assignments, and 8 (6.2%) always completing assignments. Completion of assignments correlated significantly with weight loss ( $r = .36$ ,  $p < .001$ ) and RI ( $r = .32$ ,  $p < .001$ ). Participants who reported always completing techniques lost a mean of 21.05 pounds, and those who reported never or rarely completing assignments lost a mean of only 7.2 pounds.

Question 6 - how often have you used the weight control techniques presented? 1 = never, 2 = rarely, 3 = about half the time, 4 = usually, 5 = always.

Of the 124 participants who responded to this question, 3 (2.4%) stated they never used the techniques, 4 (3.2%) rarely, 49 (39.5%) half the time, 63 (50.81%) usually, and 5 (2.6%) always. These self-ratings correlated significantly with mean weight loss ( $r = .38$ ,  $p < .001$ ) and RI ( $r = .38$ ,  $p < .001$ ). Participants who reported always using weight loss techniques lost a mean of 26.74 pounds and those who stated they never or rarely used the techniques lost a mean of 7.2 pounds.

Summary. At Session 12 (month 4) 95% of the participants rated the weight loss program in general as at least moderately successful, with 42.7% rating the program as extremely successful. When asked specifically how successful the program had been for them, at least 87% of the participants rated the program as at least moderately successful, with 36% rating it as extremely successful. Self-report

of general success and individual success correlated significantly with weight loss and RI at Session 12 in the expected direction.

Participants were also asked to evaluate their own performance in terms of following the exchange plan, recording food intake, completing assignments and using weight control techniques. For each of these four factors, responses correlated significantly with weight loss and RI at Session 12, and participants who reported high scores for their performances also lost the greatest amount of weight.

Session 21. At the end of Session 21, participants who had completed the year-long program answered the eight questions in Self-Evaluation Questionnaire-21 (Appendix 10) concerning success in the weight loss program. As in the Self-Evaluation Questionnaire - Session 12 - all questions were answered on a scale of 1-5. The two questionnaires are similar in nature but contain different questions. The questions, question responses, and corresponding weight losses can be found in Table 48.

Approximately 70% of the 62 participants who completed the weight loss program considered themselves to be at least moderately successful in their weight loss attempts over the year. Participants who rated themselves as extremely successful ( $N = 13$ , 21%) lost a mean of 43.7 pounds, whereas participants who considered themselves not at all successful ( $N = 4$ , 6.4%) lost a mean of only 2.7 pounds. Significant correlations between ratings of success and mean number of pounds lost from Session 1-21 ( $r = .60$ ;  $p < .001$ ) and RI at 21 ( $r = .7$ ;  $p < .001$ ) occurred.

In answer to the question, "Did you lose the weight you wanted to lose," 57.3% ( $N = 35$ ) of the participants reported that they had lost at least half of the



TABLE 48

MEAN POUNDS LOST BY RESPONSES OF SELF-EVALUATION  
QUESTIONNAIRE - SESSION 21 (ONE YEAR)

	<u>Mean Pounds Lost</u>	<u>N</u>	<u>%</u>
Question 1: How successful do you feel in your weight loss attempt over the past year?			
1 - Not at all	2.7	4	6.4
2 - Slightly	9.1	13	21.0
3 - Moderately	15.4	18	29.0
4 - Very	20.6	14	22.6
5 - Extremely	43.7	13	21.0
Question 2: Did you lose the weight you wanted to lose?			
1 - None	8.7	5	8.2
2 - A little	11.3	21	33.9
3 - About half	17.6	9	14.7
4 - Most of it	28.6	17	27.9
5 - All of it	35.5	9	14.7
Question 3: How do you feel about your body now?			
1 - Bad	6.5	5	8.1
2 - Not so good	12.6	11	17.7
3 - O.K.	13.0	19	30.6
4 - Pretty good	33.1	6	9.7
5 - Great	28.7	11	17.7
Question 4: Do you expect to maintain your weight loss?			
1 - No	1.0	1	1.6
2 - Probably not	13.0	1	1.6
3 - Maybe	12.2	5	8.2
4 - Probably	6.8	5	8.2
5 - Yes	23.2	49	80.4

TABLE 48 (Continued)

	<u>Mean Pounds Lost</u>	<u>N</u>	<u>%</u>
Question 5: Do you expect to lose more weight?			
1 - No	39.3	3	4.8
2 - Probably not	46.7	2	3.2
3 - Maybe	7.5	8	12.9
4 - Probably	27.0	7	11.3
5 - Yes	19.1	42	67.8
Question 6: How helpful has your spouse been in your weight loss attempt?			
1 - Hurt efforts a lot	--	0	0
2 - Hurt efforts some	7.5	7	11.3
3 - Neither hurt nor helped	12.7	9	14.5
4 - Helped some	19.4	22	35.5
5 - Extremely helpful	28.0	24	38.7
Question 7: How much have your eating habits improved?			
1 - A lot worse	--	0	0
2 - Some worse	2.0	1	1.6
3 - Same	6.6	11	17.7
4 - Some improvement	16.6	23	37.1
5 - Great improvement	30.0	27	43.6
Question 8: How responsible do you feel for your weight loss?			
1 - Not at all	--	0	0
2 - Very little	--	0	0
3 - Some	9.2	14	22.6
4 - Mostly	23.2	18	29.0
5 - Totally	23.9	30	48.4

weight they had planned on losing. Overall, 14.7% ( $N = 9$ ) stated they had lost all of the weight they had planned on losing, and 8.2% ( $N = 5$ ) reported they had lost none of the weight they planned on losing. Responses to this question correlated significantly with mean number of pounds lost from Session 1-21 ( $r = .47$ ;  $p < .001$ ) and RI ( $r = .63$ ;  $p < .001$ ).

Overall, 80.4% of the participants reported they would "definitely" maintain their weight losses and another 16.4% responded "probably" or "maybe" to this question. Strong correlations did not exist between question responses and weight loss or RI.

Approximately 80% of the participants expected they would "probably" or "definitely" lose more weight in the future, but weight loss and RI during the program did not correlate strongly with question responses.

Over half (58%) of the participants answered that they were feeling at least "O.K." about their body, and 17.7% reported that they were feeling "great". Significant correlations occurred between responses to the question and mean pounds lost ( $r = .41$ ,  $p < .001$ ) and RI ( $r = .61$ ,  $p < .001$ ) from Session 1-21. Participants who reported feeling "bad" about their bodies lost a mean of only 6.5 pounds, but those who reported feeling great lost a mean of 28.7 pounds.

Spouses were rated as helpful or extremely helpful in the weight loss attempt by approximately 80% of the participants; only 11.3% stated their spouses had "hurt efforts some", and 0% responded spouses had "hurt efforts a lot". Those participants who rated their spouses as most helpful lost a mean of 28.0 pounds, whereas participants who stated their spouses hurt weight loss efforts some lost only a mean of 7.5

pounds. Significant correlations occurred between question responses and weight loss from 1-21 ( $r = .35, p < .006$ ) and RI ( $r = .36, p < .005$ ).

Over 80% of all participants reported that their eating habits had significantly improved since the beginning of the program; no participants reported that eating habits were "a lot worse", and 1.6% ( $N = 1$ ) responded that eating habits were some worse. Improvement in eating habits correlated significantly with mean pounds lost from Session 1-21 ( $r = .45, p < .001$ ) and RI ( $r = .53, p < .001$ ). Those people reporting great improvements in eating habits lost a mean of 30.0 pounds, and those who stated that eating habits "stayed the same" or became "some worse" lost only a mean of 6.2 pounds.

In answer to the question "How responsible do you feel for your weight loss", all participants answered at least "some" and 48.4% answered totally. Those who felt only "some" lost a mean of 9.2 pounds, participants who answered "mostly" lost a mean of 23.2 pounds, and those answering "totally" lost a mean of 23.9 pounds. Correlations with weight measures were not made since no participants responded "very little" or "not at all".

Summary. Approximately 70% of the participants who completed the entire Weight Loss Program reported they felt at least moderately successful in their weight loss attempts, and 21% considered themselves to be extremely successful. Over 50% of the participants stated they had lost at least half of the weight they had intended on losing, and 14.7% reported they had lost all of the weight they had intended on losing. Self-reports of success correlated significantly with mean pounds lost and RI at Session 21. Most participants (80.4%) stated they would definitely maintain these

weight losses, and 80% expected they would "probably" or "definitely" lose more weight in the future.

Over half of the participants (58%) reported feeling at least "O.K." about their bodies, and significant correlations in the expected direction occurred for weight measurement and responses to this question.

Most participants considered their spouses to be "extremely helpful" or "helpful" in their weight loss attempt and only 11.3% reported that spouses had "hurt efforts some". Over 80% of the participants reported improved eating habits. Both spouse helpfulness and improved eating patterns were significantly correlated with weight measures. Finally, all participants considered themselves to be at least partially responsible for their weight loss and almost half of the participants reported feeling totally responsible for their weight loss.

Because most of the questions were different for Session 12 and Session 21, success or failure as measured by self-report is difficult to compare for these two times. However, one question, "How successful do you feel in your weight loss attempt" is similar. At Session 12, 87% of the participants reported at least moderate success, and at Session 21, 70% of the participants reported at least moderate success. In addition, at Session 12, 42.3% of the participants rated themselves as extremely successful; these participants had a mean weight loss of 20.5 pounds. At Session 21, 21% of the participants rated themselves as extremely successful; they had a mean weight loss of 43.7 pounds.

In general, for both questionnaires, self-evaluation of success and failure correlated significantly with actual weight loss measurements. Adherence to program



techniques (as measured by self-report) such as recording, following the exchange plan, and completing assignments appear to be very important factors in weight loss.

## CHAPTER IV

### DISCUSSION

#### Section One: Major Results

Overall weight loss. Overall weight loss data for the present study compare favorably with results reported for other "successful" weight loss programs (Wollersheim, 1970; Penick et. al., 1971; Rosenthal, 1976; Brownell et. al. 1976; Ashly and Wilson, 1977). Mean weight loss for all groups by Session 12 (4 months), a time period equivalent to most behavioral weight loss programs, was 13.7 pounds and mean RI was 39.7. Weight losses for the typical behavioral program reported in the literature have averaged about 10-12 pounds by post-treatment. However, Session 12 for the present study was not really considered post-treatment, since all groups continued to meet on a monthly basis for the remainder of a year.

Overall mean weight loss at the end of the year program was 19.3 pounds, and mean RI was 48.91. This data also compares favorably to other studies including maintenance or booster sessions over a similar period of time, and overall RI at this time is superior to any reported in the literature to date.

One study (Brownell et. al., 1976) reports greater overall weight losses than the present study and reports that "the magnitude of weight loss for their

couples training group is the best reported in the literature for any well-controlled study, and is nearly triple the 10-12 pound losses reported in other studies. Participants in their Couples Training Group lost a mean of 29.6 pounds by the six month follow-up and had an RI of 35.3. Participants in their Individuals Groups lost a mean of 19.4 pounds,  $RI = 30.1$  (Cooperative Spouse, Subject Alone). Overall mean weight loss for all participants was 20.93 pounds and overall mean RI was 31.68.

At an equivalent time in treatment, (Session 18, 10 months) overall mean weight loss for participants in the present study was 20.24 pounds and overall mean RI was 55.04. Combined, SC and AC Couples Groups had a mean weight loss of 19.69 pounds and a mean RI of 59.20 as compared to Brownell et. al.'s reported weight loss of 29.6 and RI of 35.3. Combined SC and AC Individuals Groups had a mean weight loss of 21.26 pounds and mean RI of 47.38, as compared to Brownell's equivalent Cooperative Spouse-Subject Alone group with a mean weight loss of 19.4 pounds,  $RI = 30.1$ .

The superior Weight Reduction Quotient (RI) of the present study must be viewed with caution, as weight losses were equivalent to or less than those reported by Brownell et. al. (1976). The nature of the Weight Reduction Quotient is that smaller weight losses for lighter participants will result in higher quotients. In Brownell et. al's study, participants averaged 55.7% overweight, mean weight was 207.8 pounds, and average age was 45.3 years. The mean initial percentage overweight for participants in the present study was 42.5; mean initial weight was 19.5 pounds and mean age was 40.2 years. Although participants in the present study were significantly overweight, the discrepancies in weight loss and RI among the

two studies is explained by the higher percent of excess weight of participants in the Brownell et. al. study. Because they were more overweight, Reduction Coefficients would have been relatively lower, and higher weight losses could still result in lower Reduction Indices.

Brownell et. al.'s study does not extend to one year of treatment, so comparisons at this time cannot be made. Weight losses and RI for the present study were approximately the same as they were at 10 months of treatment, but some weight (range  $\approx$  .5 - 5 pounds) had been regained by all groups except ACC, which lost an additional half pound over the time period.

Another measure of overall success of a weight loss program was first suggested by Penick et. al. (1971) and used by Brownell et. al. (1976) and reports the percentage of participants losing over certain amounts of weight. Overall, by the end of the present study, 40% of all participants lost more than 20 pounds, 30.5% lost more than 30 pounds, 19% lost more than 40 pounds, 10.8% lost more than 50 pounds, and 8.7% lost more than 60 pounds. These results also compare favorably with those reported in other studies (e.g., Harris, 1969; Penick et. al., 1971). In Brownell et. al.'s study, 44.8% of the participants lost more than 20 pounds, 24.1% lost more than 30 pounds, 10.3% lost more than 40 pounds, and no reports were given for over 50 pounds. In the present study, a higher percentage of participants experienced large weight losses than in Brownell et. al.'s (1976) and most other reported studies.

Range of weight loss. In most weight reduction studies, there is large intra-group variability which can obscure the clinical utility of the weight loss

procedures (Jeffrey et. al., 1978; Mahoney and Mahoney, 1976; Penick et. al., 1971). The present study is no exception. At Session 12 (4 months) weight losses ranged from 5 pounds to 52 pounds. By the end of the program (Session 21 - 1 year) "weight losses" ranged from a gain of 5 pounds to a loss of 105.5 pounds. This variability was expected for Stimulus Control Groups which ranged from a weight loss of 1.5 - 85.5 pounds, but also occurred with higher variability for the Affective Control Groups with a low "weight loss" of +5 pounds and high weight loss of 105.5 pounds. Seven out of the eight participants losing more than 50 pounds were in the Affective Control-Couples Group.

Rate of weight loss. Pattern of weight loss can be best assessed by calculating rate of weight loss per week for various time segments of the program. For this calculation, data was used from the 69 participants who completed the entire program. For week 1-9 (Session 1-9) of the Weight Loss Program, participants lost a mean of 1.36 pounds per week, and sessions were on a weekly basis. After Session 9, participants met once every two weeks for 6 weeks. Over this six week period (Session 10-12) rate of weight loss diminished to .63 pounds per week. Following Session 12, meetings were held once a month for the remainder of the year. For the sixteen weeks from Session 12-16, rate losses were .21 pounds per week, and from Session 16-18 (8 weeks), .16 pounds per week. From Session 18-21 (12 weeks), participants gained a mean of .14 pounds a week.

While participants were meeting on a weekly basis, weight losses averaged between the 1-2 pounds recommended by the therapists in the present study. When participants began meeting bi-weekly, this rate of weight loss was cut in half, and



when meetings became monthly, rate of weight loss slowed even more. Very slight gains occurred from Session 18-21 which coincided with the holiday times of Thanksgiving, Christmas and New Year.

These results support recent findings by Jeffrey et. al. (1979) who found that participants in a behavioral weight loss program who were contacted three times per week, in person or by phone, lost significantly more weight and reported significantly less food consumption than in sessions on a once-per-week basis. Frequency of therapist contact seems to be a potent factor in rate of weight loss. Suggestions for future programs include the continuance of weekly or bi-weekly meetings for participants who are still attempting to lose weight. Monthly meetings do not appear to be adequate for this purpose. Frequent meetings during holiday periods would also be desirable.

Summary. Overall weight losses compare favorably to other reported programs in terms of mean pounds lost and RI. Similarly, the wide range of weight losses experienced in all treatment groups is typical of the individual variability reported in other behavioral programs. Range of weight loss in the Affective Control Groups was even larger than in Stimulus Control Groups. Rate of weight loss for the initial nine weekly meetings was within the 1-2 pound per week range suggested by many weight loss practitioners, but rate of weight loss diminished when meetings began on a less frequent basis.

Stimulus control and affective control. Contrary to expectations presented in Hypothesis 1, participants in Stimulus Control Groups did not differ significantly in mean pounds lost or RI from participants in Affective Control Groups for any of the

time periods measured. Both groups lost significant amounts of weight over the year-long program. Mean pounds lost for Stimulus Control Groups was 17.88, with an RI of 53.21. Mean pounds lost for Affective Control Groups was 19.55, with an RI of 53.87.

This finding is somewhat contradictory to the results of research on the treatment of obesity which indicates that behavioral programs, at least at post-treatment are superior to other methods such as group therapy, insight-oriented therapy, individual therapy and social pressure. However, the present study is the first to use a comprehensive, group-oriented affective control method for the treatment of obesity. Previous alternative methods were used as placebo or attention control groups.

To explain the successful performance of participants in Affective Control Groups, several factors must be investigated. One possible rationale to explain the effect of Affective Control is that the method acted as a placebo - participants expected to lose weight so they did. However, an examination of available research indicates that groups used as placebo treatment groups to control for effects such as attention, social pressure, group support, weigh-ins and nutritional and exercise information were not effective for weight loss.

For example, Wollersheim (1970) included both a Social Pressure Group and a Nonspecific Therapy Group in her study to control for motivational and attention factors. All groups received the same information about obesity, health, nutrition, exercise and dieting; and were told to reduce their calorie intake to 1,000-1500 calories a day. The Social Pressure Group relied on group support as a treatment factor and employed techniques of group and therapist praise and criticism. In the

Nonspecific Therapy Group, participants learned relaxation techniques and discussed underlying causes for behavior. At the end of treatment, the Focal Therapy Group (Behavioral Treatment) was superior to the Social Pressure and Nonspecific Therapy Groups which lost a mean of approximately 5 and 6 pounds respectively. These two groups regained some of the weight by the eight week follow-up, whereas the Focal Therapy Group maintained the weight losses. Other groups including placebo groups and social pressure groups report similar results (Abrahms and Allen, 1974; Harris and Bruner, 1971; Hanson et. al., 1976; Hall et. al., 1977, Kingsly and Wilson, 1977; Polly and Keenan, 1976) with behavioral groups losing the most weight and placebo groups losing only negligible amounts of weight at the end of treatment.

However, those studies including long-term follow-up periods (Hall et. al., 1977; Hanson et. al., 1976; Kingsly and Willson, 1977) found that at the end of six months or a year, weight losses were no longer significantly different among groups. The primary reason for the lack of long-term differences was the tendency of participants to regain weight after treatment ended, not because participation placebo groups continued to lose weight. Hall et. al. (1977) concluded that although behavior modification training does produce significant results for the short-term, by six months these differences are no longer significantly different from other measures generally considered less effective.

Although this rationale may apply to the present study, the important differences are that weight losses for both Stimulus Control and Affective Control Groups were relatively large, and that at no time in the study were weight losses

larger for Stimulus Control Groups than Affective Control Groups.

A second possible explanation for the performance of Affective Control Groups is that both self-monitoring and exercise were encouraged as weight loss methods. However, Mahoney (1974) studied the effect of self-monitoring on weight loss over an eight week period and concluded that even after six weeks of self-monitoring, and an additional two weeks of self-monitoring and goal-setting, significant weight losses were not obtained. Mahoney (1974) concludes that his findings were consistent with previous research reporting transient and variable results of self-monitoring operations (Mahoney, Moura and Wade, 1974; Thorenson and Mahoney, 1973).

In addition, evaluations of the impact of nutritional counseling and exercise management have shown them to be insufficient factors for long-lasting, clinically significant weight losses (Harris and Hollamer, 1973; Jongmans, 1969, 1970; Levetz and Stunkard, 1972; Stuart, 1971).

-One factor, not controlled in the present study, that might account for performance of Affective Control Groups is the therapist variable. The same two therapists conducted all weight loss groups, thus there was no way to check for generalizability of treatment methods among various groups. Future research using Affective Control Techniques should use therapist crossover or many different therapists to account for this potential effect.

Some evidence indicates that Affective Control Groups were successful in weight loss because the participants used the Affective Control techniques. On the Weight Factors Questionnaire, participants in Affective Control Groups rated

techniques such as learning not to overeat when emotional, positive self talk, and use of visual imagery as most helpful in weight loss. In addition, general discussions and feedback from the participants indicated that they were using the Affective Control methods for weight loss and believed the techniques were very helpful.

Other factors point to the success of Affective Control as a viable weight loss treatment. First, significantly less participants dropped out of the Affective Control Groups than Stimulus Control Groups. By week nine, 30% of the participants had terminated from the Stimulus Control Group as compared to only 7% in the Affective Control Groups. Over the year-long period, 20% more participants (a significant difference) had dropped out of the Stimulus Control Groups than the Affective Control Groups. Since dropouts were less successful weight losers while in the program, overall results may be somewhat biased in the favor of Stimulus Control.

Finally, of the eight participants who lost over 50 pounds, seven were in Affective Control Groups.

Overall, the lack of differential weight losses between the treatment groups is difficult to explain. If the rationale is accepted that participants in Affective Control Groups lost weight because of placebo effects or therapist variables, then the reasons for the weight losses of the participants in Stimulus Control Groups must also be assessed.

According to Mahoney (1975) the behavioral treatment of obesity derives from a set of assumptions which are generally unexamined or contradicted by evidence in other disciplines. For example, most behavioral treatment programs are based on the beliefs that obese and non-obese individuals exhibit distinctive "eating styles"



and that if an obese person learns to adopt the eating style of the non-obese, he or she will lose weight. The so-called obese eating style, first described by Schacter (1971) is characterized by large bites, rapid eating pace, short meal duration, and an exaggerated sensitivity to external stimuli. Therefore, behavioral methods of weight control include recommendations to slow down the pace of eating, take small bites, and control eating cues by altering the environment.

The validity of both of these beliefs is questionable. Results from a series of studies performed over the last several years indicate that the "obese eating style" is only a myth. One field study in a restaurant failed to detect a difference in the eating speed of obese and non-obese customers and a second study found that obese subjects took more bites than non-obese (Mahoney, Inpiese, Gaul, Craighead and Mahoney, in press). In fact, the few existing studies on the effect of bite size indicate that taking smaller bites may actually result in increased food consumption (Pliny, 1974; Wooley, 1972).

In a comprehensive review of the literature, Wooley and Wooley (1975) remark that Schacter's theory of externality may have less support and relevance than commonly assumed. They conclude that current evidence does not support obese-non-obese differences in response to cue salience.

If the so-called obese eating style is a myth, then researchers who use behavior modification programs for the treatment of obesity may be incorrectly attributing weight losses to stimulus control techniques.

In light of these findings, it is just as difficult to attribute weight losses in the Stimulus Control Group to behavioral techniques as it is to attribute weight losses

in the Affective Control Groups to affective control techniques. According to the Weight Factors Questionnaire and Self-Evaluation of Weight Loss Questionnaires, participants believed they lost weight because of the particular methods used in their program, but actual measurements of technique implementation and correlations with weight loss were not assessed.

Based on this rationale, attributing success in weight reduction to particular treatment methods is not possible. Both groups lost experimentally and clinically significant amounts of weight over a year-long period. Future research should include more precise evaluation of implementation of weight loss techniques. Self-report measures of eating habits can be biased (Fredericksen, Epstein, and Kosevsky, 1975) so additional methods such as spouse monitoring or precise self-monitoring of baseline, treatment and post-treatment behavior should be attempted.

Couples and individuals. In general, participants in Couples Groups lost more weight with respect to RI than participants in Individuals Groups; this difference was significant at two and eight month analyses, with a strong trend in the same direction at four and twelve month comparisons. In analyses of females only, the same results were found, with Couples' RI significantly higher than Individuals' RI.

However, in all of these analyses, there were no significant differences between Couples and Individuals with respect to pounds lost. The discrepancy between results, measured by pounds lost compared to RI, may reflect the fact that the initial RC for Couples (4.2) was higher (though not significantly so) than for Individuals (3.0). Similarly, Individuals tended to be more overweight (47.1%) initially than Couples (40.9%) in terms of percentage of excess weight. Therefore, similar

weight losses for Couples and Individuals would yield higher RI scores for Couples. Contrary to Hypothesis Two, participants in Couples Groups did not actually lose more weight than participants in Individuals Groups. Furthermore, there were 20.5 percent more drop-outs in Couples Groups than in Individuals Groups. These differences may have biased the results in favor of Couples Group data since drop-outs while in the program were losing less weight than participants who completed the entire program.

These results do not coincide with initial correlational data and one experimental investigation involving spouse participation; however, they are consistent with the two other major studies which have been reported concerning spouse involvement.

Two groups of researchers (Jeffrey et. al., 1978; Mahoney and Mahoney, 1976) reported significant correlations between weight loss and measures of family members' support of participants' weight loss efforts. Similarly, Brownell et. al. (1976) reported significantly greater weight losses for participants in a Couples Group in a study comparing a spouse training program and an individual treatment program. However, differences reached significance for pounds lost, but not RI. The fact that there were large differences among groups with respect to initial weight and initial percentage overweight may explain this discrepancy. Participants in Couples training averaged 69.7% overweight, whereas participants in the Individuals Groups averaged 53% and 46.5% overweight. According to Murray (1975), there is a tendency for individuals with the highest initial weight to lose more weight. Therefore, the fact that Couples' participants in Brownell et. al.'s study lost more weight may be associated with initial differences, and thus the increase in pounds lost is not reflected

by RI. Furthermore, these results are limited by the small sample size of 29 participants overall, and only 9 in Couples training.

Wilson and Brownell (1972) found no differences in weight loss between a group including a family member and a group with individuals only. Another recent study (O'Neil et. al., 1979) also reported no significant effects of spouse involvement on weight loss during treatment or follow-up. However, as O'Neil et. al. suggest, the insignificant findings in both of these studies may be due to the passive role of spouses as observers only. Spouses in treatment groups of Brownell et. al. were instead, active models and trainers.

The nature of partner influence may very well account for some of the inconsistencies across studies concerning the effects of spouse involvement. Brownell et. al. (1976) reported that subjects mentioned mutual monitoring as an important factor, and these authors suggest that spouses provided potent and immediate reinforcement for appropriate eating behavior. In a comparison of reinforcement procedures (therapist versus significant other) for weight loss or positive change in eating habits, Israel and Saccone (1979) found that participants who received reinforcement from a significant other for eating behavior change were most successful. Significant others were instructed to monitor the client's eating behavior, according to a checklist, at one meal each day. According to points earned for appropriate eating behaviors, the significant other rewarded the client with all or part of \$5.00 from a deposit.

However, in a study of overweight friends working as partners, Zitter and Fremouw (1978) observed that partners sabotaged each other by socially reinforcing



each other for deviating from newly learned eating patterns. A group in which pairs of overweight friends were reinforced monetarily if both partners lost weight was compared to a group consequenceing individual performance only. While both groups lost weight, at the end of a 6-month follow-up, the partner consequence group had regained most of the weight. In contrast, the individual consequence group had maintained their weight loss. One explanation offered for these results was based on anecdotal information. Participants felt that they convinced their partner to engage in inappropriate eating behaviors more often than helping each other to control eating. Apparently, sabotage was quite potent.

A most striking difference between Zitter-Fremouw's study compared to Brownell et. al. (1976) is that in the latter, both members of the "couple" were trying to lose weight, whereas in the former, only one client was attempting to lose weight with the help of a spouse.

Both the nature of partner influence and the weight of the spouse seem to have had direct influence on the results of the present study.

In an assessment of factors which influenced weight loss, participants in Couples Groups rated "exercising jointly", "doing homework together," and "having weekly meetings at home" as least helpful. The specific factors related to working together as a couple did not seem to facilitate weight loss. Furthermore, despite much encouragement from the therapists, discussions with participants indicated that many were not performing these homework assignments. Therefore, the role of the spouse in the present investigation appears to have been quite different from the active reinforcer role described in the studies reporting facilitative effects of



significant others.

In addition, responses to a survey of forty-seven factors which negatively influenced weight loss, participants ranked sabotage by spouse (e.g., spouse bringing home high-calorie foods; spouse suggesting eating dinner out) as the sixth important negative influence. They did, however, rate general factors such as "having spouse involved in weight loss too" as most helpful. Therefore, it seems that the role of the spouse was an important variable, either as a help or a hinderance.

A second factor, weight of spouse, proved most interesting. In overall comparisons of overweight participants with overweight spouses (OP-OS) and overweight participants with non-overweight spouses (OP-NS), there were no significant differences in weight loss. However, for Individuals Groups only, OP-NS lost significantly more weight with respect to RI. Also, there was a significant interaction in terms of pounds lost indicating that OP-NS lost weight consistently over the year-long program, whereas OP-OS began to regain weight after four months. Therefore, if they attended a group alone, participants with non-overweight spouses were more successful at weight loss than participants with overweight spouses. On the other hand, in a comparison of OP-OS couples, participants with overweight spouses had a significantly larger RI over time and lost significantly more weight in Couples Groups than in Individuals Groups. Participants whose overweight spouses were not involved in the program did lose weight initially, but began to regain the weight after four months. However, couples where both overweight participants were involved in the program lost weight consistently over the entire year.

In summary, if a participant had an overweight spouse, they were more

successful at weight loss if both attended the program. However, for participants who attended alone, they were more successful if they had a non-overweight spouse.

The major variable of Couples or Individuals treatment, in and of itself, did not seem to influence weight loss. However, together with the factor of weight of spouse, there were significant effects. Results indicated that, in particular, for overweight participants with overweight spouses, it was important to include both in treatment. Since studies investigating spouse involvement have not controlled for weight of spouse, results may be confounded by a variable found to be highly significant in the present study. Future research to investigate further the influence of spouse's weight on weight loss and maintenance is warranted. Additionally, the role of the spouse, either at home or during actual program sessions, needs careful consideration in studies of spouse involvement.

Males and females. With respect to sex differences, there was an initial significant difference in pounds lost (at 2 months, males had lost 12.20 pounds and females, 9.64) and other slight trends for males to lose more pounds at some points in the program. However, after one year in treatment, males had lost a mean weight of 20.1 pounds, and females, 17.9 pounds, a difference which was minimal. RI differences for males and females were not significant for any analyses; however, these findings are biased by the significantly lower pretreatment RC for males (2.68) than for females (3.84).

The results of the present study negate Hypothesis Three, a prediction that males would lose significantly more weight than females, and are contrary to the findings of some studies investigating sex differences. While sex differences in

weight loss are not consistently observed in the literature, whenever differences have been reported, males have been more successful than females (Harris, 1969; Cormur, 1972; Jeffrey et. al., 1978). Furthermore, a recent investigation of sex of subject which included spouses in treatment (O'Neil, et. al., 1979) found a significantly greater weight loss for males as measured by many indices. However, only 17 subjects were included in this study, and treatment and follow-up lasted for only four months. These differences may parallel the trend in the present study for males to lose more weight initially. However, with long-term follow-up, the greater success reported by O'Neil et. al. may have diminished, as was the case in the present study.

The fact that males in the present study were significantly more overweight (as measured by RC) than females may have biased the results. According to Murray (1975) there is a tendency for individuals with the highest initial weight to lose more weight. On the other hand, there is some evidence which suggests that a greater initial percentage overweight may negatively influence treatment (Nash, 1976). Salans (1974) proposes that the metabolism of the enlarged fat cell actually hinders weight reduction. Due to insulation provided by adipose tissue, the obese experience a more efficient use of calories (Quade, 1963). Also, Dabney (1964) notes that due to relatively low levels of activity, the obese are subjected to reduced levels of metabolism.

An additional factor, number of calories prescribed in the diet plan, warrants consideration as a possible confounding variable in studies of sex difference. At normal weight, males generally weigh more than females and therefore, require more

calories to maintain their body weight. If males and females (or any two groups) differ significantly at pretreatment, then the group weighing more initially may lose more weight if they follow a diet prescribing the same number of calories. Therefore, initial differences in body weight alone may bias results.

In the present study, males had a significantly higher body weight initially and were prescribed the same 1200 calorie diet as females. Therefore, assuming they followed the diet plan, males may have been expected to lose more weight.

Aside from the initial difference in overweight for males and females, other factors may have confounded the results of the present study. Males and females were not matched for age, socioeconomic status, prior attempts at dieting, exercise activities, or number of inappropriate eating behaviors.

Nonetheless, the present study is one of the largest to compare males and females and includes more males than any other reported investigation, as well as data for an entire year. Therefore, results support similar research (Hall et. al., 1974; Glennon, 1966; Jeffrey et. al., 1978) which indicate that males and females do not perform differently in weight reduction.

Eating patterns. In an assessment of the Eating Patterns Questionnaire, results indicated that participants reported improvement in eating patterns from the initial session to four months in treatment, but then a tendency to revert to old habits by one year. This pattern was also found for reports of spouse helpfulness. Given the changes in scheduling of sessions and time of year of the last administration, these results are not surprising. From Administration One to Two (Session 1-4 months in treatment) meetings were held weekly for nine weeks and then bi-weekly for six

weeks. Participants were reminded regularly about techniques and methods to control eating. However, from Administration Two to Three, meetings were monthly, and by one year in treatment many people did discuss the tendency to revert to old habits. Also, the last administration was completed in January, a time of year which, due to the holiday season, was discussed by participants as being most difficult in terms of conscientious implementation of techniques.

Although it was expected (Hypothesis 6) that weight loss and RI would correlate positively with changes in eating habits and spouse helpfulness, the only significant correlation that did occur was between a decrease in eating during specific situations and pounds lost at four months (Session 12). However, the rate of weight loss does parallel the change in eating patterns and spouse helpfulness: by four months there were significant positive changes in eating patterns and spouse helpfulness, and participants had lost weight steadily; by twelve months, participants reported more inappropriate eating behaviors and had started to regain a slight amount of weight.

The ambiguity of these findings is similar to the inconsistency reported across published studies of eating pattern change. Wollersheim (1970) and Hagen (1974) found significant correlations between weight loss and the Eating Patterns Questionnaire. However, in comparisons of self-monitoring records (Jeffrey et. al., 1974) and in daily self-reports of behavior change and calorie intake (Brownell et. al., 1976) no significant correlations were found.

Also, in the present study, no significant differences in eating patterns, change in eating patterns or correlations with weight loss were found among treatment groups. Two measures of eating patterns (eating during specific situations and



eating during emotional times) reflected differences in the two major treatment groups, Stimulus Control and Affective Control. Therefore, it may have been expected that these two groups would report differential changes in these two measures. The fact that no difference existed suggests that prescribed behavior change may not be responsible for weight change.

However, various problems exist with this method used to measure eating habit changes. The Eating Patterns Questionnaire is a self-report inventory, and the reliability and validity of the instrument is therefore questionable. Fredericksen et. al. (1975) have demonstrated that in self-monitoring, accuracy declines as the time between behavior and recording increases. Instead, independent assessment in studies of weight reduction will be necessary to accurately evaluate program adherence as well as cause-effect relationships between therapeutic techniques and treatment outcome.

Age of onset of obesity. Results pertaining to age of onset of obesity negated the original Hypothesis 4 that child-onset obese would lose less weight than adult-onset obese. At four months during treatment, child-onset lost significantly more pounds than either adult or adolescent onset. Although the Reduction Index was also greater for child-onset, this difference was not significant. Comparisons after one year in treatment demonstrated that child-onset continued to lose significantly more weight than adult-onset, and although the difference in pounds lost was large for child and adolescent onset, results did not reach significance. Overall, child-onset lost 28.50 pounds, 14.45 pounds more than adult and 11.75 pounds more than adolescent onset obese. A trend continued for RI to be larger for child-onset obese also.

These results are similar to findings reported in two other studies comparing weight loss and age of onset. In Jeffrey et. al.'s study (1979) the 47 clients who were considered juvenile-onset obese (defined as being 20 pounds or more overweight by age 20 according to a self-report questionnaire) were less overweight initially and lost more weight than the 24 adult-onset obese. These data were compared following a ten or twenty-week treatment program. Brownell et. al. (1976) reported that their seven childhood-onset obese (participants reporting an earliest age of 13 or less at which they were overweight) were significantly more overweight initially than twenty adult-onset participants. However, after a ten-week treatment program, there were no significant differences between the two groups in weight loss.

Both of these studies are confounded by initial differences between groups and provided relatively short-term data. In the present study, results are somewhat stronger since the onset groups did not differ initially, with respect to degree of overweight, and data was collected for an entire year.

Therefore, despite evidence that juvenile-onset obese have additional numbers of fat cells (Bjorntorpan-Sjstrom, 1979; Hirsch and Knittle, 1970), higher incidence of emotional problems associated with obesity (Stunkard and Rush, 1974) and more negative emotional reactions to treatment (Grinker, Hersch and Levin, 1973), there is no indication, to date, that they lose less weight than adult-onset obese.

One discrepancy across studies which may bias results significantly is the definition of categories of onset. Jeffrey distinguished juvenile onset-obese as those individuals who were 20 pounds or more overweight by age 20. Brownell et.

al.'s definition was quite different: child-onset were those individuals who reported being overweight by 13 years of age or less. Neither of these studies distinguished adolescent-onset obese. Based on studies of body-image distortion which concluded that the greatest disturbances occurred in adolescent-onset obese and therefore may influence reactions to dieting (Bruch, 1951; Stunkard and Burt, 1967; Stunkard and Mendelson, 1967), participants in the present study were divided into child, adolescent and adult onset obese. Some evidence was provided to conclude that these three categories are necessary since child and adolescent groups differed in terms of weight loss. Nonetheless, these categories were not defined in terms of exact age range and percentage overweight during those years.

In future investigations of onset of obesity, it will be imperative to clearly distinguish categories, including adolescent-onset, and to use standard definitions across studies. Furthermore, verification of self-report information from medical and school records would strengthen the validity of procedures. Also, control for other subject selection factors such as prior attempts at dieting, sex or socioeconomic status will be required to provide conclusive evidence. Finally, weight loss maintenance warrants investigation as a separate factor which may vary according to age of onset of obesity.

Other variables. In analyses of depression, marital communication and expectancy for success, scores improved significantly from the initial session to four months in treatment. These results were consistent across treatment groups.

Given evidence which indicates that depression and emotional upset often accompany weight loss or dieting (Glucksman et. al., 1968; Stunkard and Rush,

1974; Wooley and Wooley, 1976) the overall improvement in these measures, and in particular, depression, is somewhat surprising. However, it does seem likely that expectancy for success may have increased if participants felt that weight loss attempts were successful, as may have been the case at four months, since the majority of participants were losing weight consistently. If so, it would follow that weight loss would correlate positively with expectancy of success. However, weight loss did not correlate significantly with any of the above measures.

These results were not consistent with Hall, Bass and Monroe (1978) who found that a lower level of mood disturbance was correlated with greater weight loss during treatment. However, this measure of mood disturbance (Total Mood Disturbance Score of the Profile of Mood States) was administered six times during a year-long treatment program. Also, this scale has been shown to be sensitive to fluctuations in mood states (McNair, Lorr and Dropplemar, 1971) and appropriate for multiple administrations.

One other finding of interest was that Couples and Individuals Groups did not change differentially with respect to marital communication. Although they participated together in the treatment program, their work as a team did not seem to influence communication as measured by the Communication Inventory.

Methodological considerations. Several methodological considerations should be taken into account when assessing the results of the present study or planning future research in the area of treatment for obesity.

Weight loss maintenance. Usually, the bi-weekly or monthly group meetings that follow an initial treatment program of 8-12 weeks are called booster, maintenance,



or follow-up sessions. Such names can be misnomers since in most cases, participants are still attempting to lose weight rather than just maintain weight losses. These additional meetings are a part of continued treatment in the sense that even regularly scheduled weigh-ins may be effective treatment components. For example, in the present study, the monthly meetings were considered to be part of the weight loss program. Therefore, true follow-up data on weight loss maintenance can only be collected after treatment stops completely. The follow-up data for participants of the present study will be collected in August, 1979, six months after treatment completion.

In addition, researchers should be clear when reporting "follow-up data" if participants were completely terminated from treatment at the time of data collection or if treatment was ongoing on a limited basis.

Another factor which may confound results on weight loss maintenance is the grouping of participants into one category. Actually, when possible, follow-up reports should classify participants into two categories: those wishing to lose more weight and those who have reached their goal weights and desire only to maintain weight losses. Indeed, if a large number of participants reach goal weights during a weight loss program, rate of weight loss would be expected to drop off severely both during the treatment program and by follow-up periods. The present study does not distinguish between participants who reached their goal weights and those who desired additional weight losses, although 14% of the participants achieved their target weight before the end of the program. This result may have slightly confounded the experimental results in terms of data on rate of weight loss.



Therapist variable. For the present study, the same two therapists conducted all sessions for both Stimulus and Affective Control Groups. Consequently, assessment of treatment methods for generalizability is not possible and the effectiveness of actual treatment components cannot be thoroughly investigated. Studies in the past (Wollersheim, 1970; Rosenthal, 1976) have reported that therapist variables have not affected treatment outcome in behavioral programs. Furthermore, the results previously discussed concerning placebo treatments suggests that the effect of a therapist plus various non-specific treatment methods are not sufficient to induce weight loss. However, since this study is the first to investigate a comprehensive affective control treatment method, no studies exist proving the general effectiveness of this treatment. Further research must be conducted using the Affective Control techniques before it can be labelled a viable treatment method. However, results of the present study suggest this program is equally as effective as the traditionally employed behavioral programs.

- Matching. Because of the large number of participants in the present study, subjects were randomly assigned to treatment groups. However, results of the study indicate that in the future matching subjects in treatment groups for several factors would increase the soundness of experimental results. For example, studies in the past have not even reported the weights of participant's spouses. This factor appears to be an important variable in weight loss. Results of the present study show participants with overweight spouses lose significantly more weight when both members of the couple participate in the program. If research investigating the effect of spouse participation in weight loss programs does not control for this factor, results may be

confounded. Participants in the present study were not matched in groups by weight of spouse, and if there had been a difference in weight losses among treatment groups, a thorough investigation as to the proportional number of participants in each group would have been necessary.

Also, in the present study, participants were not matched by sex. There was a higher proportion of males in the Couples Groups than in Individuals Groups. Since overall weight losses for males and females were not significantly different in the present study, experimental results are not strongly influenced. However, just the difference in number of males present at the meetings may have been influential and should be controlled if possible.

Future research should also match participants by percent overweight as there is some recent evidence (Brownell et. al., 1976) that the more obese person has greater difficulty with weight loss.

Drop-outs. A high percentage of participants dropped out from the present study. Fortunately, the initial number of participants was large enough so that the number of individuals completing the program was greater than the number of participants included in most reported studies. However, subjects did drop out differentially among treatment groups. This effect was somewhat counterbalanced by analyzing data with repeated measures analysis of variance for five different time periods of the program. Since drop-outs were losing less weight while in the Weight Loss Program, the treatment groups with the highest number of drop-outs (Stimulus Control and Couples Groups) may have shown slightly inflated mean weight losses. Again, had weight losses varied among treatment groups, this effect would have been thoroughly

investigated. Jeffrey (1976), for example, suggests including weight loss data from drop-outs in the overall results. Although this procedure is not reported in the results, initial analyses indicate that inclusion of the weight loss data of drop-outs does not change the overall results of the present study.

## Section Two: Drop-outs

Prognostic factors. In the past, researchers have experienced difficulty finding factors predictive of dropping out of treatment for obesity. Of the 15 factors investigated in the present study, 6 successfully differentiated drop-outs from non-drop-outs. One possible reason for the isolation of these effective predictors is the relatively large number of participants in the study. For each variable, information was collected on at least 66 and up to 99 drop-outs, and at least 45 and up to 66 non-drop-outs. Most studies investigating prognostic factors have consisted of smaller subject populations; one study, however, was of equal size (Nash, 1976).

- Overall, dropouts in the present study scored significantly higher in depression both at the beginning of the program and at the fourth month of treatment (Session 12). In other words, drop-outs were significantly more depressed at the beginning of the program than non-drop-outs, and participants who dropped out after the fourth month of treatment reported more depression at Session 12 than program completers.

A correlation between dropping out of treatment and depression is not surprising. Of course, a statement cannot be made that participants dropped out because they were feeling depressed, but participants who begin a weight loss program feeling depressed may indeed have difficulty losing weight. Although traditionally, one of

the main symptoms of depression is a loss of appetite (Beck, 1967; Zung, Coppedge, and Green, 1974), for many overweight people the opposite may be true. Bruch (1974) reported that for many of her overweight patients, depression resulted in weight gain. Polivy and Herman (1976) concluded that for dieting, weight conscious individuals in their study, feelings of depression interfered with self-control of eating. Thus participants who begin a weight loss program feeling depressed may have difficulty losing weight, and subsequently drop out of treatment.

The results of the present study show that initially drop-outs had a mean score of 9 on the Beck Depression Inventory. Schuab, Bialow, Brown and Holzer (1967) have recommended a cut-off point of 10 for screening of depression among general medical patients; a score of 9 would indicate the presence of mild, not clinically debilitating, depression. Drop-outs in the present study, while in the program, did lose significantly less weight than program completers over the same time period. Although this result in no way proves a causal relationship between depression, difficulty losing weight, and dropping out of treatment, further investigation into the area is warranted. If such a relationship does exist, weight loss practitioners might benefit from screening potential weight loss participants for depression and either advising them to deal with the depression before attempting a diet, or taking special care to motivate the depressed client during treatment.

Drop-outs also reported significantly less self-motivation and control losing weight than program completers. The finding that participants who dropped out of the program reported, at the initial session, less self-motivation and less control for losing weight is not unexpected. Balch and Ross (1975) reported a similar finding from their



study in which drop-outs scored significantly higher in externality on the Rotter Internality-Externality Scale than non-drop-outs. Although analyses correlating depression, self-motivation for weight loss, and control losing weight were not performed, relationships between these measures and dropping out of treatment should be investigated in the future. Depressed participants may indeed feel less motivated and less in control of their weight loss and subsequently leave treatment when experiencing difficulty losing weight. At this point, such a hypothesis is merely conjecture, and should be experimentally investigated.

In addition to lower self-motivation, drop-outs reported significantly less concern on the part of spouses for their weight problem than non-drop-outs. Overall, then, drop-outs appeared to have relatively little inducement to lose weight - their own motivation was low and motivation to lose for a significant other may also have been mild.

Another factor which successfully differentiated drop-outs from non-drop-outs was age; drop-outs were significantly older than program completers. This finding is contrary to the results reported by Silverstone and Cooper (1972) who reported that middle age subjects were less likely to drop-out of treatment than younger participants, and Nash (1976), who found no difference in the age of drop-outs and non-drop-outs in her study. The age difference between the two groups in the present study is not large, approximately four years, but it is one of the only studies reporting age differences between drop-outs and non-drop-outs.

Only one factor was significantly different for drop-outs and non-drop-outs in the early part of the Weight Loss Program (Session 1-12). Participants who dropped out



from Session 1-12 scored lower on desire for external praise for their weight loss efforts than non-drop-outs. The higher score of non-drop-outs in this area is reasonable since desire for praise by group members and group leaders were two components of the total score for the factor. The desire for external praise may have been an additional motivating factor inducing participants to stay in treatment.

In answer to the question "who are the drop-outs in weight loss program?" the response in, in the present study, they were slightly older, reported more depression, less self-motivation, control in losing weight, and concern on the part of their spouse for their weight problem, and less desire to receive praise from others for weight loss attempts than program completers.

Certainly, replication of these results are necessary, but an assessment of participants' overall motivation for losing weight before treatment begins may be a necessary part of weight loss programs. If motivation is low, participants would be advised to wait until motivation for losing weight increases, or particular techniques, such as high deposits contingent upon program attendance, could be instigated.

Results from the present study concerning drop-outs should be compared to results of other studies cautiously. Treatment in the Affective Control Group was very different than in behavioral programs, and in fact, treatment in the Stimulus Control Group was also somewhat different in that only "strict" stimulus control procedures were implemented. Factors predicting drop-outs in the present study may not predict drop-outs in programs using different treatment methods.

Frequency of drop-outs. Overall dropout rates for the year-long weight loss program was 59.4%. This high percentage is similar to the 60% drop-out rate reported by

Romanczyk et. al. (1973) and Harris and Bruner (1971) at one year follow-up periods, but is more than the 0% attrition rate reported by Brownell et. al. (1976). The two studies are not totally comparable, however, since Brownell et. al.'s study included only 29 participants as compared to 178 in the present study. Analysis of drop-out rates indicate that a minimal number of participants (4.7%) terminated after the eighth month of treatment (Session 16-21). Highest drop-out rates occurred after Session 12 (4 months) when groups began meeting on a once-a-month basis. For many people, monthly meetings may have been too infrequent to promote high motivation and corresponding good attendance. The thirty dollar deposit contract did not appear to be sufficient to ensure continued participation. Perhaps a larger deposit, such as the \$150 deposit used by Brownell et. al. (1976) would be more effective.

Surprisingly, a significantly higher proportion of participants dropped out of Stimulus Control Groups than Affective Control Groups. By the ninth week of treatment, Stimulus Control Groups had an attrition rate of 30%, whereas Affective Control Groups had an attrition rate of only 7%. By the end of the program, approximately 20% more participants had dropped out of Stimulus Control Groups than Affective Control Groups. Reasons for this significant discrepancy are unclear and not explained experimentally as weight losses and other behavioral measures did not differ among treatment groups. A possible explanation is that behavioral methods for the treatment of obesity are widely known by the general public due to the wealth of information available in books, lectures and other commercial treatment programs. Many overweight people search for new weight loss methods, as evidenced by the

rapid sale of books describing "fad diets". Perhaps Affective Control techniques were novel, and therefore more interesting to participants in the program, whereas behavioral methods may have been repetitious for some participants. This explanation is only conjecture and certainly is not supported by fact or even by feedback from group members.

Another unexpected result concerning frequency of drop-outs was that Couples Groups toward the end of the program (Session 18, Session 21) had significantly higher attrition rates than Individuals Groups. By Session 18 (10 months) Couples Groups had a 19% larger attrition rate, and by Session 21 (1 year) Couples Groups had a 20.5% larger attrition rate than Individuals Groups.

Again, explanations for this discrepancy are not clear. An argument could be made that couples should drop out less since they were working together as a team. Instead, coming to groups as a couple may have inhibited attendance. Couples may have experienced more difficulty attending the groups than Individuals due to baby-sitting and scheduling problems. Participants were aware they were expected to come as a couple, and the return of the initial report was contingent upon attendance of both members of the couple. If one person wished to terminate the program early, the remaining spouse may have felt less motivation to continue alone.

Are drop-outs treatment failures? Results support Hypothesis 7 which predicted that while participating in the weight loss program, drop-outs would lose significantly less weight than program completers over the same time period. In the past, researchers have intimated that drop-outs are treatment failures, even while they are still in the weight loss program (Jeffrey, 1978). The results of the present study provide some

support for this conclusion, but labelling drop-outs treatment failures appears to be, at least in this study, an exaggeration. For the two time periods analyzed (Session 9, Session 12), future drop-outs were losing significantly less weight than program completers. However, at Session 9 the weight differential was approximately 3 pounds, and at Session 12 the weight differential was approximately five pounds. This is certainly a significant difference but not enough to call drop-outs treatment failures since they were losing weight. For example, by Session 12, participants who would complete the entire program had lost 16.3 pounds, whereas participants who would drop out sometime after Session 12 had lost 11 pounds. A loss of 11 pounds was a significant weight loss.

Follow-up data gathered on drop-outs after they dropped out of treatment corroborated Hypothesis 8 which predicted that at the time of eight months of treatment, and at the end of the program, participants who had dropped out of the program would have lost less weight than program completers.

Prior to the present study, all follow-up weight data collected on drop-outs was by telephone or correspondence. The reliability of this data is somewhat questionable, as participants may tend to underestimate their weight slightly (Jeffrey, 1978). In addition, the number of studies supplying any weight information on drop-outs is very few (Jeffrey, 1976), and those studies that do report data include only a small number of drop-outs (Jeffrey, 1975, 1976).

To ensure reliability of measurement, a research assistant went to the homes of drop-outs with the doctor's scale and conducted follow-up weigh-ins during the eighth month of treatment. Results indicate that by this time, drop-outs had lost



significantly less weight than non-drop-outs; the weight difference was approximately 10 pounds. However, drop-outs had maintained a mean weight loss of approximately 8 pounds, which is not insubstantial when compared to the average 10-12 pound weight losses experienced by program completers of the typical behavioral weight loss program. The majority of drop-outs ( $N = 30$ ) who were weighed in at eight months of treatment had dropped out before Session 12; however, some dropped out between Sessions 12-14, and the weight losses of these participants may have slightly inflated the overall weight losses of drop-outs.

Follow-up data was also collected on drop-outs at the end of the program. Data collection was by telephone, and therefore not as precise as the weights collected at eight months of treatment; however, most participants weighed with their spouses present while the experimenter was on the phone. Although weights may not be entirely accurate, since the scales used were primarily bathroom scales, the data is probably sufficient to give a good picture of the weights of drop-outs.

Overall, weight lost by drop-outs by the end of the program was only a third of that lost by program completers. Relative to program completers, drop-outs could indeed be called treatment failures. However, the fact that drop-outs were able to maintain a seven pound weight loss mitigates against calling them total treatment failures.

Overall, then, the weight loss performances of drop-outs in the present study do not compare favorably to program completers. Nevertheless, drop-outs are not total treatment failures. Although they lost less weight than program completers while in the program, the differences were not extremely large, and a moderate



amount of weight loss was maintained by the end of the program.

### Section Three: Program Evaluation

Weight factors. Of the ten general factors rated as having the most important positive influences on weight loss, three concerned self-initiative, self-responsibility, and desire to please self. This result may reflect the overlying philosophy of the weight loss program that weight loss is each person's own responsibility, but it may also support the theory that success in weight loss is highly correlated to self-motivation. Participants also reported that concentrating on changing habits and attitudes about food was extremely important. This report lends support to the experimental findings of Mahoney (1976) of the superior performances of participants in weight control groups who are rewarded for habit change rather than weight loss. Surprisingly, recording of food intake, although receiving a high rating, did not rank in the top ten factors influencing weight loss. The participants in one recent study (Mahoney and Mahoney, 1976) rated this technique as the most helpful.

Participants in Stimulus Control Groups rated as most helpful techniques concerning the behavior of eating, and the three most helpful techniques pertained to slowing down the rate of eating. Although many recent studies have indicated that the obese eating style is a myth, participants thought that these behavioral techniques were helpful in promoting weight loss. Similarly, participants in Affective Control rated techniques such as positive self talk, learning to deal with emotions in ways other than eating, and various visual imagery techniques as most helpful in promoting weight loss. The present study included no analyses to prove that participants actually

used these techniques, or that implementation of the methods resulted in weight loss. Perhaps what is most important is that the participants believed that the methods were helpful. Future research should further investigate the role of cognition in weight loss. Already some research in the area of weight control has demonstrated that food intake of the obese can be dependent on how many calories people think they consume rather than how many they actually consume (Wooley, Wooley and Punham, 1972).

According to participants' reports, not completing homework assignments had the most negative influence on weight loss. Further support for this results is provided by results from the Self Evaluation Questionnaire administered at the same session. Self-report of completion of homework assignments was significantly correlated with weight loss, and those participants who reported always completing assignments lost a mean 21.1 pounds by Session 12, whereas participants reporting rarely or never completing assignments lost a mean of only 7.2 pounds. Overall, mean weight loss at Session 12 was 13.7 pounds, so participants who reported completing assignments achieved superior weight losses.

Since "homework assignments" appears to be an important factor in weight loss attempts, efforts should be made to encourage participants to complete these tasks. Verbal persuasion, at least in the present study, was not sufficient. Less than half (45%) of the participants reported "usually" or "always" completing assignments, and 26% reported "rarely" or "never" completing assignments. Some sort of initial deposit contract could be instigated, with money refunded for completion of assignments. However, care must be taken not to sabotage participants' feelings of self-responsibility and self-initiative for weight loss by setting up a high degree of

external control on the part of the therapists.

Couples tended to rate favorably the nonspecific benefits of spouse participation in the weight loss program such as having the spouse involved in losing weight and working in general as a husband and wife team. More specific treatment components such as exercising jointly and completing homework assignments together were not rated as helpful.

Overall, the majority of participants appeared to be unwilling or unable to use techniques involving a large expenditure of time. For example, taking small bites of food was rated highly, but completion of behavioral contracts was not; using positive self-statements was rated highly, deep muscle relaxation was not. The Weight Factors Questionnaire, in the present study, supplies valuable information from a large sample of participants in a weight loss program. This type of self-report information could be valuable when planning future weight loss programs.

Self-evaluations. Participants' own evaluations of their performance in the weight loss program provide a way to assess success and failure other than measurements of weight. In addition, correlations between participants' self-evaluations and actual weight data indicate the comparability of the two types of assessments.

A high percentage of participants in the weight loss program reported feeling at least moderately successful in their weight loss attempts both at Session 12 (4 months) and Session 21 (1 year). At Session 12, 87% of the participants reported feeling at least moderately successful, and at Session 21, 70% of the participants reported at least moderate success. Although a lower percentage reported success by the end of the program, the percentage is still very high. Self-reports of success

did correlate significantly with actual weight losses, indicating that individuals' perceptions of success coincided with actual weight loss performance.

As predicted in Hypotheses 9, 10, 11, 12 and 13, self-report measures of adherence to the exchange plan diet, recording of food intake, completion of home-work assignments, implementation of weight control techniques and improvements in eating habits were significantly correlated with weight loss measures. Self-reports of two other factors, body image and spouse helpfulness, also correlated significantly with weight loss. In each case weight losses were in the expected direction. For example, the five participants who reported "always" implementing the weight control techniques lost a mean of 26.7 pounds by Session 12; this was 13 pounds more than the mean weight loss for all participants at this time. Whether or not these participants actually used the weight loss techniques cannot be empirically supported. The possibility exists that the successful participants rationalized that they must have used the techniques because weight losses were large. However, general comments about behavior changes by participants who lost large amounts of weight indicate that they were indeed implementing the weight loss methods suggested in their group. Unfortunately, empirical evidence to support this conclusion is lacking, and would be difficult to collect. One possible method of data collection would include detailed baseline and post-treatment records of eating patterns and implementation of treatment methods by the participant and an observer or significant other.

Few weight loss studies include information indicating how many participants reach their goal weights. By the end of the treatment program, 14.7% of the program completers reported reaching their goal weight, and approximately 57% of the



participants indicated they had lost at least half of weight they desired to lose. Furthermore, 80% reported "definitely" expecting to maintain the weight losses and well over half expected to lose more weight.

Overall, then, how successful was the weight loss program? Measured by weight losses, the program was more successful than the typical behavioral weight loss program reported in the literature. The mean weight loss of approximately 20 pounds is significant both clinically and experimentally, but weight losses were extremely varied, and a few participants ended the year program weighing the same as when they started. A relatively small percentage of participants actually reached their goal weight, although most were able to maintain their weight losses. Many participants commented that monthly meetings were not sufficient to promote weight loss, but were sufficient for weight loss maintenance. These comments are supported by the data on rate of weight loss, which diminished when the weekly meetings ceased. Future programs should keep these results in mind when planning frequency of group sessions.

The program was not successful in terms of limiting rate of drop-outs. Over half of the participants failed to complete the program in spite of the thirty dollar deposit contingent upon program attendance. Perhaps a larger deposit would be more successful, but a thorough screening of potential weight loss participants in terms of self-motivation and readiness to diet should be implemented. Some individuals might benefit from a "pre-dieting" workshop which would address issues such as motivation, depression, and the importance of self-control on losing weight. Although attrition rate was high, drop-outs in the present study were not complete failures. A moderate



amount of weight loss was evident at the follow-up weigh-ins at eight months and one year.

Perhaps the most important factor determining success or failure of a weight loss program are the reports by participants of their feelings of success or failure. If participants feel good about their own weight loss, body image, and eating habits, an important goal has been attained. Overall, in the present study, reports by participants about their feelings of success were very positive. More importantly, individuals reported that they believed the weight losses would be maintained, and that more weight would be lost in the future. Further follow-up data will verify the validity of these beliefs.

Overall, then, for the majority of participants who completed the treatment, the program was moderately successful in terms of weight loss and self-evaluation of performance. For participants who dropped out, the program was less successful but not a total failure.

### Conclusions

The major contributions of the present study to research in the area of weight control consist of the implementation of a new treatment method, an extension of the recent research concerning spouse involvement in treatment, and the investigation of various determinants of success and failure in weight loss made possible by the study's large subject population and length of treatment.

The present study introduces a comprehensive treatment method for weight loss focusing primarily on affective control techniques. In the past, behavioral

methods for the treatment of obesity have been found superior to alternative methods by the end of treatment, though not necessarily at follow-up periods. In the present study, weight losses for both groups throughout the study were equivalent, and statistically and clinically significant. Although effective treatment components were not isolated, results indicate that further research in the area of affective control and alternative obesity treatments is warranted.

Recent studies in the area of spouse participation in weight loss programs have reported ambiguous results. Some investigators have concluded that spouse involvement enhances weight loss and weight loss maintenance, whereas others have reported negligible effects of spouse participation. Possible explanations for this discrepancy are provided by the results of the present study which indicated that the weight of the spouse was a potent factor in weight loss. To ensure valid experimental results, this variable should be controlled prior to experimental manipulations. Research in weight control has not previously accounted for this factor; consequently, results may be confounded. Another discrepancy among programs investigating the effects of spouse participation, which could account for differential results, is the role of the spouse in the treatment program. In some studies the spouse is trained to be an active model and reinforcer; in others a passive observer, and in the present study, the majority were also dieters. The present study provides the first empirical results from couples where both members are involved as weight loss participants. Future research should further investigate the effects of the role of the spouse during the treatment program.

Attempts by other research projects to isolate significant prognostic factors

concerning performance with weight loss have met with varied results. In general, personality factors have not successfully differentiated the successful from the unsuccessful weight loss participant. This study was no exception as weight losses did not correlate significantly with various self-report measures of depression, marital communication and expectancy of success.

The large subject population of the present study allowed comparisons between the weight loss performance of males and females. No overall significant differences were found for males and females. Although many practitioners and the general public often assume that males lose weight more successfully than females, empirical support for this assumption is mixed. Of the few studies that have found significant male-female differences, males have had the superior performance. However, since the present investigation reports on the largest male-female comparison to date, the assumption of superior weight loss performance by males must be questioned.

Theoretical rationale and physiological factors suggest that child onset obese are more resistant to weight change than adult-onset obese. Little empirical evidence supports differential performances by these groups in weight loss programs. However, in the present study, child onset obese actually lost significantly more weight than adult onset obese. Furthermore, child onset obese lost more weight than adolescent onset obese. Although this result did not reach significance, the importance of differentiating among the weight loss performances of all three groups is demonstrated.

Recently, several researchers have acknowledged the necessity for more thorough data collection on the drop-outs from weight loss programs. The present study provides a comprehensive study on program drop-outs, including information

on prognostic factors and weight loss performance. Several variables, related to depression and self-motivation, successfully differentiated between drop-outs and non drop-outs. Weight loss performance of drop-outs was relatively mediocre, not only by follow-up periods, but also while they were still in the program. These results suggest that some individuals may benefit from a "diet readiness class", especially if motivation is low and depression is high. Future research could investigate the potential effects of such a treatment.

Additional measures other than weight change of program success and failure were included in the present study.

Self-reports by participants about effective treatment components and feelings about their weight loss performance, body image, eating habits, and weight loss maintenance in the future may be just as important as the actual weight losses. If participants who lose great amounts of weight report feelings of failure and poor body image, then the program is not a success for them. On the other hand, if participants who lose only a moderate amount of weight report feeling successful and pleased about their new eating habits, then the program is a success for them. In the present study, most participants reported that the program was at least moderately successful, which coincides with the moderate weight losses of most participants. A mean weight loss of twenty pounds over a year-long treatment program is not a lot of weight, at least compared to the 50-104 pounds participants should have lost according to the 1-2 pound per week rate recommended. Even a relatively slow, consistent weight loss may be unrealistic for most people unless therapist and group contact is frequent (at least weekly) during the actual weight loss period.

The results of the present study as well as the outcomes of numerous other studies indicate that most people who seek out a weight loss program need some type of frequent contact with either a therapist, group, or significant other who has learned how to play an active role in the weight loss effort, to ensure continued weight loss over a long period of time. For example, in the present weight loss program, rate of weight loss dropped off dramatically when weekly sessions ended, and again when bi-weekly sessions were replaced with monthly sessions. The diminished rate occurred even though therapists had continuously stressed the importance of the individual in weight loss and had discouraged group dependency. Future research should continue to focus on methods to enhance weight loss and weight loss maintenance, and special attention should be paid to the precise role of the significant other in weight loss attempts.

A second important focal point for future research efforts will be attempting to match individuals with treatment methods. An individual with a history of emotional connections to food may have far more success in a group teaching affective control than stimulus control, and an individual whose primary problem is eating in front of the television may be most successful in a behavioral group.

Although research in the area of obesity is proliferating, and the future research possibilities are numerous, now may be the time to pursue some basic "groundwork" that is lacking in the field. Behavioral programs for weight loss appear to be successful, at least for moderate lengths of time. The affective control technique presented in this study also seem to be moderately effective. However, no one seems to know for sure why the methods work. Are participants using the techniques, and



if they are, which ones are most effective? Are weight loss techniques based on theories that are unsupported by empirical evidence? Is the so-called "obese eating style", the premise of behavioral programs, a myth, and if it is, why do behavioral programs work at all? Methods for measuring program compliance and experimental design to isolate effective treatment components must be designed. Perhaps these basic questions must be answered before highly successful programs for the treatment of obesity are developed.

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## Appendix 1

Telephone Interview Data Sheet

Name \_\_\_\_\_ Phone No. \_\_\_\_\_ (H)

Address \_\_\_\_\_ (O)

Age \_\_\_\_\_ Sex M \_\_\_\_\_ F \_\_\_\_\_ Ht. \_\_\_\_\_ Wt. \_\_\_\_\_ %OW \_\_\_\_\_

Marital Status \_\_\_\_\_ (If married) how long \_\_\_\_\_

(If single) length of time living together \_\_\_\_\_

Number of previous marriages \_\_\_\_\_

Number of children (list sex, age, height and weight)

Education: Years Completed \_\_\_\_\_ Degrees \_\_\_\_\_

Present Employment \_\_\_\_\_

Will your spouse be able to attend all sessions and participate? Yes \_\_\_\_\_ No \_\_\_\_\_

Do you have any medical complications connected to your weight or diet? (For example: diabetes, cardiac condition, pregnancy.)

Are you currently involved in any counseling or therapy? Yes \_\_\_\_\_ No \_\_\_\_\_

Approximately how many sessions have you had to date? \_\_\_\_\_

Have you ever been involved in any counseling or therapy? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, please describe problem and indicate how many sessions.

How long do you plan to remain in the Atlanta area? \_\_\_\_\_ Do you smoke? \_\_\_\_\_

How many cigarets per day? \_\_\_\_\_ Times available: \_\_\_\_\_

## Appendix 2

Screening Session

1. WELCOME!!!!!! We're glad you're here. We certainly are pleased to have had such a good response. (Have everyone introduce themselves.)
2. Let us tell you a little bit about ourselves and then we want to explain more about the program.
  - A. We are both advanced graduate students and doctoral candidates at the University of Massachusetts and have had experience in research and clinical aspects of weight control.
  - B. This research project is part of our dissertation. We are evaluating many different weight control programs, all of which we feel are very good, but are mainly interested in the effects of these methods on weight loss maintenance.
  - C. We want you to understand that if you become a participant of this program, you will be making a very large commitment -- not only to us but to yourselves. The meetings will take one hour of your time each week but we believe that you will actually be making a life-long commitment. Many of you will have to change your habits for the rest of your life.

We want you to know that we expect you to attend all of the meetings and to participate in every follow-up session at various times for one year. We feel that you should be fully informed about this program before you make such a commitment. Here are some things you should know:

1. There is a \$30.00 deposit required per couple or individual participant. All of this money will be returned to you if you complete the entire program for one year. If you need special arrangements for this, please speak to us.
2. You will be asked to answer questionnaires. We know that filling out questionnaires can be informative but also tedious. What you are getting in return is a program which we feel could be of benefit to you. We do NEED this information, and you will also be helping other people with weight control problems by supplying answers on the questionnaires.

Everything will be strictly confidential -- only statistics will be used to evaluate the results. We will be happy to give individual feedback about any of the questionnaires at the end of the program. Also, everyone who requests a summary of the study will receive one.

3. So far, we are asking you to attend all sessions and to conscientiously supply the information on the questionnaires. If you commit yourself to the program and miss two or more session or questionnaires, you will forfeit your deposit.
4. We also ask that you see your family doctor and talk to him or her about dieting. Bring a consent form signed by your doctor stating that it is O.K. for you to be on a diet.

The diet used is a well-balanced 1200 calorie diet including foods from every essential food group.

We will be happy to speak to your physician about the program.

5. We ask that you participate in this weight control program only during the entire length of the program (one year). It is difficult enough to diet without trying to follow two different diets and many methods.
6. Because we have had so many more people apply than we can accomodate, and because of scheduling conflicts, we cannot guarantee that you will be in a group or what kind of group you will be in.

If you are placed in a group, it may be a couples group or an individuals group -- and it may not be scheduled for your first time preference. We know that all of these programs are very effective and we want to evaluate what worked best for you over a long period of time.

If you have any doubts about your commitment, please let us know today. Each person must make sure they have been weighed and measured today and have fully completed index cards.

Please fill in all times available -- the more times you sign up to be available, the greater your chance of being placed in a group. For those of you who can make Saturdays, this is particularly true.

ANY QUESTIONS?

## Appendix 3

Weight History Questionnaire

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone: Home: \_\_\_\_\_ Office: \_\_\_\_\_

Occupation: \_\_\_\_\_ Date of Marriage: \_\_\_\_\_

Age: \_\_\_\_\_ What was your weight last time you weighed yourself? \_\_\_\_\_ lbs.

What is your height without shoes? \_\_\_\_\_ ft. \_\_\_\_\_ in.

How much would you like to weigh? \_\_\_\_\_ lbs.

What was your highest adult weight? \_\_\_\_\_ lbs. Lowest? \_\_\_\_\_ lbs.

Do you weigh more now than when you got married? Yes \_\_\_\_\_ No \_\_\_\_\_ Same \_\_\_\_\_

If yes, how much more? \_\_\_\_\_ lbs.

When did you first become overweight? (Circle one and indicate approximate age.)

As a Child/Age: \_\_\_\_\_ As an Adolescent/Age: \_\_\_\_\_ As an Adult/Age: \_\_\_\_\_

Who else in your family is or has been overweight? (Circle all which apply.)

	<u>Is Overweight Now</u>		<u>Was Overweight in Past</u>	
Mother	Yes	No	Yes	No
Father	Yes	No	Yes	No
Sister/Brother	Yes	No	Yes	No
Husband	Yes	No	Yes	No
Child/Children	Yes	No	Yes	No

Weight History Questionnaire - Page 2

Name: \_\_\_\_\_

What has your spouse's attitude been toward your weight problem? (Check one.)

Very concerned	_____
Moderately concerned	_____
Slightly concerned	_____
Slightly unconcerned	_____
Moderately unconcerned	_____
Very unconcerned	_____

Please describe your spouse's attitude in your own words in a sentence or two:

How helpful has your spouse been in your past attempts to lose weight? (Check one.)

Very helpful	_____
Moderately helpful	_____
Slightly helpful	_____
Slightly unhelpful	_____
Moderately unhelpful	_____
Very unhelpful	_____

In what ways has your spouse been helpful or not helpful? Describe in a few sentences.

Do you think your spouse wants you to lose weight now? Yes \_\_\_\_\_ No \_\_\_\_\_ Doesn't Care \_\_\_\_\_  
Why or Why not?

Do you think your losing weight is important to your spouse now? Yes \_\_\_\_\_ No \_\_\_\_\_

How do you imagine he/she would feel if you were successful in achieving your weight loss goal?

Pleased _____	Threatened _____	Displeased _____
Jealous _____	Proud _____	More attracted to you _____
Less attracted to you _____	Other _____	



Weight History Questionnaire - Page 3

Name: \_\_\_\_\_

Has anybody else been important in your attempts to lose weight? Who and How?

Are you currently on any type of dieting program? Yes \_\_\_\_\_ No \_\_\_\_\_  
If yes, please specify.

To what do you attribute your overweight condition?

Metabolic or organic factors \_\_\_\_\_  
Bad eating habits \_\_\_\_\_  
Family influence \_\_\_\_\_  
Unstable marriage \_\_\_\_\_  
Lack of motivation \_\_\_\_\_Dislike of self \_\_\_\_\_  
Boredom \_\_\_\_\_  
Dissatisfaction with job \_\_\_\_\_  
General anxiety \_\_\_\_\_  
Other \_\_\_\_\_

## Appendix 4

Participant Consent Form

The purpose of this group and research project is to develop and evaluate techniques to improve maintenance of weight loss. Please read carefully the following important considerations regarding participation in this project.

1. I have discussed any potential medical problems of which I am aware with the persons directing this group, and I understand that I may be requested to bring a clearance from a physician before being accepted for participation in the program.
2. I agree to consult my personal physician should any medical complications arise as a result of my participation in this weight reduction program. I further agree that the University of Massachusetts, the Psychology Department, the Georgia Mental Health Institute, and their representatives, shall not be held legally liable for the occurrence of any medical complications.
3. I have been advised that crash diets and the use of such substances as amphetamines, laxatives and enuretics could be harmful to my health, and that this program will not employ any such methods. I also understand that the recommended rate of weight loss in this group will be 1-2 lbs. per week.
4. I will deposit \$30.00 at the beginning of the program which will be returned to me according to the schedule detailed on the deposit contract.
5. I understand that I, or my partner and I, am to attend all sessions. If I or my partner are unable to attend, I will call the group leader in advance. I also understand that I am free to terminate my participation any time, but if I choose to do so, I will forfeit my financial deposit.
6. I understand that information from the questionnaires will be used solely to evaluate the weight program, and that my name will be removed and the data will be coded by number to protect my confidentiality.
7. I understand that I will receive a summary of results of the weight program upon request.

Participant Consent Form - Page 2

I have read the above information; I agree to the requirements for participation,  
and I wish to participate in the project.

\_\_\_\_\_  
CLIENT NAME

\_\_\_\_\_  
DATE

\_\_\_\_\_  
PARTNER

\_\_\_\_\_  
DATE

## Appendix 5

\$30.00 Deposit

The \$30.00 deposit you have given your group leaders represents a financial commitment to complete this program. The deposit is asked so that you have an extra incentive for attending all sessions and completing the questionnaires. Your deposit plus interest will be returned to you upon completion of the following:

1. Attendance at all group training sessions.
2. Completion of all questionnaires and interviews.
3. Attendance at all follow-up sessions for one year.

Missing two or more sessions (or questionnaires) will result in loss of the deposit.

If, for any reason, it is impossible for you to complete all parts of this program, we ask that you agree to attend an interview and weigh-in to be scheduled at the end of the program. \$5.00 will be returned to you upon completion of this interview.

I have received \$30.00 in: cash \_\_\_\_\_ check \_\_\_\_\_ from: \_\_\_\_\_  
 \_\_\_\_\_ on this date: \_\_\_\_\_.

The deposit will be returned to the above party according to the schedule detailed herein.

(Signed) \_\_\_\_\_

(Signed) \_\_\_\_\_  
 (Participants)

(Signed) \_\_\_\_\_  
 (Group Leader)

## Appendix 6

Eating Patterns Questionnaire

Name: \_\_\_\_\_ Date: \_\_\_\_\_

1. How many main meals do you eat per day? (1 - 5) \_\_\_\_\_
2. On the average, at how many of these main meals do you tend to overeat? (1 - 5) \_\_\_\_\_
3. How often do you eat between meals (on the average, per day)? (1 - 5) \_\_\_\_\_

All of us eat for at least two reasons:

- 1) Because we need food physiologically.
- 2) Because the situation tempts us to eat (we're at a movie, we pass a bakery, it's dinnertime, etc.)

On a scale of 1 - 5, where 5 represents eating only because you're hungry, and 1 represents eating only because of specific situations, try to rate your eating behavior: \_\_\_\_\_

Estimate your average daily caloric intake for a typical day: \_\_\_\_\_ calories.

Use this scale to answer the questions below:

- |     |                     |
|-----|---------------------|
| 1 = | almost never        |
| 2 = | rarely              |
| 3 = | about half the time |
| 4 = | very often          |
| 5 = | almost always       |

## DO YOU EAT:

4. While you read? \_\_\_\_\_
5. While you watch T.V.? \_\_\_\_\_
6. While studying? \_\_\_\_\_
7. While listening to the radio? \_\_\_\_\_
8. While preparing meals? \_\_\_\_\_
9. While playing cards? \_\_\_\_\_
10. When talking with friends? \_\_\_\_\_
11. When in movie theaters? \_\_\_\_\_
12. When at the supermarket? \_\_\_\_\_



Eating Patterns Questionnaire - Page 2

13. When in a new situation? \_\_\_\_\_
14. When giving the children snacks? \_\_\_\_\_
15. After the children are in bed? \_\_\_\_\_
16. After physical exercise? \_\_\_\_\_
17. After smoking? \_\_\_\_\_
18. When your husband/wife is snacking? \_\_\_\_\_
19. When bored? \_\_\_\_\_
20. When nervous? \_\_\_\_\_
21. When excited? \_\_\_\_\_
22. When depressed? \_\_\_\_\_
23. When angry? \_\_\_\_\_
24. When anxious? \_\_\_\_\_
25. After an argument? \_\_\_\_\_

How helpful do you feel your spouse is in your attempts to reduce weight and not overeat? Use the scale below to rate how helpful spouse is in these situations:

- |     |                             |
|-----|-----------------------------|
| 1 = | almost never helpful        |
| 2 = | rarely helpful              |
| 3 = | helpful about half the time |
| 4 = | very often helpful          |
| 5 = | almost always helpful       |

26. At mealtimes: \_\_\_\_\_
27. While spouse is snacking: \_\_\_\_\_
28. While watching T.V.: \_\_\_\_\_
29. After the children are in bed: \_\_\_\_\_
30. When at a restaurant: \_\_\_\_\_
31. When having guests: \_\_\_\_\_
32. At parties: \_\_\_\_\_
33. When visiting friends: \_\_\_\_\_
34. When exercising: \_\_\_\_\_
35. Others (please specify): \_\_\_\_\_

## Appendix 7

Weight Reduction Program  
Questionnaire

---

1. Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Phone: \_\_\_\_\_ Age: \_\_\_\_\_ Sex: \_\_\_\_\_
2. How did you hear about the weight reduction program?
  - a. Friend \_\_\_\_\_
  - b. Referral \_\_\_\_\_
  - c. Posters \_\_\_\_\_
  - d. Newspaper Advertisement \_\_\_\_\_
  - e. Other \_\_\_\_\_
3.
  - a. What is your height? \_\_\_\_\_
  - b. What is your present weight? \_\_\_\_\_
  - c. How long have you been your present weight? \_\_\_\_\_
4. Have you talked to a physician before about your weight?  
Yes: \_\_\_\_\_ No: \_\_\_\_\_  
If yes, what were the physician's recommendations?  
\_\_\_\_\_  
\_\_\_\_\_
5. How many pounds do you want to lose? \_\_\_\_\_  
What is your ideal weight? \_\_\_\_\_
6. Why do you want to lose weight (list most important reason first):
  - a. \_\_\_\_\_
  - b. \_\_\_\_\_
  - c. \_\_\_\_\_
  - d. \_\_\_\_\_

Weight Reduction Program  
Questionnaire - Page 2

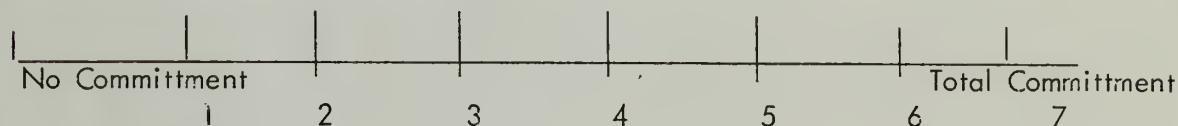
e. \_\_\_\_\_

(PLEASE PLACE A CHECK ON THE LINE TO MOST CLOSELY APPROXIMATE HOW YOU FEEL)

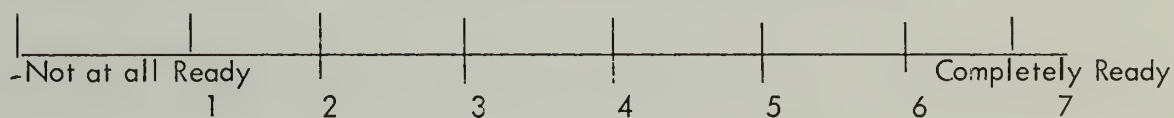
7. How much control do you feel you have in losing weight?



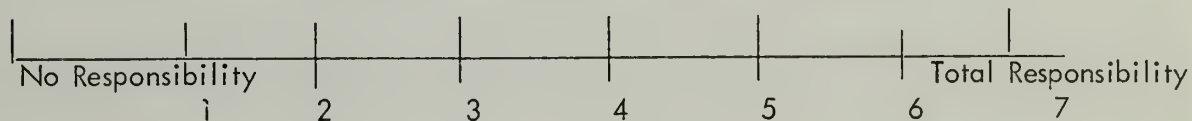
8. How committed are you to losing weight?



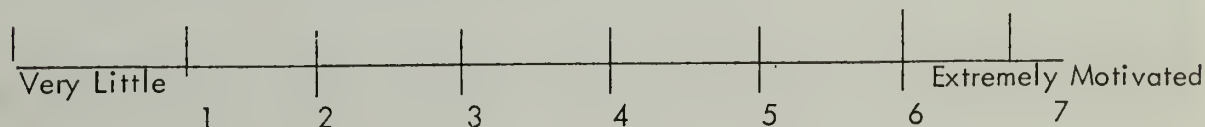
9. How ready are you to participate in this weight reduction program?



10. How much responsibility do you feel you have for losing weight?



11. How motivated are you to lose weight?



12. Rate how much you would like to receive congratulations for losing weight from each of the following:

Weight Reduction Program  
Questionnaire - Page 3

A. Spouse

None						Very Much	
	1	2	3	4	5	6	7

B. Male Parent

None						Very Much	
	1	2	3	4	5	6	7

C. Female Parent

None						Very Much	
	1	2	3	4	5	6	7

D. Friend

None						Very Much	
	1	2	3	4	5	6	7

E. Sibling

None						Very Much	
	1	2	3	4	5	6	7

F. This Weight Control Group

None						Very Much	
	1	2	3	4	5	6	7

Weight Reduction Program  
Questionnaire - Page 4

G. Group Leaders

None	1	2	3	4	5	6	Very Much 7

H. Employer

None	1	2	3	4	5	6	Very Much 7

I. Yourself

None	1	2	3	4	5	6	Very Much 7

13. Please record as accurately as possible the following information about your -previous attempts to lose weight.

A. FIRST ATTEMPT

Age \_\_\_\_\_ Approximate Weight \_\_\_\_\_

Type of Program: \_\_\_\_\_

Length of your participation in Program: \_\_\_\_\_

Results: \_\_\_\_\_

How long did you maintain your weight loss? \_\_\_\_\_

To what do you contribute your weight gain? \_\_\_\_\_

\_\_\_\_\_



Weight Reduction Program  
Questionnaire - Page 5

B. SECOND ATTEMPT

Age \_\_\_\_\_ Approximate Weight \_\_\_\_\_

Type of Program: \_\_\_\_\_

Length of Participation: \_\_\_\_\_

Results: \_\_\_\_\_

How long did you maintain your weight loss? \_\_\_\_\_

To what do you contribute your weight gain? \_\_\_\_\_

\_\_\_\_\_

C. THIRD ATTEMPT

Age \_\_\_\_\_ Approximate Weight \_\_\_\_\_

Type of Program: \_\_\_\_\_

Length of Participation: \_\_\_\_\_

Results: \_\_\_\_\_

How long did you maintain your weight loss? \_\_\_\_\_

To what do you contribute your weight gain? \_\_\_\_\_

\_\_\_\_\_

## Appendix 8

Weight Factors Scale - Part 1

Weight reduction may be attributed to many factors. On a scale of 1 to 5, rate how much each of the factors listed below influenced your weight loss so far in this program.

- 1 - some negative influence hindered weight loss efforts
- 2 - no influence at all
- 3 - slight positive influence in helping weight loss effort
- 4 - moderate positive influence in helping weight loss effort
- 5 - very important positive influence in helping weight loss effort

Situation	Scale				
	1	2	3	4	5
1. Time of year of the group (January-May)					
2. Length of the program (once a week for nine weeks; bi-weekly for six weeks; monthly for remainder of year)					
3. Attending group meetings					
4. Being weighed in before group meetings					
5. Size of group					
6. Commitment to the group					
7. Desire to please the group leaders by losing weight					
8. Desire to please your spouse by losing weight					
9. Wish to show group you had lost weight					
10. Desire to please yourself by losing weight					
11. The encouragement and support of the group					
12. The encouragement and support of the group leaders					
13. The encouragement and support of your spouse					
14. The encouragement and support of friends and relatives					
15. Your own self-initiative					
16. Your thirty dollar commitment to the program					
17. Discussions about caloric intake and expenditure					
18. Discussions about exercise, physical activity and health					
19. Discussions of psychological theories of obesity and dieting					
20. The exchange diet used in the program					
21. Being able to eat "miscellaneous" foods					
22. Using the favorite food plan					
23. Improving your nutrition					

Weight Factors Scale - Part 1 (Page 2)

Situation	Scale				
	1	2	3	4	5
24. Recording what you ate					
25. Increasing your exercise					
26. Not feeling deprived of particular foods					
27. Recognizing what it feels like to be hungry					
28. Recognizing what it feels like to be full					
29. Accepting that a slow steady weight loss will help weight loss maintenance					
30. Eating breakfast					
31. Eating protein at each meal					
32. Planning snacks					
33. Weighing at home					
34. Talking to spouse and family about program					
35. Concentrating on changing habits and attitudes about food rather than just on weight loss					
36. Accepting that watching your weight will be a life-long endeavor					
37. Accepting responsibility for your own weight loss					

### Weight Factors Scale - Part 2 - AC

On a scale of 1 to 5 rate how much each of the factors listed below influenced your weight loss so far in this program.

- 1 - some negative influence
- 2 - no influence at all
- 3 - slight positive influence
- 4 - moderate positive influence
- 5 - very important positive influence

Situation	Scale				
	1	2	3	4	5
38. Changing negative self-statements to positive self-statements					
39. Saying to yourself: "I choose to eat this food" or "I choose not to eat this food."					
40. Not feeling guilty if you do overeat					
41. Saying positive self-statements to self in times of discouragement or plateaus					
42. The Relaxation Techniques					
43. Learning to associate overeating with being overweight					
44. Discussing the negative feelings that go along with being overweight					
45. Learning to associate not overeating with ideal weight and state of relaxation and good feelings					
46. Practicing visualization of difficult eating situations before they happen and practicing appropriate behavior by visualizing what you would like to do					
47. Learning to be assertive about your new eating behavior					
48. Not feeling guilty about refusing food or not taking seconds					
49. Asking others to help you with your new eating habits					
50. Telling people who hinder your diet efforts what they are doing and how you would like them to change					
51. Visualizing yourself at your goal weight					
52. Being able to change your body image as you lose weight					
53. Positive compliments and praise from your spouse about your weight loss and new eating habits					
54. Positive compliments and praise from family and friends about your weight loss and new eating habits					
55. Learning to distinguish anxiety from hunger and act appropriately					

Weight Factors Scale - Part 2 - AC - Page 2

Situation	Scale				
	1	2	3	4	5
56. Using Relaxation Techniques when anxious					
57. Exercising when anxious					
58. Learning to distinguish tiredness from hunger and dealing with with tiredness in ways other than eating					
59. Learning what emotions trigger overeating					
60. Learning to deal with emotions in ways other than eating					
61. Deciding to lose weight for your self -- not for others					
62. Using positive self-statements to avoid binges					
63. Giving up irrational beliefs about self such as "I have no control over my eating" or "I am a bad person if I overeat."					
64. Starting new activities that you hadn't done before because of your weight					
65. Thinking as a thin person; giving away or altering baggy clothes, shopping, looking in mirrors					
66. Learning to give and receive positive compliments					
67. Learning to receive constructive criticism					
68. Learning how to deal with negative statements from others					
69. Weighing in at home					
70. Having a weekly meeting at home with someone else					
71. Learning how food was used as a reward by your parents when you were a child					
72. Learning why you turn to food in times of stress or emotion					
73. Learning to eat favorite foods by saying: "I can have some now -- a moderate portion -- and have some again tomorrow or the next day."					
74. Realizing that you <u>can</u> control your own eating habits					
75. Doing homework assignments					



### Weight Factors Scale - Part 2 - SC

On a scale of 1 to 5 rate how much each of the factors listed below influenced your weight loss so far in this program.

- 1 - some negative influence
- 2 - no influence at all
- 3 - slight positive influence
- 4 - moderate positive influence
- 5 - very important positive influence

Situation	Scale				
	1	2	3	4	5
38. Keeping the chart about what time of day you ate; where you were; what you were doing; who was with you					
<u>BUYING FOOD :</u>					
39. Preparing a low calorie, balanced food list					
40. Shopping from a food list only					
41. Shopping when you are not hungry					
42. Buying only what you need to eat					
43. Buying low calorie, nutritious food					
44. Not buying high calorie, junk food					
45. -If you had to have high calorie foods for other family members, buying the high calorie foods you didn't like as well					
<u>STORING FOODS:</u>					
46. Storing problem foods in hard to see, hard to get at places in the refrigerator					
47. Storing problem food in hard to see, hard to get at places in the cabinets					
48. Keeping food only in the kitchen, not in other rooms or on the kitchen counter					
<u>PREPARING FOODS</u>					
49. Preparing low calorie, high nutrition meals					
50. Preparing moderate quantities only -- enough for a single serving for each person					
51. Not nibbling while preparing food					
52. Having low calorie foods available if you must nibble					
53. Preparing own food or telling others how to prepare it					
<u>SERVING FOOD</u>					
54. Serve just enough food to meet your caloric needs for that meal					

Weight Factors Scale - Part 2 - SC - Page 2

Situation	Scale
	1 2 3 4 5
55. Not going back for seconds	
56. Not serving family style -- putting food on the plate and leaving the rest in the kitchen	
57. Putting extra food away before eating	
<u>EATING FOOD</u>	
58. Eating more slowly	
59. Chewing more slowly	
60. Putting a small quantity of food on eating utensil	
61. Putting your fork down between bites of food	
62. Stopping eating when you are full	
63. Leaving some food on your plate	
64. Making eating a pure experience -- not watching television or doing other activities like reading while eating	
<u>AFTER EATING</u>	
65. Clearing table immediately after eating	
66. Immediately clear food from plates and store it or throw it away	
67. Getting up from the table after the meal and moving to another room	
68. Planning another activity for after meal time	
<u>SNACKING</u>	
69. Planning and having available low calorie snacks	
<u>CONSEQUENCES OF EATING</u>	
70. Bringing consequences of overeating into awareness -- looking in full length mirror, putting pictures on refrigerator, looking at clothes that are too big or too small, etc.	
71. Learning to reinforce self for appropriate eating habits	
<u>MISC. WORKING ON PROBLEM SITUATIONS (PROBLEM, SOLUTION, EVALUATION)</u>	
72. Using techniques while eating out at restaurant and friend's	
73. Using behavioral techniques for drinking alcoholic and non-alcoholic beverages	
74. Preplanning meals before eating out or during holidays	
75. Talking about problem situations in group	

### Weight Factors Scale - Part 3

Some of you may not be doing as well as you had expected as far as weight loss; others of you have probably had times of discouragement and frustration. We would like to find out some of the reasons you have felt discouraged and also the reasons you might not be doing as well as you had expected. If the question does not apply, simply fill in the answer box with Number 2, "no influence at all".

- 1 = some positive influence on weight loss (helped you lose weight)  
 2 = no influence at all  
 3 = slight negative influence on weight loss (hindered efforts)  
 4 = moderate negative influence on weight loss  
 5 = very important negative influence

Situation	Scale 1 2 3 4 5
76. Lack of support at home for changed eating habits	
77. Lack of support by friends of new eating habits	
78. Lack of support at work for new eating habits	
<u>SABOTAGE OF WEIGHT LOSS EFFORTS BY SPOUSE BY:</u>	
79. Suggesting dinners out at restaurants	
80. Complaining about your new shopping and eating habits	
81. Bringing home high-calorie foods	
82. Eating high calorie foods in front of you	
83. Nagging you about your diet	
84. Criticizing your appearance	
85. Criticizing this particular program	
86. Criticizing your weight loss -- saying it's slow or too little	
87. Telling you that you don't need to lose weight	
88. Encouraging you to go off diet -- just this once	
89. Saying you look better with a little meat on you	
<u>SABOTAGE OF WEIGHT LOSS BY FRIENDS AND ACQUAINTANCES:</u>	
90. Encouraging you to eat big lunches	
91. Inviting you over to dinner and feeling hurt if you don't eat a lot	
92. Criticizing your new eating habits	
93. Making negative statements about your appearance	
94. Criticizing this particular program	
95. Telling you that you don't need to lose weight	

Weight Factors Scale - Part 3 - Page 2

Situation	Scale				
	1	2	3	4	5
96. Telling you that you are looking ill since you lost weight					
<u>NEGATIVE REACTIONS TO THIS PROGRAM:</u>					
97. Negative reactions to group leaders					
98. Negative reactions to other group members					
99. Negative reactions to the exchange plan					
100. Negative reactions to eating "favorite foods" as outlined in plan					
101. Negative reactions to weighing in before group meetings					
102. Negative reactions to format of meetings: once a week, then bi-weekly, then monthly					
103. Negative reactions to encouragement of slow weight loss					
<u>OTHER REASONS</u>					
104. Can't seem to control bingeing					
105. Overeating on weekends					
106. Overeating while eating out (restaurants and friends)					
107. Schedule doesn't allow for scheduled meals					
108. Didn't do "homework assignments"					
109. Didn't do enough recording					
110. Am losing weight for someone or something other than self					
111. Missed too many group meetings					
112. Felt too deprived on diet					
113. Low self-concept					
114. Can't see that you have lost weight even though you weigh less					
115. Competing with spouse about weight loss					
116. Spouse has lost more weight					
117. Not committed to making permanent lifestyle changes about eating					
118. Not getting enough exercise					
119. Poor self-control					
120. Blaming others for my weight problem					
121. Blaming myself for my weight problem					

Weight Factors Scale - Part 4

Please rate, in the described manner, these additional factors:

- 1 = some negative influence
- 2 = no influence
- 3 = slight positive influence
- 4 = moderate positive influence
- 5 = very important positive influence

Situation	Scale				
	1	2	3	4	5
133. Participation in a couples group rather than by yourself					
134. Combined husband-wife discussions and participations at meetings					
135. Husband-wife meetings at home					
136. Weighing in together at home					
137. Doing homework assignments together					
138. Talking together about the group and problems with dieting					
139. Exercising jointly					
140. Helping each other stay on the diet					
141. Making positive statements to each other about weight loss					
142. Working in general as a husband and wife team					
143. Having your spouse involved in losing weight too					



## Appendix 9

Self-evaluation Questionnaire

Name \_\_\_\_\_ Date \_\_\_\_\_

1. In general, how successful do you feel this program has been so far?  
(1) not at all (2) slightly (3) moderately (4) mostly (5) extremely
2. How successful do you feel this program has been for you so far?  
(1) not at all (2) slightly (3) moderately (4) mostly (5) extremely
3. How often have you followed the exchange plan during this program?  
(1) never (2) rarely (3) about half the time (4) usually (5) always
4. How often have you recorded your food intake during this program?  
(1) never (2) rarely (3) about half the time (4) usually (5) always
5. How often have you completed assignments during this program?  
(1) never (2) rarely (3) about half the time (4) usually (5) always
6. How often have you used the weight control techniques presented?  
(1) never (2) rarely (3) about half the time (4) usually (5) always

## Appendix 10

Self-evaluation Questionnaire

Name \_\_\_\_\_ Date \_\_\_\_\_

1. How successful do you feel in this weight loss attempt over the past year?  
(1) Not at all successful (2) only a little successful (3) moderately successful  
(4) very successful (5) extremely successful
2. Did you lose the weight you wanted to lose?  
(1) none (2) a little (3) about half (4) most of it (5) all of it
3. How do you feel about your body now?  
(1) bad (2) not too good (3) O.K. (4) pretty good (5) great
4. Do you expect to maintain your weight loss?  
(1) no (2) probably not (3) maybe (4) probably (5) yes
5. Do you expect to lose more weight?  
(1) no (2) probably not (3) maybe (4) probably (5) yes
6. How helpful has your spouse been in your weight loss attempt?  
(1) hurt efforts a lot (2) hurt efforts some (3) neither helped nor hurt (4) some  
(5) extremely
7. How much have your eating habits improved?  
(1) worse (2) almost as bad (3) same (4) somewhat better (5) great improvement

Self-evaluation Questionnaire - Page 2

8. How responsible do you feel for your weight loss?

(1) not at all   (2) not very much   (3) some   (4) more than before   (5) totally

## Appendix 11

Drop-out Questionnaire

Name \_\_\_\_\_ Weight \_\_\_\_\_ Date \_\_\_\_\_

1. How many group sessions did you attend? \_\_\_\_\_
2. Why did you drop out of this program? (Write on back if necessary)
3. Have you ever dropped out of a weight loss program before? \_\_\_\_\_

On a scale of 1 - 5, where 1 means a Very Important Reason in My Dropping Out and 5 means Had Nothing at All to do with My Dropping Out, rate the importance of the following factors:

Situation	Scale				
	1	2	3	4	5
4. I had lost all the weight I wished to lose					
5. I did not like the exchange diet					
6. The recommended one-two pound weight loss/week was too slow for me					
7. The meetings did not fit my schedule					
8. I felt like a failure because I was not losing weight					
9. I did not like meeting in groups					
10. I did not like the group leaders					
11. I already knew everything being taught in the groups					
12. I did not feel motivated enough to diet and carry out diet techniques					
13. Transportation problems					
14. My spouse or family did not want me to come to the groups					
15. I decided that I did not want to lose weight					
16. Now is not a good time for me to be on a diet					
17. I was not willing to make a life-long commitment to watching what I eat					
18. I did not like filling out the questionnaires					
19. I did not like weighing in before meetings					
20. Other problems in my life make it hard to diet now					
21. I felt I would lose weight better on my own					
22. I learned what I needed from classes and wanted to try on my own					

Drop-out Questionnaire - Page 2

23. Are you dieting now? Yes \_\_\_\_\_ No \_\_\_\_\_ What kind? \_\_\_\_\_

24. Circle adjectives that describe how you feel about your dieting efforts this year.

Successful

Unsuccessful

Proud

Disappointed

Happy

Unhappy

Angry

Let down

Depressed

Elated

Anxious

Frustrated

Ambivalent

Guilty

Motivated

Disgusted



