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STIMULUS AND AFFECTIVE CONTROL IN WEIGHT REDUCTION:
EVALUATION OF SPOUSE PARTICIPATION,
RESTRAINT AND BINGING

A Dissertation Presented

By

DEBORAH LEIGH SCHONITZER

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

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Deborah Leigh Schonitzer

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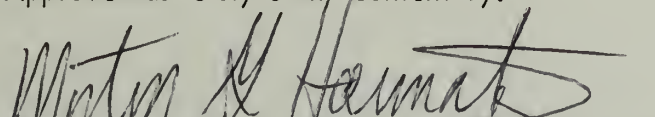
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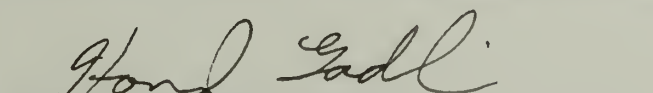
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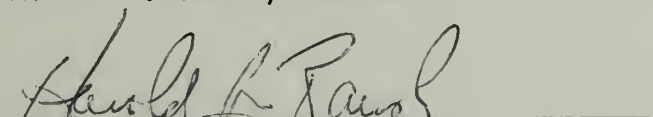
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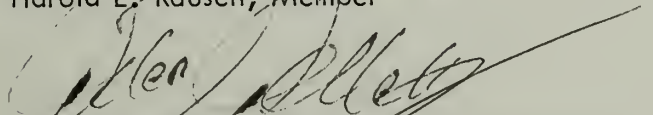
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To my grandmother, Ella M. Schonitzer.

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This dissertation represents three years of joint research with Kay Loveland. Although two dissertations evolved from the project, the initial major hypotheses, results, and discussion are the result of joint efforts. Two additional sections of the dissertation were independently written, analyzed and discussed. This type of joint dissertation was planned to fulfill our desires to make a major contribution to the field of obesity research, and to conduct a large scale clinical research project. Only through joint efforts was a dissertation project of this scope feasible or manageable. I wish to express my thanks and respect to Kay who provided continuing support, intellectual stimulation, and humor at times when the tasks seemed overwhelming. Aside from the benefits of working as colleagues, the support of Kay as a friend was invaluable during these years.

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ABSTRACT

Stimulus and Affective Control in Weight Reduction: Evaluation of Spouse Participation, Restraint and Binging

September 1979

Deborah Leigh Schonitzer, University of Massachusetts

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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 of 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 for 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 affecting 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.

In recent research, little attention has been paid to the factors which induce a breakdown in dieting. In the present study, the clinical and theoretical aspects of restrained overeating and bingeing were assessed.

Results indicated that restrained overeating (switch-like eating which appears to be related to overconcern with dieting) was more extreme for females, overweight participants, drop-outs and multi-attempt dieters. However, in overall analyses these restrained behaviors decreased by four months in treatment. While no conclusive evidence was presented to explain how this change occurred, it was suggested that the type of diet methods used may have positively influenced these behaviors.

In analyses of bingeing, or overeating excessively with no control, it was determined that participants who binged frequently lost significantly less weight. Results also revealed a strong relationship between bingeing and feelings of deprivation and denial of specific foods. Furthermore, results revealed a significant positive relationship between bingeing and restrained overeating.

A theoretical explanation for these overeating behaviors based on the set-point theory and potential biological starvation induced by weight loss was discussed. An alternative theory, based on the effects of psychological deprivation on

eating behavior, was presented. Finally, implications for treatment and future research were outlined.

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CHAPTER I

INTRODUCTION

Theoretical Perspective

Despite major medical, professional and commercial endeavors to successfully treat obesity, the U.S. Public Health Service estimates that there are between forty and eighty million obese Americans. Obesity remains one of the most serious and prevalent health problems in the United States (Gotto, Foreyt and Scott, 1976).

Research findings coincide with the statistics concerning the pervasive problem of obesity. The majority of individuals in treatment lose less than twenty pounds (Stunkard and McFaren-Hume, 1959). Furthermore, of the individuals who do lose weight, few are able to maintain the loss (Stunkard, 1958; Hall, 1972; Mahony, 1974).

Nevertheless, Americans are extremely weight conscious; a recent poll indicated that about fifty-two million Americans were either dieting or concerned about their weight (Stuart and Davis, 1972). The current socioeconomic consequences of obesity are profound; in 1973 alone, Americans spent over ten billion dollars to lose weight.

Similarly, there is a wealth of current data available on various treatments for obesity. The majority of treatment methods studied are all based, to some degree, on etiological theories. The following review examines the current theories of obesity by presenting major concepts and research evidence for each view. An additional view of obesity, based on the potentially negative consequences of dieting, is presented.

Current Theories of Obesity

Behavior Theory

Research carried out by Schacter and his colleagues (Schachter & Gross, 1968; Schacter, Goldman & Gordon, 1968; Schacter, 1971) has suggested that the eating behavior of obese individuals is controlled primarily by external stimuli (such as appearance of food or time of day) as opposed to internal physiological cues (such as gastric motility or level of blood constituents). The obese lack internal regulation and overeat in response to the multiplicity of external stimuli which are capable of initiating eating. Approach to treatment involves teaching stimulus control of eating.

Development of the theory. Current notions of hunger control mechanisms indicate that food deprivation leads to various physiological changes including alteration of blood constituents, increase in gastric motility and change in body temperature. By means of some still debated mechanism, these changes supposedly activate a hypothalamic feeding center. There is, however, evidence which strongly suggests

that this purely biological sequence may not control eating for obese persons.

Support for this notion came from a study in which Stunkard and Koch (1964) measured the extent to which a person's self-report of hunger corresponds to one's gastric motility. Thirty-seven obese and thirty-seven non-obese swallowed a gastric balloon and recordings were made of gastric motility and feelings of hunger. The results showed that for non-obese self-reports of hunger coincided with gastric motility 71% of the time, whereas for the obese the percentage was only 47.5%. This study suggested that there are significant differences in how obese and non-obese refer to the term "hunger" or respond to internal cues.

From these observations, Schacter, Goldman and Gordon (1968) hypothesized that while direct manipulation of hunger symptoms would, for normal weight subjects, be directly changing feelings of hunger and eating behavior, there would be no correspondence between altered internal states and eating behavior for the obese. To test these expectations, they manipulated food deprivation and fear. Based on the work of Carlson & Cannon (1915) which demonstrated that fear inhibits gastric motility, some Ss entered an experimental eating situation with full stomachs and others entered with empty stomachs. Furthermore, some Ss were badly frightened (were told they would receive painful shocks) and others were quite calm (were told they would receive weak stimulation) before eating. Self-report measures indicated that differential fear in the two groups was created. Schacter, Goldman & Gordon predicted that in the fear condition feelings of hunger should be repressed and Ss should eat less. The results showed that, as predicted, non-obese Ss ate less on a full stomach than on an empty stomach, and more when they were calm than when

they were frightened. Oppositely, obese individuals ate just as much when their stomachs were full as when empty, and slightly more when frightened as when calm. These investigators concluded that the set of bodily symptoms a person labels "hunger" differs for obese and non-obese. Whereas for non-obese there appears to be direct correspondence between the physiological state and eating behavior, it is unclear what circumstances regulate food intake for the obese.

Hashim & Van Itallie (1965) provided some information concerning factors which regulate eating for the obese. They prepared a bland liquid diet and restricted six grossly obese and five non-obese to this diet for periods ranging from a week to several months. Basically, they arranged an eating situation in which the food was unappealing, eating was entirely self-determined (Ss could eat as much or as little as they wanted), and the environment was devoid of any social or domestic determinants. They found that while each of the non-obese Ss steadily consumed their normal amount of food, the food consumption of each obese S dropped to a marked low level for the duration of the experiment. It seems that the type of food and the eating situation affected the eating behavior of the obese, whereas the physiological state largely determined food intake for the non-obese.

Schacter translated these differences into a theory of internal versus external control of eating, suggesting that obese individuals differ from those of normal weight in that their eating is controlled primarily by external factors (e.g. social stimuli, habit) as opposed to internal factors (physiological states). While external variables such as smell, sight, and taste do affect the eating behavior of normal weight individuals, they do so chiefly when they are in a state of physiological hunger.

To begin testing this notion, Schacter and Gross (1968) manipulated time such that for one group of Ss a clock moved twice as fast as for another group of Ss. The experiment was run during the dinner hour and food was available to be eaten freely as the Ss waited to participate in the experiment. They found that obese Ss ate more as they thought time passed, whereas normal weight Ss ate less, perhaps for fear of spoiling their dinner. The authors concluded that the external cue, manipulation of time passage, did in fact trigger eating among the obese. One might also speculate, however, that the obese Ss responded instead to boredom or anxiety by eating while waiting to complete the experiment.

In comparing eating habits of obese and non-obese individuals in every-day situations, Schacter & Gross (1968) found further evidence that external rather than internal cues regulate eating for the obese. They noted that obese eat more often between meals, indicating that they may indeed respond more often to cues such as candy machines, snack shops, etc. Studying college students they observed that obese individuals eat much more irregularly on the weekend than non-obese. Schacter & Gross' explanation for these findings is based on the fact that daily activities, including dormitory meals, are much less structured on the weekend; the obese individual's reliance on external cues is reflected in their increased irregularity in eating habits that accompanies an increased irregularity in external cues.

Nisbett (1968) provides further evidence in support of the findings that obese individuals are insensitive to internal cues while being acutely susceptible to external cues. He also extends this hypothesis to see if the opposite is true for underweight individuals, namely oversensitivity to internal variables and under-sensitivity to external factors. Employing two manipulations, taste and deprivation,

Ss were given good or bad tasting ice cream in a deprived or full state. Findings showed that underweight Ss were, in fact, less affected by taste (the difference in amount of good and bad ice cream eaten was small). Oppositely, overweight Ss were highly receptive to taste, and they consumed significantly more good tasting ice cream than bad tasting ice cream.

Considering the deprivation manipulation, results showed that underweight Ss ate seventy percent more ice cream if their stomachs were empty than if they were full. However, deprivation had no effect on overweight Ss; Ss who were full ate just as much as Ss who had not eaten previously. Furthermore, whereas the self-reports of hunger for the underweight and normal Ss varied as a function of pre-experimental deprivation, those of the overweight Ss did not. In view of the results of other studies mentioned thus far, these findings are consistent.

Evaluation of Research. Since the development of the externality theory, there have been many studies attempting to support or dispute the notion. In an excellent review of the literature concerning external cue sensitivity, Leon and Roth (1977) summarize findings which assess the influence of emotional arousal, food cue prominence, and taste responsiveness on eating behavior of the obese. The following summary also reviews studies concerning the role of external stimuli on non-eating behavior of the obese and the degree to which non-obese, are, in fact, sensitive to internal cues.

Emotional arousal. Research assessing the influence of emotional factors on the eating behavior of obese is contradictory. For example, in an attempt to replicate Schacter's findings that obese do not respond to emotionally arousing

(fear) situations by eating significantly more, Abramson and Wunderlich (1972) placed male obese and non-obese Ss in either an interpersonal anxiety, objective fear, or control condition, measuring the number of crackers consumed. They found that there were no differences in the amount eaten by obese and normal weight Ss in the various conditions. On the other hand, McKenna (1972) found that obese Ss did eat significantly more under high-anxiety conditions, whereas normal weight Ss ate more in the low-anxiety condition.

Some of these contradictory findings may be accounted for by differences in methodologies. Leon and Roth specify the importance of the experimental setting and the limitations of generalizing from "the cracker-and-cookie eating behavior of essentially slightly overweight male college students in a highly contrived laboratory situation to the eating behavior of obese persons in the natural environment in response to a number of states of naturally occurring emotional arousal" (1977, p. 118). They also highlight the limits of an exclusively male population, the influence of different instructional sets employed, and the interaction of compounding factors, such as the effect of low self-esteem on the number of crackers necessary to confidently rate the experimental food.

Food cue prominence. There are similarly mixed findings concerning the effect of food attractiveness and food cue prominence in terms of the external control hypothesis. For example, Stuart (cited in Stuart & Davis, 1972) did not replicate the findings of Nisbett and Kanouse (1969) in the super-market study. He found instead that obese women who had signed up for a weight reduction program and who shopped before 5:00 p.m. bought more food than those who shopped after 6:30 p.m.,

suggesting that obese individuals may buy more food when they are hungry (in this case before dinner) and thus, may be sensitive to internal cues of hunger when shopping. Comparisons of other studies which investigated the eating behavior of obese and non-obese in differential food cue prominence sets (e.g. shelled or unshelled almonds available, Schacter & Friedman, cited in Schacter, 1971; varied amount of illumination on food, Ross, 1974) also present contradictory findings regarding the sensitivity of the obese to external cues.

Taste responsiveness. Across a variety of studies and subject populations, obese persons tend to show a greater responsiveness to the external cue of taste (Goldman, Jaffa & Schacter, 1968; Hashim & Van Itallie, 1965; Nisbett, 1968, 1972; and Nisbett & Gurwitz, 1970). In experimental settings, obese persons generally tend to eat more good tasting food and less bad tasting food than normals. However, Leon and Roth note that these studies are confounded by the experimental task: to make taste ratings. It could be that obese Ss are more certain of the foods they dislike and less certain of the foods they like, requiring more of the good food to make the rating. They also point out the importance of distinguishing between measures of taste sensitivity (detection of differences) and taste responsiveness (evaluation of taste).

Non-eating behavior. Much research has also examined an extension of Schacter's theory, namely the notion that obese persons are generally more external in orientation. The strongest evidence for the influence of external cues on the behavior of obese persons in non-eating situations is in the area of time estimation. Obese individuals report longer estimations of elapsed time in the presence of

emotionally sensitive stimuli (Hughs & Reuder, 1968), manipulated time (Schacter & Gross, 1968), visual cues (Pliner, 1973), and boredom (Rodin, 1974).

Various thinking and learning processes appear to be distinctly affected by external cues for the obese also. For example, the performance of obese males on choice reaction time, immediate recall, and word recognition thresholds was negatively influenced by the presence of external stimuli in a study by Rodin, Herman and Schacter (1974). Rodin (1973) found similar interference by external cues on a task which required obese Ss to proofread.

However, results of many of the studies investigating generally heightened externality for the obese are difficult to interpret due to contradictory findings and methodological inadequacies. For example, contrary to the findings reported by Rodin et. al. (1974), Singh, Swanson, Letz and Sanders (1973) found no significant differences between obese and non-obese in choice reaction time.

Two studies were conducted that indicate that obese males are more responsive to the emotional stimuli (Pliner, et. al., 1974; Rodin, Elman & Schacter, 1974), but there was no control for the possibility that obese persons are generally more emotional as opposed to more "external". Moreover, Pliner et. al., found differences in emotional response to positive affective stimuli but not in response to negative affective stimuli.

In various other studies, results showed that while obese Ss performed worse when distracted, they performed better than non-obese when there were no distracting stimuli (Rodin, 1973; Rodin, Herman & Schacter, 1974). To determine whether these differences were due to motivational factors rather than external

cue sensitivity, Rodin and Slochower (1974) tested obese and non-obese female's learning in high and low potency stimulus and high and low distraction conditions. Some of their results were contradictory to the external cue hypothesis. Namely, they found no significant differences in incidental learning between obese and non-obese in the no-distraction condition and no differences between Ss in the high and low potency conditions. If obese are more responsive to the external environment, one would predict that they would, in fact, perform better in the no-distraction and high potency conditions.

Internal sensitivity of non-obese. According to the externality theory, normal weight individuals are more sensitive to internal physiological hunger cues. However, this notion has not been substantiated by further research. Coddington and Bruch (1970) found that non-obese were accurate only 63% of the time in differentiating between 0 and 1 ounce of intragastrically placed Metrecal. Participants in Jordan's study (1969) did not increase either volume of intragastric intake or report increased hunger when their Metrecal diet was diluted without their knowledge to nine parts water and one part Metrecal. Nisbett and Storms (1974) found that when normal weight Ss believed that a preload was high in calories they ate less two hours later than if they believed it was low in calories. Wooley (1972) found that obese and non-obese alike consumed 3,000 calories per day of high calorie food and only 1,920 calories per day of identically tasting low calorie food. She also found that obese and non-obese showed the same voluntary intake following 600 and 200 calorie preloads.

In another test of the effect of calories on subsequent intake, Wooley, Wooley and Dunham (1972) replaced one meal each day with a disguised liquid meal of either high caloric content or low caloric content. Both obese and non-obese showed almost no ability to identify the meals as high or low calorie. Also, their reports of hunger during twenty-four hours following ingestion of the meals were based primarily on their initial belief about the caloric value rather than on the actual value.

These results are consistent with the findings of Stunkard and Fox (1971), who attempted to replicate the results of the previous investigation of Stunkard and Koch (1964) using more sensitive instruments and a more refined measure of hunger to assess the differential sensitivity of obese and non-obese to internal cues of hunger. Stunkard and Fox found that the majority of obese and non-obese did not associate that hunger and gastric motility had any influence on the intensity of hunger reported or on food intake.

In summary, the original notion of the externality theory which hypothesized that non-obese were sensitive to internal cues of hunger and satiety is being seriously challenged. Research is showing that the onset and intensity of hunger following a meal is not directly related to the meal's caloric content or to gastric motility.

Conclusions. The evidence for the externality theory of obesity is equivocal.

Aside from contradictory findings, there are serious limitations in the generalizability of the results. Most data, thus far, has been obtained about the behavior of overweight (not necessarily obese) male students at expensive private colleges in

contrived laboratory situations. Little is known about sex differences, age differences, and socio-economic differences. These factors may very well account for some of the variability found in results across studies. For example, Milich (1975) points out that by studying college age individuals, Schacter has limited his sample to juvenile-onset overweight persons. Since 70% of all obese individuals can be categorized as adult-onset (Mullins, 1959), Schacter's findings may not generalize to the majority of the obese population.

While Schacter and others (e.g. Nisbett, 1969) have attempted to examine externality in the natural environment, the research lacks control and base-line data (Leon & Roth, 1977). Support for the theory is correlational, and insufficient to verify the theory.

Pliner (1976) points out what is perhaps the most important limitation of externality research thus far. There is little evidence concerning the causal relationship between obesity and externality. Decke (1970) found that volunteer prisoners who were made obese experimentally showed no heightened response to external food cues. Nisbett (1968) found that normal weight individuals who had formerly been obese were as responsive to external food cues as Ss who had never been obese. While both of these studies suggest that obesity per se does not account for or produce sensitivity to external cues, there is no evidence to indicate if the opposite is true (that externality catalyzes obesity) or if, in fact, a third factor is responsible for both externality and obesity. 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 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; Schlopback & 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 (Condrad, 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 reported 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 Pudel (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.

Slochower (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, Slochower 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.

In summary, there appears to be more current research which supports the psychosomatic view of obesity than has been acknowledged recently in many reviews. Questions concerning the type and quality of emotional state which induces eating remain unanswered. However, this view is by no means passe and merits further investigation.

Biological Theories

Early biological approaches to obesity centered on searching for metabolic dysfunctions. Assuming that obese individuals utilize fewer calories to maintain their

biological functions, or have a lower basal metabolism, treatment involved medications to correct the "underactive thyroid". However, with the development of refined techniques to measure thyroid activity, metabolic studies (e.g. Buskirk et. al., 1963) showed that endocrine pathology is rarely responsible for producing obesity. In place of this endogenous view, an exogenous theory was accepted, based on the notion that obesity results from a long-term positive calorie balance stemming from excess food intake and inadequate energy expenditure. The role of hunger has been the primary focus of these current physiological theories of obesity.

Research into the physiology of hunger has concentrated on the role of the central nervous system (CNS), and in particular the hypothalamus. The foundations for much of the theorizing about hunger during the 1950's stemmed from work by Brobeck and his colleagues. From their studies showing that damage to specific hypothalamic areas resulted in drastic alterations in food intake and body weight (Anand and Brobeck, 1951; Brobeck, Tepperman & Long, 1943), they postulated a "feeding center" in the lateral hypothalamus which is inhibited by a "satiety center" in the ventromedial hypothalamus.

There have been a number of theories to explain this hypothalamic control based on the notion that eating serves to restore a body set-point. Food absorption initiates a metabolic signal, carried by the blood to the brain, which activates receptor cells in the hypothalamus to produce satiety. Hunger occurs when some nutrient has been depleted, resulting in a decrease in the metabolic signal. Mayer's glucostatic theory (1955) maintains that the hypothalamus responds to blood glucose

levels. From the perspective of the lipostatic theory (Kennedy, 1953), food intake repletes depleted fat reserves.

Set-point theory of obesity.

Development of the theory. Extending this parallel, Nisbett (1972) has proposed a set-point theory of obesity based on the notion that hypothalamic feeding centers become adjusted to certain levels of food intake in order to maintain a minimum quantity of fat stores. Body fat is stored in specialized cells, the adipocytes. The amount of body fat varies from person to person and is a function of both the number and the size of adipocytes. Recently, researchers have found a way to count and measure adipocytes (Hirsch & Han, 1969; Hirsch & Knittle, 1970; Knittle & Hirsch, 1968; Bjorntorp, 1972). Comparing obese and non-obese, they have found that adiposity in the obese is determined by an increase in the number of cells, hyperplasia, as opposed to an increase in the size of these cells or hypertrophy.

Goss (1966) has shown that the number of adipocytes an adult possesses is fixed and stable. Through starvation and dieting, the size of fat cells decreases, but there is no significant change in the number (Hirsch & Knittle, 1970). Experimentally induced obesity in prison volunteers resulted in hypertrophy but not hyperplasia, indicating that overeating does not stimulate the growth of more adipocytes in adults.

From this work in the anatomy of adipose tissue, two biological types of obesity have been distinguished: (1) juvenile-onset obesity characterized by hyperplasia, or overabundance of fat due to the increase in the number of fat cells; and,

2. adult-onset obesity characterized by hypertrophy, or fatness due to enlarged adipocytes. Due to differences in biological demands, this distinction raises important implications for treatment.

Nisbett contends that those individuals with a higher baseline number of fat cells are biologically programmed to be fat. The two primary influences affecting baseline of adiposity are heredity and early nutritional experience. Animal research indicates a significant difference among various strains of rats in their potential to accumulate fat stores (Schemmel, Meichelson & Gill, 1970; Schemmel, Michelson & Tolgay, 1969; Marshall, Smith, Munson & Lahmann, 1969). Others have shown that early feeding experience primarily affects the percentage of fat in rats (Kennedy, 1957; Widdowson & McCance, 1960).

According to Nisbett, hypothalamic feeding centers control food intake so as to maintain fat stores at a "set-point level" determined by the number of fat cells in the body. Given this view, obesity is for some a normal state; obese individuals eat so as to bring their weight into line with a biologically determined set-point. This set-point is ultimately a direct function of the number of fat cells in the body. Dieting serves to reduce the size, not the number of fat cells, with the result that the fat cells of dieters are relatively depleted. This depletion, it is assumed, is conveyed by some messenger to the hypothalamus, which in turn governs the instrumental behavior required to bring the weight of the individual into line with the set-point. Thus, individual differences in eating behavior and weight are ultimately governed by this depletion.

Given this viewpoint, for some individuals, obesity may be a biologically "normal" state. Nisbett suggests that for an obese person at set-point level, dieting to become "underweight" results in responses similar to a deprived or hungry organism. He supports his hypothesis by reviewing the behavioral parallels between obese humans and hungry organisms. For example, by outlining the similarities between VMH lesioned rats and obese persons, Schacter and his colleagues have attempted to show that obesity is a result of a defect in this overall mechanism. These similarities include excitability, sensitivity to pain, inability to regulate caloric intake, over-eating with a reluctance to work to get food, and increased ability at active avoidance rather than at passive avoidance (Schacter, 1971).

Evaluation of the theory. According to the set-point theory, genetic influences affect fat cell baseline. The fact that obesity is common among children of obese parents (Charney, 1936; Rony, 1940) lends support to this notion. It has also been observed that certain groups are more likely to inherit distinctive patterns of adipose tissue formation (Mayer, 1960). However, research into the genetic theory of obesity lacks empirical support due to environmental confounds and the fact that the nature of the problem being studied does not permit experimentation with humans. Supportive evidence for genetic influence primarily stems from inbreeding studies from animal laboratories (Danforth, 1927; Mayer, 1953). The generalizability of these findings are challenged by the fact that there is no evidence that animal obesities have a counterpart among humans (Bruch, 1973; Schacter, 1968).

Another basis for the set-point theory is contained in the distinction between hyperplastic and hypertrophic obesity. Ingram (1976) questions this distinction and the notion that an increased number of fat cells "induces" eating. Aside from methodological problems concerning the cell-counting techniques (Mann, 1974), Ingram points out that individual cases do not correspond to the hypothesis predicted by the theory. Finally, some of the issues which he feels require explanation include the mechanisms by which the adipocytes influence the central nervous system and the extent to which this mechanism controls weight.

The foundation for Nisbett's theory, that set-point and hence hunger and eating are determined by the number of fat cells in the body, lacks empirical and theoretical support. In an excellent review of the physiological psychology of hunger, Friedman and Stricker (1977) critique the current theories of hunger. Detailing the inadequacies of a single-factor theory, they conclude that the availability of any utilizable metabolic fuels regulates hunger. Furthermore, they challenge the notion of a dual-centered center in the hypothalamus. Instead, they propose that the stimulus for hunger arises in the liver since this organ is most responsive to differences in the supply of metabolic fuels from fat stores:

"It is the liver that may integrate information about caloric homeostasis and initiate hunger sensations in the brain, and it is the liver whose function seems to be most affected by feeding so as to provide rapid feedback for the termination of hunger." (Friedman & Stricker, 1977, p. 28)

Oppositely, in reviewing the current literature concerning energy balance and obesity, Garrow (1974) suggests that any physiological regulation of energy intake in adults may in fact be ineffectual. Instead he states that:

The factors which determine energy intake are the habitual diet, modified by social pressures and to a lesser extent the sensation of hunger, appetite and satiety . . . input is almost entirely consciously controlled and the only significant physiological control is one of limited amplitude on the variable components of metabolic work (Garrow, 1974, p. 223).

The Restraint Theory of Overeating

Development of the theory. Thus far, the theories discussed have focused on differences between obese and normal weight individuals to explain obesity. A group of investigators at Northwestern University have concentrated on a somewhat different distinction in efforts to understand eating behavior.

The original notion was based on an observation by Nisbett (1968) that not all obese eaters were primarily externally controlled. "Overweight Ss exhibited a remarkable pattern of behavior completely unanticipated. They tended to eat very large or very small amounts of food." (p. 114) Nisbett and Kanouse (1969) confirmed this notion of a switch-like regulation of eating in obese individuals reporting that overweight shoppers bought more and intended to buy more if they had recently eaten. It seems that some overeaters are either in an eating state or they are not. Similarly, Stunkard (1959) reported that such individuals tend to do the great bulk of their eating in relatively confined intervals; they may eat only in the evening, for example, or during binges followed by low intake or abstinence.

In a study which experimentally triggered switch-like eating behavior, Herman and Mack (1975) found that differences in this pattern of eating behavior do not necessarily correspond to the classes obese and non-obese. Their hypotheses followed from Nisbett's theorizing that individual differences in set-point account for individual variations in eating behavior and weight. Obese who are over-endowed with fat cells may in fact have a "high" set-point which forces the body to strive to maintain weight at a biologically appropriate, but socially inappropriate level. In other words, an obese individual at set-point who forces even minimal weight loss, may become biologically "underweight". According to Schacter's externality hypothesis, the obese individual who is below set-point resembles the deprived animal and exhibits externality with regards to eating behavior. Another obese individual, identical in weight but at set-point, would not be externally controlled.

Herman and Mack assumed that such set-point discrepancies should also underlie a population of normal weight individuals. Persons who are biologically "underweight" should be expected to overeat in response to set-point demands. Instead, through dieting, and restraint, these individuals have kept their weight low in response to social pressures or some other factor. Such individuals, then, should be characterized by normal weight levels, restraint in their eating habits and a form of "latent" externality which would be manifested strongly in the event that chronic restraints could be eliminated or overcome. Herman and Mack hypothesized that normal weight college age females, differing in extent of their eating habits, would differ in their reaction to the experimental removal of restraint. The more restrained (and

consequently sub-set-point) would eat more in an external manner if chronic restraints are experimentally eliminated. Unrestrained Ss were expected to exhibit internal regulation.

Ss were divided into restrained and unrestrained eaters on the basis of a self-report questionnaire which assesses weight fluctuation, dieting history and attitudes about eating. Some of the Ss in the high restraint group were asked to consume two milkshakes as part of a "taste experiment". Others were not asked. Both sub-groups were then given ice cream to "rate". Those Ss who consumed the two milkshakes ate large amounts of ice cream; those who had consumed no milkshakes ate relatively little ice cream. Unrestrained Ss reacted in the opposite, and more obvious manner, eating less after a large milkshake preload than after a small preload or none at all.

The hypothesis that differences in the pattern of eating behavior correspond to two theoretically distinct classes of individuals, obese and normal weight, was contradicted by this study. Within the population of normal weight individuals, fairly sizeable differences exist with respect to concern with weight and eating behavior -- in Herman and Mack's terminology, restraint; and corresponding to these individual differences in restraint are strong differences in actual eating behavior. The eating behavior of low restraint subjects seems to conform fairly well with the pattern formerly thought to characterize all normal weight individuals; namely, "internal" regulation of intake such that a larger preload results in decreased subsequent consumption. High restraint subjects, however, although normal weight, behave in a manner that appears to be largely "external"; the presence of attractive

food cues, once restraint has been abandoned, serves to trigger additional eating which apparently defies the laws of caloric homeostasis.

The behavior of obese subjects conformed to these categorizations, high restraint and low restraint. Obese subjects were not significantly more restrained than the normal weight subjects. The correlation between restraint and percent overweight was not significant, though positive. Furthermore, if, instead of classifying subjects as high or low with respect to restraint, one classifies them as high or low with respect to degree of overweight, the resulting analysis of variance reveals no effect of weight classification, preload, or their interaction.

The important dimension, it seems, is not degree of overweight so much as degree of restraint. Despite the weak correlation between restraint and percent overweight, the dimension of restraint was the best predictor of behavior in the present circumstances. Preloading apparently acts directly on the "restraint" mechanism, serving to maintain or release such restraint in an "all or none" fashion. It may be that restraint rather than a large degree of overweight is the critical variable governing the eating behavior of obese individuals.

Rationales for restraint. The restraint measure provides an index of the degree to which individuals concern themselves, both subjectively and behaviorally, with keeping their weight down; in other words, restrained eaters are weight conscious dieters who are extremely concerned with eating, or not eating. They respond "often" or "always" to questions like:

1. How often are you dieting?
2. Do you give too much time and thought to food?
3. Do you eat sensibly before others and make up for it alone?
4. Do you feel guilty after overeating?

Normal weight restrained eaters have managed to control their weight, while obese restrained, though extremely concerned about weight, have not been successful. The internal reliability of the restraint scale has been substantiated; Herman and Polivy (1975) report an internal consistency coefficient = .75. The validity of the scale, however, has thus far been based on its predictive power. Behavioral verification of the truth of the responses to the scale is needed.

While the original study stemmed from a set-point explanation of restraint, there are two primary components of the restraint dimension which may theoretically explain the trigger-like overeating of restrained eaters: physiological restraint and cognitive restraint.

Physiological restraint. Nisbett (1972) might argue that restraint reflects a state of chronic deprivation. High restraint \underline{Ss} , according to this model, are below their set-point, and are able to maintain this relative deprivation precisely because of the restraint which they chronically exercise. Low restraint \underline{Ss} , since they are evidently able to maintain normal weight levels without the support of restraint mechanisms, are presumably at or near set-point so that there is no biological "demand" on them to eat externally or excessively. This "demand", however, theoretically produces a precarious state in the relatively deprived high restraint \underline{Ss} , where-

in restraint and "stimulus-bound" eating (externality) may alternate in the all-or-none fashion originally attributed by Nisbet (1968) to the obese. The excessive eating which is triggered in circumstances such as the restraint experiment stimulates, then, may reflect the compliance of the individual to the lure of external cues, an attraction heightened by relative deprivation.

According to this explanation, there is no reason to assume that all obese individuals are "external" with respect to food, any more than all normal weight individuals are "internal". An obese individual may or may not be below set-point; while some grossly obese individuals may have clearly abandoned all restraint and achieved their set-point weight, there are undoubtedly many technically obese people who attempt (with varying success) to restrain their eating behavior.

The restraint theory maintains that weight suppression, rather than obesity per se, is the effective factor in producing "obese" attributes. Previous studies (Schacter, Goldman & Gordon, 1968; Pliner, 1974) found greater evidence of appropriate responding to preloads in normal weight individuals than in the obese. Herman and Mack did not include sufficient obese Ss in their sample to test directly whether restraint or obesity is the better predictor of caloric regulation. Hibscher and Herman (1976) tested this hypothesis by separating obese and normal weight groups into restrained and unrestrained subgroups and replicating the Herman and Mack procedure. Furthermore, they attempted to provide evidence in support of the biological basis of restraint by measuring free fatty acid levels (FFA) and thus extending the parallel between restrained eaters and the obese to the physiological level.

Elevated blood levels of free fatty acids (FFA) is one well-established "obese" physiological characteristic (Bjornthorp, Bergman, & Varnaushas, 1969; Bergman, Varnaushas & Lendholm, 1969; Issikutz, Bortz, Miller & Wroldsen, 1967). Nonetheless, there are conflicting interpretations as to the source of this elevation. Evidence in support of Nisbett's notion (1972) that elevation of FFA in the obese reflects relative deprivation (from sub set-point weights) stems from:

1. studies which show that FFA increase as a direct function of hunger (Cahill, 1973; Gordon, 1960; Morse & Mahabir, 1964);
2. work by Omura, Nahamura, Sugimori and Yamada (1975) showing that FFA have a facilitative effect on neural firing in the lateral hypothalamus, from which they infer that FFA level may act as a hunger signal;
3. indications that weight gain in the obese lowers FFA levels, while weight loss raises FFA levels;
4. the finding that artificially induced obesity in originally normal weight prison volunteers failed to produce elevated FFA levels, suggesting that FFA levels reflect deprivation and not obesity per se (Sims, 1974).

However, there is also strong evidence showing that FFA levels are actually an indication of stress; elevation of FFA have been demonstrated in response to exercise (Gollnick, 1967; Issekutz, 1967), norepinephrine (Balasse, 1968; Galton & Bray, 1966), amphetamines (Herrera & Pascual, 1973), and psychosocial stress (Brown & Heninger, 1975).

Returning to Hibscher's study, by measuring levels of FFA, restraint (using the Restraint Questionnaire developed by Herman & Mack) and amount of ice cream eaten following various preloads, Hibscher hypothesized that restraint rather than overweight per se would predict FFA level and consumption. Indeed, these hypotheses proved correct. Unrestrained Ss ate 36% less after a larger preload, while restrained Ss ate 13% more. Also, FFA levels varied directly as a function of restraint, while degree of overweight, when analyzed separately, was unrelated to FFA levels. While there was a high correlation between degree of overweight and FFA level, confirming the relative elevation of FFA in the obese, analyses clearly indicated that this correlation was due entirely to the over-representation of restrained eaters in the obese sample.

In summary, this study replicated the Herman and Mack effect showing that unrestrained eaters reduce consumption as a consequence of forced preloading, whereas restrained eaters respond oppositely by overeating. The findings also show that FFA elevation is a characteristic of dieters and not simply of the obese, lending some support to the notion of restraint as a correlate of a biological state.

The study, however, does not offer conclusive evidence for either interpretation of the role of elevated FFA levels; it is equally likely that FFA elevation in restrained individuals results from deprivation (hunger) or from stress.

Cognitive restraint. There is experimental evidence indicating that cognitive factors rather than physiological factors are primarily responsible for short-term food regulation (these studies are reviewed in Chapter I of the present paper: Schacter

and Gross, 1968; Nisbett, 1968; Wooley, 1972). Polivy (1975) linked the notion of restrained eating to these studies of cognitions, hypothesizing that restraint, or intentional restriction of intake, represents cognitive control, as opposed to physiological control.

In order to test the extent to which restraint predicts responsiveness to cognitive cues, Polivy manipulated true caloric content and perceived calories. Male restrained and unrestrained Ss were given an eight ounce pudding preload which contained 750 or 350 calories. They were informed that the pudding was either a "rich, high-calorie gourmet dessert" or a "new, low-calorie, gourmet-type dessert". Half of the Ss were correctly informed about the caloric content and half were misinformed. After the preload, they were given sandwich quarters and asked to rate them on "taste" and "energy" scales.

As predicted, results showed that the counterregulatory behavior of restrained eaters is based on cognitions. Restrained Ss increased their intake only when they believed they had eaten excessively, regardless of true caloric intake. Polivy states that:

Counterregulation is a cognitive effect. The expressed separation of perceived from actual calories in the preload revealed that restrained eaters overate only after they thought they had consumed a high-calorie preload. This latter finding effectively ruled out the possibility that restrained eaters were experiencing an unusual physiological (hypoglycemic) reaction to the preload (1975, p. 83).

Polivy compares the behavior of restrained eaters with a description by Mahoney and Mahoney (in press) of "cognitive claustrophobia", a condition which

results in binge eating, characteristic of perfectionistic dieters following a lapse of one's diet. Similarly, Polivy's study indicates that for restrained eaters, merely the belief that the diet has been "broken" is sufficient to trigger overeating. Overeating of restrained eaters is a response to their belief that they have broken their diets by eating a "fattening" preload rather than a biological response to the calories of the preload.

Summary. Although far from conclusive, Hibscher's study initiated an investigation of the extent to which restraint is a function of physiological deprivation. While he found that elevations in FFA were correlated with restraint, the source of this elevation remains unknown. Evidence suggesting that it reflects deprivation from sub-set-point weights is correlational and equivocal. For example, the fact that FFA levels are elevated in the obese and elevated as a function of hunger may simply reflect the eating habits of the obese. Often, obese individuals will go all day without food and then overeat continuously throughout the evening. Therefore, at times, obese individuals may simply be hungry as opposed to chronically sub-set-point. Also, the fact that weight gain in the obese lowers FFA levels may offer equal support for the stress theory of elevated FFA; overeating may serve to relieve everyday stress for the obese. However, studies which show a closer relationship between stress events and eating are needed to substantiate this notion.

While Polivy's study shows that overeating behavior following large preloads may be a response to cognitions rather than to immediate physiological feedback, this finding does not rule out the hypothesis that the primary basis for the development of

cognitive restraint is biological. In other words, restraint may be cognitive control developed in response to gross "biological hunger" in the presence of strong social and personal pressure to be thin. On the other hand, it is equally likely that restraint may be cognitive control which is developed in response to previously learned patterns of eating. Psychosomatic theorists might argue that overeaters learn to eat in response to anxiety, but as they mature, and as social desirability becomes increasingly more important, they are faced with a conflict between strong desires to eat during certain emotional states and attempts to maintain weight. Using the stress theory of FFA elevation, one might speculate that the fact that weight gain lowers FFA levels in the obese reflects the release of tension associated with abandoning the behavioral and cognitive rigidity necessary for control of this conflict.

These two viewpoints contain markedly different explanations for why overeaters desire food. Nonetheless, in both cases, restraint is seen as rigid cognitive control of eating which arises from the desire to eat conflicting with the desire to be thin. Evidence is presented in the following sections of this review to show that restraint, or chronic dieting, may catalyze an overwhelming desire for and an obsession with food. The remainder of this review will be devoted to examining how the process and effects of dieting can explain restrained eating behavior and perhaps some of the overeating common to obese dieters.

Reactions to Dieting

Adverse emotional reactions to dieting. Parallels have been made between the behavioral changes which occur during starvation and those reactions which are commonly found in the dieting obese. Data obtained from food-deprived prisoners of war (Leyton, 1946), hungry civilians during the Second World War (Meerlo & Klauber, 1952), and Ss undergoing experimental starvation (Keyes, Brozek, Henschel, Michelsen, & Taylor, 1950; Lohr, Slater, Palmer, Doctor, & Mandell, 1964) indicates that the semi-starvation syndrome includes increased preoccupation with food, irritability, anxiety, and affective lability.

Also, Meerloo and Klauber (1952) noted that famine victims (individuals in Western Europe during World War II whose daily intake ranged from 600-1700 calories) experienced a frantic desire to fill themselves with bulk or spicy foods, rather than with food which provided real nutritive value. These investigators suggest that these actions represent victims' efforts to compensate for their feelings of deprivation.

Observations of similar adverse effects have been reported for overweight individuals as a result of dieting. However, due to vast methodological differences, the literature concerning the effects of dieting presents many contradictions. In an excellent review of this research, Stunkard and Rush (1974) distinguish between studies of inpatients and outpatients. This distinction will also be made in the present paper in an effort to make comparisons more meaningful.

Outpatients. In the past twenty-five years, there have been very few studies of the effects of dieting on individuals involved in outpatient programs. Hamburger (1951) initiated some research when he reported that six out of his eighteen obese patients developed emotional problems while losing weight. Bruch, well-known for her clinical examinations of the process of weight reduction, documented her findings with detailed descriptions of severe emotional problems in three obese adolescent girls (1952). In 1957, Stunkard expanded this line of investigation, studying two separate groups of obese patients.

The first group studied consisted of twenty-five high-risk patients who had been referred to the special study clinic because of the severity of their obesity or the difficulty in its management. Nine of the twenty-five patients were suffering, or had suffered in the past, severe emotional troubles while trying to lose weight.

The disturbances had certain characteristics in common. In half of the cases there was an early period of euphoria and exaltation when the decision to diet was made; there were feelings of freedom and extravagant fantasies about the benefits weight loss would bring. In each patient, the acute disorder began with the abrupt onset of a one to three week period of depression, which often lasted for months, and which included crying spells, sleep disturbance and difficulty in functioning. Most had trouble working, and thoughts of suicide were common. (Stunkard & Rush, 1974, p. 527)

In this first study, due to the high-risk nature of the sample, a high incidence of emotional problems associated with dieting was expected. Therefore, the second group Stunkard studied was a random sample of one hundred obese individuals admitted to a nutrition clinic. Assessment of reactions to dieting was based on self-reports of symptoms they had experienced during previous attempts at reduction.

Of the seventy-two patients who had dieted seriously in the past, 54% reported that they had experienced symptoms including "nervousness", "weakness", "irritability", "fatigue", or "nausea".

The opinion of these two authors is that dieting can often have dilatorious effects and, in some cases, disastrous consequences. While various recent investigations have challenged this conclusion, only two of these studies have dealt with outpatients. Moreover, Stunkard and Rush (1974) argue that these reports, in fact, offer convincing support for their findings. They noted that the fact that 74% of the participants dropped out of one program (Shipman & Plesset, 1963) may, in itself, suggest some kind of untoward emotional response. Stronger support is found in a study by Silverton and Lascelles (1966); of seventy-two patients, twelve dropped out and half of the remaining participants reported either the onset or the intensification of depression. Of twenty-five who reported increased anxiety, eleven became "markedly anxious".

However, these conclusions concerning the negative effects of dieting on outpatients are very limited by the questionable reliability of self-report data and general lack of control over food intake, eating habits and environmental influences. Furthermore, due to the small number of studies of outpatients' reactions to dieting and to the high attrition rates, results must be interpreted with caution.

Inpatients. The methodological problems associated with studying the reaction of inpatients (as opposed to outpatients) to weight reduction are greatly reduced: the attrition rate is generally lower, observation and recording is easier, caloric intake

can be strictly controlled and monitored, and some confounding variables and environmental influences can be circumvented. Consequently, studies of inpatients are numerous and somewhat more reliable. Nevertheless, due to the artificial controls inherent to an inpatient setting, the generalizability of these findings must be questioned. Categorizations of these studies can be made on the basis of type of diet implemented, including short-term fasts, long-term fasts and low-calorie diets.

Across many investigations of the effects of short-term fasts (less than two weeks), there is a general consensus among authors indicating a lack of detrimental consequences (Biggers, 1966; Bloom, 1959; Gilliland, 1968; Fischer, 1967). This conclusion is consistent with the findings of Kollar, et. al. (1964) that obese persons can in fact tolerate short periods of fasting with less difficulty than normal weight individuals.

Oppositely, individuals involved in long-term fasts (over two weeks) are at high risk for consequential emotional stress. Various studies indicated increased emotional disturbance including mood fluctuation and aggression (Rowland, 1968), and depression and anxiety (Kollar & Atkinson, 1966) in fasting individuals. While these authors do not conclude that these reactions were caused by fasting, (since they occurred as often during refeeding periods and seemed to be most closely correlated to interpersonal events), Stunkard and Rush (1974) point out that the refeeding consisted of only 900 to 1500 calories, which most likely was not enough to satisfy a patient's hunger.

They note, then, that the low-calorie refeeding diets, in fact, may have been even more stressful than the fasts and thus it is not surprising to find that interpersonal events aggravated emotional upsets during this time. These comparisons of short and long-term fasts seem quite tentative, however, since the authors make no mention of matching of Ss for relevant variables such as percentage overweight, age, sex, etc.

In a study of twenty-five severely obese individuals who were starved in a hospital for periods of eight to eighty-five days (average thirty-eight days), Swanson and Dinello (1970) found that:

" . . . during prolonged food restriction, such as starvation, unwanted feelings and psychological disorder are often manifested. Return to eating relieves this unrest and was actually acceptable to even the motivated Ss in this study ." (p. 312)

However, consistent with the findings reported concerning short-term fasts, these authors noted the following patterns: during the first three to ten days of the fast, all patients reported feeling better, showed an improved mood and high motivation; it was only when the fast extended beyond ten days that emotional disturbances increased.

None of the patients maintained their weight loss. Two reasons were given. First, the emotional disturbances negatively affected weight maintenance. Second, no real behavioral changes had taken place; Ss had not learned to modify their intake.

Similar findings of severe emotional disturbance are associated with low-calorie diets during hospitalization. In a series of studies at Rockefeller University, the response of obese patients to weight reduction was studied systematically. First, four male and female obese patients were hospitalized and observed during an initial

four-week period of weight maintenance followed by a sixteen to twenty week period of weight loss, and a final four-week period of weight maintenance (Glucksman & Hirsch, 1968). Observational data indicated that for each patient, nonspecific symptoms of semi-starvation (for example, fantasies of food and eating, dreams of food, anxiety and affective lability) increased as weight reduction progressed. Furthermore, sufficient caloric intake following weight loss did not significantly alter these symptoms. The generalizability of these findings is, however, severely limited by small sample size, insufficient time for maintenance, and lack of behavioral correlates of the self-report and observational measures.

In an attempt to quantify these experiences of dieting adult obese, Glucksman, Hirsch, McCully, Barron and Knittle, (1968) studied six severely obese patients. They were hospitalized for eight months and participated in an experimental program of six weeks of weight maintenance followed by fifteen weeks of weight loss and finally, six weeks of weight maintenance. A behavioral rating form consisting of fourteen scaled variables (for example, anxiety symptoms, depressive symptoms, physical appearance, and food-oriented behavior) was employed by trained observers to measure behavioral changes. Also, projective tests and figure drawings were administered at various times throughout the study and analyzed through the use of standard scoring methods.

The authors report behavioral changes in four categories of behavioral response: 1. affective; 2. perceptual; 3. sexual; and 4. hunger-food behavior. Affective changes included an increase in anxiety and depressive symptoms during

and following weight loss, and in hostile-aggressive behavior during the deprivation period. Perceptual alterations included increased concern over body size during the period of weight loss. Changes in sexual behavior noted were impairment of heterosexual functioning prior to weight loss. An increase in hunger symptoms during the period of caloric deprivation and weight loss was also reported.

Those behavioral changes which persisted during the maintenance period (following weight loss) included anxiety and depressive symptoms, excessive food-oriented behavior, and overestimation of body size. Hunger symptoms, hostility-aggression, and concern with alteration of body size did not continue during weight maintenance. These authors conclude that "instead of weight reduction resulting in a normal behavioral-metabolic state for obese patients, it more likely results in an abnormal state similar to that of starved non-obese individuals" (p. 370). Various methodological inadequacies make these results inconclusive. Small sample size, raters who were blind as to the purposes of the study, and the questionable reliability and validity of self-report data as well as projective test data suggest that these findings must be interpreted cautiously. Also, the generalizability of the results is limited to severely obese patients who are hospitalized, a rare population.

Wooley and Wooley (1976) studied the effects of dieting through measurements of salivation, an indicator of hunger and depression. They found that for normal weight individuals, salivation increased with increasing hunger, however, this did not happen for obese individuals. For depressed patients, salivation is greatly reduced, and inversely proportional to the severity of depressive symptoms.

When the individual recovers from the episode of depression, salivation returns to normal. The authors suggest that the neural mechanisms involved in satiety and hunger are the same as those involved in depression and recovery from depression and that dieting causes what Akiskal and McKinney (1973; 1975) refer to as "impairment of the neurophysiological substrates of reinforcement", a condition they feel is common to all types of depression.

Wooley and Wooley hypothesized that if dieting causes depression and depression is associated with decreased salivation, then diets should decrease salivation. They measured saliva flow at four different times throughout the first and last day for Ss spending a week at a fitness camp where daily caloric intake was 900 calories. Indeed, they found that salivation was less on the last day. Furthermore, they note that saliva flow increased later in the day, a phenomenon which Palma and Blackwell (1965) found associated with depression; for non-depressed Ss, salivation decreased at the end of the day.

In summary, there is some evidence from the study of adverse emotional reactions to dieting in outpatient and inpatient settings that weight loss can result in adverse psychological consequences. Short-term fasting (up to ten to fourteen days)* appears to be the most benign form of treatment, whereas long-term treatment, whether fasting or low-calorie dieting, is associated with adverse reactions. There is also some evidence to indicate that low-calorie diets may be more stressful than total fasting, a finding which Stunkard and Rush (1974) hypothesize is due to the notion that low-calorie diets revive hunger without satisfying it. Research also suggests that juvenile-onset obese are more likely to experience psychological

distress, and have greater difficulty in weight loss, than adult-onset obese.

Methodological shortcomings limit the conclusiveness of these results as well as their generalizability. In the study of outpatient reactions, the sparsity of studies, high attrition rates, lack of controls over environmental influences, limitations of self-report data, differences or lack of information concerning age at onset of obesity, and different settings and types of populations pose serious limitations.

While the study of inpatients also suffers from many of these inadequacies, confounds also include inconsistent use of control groups, variability in degree and method of measurement of obesity, variability in number of Ss and method of measurements of adverse reactions, different types of dietary programs and treatment procedures, and variations in emotional history for participating Ss. Furthermore, there is no control for the effects of amount of contact with the therapist or degree of voluntary control.

Body image distortions. Distortion of one's appearance, feelings of self-consciousness, and contempt toward oneself are disturbances of body image common to the obese (Stunkard & Mendelson, 1967; Stunkard & Burt, 1967; Glucksman & Hirsch, 1968). Traditionally, measurements of body image included subjective data from interviews, questionnaires and projective tests. In order to quantitatively evaluate body-size perception, Traub and Orback (1964) developed a body-distorting mirror. Their conclusions indicated that body size perception, an important component of body image, is sometimes distorted during weight reduction. Some patients reported persistent feelings of obesity following weight loss. Glucksman and Hirsch (1969)

extended the body perception measures, employing a body-sizing apparatus consisting of variable lenses which allowed a S to control the size of their image projected on a screen. They measured body-size perception in six severely obese patients before, during, and following weight loss. The experiment paralleled their previous studies in that the Ss were hospitalized and measurements were taken during an initial six-week period of weight maintenance. Measures were taken weekly by presenting a photograph of each S projected on a screen. The image was distorted in either the direction of thinness or obesity, and the S was requested to make the screen image correspond to their perceived body size. The same task was repeated using a slide of a vase, an average-weight male and an average-weight female, whereby Ss were asked to estimate the real size of the image. The results showed that obese Ss consistently overestimated their own body size during and following weight loss; they perceived themselves at their initial obese weight. It is interesting to note that the non-obese Ss underestimated their own body size.

Further investigations directed attention to differences between disturbances as a function of age at onset and occurrence of obesity. Stunkard and Burt (1967) designed a study to determine if body image disorders originated in adolescence. Interestingly, after two attempts, they found an exceptionally low frequency of individuals who had been obese in childhood, but not in adolescence: of 189 obese adults, only two fit this criteria. While this lack of pertinent subject sample made it impossible to complete their original study, a most important aspect of their work is the implication concerning the historical progression of obesity: an exceptionally

few number of persons are obese in childhood and adulthood, but normal in adolescence.

In a second study, Stunkard and Burt (1967) interviewed twenty obese girls to determine whether body image disturbances were present before adolescence. Although a few mentioned weight as a concern about their physical appearance, other characteristics including pigtails and braces were of equal concern. The authors concluded that the body image disturbance common in obese adults does not occur prior to adolescence.

In a third investigation, these authors studied the effects of prolonged maintenance of a normal body weight upon body image disturbance of previously overweight persons. Out of ten persons interviewed, three individuals reported that body image distortion developed in adolescence. Various commonalities found among these three people provide some information about body image disturbance in obese. All three women had lost their obesity during later adolescence. They were the only people who reported losing weight for cosmetic reasons, as a response to pressure from others. For each of them, weight reduction had been a conscious and deliberate effort, as opposed to "outgrowing" their obesity, as others reported. Although the distortion in body image had been decreased for these women as a result of weight loss:

"... all three women reported undue and morbid preoccupation with their physical appearance, and anxiety, often of intense degree, over the gain of even two or three pounds. All of them said that they had to diet constantly." (p. 1445)

These results suggest that adolescence may represent a critical period in the development of body image disturbances. From these studies one might hypothesize that those who were particularly vulnerable to external pressures, teasing, parental

disapproval, etc., and responded by dieting, were highest risk for the development of body image disturbances. Furthermore, these derogatory views, once internalized, seem to endure.

In summary, the research on body image distortion is consistent in demonstrating that the greatest distortions in body image occurred in adolescent-onset obese (Bruch, 1951; Stunkard & Burt, 1967; Stunkard & Mendelson, 1967). However, not all persons with juvenile-onset of obesity showed disturbances in body image. Also, juvenile-onset obese were found in a number of studies to respond in a significantly different manner during and after weight loss from adult-onset obese. Male and female juvenile-onset obese showed increasing overestimations of body size during and after weight loss (Glucksman & Hirsch, 1969; Glucksman et. al., 1968). However, these results, as well as the other studies of body-image distortion discussed, should be interpreted with caution due to the relatively small number of Ss evaluated, variability in degree of obesity, differences in measurement of effects, differences in setting, and lack of control for other relevant variables such as sex.

A good example of how these factors may thwart efforts to generalize from various studies is the influence of sex and type of population studied on perceptual distortions. Schonback and Schell (1967) studied undergraduate male college students who were underweight, normal weight, and overweight, and found no significant differences in accuracy of the Ss assessment of their own body shape and size in comparison to a series of nude male photographs. In a study of males and females seeking help for weight reduction, Cappon and Banks (1968) found that both the obese

Ss and control Ss overestimated their body size. However, Meyer and Tuckelt-Gallwitz (1968) found that obese women were more uncertain about their actual photograph than control Ss.

Until more carefully controlled studies which take into account relevant variables are completed, it will be difficult to determine the extent and nature of body-image distortion during and after weight loss.

Factors influencing adverse reactions to dieting .

Age at onset. Some of the factors which influence an individual's reaction to weight loss have already been mentioned. Perhaps the most distinctive factor, thus far, is age at onset. Adults who developed obesity in childhood tend to be more overweight than adult-onset obese (Mullens, 1958). They also tend to be more difficult to treat in terms of amount of weight lost (Nash, 1976), and tend to have more emotional difficulties, particularly in their body image. In a post-hoc summary, Stunkard and Rush (1974) point out that although age at onset was not a distinguishing factor in many studies of adverse reactions to weight loss, the majority of individuals who experience consequential emotional disturbance (including self-reports of increased anxiety, sadness, pessimism, disappointment, and apathy) are juvenile-onset obese.

Table A
Percentages of Ss Reporting
Adverse Reactions to Dieting

<u>Study</u>	<u>Type of Diet</u>	<u>Proportion of Juvenile-Onset Obese Reporting Adverse Emotional Reactions</u>	<u>Proportion of Adult- Onset Obese Reporting Adverse Emotional Reactions</u>
Stunkard (1957)	varied	9/20	0/5
Kollar & Atkinson (1966)	low-calorie	6/6	No <u>Ss</u>
Crisp & Stonehill (1970)	low-calorie	4/7	No <u>Ss</u>
Rowland (1968)	long-term fasting	6/6	No <u>Ss</u>
Rockefeller University Studies (1968)	low-calorie	10/10	0/5

A summary of their report (Table A) shows that in a variety of studies of juvenile-onset obese a majority of Ss reported adverse reactions; for example, four out of seven juvenile-onset obese in Crisp & Stonehill's study reported adverse emotional reactions to dieting. Oppositely, in the two studies listed which sampled adult-onset obese, none of the Ss reported such effects.

While a state of hyperplasia in juvenile-onset adults may contribute to this difference, other non-biological factors must be considered. There is a higher incidence of emotional problems in obese children (Stunkard & Rush, 1974), although it is unclear whether emotional problems lead to obesity or vice versa. The development of obesity early in life affects a child's psychosexual development (Ayd, 1974), however, emotional environment may also influence weight significantly. For example, children who have faced the emotional trauma of being placed in a foster home developed significantly more obesity than controls (Kahn, 1970).

For whatever reasons, these juvenile-onset obese are less likely to succeed in treatment (Nash, 1976) and are especially likely to have negative emotional reactions to treatment.

Length of diet. As presented previously, there is considerable difference between reactions to short-term diets and long-term diets; few adverse reactions are reported from the former while severe emotional disturbance is common among individuals during and after the latter. Stunkard and Rush (1974) combine the findings of Bloom (1959) and Duncan et. al., (1964; 1965) indicating that in over one thousand persons on a ten day hospital fast, no undesirable consequences were found. Stunkard

and Rush also point out, however, that age at onset may be confounding these results since no data concerning the kind of patient is presented. In most of the studies which indicate adverse reactions to long-term fasting and low-calorie diets, the majority of the subject population was juvenile-onset, extremely obese individuals who had most likely responded poorly to other forms of treatment. It will be difficult to sort out the effects of different length diets until controls for age at onset are established.

Other variables. An individual's reaction and success with a weight control program is also influenced by their previous experience with dieting. Since most people who do lose weight are unable to maintain the loss (Stunkard & McLaren-Hume, 1959; Mahoney, 1974; Stunkard, 1975), the experience of failure, whether with an established program like Weight-Watcher's or from a fad diet from a paperback, is a common one. Based on evidence suggesting that the experience of failure depresses performance in general (Feather, 1966; Katchmar, Ross & Andrews, 1958; Lazarus & Erickson, 1953; Osher, 1954; Sarason, 1956), Nash (1976) suggests that one predictor of response to a diet may be the extent to which a person has previously tried to diet.

Stunkard and Rush mention the following additional unresearched variables which affect reactions to dieting:

1. Medication: Clinical reports of negative side effects of medications used for dieting, in particular amphetamines, are common (Stunkard, Rickels, & Hesbacher, 1973). The effects of differential types and dosages of medication have yet to be studied.

2. Weight Loss: The amount and rate of weight loss as well as the percentage of excess weight and type of body matter (i.e. muscle versus adipose tissue) are unstudied variables which may influence adverse responses.
3. Sex: The dieter's sex may partly determine the nature of emotional responses to dieting. Since most studies have involved women, this variable has not been investigated.
4. Emotional History: One might assume that a history of emotional disturbance, particularly during attempts to diet, would increase the likelihood of similar reactions in the future. This prediction has yet to be determined.
5. Type of Therapeutic Intervention: The fact that group therapy seems more successful both in terms of attrition rates and weight loss than individual therapy (London & Schreiber, 1966) suggests fewer accompanying adverse reactions. Also, no adverse responses to behavior therapy in the treatment of obesity have been reported yet. Further controlled research is necessary to define any real conclusions.
6. Setting: The advantages to an inpatient setting include access to food, removal from an interpersonal or work atmosphere which may interfere, and close contact with a physician or therapist. While weight loss in such a controlled environment may be most

successful, and evidence suggests that short-term inpatient fasting is most benign, controlled studies of the effects of environment on weight loss are warranted.

In summary, there is sufficient evidence to suggest various possible adverse reactions to dieting, including emotional stress as well as body-image distortion. However, due to the lack of carefully controlled studies, and neglect of potentially significant variables, the nature and extent of these effects is unclear.

Restraint as a Reaction to Dieting

The effects of the process of dieting. From the preceding review, one may conclude that dieting can certainly have a substantial effect on emotional state and body-image perception. Furthermore, it seems that the process of dieting, as opposed to weight loss per se, can largely determine an individual's response to dieting. For example, two of the most salient indicators of high-risk for adverse responses (a long-term diet and repeated attempts at weight loss) are factors involving amount of time devoted to dieting, not necessarily amount of weight lost. One might speculate that a third critical high-risk variable, juvenile-onset of obesity, is also correlated with length of dieting, since the longer a person has been overweight the longer an individual has probably tried to diet.

The findings of Solow et. al. (1974) provide further evidence which implicates the process of dieting as the primary basis for adverse reactions. Twenty-nine

obese male and female patients, including twenty-five juvenile-onset obese, were studied following intestinal by-pass surgery. In a final assessment, two years after surgery, self-reports of response to weight loss included improvements in mood, self-esteem, and interpersonal and vocational effectiveness. Furthermore, a trend toward decreased anxiety and depression was reported. These findings are in striking contrast to the material reviewed thus far, however, the weight loss method employed was similarly unique. No dieting was necessary, and individuals were assured of losing weight. Also, no mention is made of control Ss or behavioral measures of self-report data.

It seems that dieting also has detrimental influences on individuals who must restrict their intake for purposes other than weight loss.

Meerlo and Klauber (1952) studied cardiac patients who were forced to follow a restrictive diet. They note that these patients may develop symptoms similar to those reported by obese dieters (including a reactive depression and apathy) despite improvements in vascular functioning. Although in this study it is difficult to separate the effects of surgery from the effects of a restrictive diet, Meerloo and Klauber report that these symptoms were overcome by giving more variety in foods, suggesting that restriction in menu does, in fact, negatively influence mood for these patients.

A comparison of results obtained by Decke (1971) and Nisbett (1968) also implies that "externality" is characteristic of dieters, and furthermore, that dieting (food restriction) rather than weight reduction (pounds lost) gives rise to heightened responsiveness to external food cues. In the former study, prison volunteers made

obese experimentally showed no heightened externality, while in the latter study, a group who had formerly been overweight, but had maintained a normal weight for some time, were found to be extremely externally-oriented. While there are many significant differences between these two samples of Ss (for example, eating-environment, availability of food, and self-control factors), one might speculate that a main difference in the two groups was experience with dieting: the prison volunteers had previously behaved in a manner opposite to dieting, whereas the weight maintainers had most likely been asserting efforts to closely control eating, but not to lose weight.

At the Dietary Rehabilitation Clinic, Musante and his colleagues (1976) observed the psychological stresses of dieting and the resultant eccentric food gathering and eating behaviors. They note, however, that these behaviors are more directly related to menu construction and cognitions than to physiological deprivation or amount of calories consumed. For example, when new patients were allowed to construct their own menus, they exhibited the following behaviors:

- "1. Rising anxiety
- "2. Ruminations about food
- "3. Over-stressing of calories in an obsessive manner
- "4. Requesting large amounts of one or two low calorie foods and then habituating to large portions
- "5. Skimping at breakfast and lunch to be able to add on at dinner
- "6. Overdoing spices and condiments
- "7. Trying a little of everything and making up unusual combinations to fit the caloric allotment, likened to nibbling at the refrigerator
- "8. Overemphasizing smell and taste of food
- "9. Complaining that eating slowly makes food cold." (p. 182)

However, when patients were served the same amount of food in pre-planned menus, these complications did not arise; the patients reported satisfaction and seldom felt hungry. These findings are reminiscent of the literature concerning the effects of short-term fasts in which individuals reported few adverse reactions to dieting when adequate structure was provided.

Perhaps most importantly, it seems that these behavioral and cognitive changes which evolve from dieting can often be permanent. A study also mentioned in this paper provides the clearest example of these consequences. Glucksman and Hirsch (1968) studied the effect of prolonged maintenance of a normal body weight upon body-image disturbance of previously overweight persons. Three individuals who were interviewed reported that they had lost weight during later adolescence, as a response to pressure from others and for cosmetic reasons. For each of them, weight reduction had been a conscious and deliberate effort, as opposed to "outgrowing" their obesity as others had reported. Although the body-image distortion had been decreased for these women as a result of weight loss:

. . . all three women reported undue and marked preoccupation with their physical appearance, and anxiety, often of intense degree, over the gain of even two or three pounds. All of them said that they had to diet constantly. (p. 445)

While this is an extremely small sample size, the interviews provide some evidence that changes caused by dieting are not necessarily transitory.

The effects of dieting on eating behavior. The process of dieting can distort an individual's affective, cognitive, and perceptual states. Data concerning restraint

indicate that excessive dieting and concern with weight also influence eating behavior. Restrained eaters or chronic dieters ate more after their diets had been broken; in fact, they overate after overeating. This pattern resembles the behavior of obese eaters who, when breaking their diets, binge excessively. Similarly, when individuals terminate a diet, they often report this kind of excessive eating. The process of dieting, then, at times affects behavior in a way completely contrary to the intended result. Why does dieting have such paradoxical consequences?

Most weight loss programs and diets concentrate on strengthening an individual's ability to restrict food intake. The focus on continual deprivation, inherent to the process of dieting, may be directly related to restrained eating behavior as well as to the tendency to re-gain weight upon termination of a restrictive diet.

In a study of weight maintenance, Schonitzer and Harmatz (1977) provide evidence consistent with this notion. First, they note an important difference between behavioral procedures and other weight loss methods, such as Weight Watchers, which may contribute to the success of behavioral programs: namely, that in behavioral programs there is no insistence on a specific diet in terms of foods allowed or foods required. Behavioral researchers feel that the omission of detailed restrictions in food choice increases the probability that the diet will be followed since the unavailability of specific foods can often lead to termination of the entire dietary program (Stuart, 1970). Schonitzer and Harmatz tested the notion that this non-restrictive approach to food choice has important consequences for eating

behavior after a diet has been discontinued. Overweight individuals followed the Weight Watcher's diet, including the instruction to exclude all of the items on the "Favorite Food" list. However, each individual in the experimental group incorporated one favorite food (a food generally not allowed while dieting) into her diet each day.

Results indicated that while Ss allowed to eat a "Favorite Food" did not lose significantly more weight than the Ss in the other comparison groups, they did maintain their weight at a significantly lower level after termination of the diet program.

The rationale used by these authors in the development of this study is based on research concerning the effects of deprivation on learned drives. In a classic experiment, Miller (1948) demonstrated the plausibility of a learned drive theory and expanded this notion stating that "even the primary drives themselves may be modified by learning, so that hunger becomes a desire for a particular type of food appetizingly prepared"(Miller, 1951, p. 435). Similarly, Brown (1961) suggests that through learning, the absence of certain substances increases drive. Combining these theories, Schonitzer and Harmatz suggest that while dieting, certain types or amounts of food acquire a high drive status when they are deprived.

As Keyes (1950) has stated:

The tendency toward overeating following a period of reduced food intake has been noted repeatedly under conditions of natural starvation when food suddenly became available again in large quantities. In none of these cases can the increase of overweight above the prestarvation level be interpreted as a result of disturbed function of the organs of internal secretion. The overeating and resulting overweight may be regarded with justification as psychogenic in nature -- that is as a result of an excessive volume of food intake not balanced by the dissipation of energy in the form of physical work. (p. 127)

The overeating following a period of severely reduced food intake reported by Keyes may parallel the behavior of the dieter upon termination of a restrictive diet. In other words, when one ends a strict diet, one's state of deprivation may increase the desire for foods not allowed previously. When the high drive status given to forbidden foods remains with a dieter during post-diet days, weight is regained as the individual overindulges in these foods.

Variances in the effects of short-term fasts versus long-term dieting may also be attributable to differences in feelings of deprivation. Short-term fasting can be a reliable and efficient method for weight loss. Obese patients report that hunger declines within two or three days after the beginning of a fast, and that they are fairly comfortable fasting by that point. Similarly, many dieters can follow a strict fad diet (for example, water and small amounts of protein) for limited amounts of time and feel exhilarated by a sense of self-control. Long-term fasts and low calorie dieting present a quite different situation. Under these conditions, dieters report hunger, obsessions with food, anxiety, and ever-present desires to diet-break and binge. A major difference in these types of diets which may affect an individual's

feelings of deprivation is duration of the diet. In a short-term fast, whether for one day or ten days, a dieter is aware of a goal or an end that is, in most instances, arbitrary or fixed. The diet ends after a certain amount of time, regardless of other factors such as amount of weight lost. Therefore, the dieter knows that deprivation will be limited. Oppositely, with most low-calorie diets and long-term fasts, it is very difficult to predict the duration, because the end is usually determined by pounds lost. In other words, duration of deprivation is dependent on performance, and therefore, indeterminable. An additional major difference with long-term fasts is perception of control; these fasts are usually imposed by someone other than the dieter, and the lack of self-control generally associated with long-term fasting may exaggerate feelings of deprivation.

In light of these notions, the effect established by Herman and Mack, namely that restrained eaters or dieters tended to overeat following a large preload may be due to the psychological effects of feeling deprived while dieting. Once the diet had been experimentally broken, dieters assumed a "what the hell . . ." attitude and continued to overeat.

Furthermore, this study shows that the psychological deprivation effects of dieting influence normal-weight individuals as well as the obese. Any restrained eater, regardless of weight, responded in a similar manner. Likewise, only those overweight individuals who are diet-conscious and actually aware of their weight would be expected to exhibit restraint in their eating. As Polivy (1976) showed, restraint is cognitive rigidity, and concern with diet and weight are the key

determinants of restrained eating behavior, regardless of weight.

Factors influencing the breakdown of restraint. Restrained eaters are overeaters who obsessively attempt to restrict food intake (either successfully in the case of normal-weight persons or unsuccessfully for the obese) and consequently, they experience the effects of psychological deprivation including: preoccupations with food, eating, weight control and certain types or amounts of food, as well as feelings of guilt, self-hatred, and helplessness after diet-breaking. It seems that the effects of psychological deprivation largely influence their eating behavior, and for the obese, attempts to lose weight. Generally, while adhering to a diet, these deprived feelings can be overcome. However, at various other vulnerable times, and in the face of stressful emotional "preloads", this self-deprivation is harder to enforce and dieters give in to their desires to overeat. For different kinds of overeaters, there are different experiences which trigger eating.

Excessive intake. As Herman and Mack (1976) showed with preloads, excessive intake seems to trigger continued overeating for dieters. Overeating is switch-like, and when a certain threshold has been surpassed, little or no control is exerted. Various other studies have shown that obese Ss eat as much when full as when they have no preloading (Nisbett, 1968; Schacter, Goldman & Gordon, 1968). These dieters consider their diets broken and, in a sense, take advantage

of the chance to indulge. Perhaps they feel that once a forbidden food or a certain amount has been consumed, they have already "cheated", and since they feel that there is no way to "atone", they take advantage of the last chance to eat favorite foods or as much as they want until the next diet-break.

Anxiety. As reviewed earlier, the eating behavior of obese individuals under high anxiety conditions is unclear. Schacter and his colleagues (1968) found that obese Ss ate no more when anxious, while McKenna (1972) found that the obese ate significantly more.

Herman and Polivy (1975) investigated the effects of eating on anxiety reduction for restrained and unrestrained normal-weight Ss. They hypothesized that normal-weight Ss, classified as to the extent of restraint exercised with respect to eating, would show the same trend in differences in individual eating behaviors as characterized by obese and normals in previous studies. This prediction was confirmed. Normal-weight, anxious dieters ate somewhat more than non-anxious normal-weight dieters. Anxiety seemed to counteract restraint, increasing rather than decreasing intake in restrained eaters. However, these authors note that there was no reduction in reported anxiety following eating.

Nonetheless, as McKenna points out, measurement of anxiety should be taken during eating since the anxiety reducing components of eating may, in fact, be distraction; eating may serve to shift attention from an anxious situation to behaviors involved in obtaining food, chewing, etc. There is, in fact, some evidence to show that the obese may be more easily distracted (Rodin, 1974). Also,

restrained eaters' performance on a simple cognitive task, proofreading, is subject to drastic deterioration when an auditory distractor is added to the situation. The effect is not significant with unrestrained eaters. Perhaps these individuals use this "distractibility ease" as a way of avoiding unpleasant circumstances. However, if this is the case, then anxiety is not minimized unless eating is continued and thus, measurement of anxiety reduction could only be recorded during the actual process of eating. In fact, for the restrained dieter, anxiety is likely to increase after over-eating as a result of feelings of guilt and helplessness due to lack of control.

It is also interesting to note that in McKenna's study, the non-eating obese control Ss showed the greatest anxiety reduction. Assuming that these obese are high-restraint individuals, diet and weight conscious (regardless of how successful they are at attempts to act upon these thoughts), this finding may be explained by an increase in feelings of self-control: dieters who endure anxiety without eating may feel less anxious afterwards.

Effects of Alcohol. Following the suggestion that anxiety acts as a disinhibitor of restrained eating (Herman & Polivy, 1976), these researchers investigated the effects of an alternate disinhibitor, alcohol (Polivy & Herman, 1976). They predicted that after a preload of alcohol, restrained Ss would "surrender" control and overeat, whereas alcohol would suppress consumption for unrestrained eaters. Instead, they found that the exact opposite was true. Their explanation for these contradictory findings was based on the assumption that participation in an experiment involving a sort of "drug" is anxiety-inducing, and that alcohol administered

without being labeled, acts as a sedative. Therefore, the disguised alcohol served as an anti-anxiety agent and Ss responded according to the patterns found in the studies of anxiety and restraint.

Due to the tentativeness of this post-hoc explanation, these researchers continued their investigations of the effects of alcohol on restraint. Based on experiments relating the importance of cognitive components and expectancy to the effects of alcohol (Lang, Goeckner, Adisso, & Marlatt, 1975), Polivy and Herman (1976) hypothesized that alcohol, if correctly labeled, would disinhibit restraint for dieters. Replicating their first study, they gave restrained and unrestrained eaters alcohol or a placebo, labeled as either vitamin C or alcohol. As predicted, the results mimicked those in the original study when alcohol was presented as vitamin C; restrained eaters ate more following placebo than following alcohol, whereas unrestrained Ss ate more in the alcohol than in the placebo-condition. However, when the drug was labeled as alcohol, the reverse was true; restrained eaters ate more in the alcohol condition than in the placebo condition, whereas unrestrained Ss ate more when given placebo. Self-reports of mood before and after consuming alcohol gave support to their speculation that the results were attributable to the sedative effects of alcohol when unaccompanied by a label. The anti-anxiety effects of disguised alcohol increased eating for non-dieters (in whom anxiety serves to inhibit appetite) and decreased eating for dieters (in whom anxiety serves to disrupt self-control).

Depression. Traditionally, one of the chief symptoms of depression is lack of appetite (Beck, 1967; Schuyler, 1974, Zung, Coppidge, & Green, 1974). However, for some individuals the opposite is true; Bruch (1974) indicates that for many of her patients depression results in weight gain. On the basis of the restraint questionnaire, Polivy and Herman (1976) distinguished between those patients who responded to depression by overeating and those who lost their appetite. Twelve patients at the outpatient mental health center who requested therapy for depression, volunteered to complete a questionnaire assessing their depression and related weight change. Patients were designated as restrained or unrestrained according to the restraint scale. There was no significant difference between restrained and unrestrained Ss with respect to degree of depression, duration, or number of symptoms. Of six restrained Ss, five reported a weight gain since the onset of the depression, and one reported no change at all (mean weight loss = 6 lbs.). Of six unrestrained Ss, four reported weight loss and two reported no change in weight (mean weight loss = 5 lbs.). It seems that for dieting, weight-conscious individuals, feelings of depression interfere with self-control in eating. For these persons, weight gain is symptomatic of depression. Nonetheless, it is important to note that this study provides no way of assessing which, overeating or depression, is causal. The interaction is most likely complex and cyclical.

Restraint and Implications for Treatment

Restraint as a catalyst for obesity. As discussed previously, there are many views concerning the etiology of overeating and obesity. Realistically, most of these theories have some validity and, in fact, are essential to the understanding of eating behavior of the many different and complex types of overeaters.

A major factor which appears to be influencing the development of overeating patterns is restraint, or overconcern with dieting.

Given the current cultural insistence on thinness, it is not difficult to hypothesize how restraint may develop. As Hilde Bruch (1973) points out, the current preoccupation with weight control is reflective of other periods in history. The Spartans, for example, made strenuous exercise mandatory for anyone who appeared overweight. The Roman culture valued slimness highly and females were starved until they reached a desired thin appearance. During the Middle Ages, the Church considered gluttony a capital sin (one of the seven deadly sins).

In the United States during the beginning of the twentieth century, obesity was looked upon more favorably. It was associated with social prominence and viewed as the end result of hard work and success. With increasing technological progress, the prevalence of obesity increased as a result of decreased energy expended at work and a general decrease in physical activity. As the health hazards associated with obesity became more apparent, the attitude toward obesity changed dramatically.

Fashion also played an important role in the creation of today's obsession with weight; in the 1960's, Twiggy (5'7", 92 lbs.) served as a model to many.

"Cultural insistence upon thinness has become greater, quite the opposite from the trends in sexual expression, race relations and education" (Ingram, 1976, p. 36).

In a nationwide survey (Dweyer & Mayer, 1970) 42% of the females and 36% of the males questioned responded that they would like to weigh less. The current motivation to lose weight stems not only from the negative social implications associated with overweight, but also from the fact that obesity is regarded as a socially deviant form of physical disability. "Obesity generally evokes disgust, anger, condemnation and pity. Fatness is also laughable and often suggest ineffectuality" (Ingram, 1976, p. 39).

Discrimination against obese individuals has been documented. Canning and Mayer (1966) showed that the number of obese applicants denied admission to college far outnumbered those of normal weight who were rejected when interviews were necessary. In a study which investigated the attitudes toward obesity among grade school children, Matthews and Westie (1966) found that obese children were perceived by their normal weight peers as having the least number of friends and the greatest amount of social disturbance. Similar studies of adolescents and adults also indicate a greater proportion of socially isolated children among the obese (Bullen, Monello, Cohen & Mayer, 1963).

The obese have similar attitudes toward themselves (Monello & Mayer, 1963). The degree of lack of self-esteem does not necessarily correspond to the extent of

of overweight, however. Rubin (1970), Buchanan (1973) and Bruch (1973) have noted that the stigma associated with obesity figures considerably in generating hateful self-conceptions among those who are fat and normal-weight individuals who strenuously exert themselves to avoid fatness.

Concern with body weight is more prevalent among women despite the fact that men tend to be more obese than women. One might interpret this finding as reflective of the more severe social standard of thinness imposed upon women.

With such overwhelming adversity toward obesity and emphasis on thinness, it is not surprising to find that some individuals are severely controlled about their eating. However, paradoxically, it is strongly suggested from the research on restraint that this rigidity can actually initiate overeating and may, in fact, defeat efforts at weight control.

While there is little doubt that the recent concern with weight control has had many necessary and beneficial effects, it seems that rigid dieting may produce consequences which are paradoxical and detrimental to these purposes. The restraint theory maintains that obsessive dieting can cause rigidity and feelings of deprivation which appear to be self-defeating for the strict dieter. Continual feelings of self-deprivation in the face of other stresses can initiate overeating. Furthermore, cognitive rigidity concerning diet "rules" can trigger binge-eating when a diet has been broken.

Implications for treatment. One might conclude that the negative consequences of dieting discussed present a rather pessimistic view for treatment of obesity. Recently, several authors have, in fact, pointed out the possibility that

for some individuals, treatment may prove as detrimental as overweight. For example, Herman (1975) concludes that there is a:

. . . distinct possibility that there may be some persons for whom weight loss, through serious dieting, is not preferable to the alternative of continual overweight . . . we must be cautious before we automatically enthuse over the prospect of successful weight reduction in our clients and friends. (p. 10-11)

The individuals to whom Herman refers are hyperplastic, juvenile-onset obese. From his viewpoint, restraint is a reaction to a biologically inappropriate state of sub-set-point fat levels. Therefore, he feels that these individuals will have particular difficulty dieting.

Similarly, Stunkard and Rush (1974) conclude that:

The development of untoward responses probably contributes significantly to the high drop-out rates from weight reduction programs. . . . This review suggests that [these] rates may not be the result of sheer perversity but instead a useful safety valve. For biologically vulnerable persons, dropping out of weight reduction programs may be a highly adaptive method of coping with impending complications. Instead of our usual irritation at patients, we might be better advised to commend their good sense. (pp. 531-532)

While not discounting the notion that for certain individuals dieting may pose a serious threat, there is far from conclusive evidence that these adverse responses result directly from efforts to achieve biological underweight (sub-set-point). A stronger implication seems to be that dieting is difficult because of the psychological stress involved in continual self-deprivation.

Regardless of the type of diet followed and the specific therapeutic procedures employed, weight loss requires self-discipline and deprivation. Pounds are lost by limiting caloric intake. Therefore, counteracting the negative effects

of restraint and feelings of deprivation may be essential components of a weight control program.

During a weight loss program, emphasis on self-control techniques which operate on the factors responsible for the breakdown of restraint may prove very helpful. These include mechanisms which may circuit-break bingeing when a diet has been broken such as relaxation training, substitution of alternative behaviors and cognitive restructuring.

Schonitzer and Harmatz (1977) have found one simple way to avoid feelings of deprivation: include "favorite foods" in moderate amounts in a diet program. In the beginning, dieters may express some fear that if they begin to eat these foods they will not be able to stop after one serving. Generally, a part of the reasoning behind this trigger-like eating is the knowledge that the food will be "forbidden" during the remainder of the diet. Cognitive restructuring may help to eliminate these fears.

At the Dietary Rehabilitation Clinic (Musante, 1976), judgemental components of restraint are also minimized through verbal reconditioning:

Obese patients are typically self-denegrating. They talk about and think about themselves in a negative manner, and are in the habit of attaching moral significance to their eating behavior. If a patient adheres to his diet he describes this behavior as "being good today". Departure from the diet is accompanied by feelings of guilt and failure, and is referred to as being bad or "cheating". At the Dietary Rehabilitation Clinic, we concentrate on extinguishing negative verbal behavior and reinforcing positive verbal behavior. Non-adherence to the diet is referred to as "unstructured eating" rather than cheating, a term which helps remove moral connotations. (Musante, 1976, p. 183)

In order to facilitate effective weight control, it seems the emphasis on negative therapy must be changed. The tendency toward preoccupation with weight, denial, and guilt can be shifted toward positive actions which teach the overeater effective ways for dealing with stress and desires to overeat without feeling deprived.

Furthermore, as most researchers, therapists and dieters know, weight loss is only part of the difficulty; weight maintenance proves to be an even greater obstacle. Often, individuals are unable to maintain weight loss because they have not learned new eating habits which can be generalized to everyday life. The focus on deprivation while dieting may also have negative effects on weight maintenance. If a dieter feels terribly deprived, one may likely be overwhelmed by the task of continuing to control eating for the rest of one's life. For permanent weight control, individuals may need to overcome the feelings of denial.

Summary and Rationale for the Present Study

A variety of areas concerning weight control and the dimension of restraint were examined in the present study with the following purposes: (1) to develop effective long-term weight control methods within a program which emphasizes positive self-control techniques. Two distinct treatment methods, one based on the Externality Theory of Obesity and the other on the Psychosomatic Theory, were compared; (2) to assess potentially important determinants of weight loss success including spouse participation, sex and age of onset of obesity; (3) to provide more information concerning restraint and its relation to specific subject variables and weight loss. An attempt was also made to implement weight loss techniques which minimize feelings of deprivation and denial of food and therefore determine if restraint can be altered; (4) to investigate a behavior referred to as "binging" which resembles the switch-like eating triggered in studies of restraint.

In the following review, a summary of the relevant literature concerning each of these topics as they relate to this study is presented.

Treatment methods: stimulus and affective control.

Stimulus control. Ferster, Nurnberger and Levett (1962) first reported stimulus control procedures for weight control. The goal of treatment was to make the negative consequences of overeating more immediate so that they would influence eating behavior. Participants were taught to record food consumption, manipulate the environment to aid in self-control and also discuss 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.

Stuart (1967) reported the results of a program similar to that of Ferster et. al. (1962). Over a twelve month period, patients lost between twenty-six and forty-seven pounds for an average weight loss of 37.75 pounds. Treatment sessions were a low of sixteen and a high of forty-one for an average of about twenty-six treatment sessions.

Because so many different types of treatment were included in the Stuart study, it is impossible to ferrett 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 planning 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 ten to twenty hours of instruction or therapy. Some studies have included booster sessions once a month for an additional year making a total of twenty to forty hours of group attendance. On the other hand, Stuart met individually with each patient an average of twenty-six times. If each session lasted approximately thirty minutes, then he spent a total of approximately one hundred thirty-six hours treating eight patients, whereas a therapist leading a behavior modification group would spend an average of ten to twenty 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 (nine and twelve 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 daycare 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. Subjects in the behavioral group were instructed in stimulus control techniques and were also instructed in a monetary self-reinforcement system contingent on practicing stimulus control techniques. Punishment was also used by doctoring favorite foods with aversive tastes and 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 the treatment, 13% of the participants in the behavior modification groups had lost more than forty pounds, and 53% had lost more than twenty pounds, whereas in the control groups none of the subjects had lost over forty pounds and 24% had lost more than twenty pounds. The differences between the behavior modification and control groups for weight losses over twenty and forty pounds were statistically insignificant as were overall differences, however, the difference for the percentage of those losing thirty 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 (twenty-four for one cohort and thirteen for the other) and for the control 14.5 (eighteen for one cohort and eleven 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 forty pounds doubled after termination of treatment (from two to four), and three of those lost more than fifty 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 forty pounds as compared to the 13% at the end of treatment, 40% had lost more than thirty pounds as compared to 33% at the end of treatment, but only 53% had lost more than the twenty pounds as compared to the same figure of 53% at the end of treatment. Thus only about half of the participants, even by follow-up, had lost an average of twenty-four pounds (behavior modification) and eighteen pounds (control) and at the end of the treatment reported median weight losses of 18.5 (behavioral) and 13.5 (control). The second cohort went from weight loss medians of thirteen (behavioral) and eleven (control) to twenty-two (behavioral) and fifteen (control). One set of groups, then, actually reported weight increases whereas the other set continued some weight losses. Overall, the control groups and behavior modification groups did not differ significantly from each other.

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 twenty 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 reanalysis 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, seventy-nine

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 therapist 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 sixteen 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 twenty-two pounds, and by six months the weight loss had settled down to a mean of 20.4 pounds. The Multi-Treatment Group had lost seventeen 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 nine, twelve and eighteen 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 eighteen months, even though large mean differences in weight losses still existed. After eighteen months the Stimulus Control Group had lost about fifteen 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.

In summary, the short term and moderate success of behavioral programs has been well documented in recent years. In particular, Stuart's multi-faceted treatment program (1967, 1971) produced impressive weight losses. Other studies have indicated that behavioral treatment is more effective than most traditional approaches. However, the initial success of behavior therapy in the treatment of obesity has currently been challenged by preliminary investigations of weight loss maintenance. While existing behavioral programs produce significant short-term weight losses, follow-up evaluations have indicated that these results may not be permanent (Hall, Hall, Borden and Hanson, 1974; Harris and Bruner, 1971). In addition, individual response to behavioral treatment programs is highly varied, and weight losses are often moderate (ten to twelve pounds) and although statistically significant, not clinically relevant for the typical obese subject.

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 psychosomatic hypothesis of obesity (Bruch, 1952) proposes that food consumption is an attempt to cope with anxiety, fear, anger, depression or other emotional disturbances.

In contrast to the ambiguous results of experimental studies, reviewed previously in the present paper, findings from the clinical literature (case reports) are more consistent. Various clinicians report an association between states of emotional arousal and increased food intake. (Leckie and Withers, 1967; Clancy, 1968; Silverstone, 1968; Weintraub and Aronson, 1969; Leon and Chamberlin, 1973b; Masleny and Copeus, 1976)

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 experiences such as anxiety or depression. Therefore, obese persons may come to associate emotion or 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 covert sensitization, covert control and systematic relaxation. Initial results suggest that these procedures may be effective techniques to aid in the control of overeating. For example, Coutela (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. However, experimental results using this technique have provided ambiguous findings. Harris (1969) employed a covert sensitization condition in 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, Jandes and Dennin (1972) compared the weight loss of participants in three groups: covert sensitization, realistic attention control (weight monitoring and relaxation) and a no-treatment control group. There were no significant differences statistically 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 sixteen weeks of treatment, there were no significant differences between the two treatment groups; however, they both lost significantly more than the control group. 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 (e.g. Hall, Hall & O'Kuliteh, 1976) have included a placebo group to assess the effects of expectation and attention and have labeled these groups supportive psychotherapy. Participants may be 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 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 (Penick, et. al., 1971) included so-called supportive psychotherapy as a treatment group, but the authors failed 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.

Summary. To investigate the differential effects of stimulus and affective control on weight loss, the present study compared a strict stimulus control method and a program which focused instead on specific techniques to control the emotional aspects of overeating. Comparisons were made over a year-long program in order to provide long-term

data for a more accurate evaluation of these two approaches.

Other determinants.

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 fifty-five 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 partner's 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 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's (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 ten males and nineteen females who were married, 15% or fifteen pounds overweight, and at least twenty-one 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) non-cooperative 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 spouses' 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 were large weight differences, they were not statistically significant. At the three-month follow-up, mean weight losses were 30.2 pounds for

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 twenty pounds, 24.1% lost more than thirty pounds, and 10.3% lost more than forty pounds. Of the couples training subjects, 66.7% lost more than twenty pounds, 44.4% lost more than thirty pounds, and 22.2% lost more than forty 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 ten to twelve 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 thirteen pounds to fifty-four 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 twenty-nine participants in the entire study. Ten of these subjects were males and nineteen 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 sixteen 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 thirty-seven 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 weigh-ins, subjects in the HI group lost an average of ten pounds each, subjects in the PHI group an average of eleven pounds, and NHI subjects an average of seven 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 thirteen pounds, whereas the wives who attended alone averaged a loss of only eight pounds. Thus the results showed that while husband involvement in a wife's efforts to lose weight are 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 twenty-six week period the average person in the most successful group lost thirteen 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.

In summary, the results of recent research has suggested that the participation of a spouse in a weight loss program along with the overweight individual 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.

However, only a few studies, limited in scope and experimental design, have documented this effect. Furthermore, the effects of an overweight husband and wife participating together in a weight reduction effort have not been investigated. 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.

The present study was designed to investigate spouse participation in a year long weight control program. Differences between couples with both members overweight and couples with only one member overweight were also evaluated.

Sex differences. The effects of sex of subject on weight loss have not been systematically examined. Some studies (Harris, 1969; Cormeer, 1972; Brownell et.al, 1978) have reported that men are more successful at losing weight while others (Hall et. al., 1974; Jeffrey et. al., 1978) have found no significant differences. Several factors may account for these inconsistencies: weight loss measures varied across studies; for the most part, only one measure of weight loss was analyzed; and groups were not matched on other important variables possibly related to weight loss such as degree of overweight, or age at onset of obesity. Therefore, adequate comparisons have not yet been reported.

A large sample of both males and females participated in the present study; therefore, sex differences were analyzed for short and long-term weight loss.

Age of onset. As discussed previously, some researchers (e.g. Hirsch and Knittle, 1971) conclude that people with an early onset of obesity show a marked increase in total number of adipocytes. 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.

From a psychological point of view, researchers have suggested that juvenile onset 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).

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 four to one at age twelve and twenty-eight to one for those who did not reduce in adolescence (Stunkard and Burt, 1967). Another study that took place over thirty-five years found that 63% of obese boys became obese men as compared to 10% of the average weight boys (Abraham, Collins, and Nordseick, 1971).

Although the evidence suggesting that juvenile-onset obese are less likely to be successful in weight reduction is mostly theoretical, results of some initial investigations lend support to this notion. Three groups categorizing age of onset of obesity (adult, adolescent and child) were compared in the present study to determine if juvenile-onset are, indeed, more resistant to weight change.

An extensive review of the literature concerning restraint, or overconcern with dieting, has been presented previously. While generally it is assumed that restraint is something to be sought after and strengthened, for many high restraint dieters the opposite may be true. Restraint appears to be a potentially major factor influencing the development of overeating patterns, though not necessarily obesity.

However, at this point, notions concerning restraint are still in the hypothetical stage, based on some behavioral data and clinical observations. Further research is essential for a complete understanding of how restraint affects eating behavior and weight control.

In the present study, restraint was investigated in a variety of ways. First, restraint was related to various subject variables (e.g. sex; age of onset of obesity) in an assessment of initial differences among groups at the first session of the program. These comparisons were made to help clarify some of the origins of restraint. For example, examination of prior attempts at dieting and age of onset of obesity may provide some insight concerning the different theories (physiological and cognitive) for restrained eating behaviors.

Second, changes in restraint during a weight reduction program were assessed. An attempt was made to implement weight loss methods which minimized feelings of deprivation and guilt and instead promoted positive self-control techniques. To date, there have been no studies reported which have determined if restraint can be altered. Also, differences in restraint and change in this dimension among treatment

groups was evaluated.

Third, the relationship between weight loss and restraint was analyzed.

Finally, the two components of the restraint questionnaire, (diet and weight history; concern with dieting and diet-breaking behaviors) were analyzed separately and compared to the total restraint score.

Binging, deprivation and diet-breaking.

The switch-like eating which was triggered in studies of restraint resembles behavior referred to by dieters as "binging". There is little information published, on a clinical or experimental basis, about binge eating. Stunkard (1959) first identified binge eating in an article describing the varied and distinct eating patterns which may be associated with obesity. The binge eater, according to Stunkard, consumes large quantities of food (as much as 20,000 calories per day) at irregular intervals. Stunkard noted that binges are often precipitated by life stress and leave the binger feeling helpless and guilty. He also commented on the tendency of binge eaters toward preoccupation with weight rather than the factors which elicited distress.

Meyer (1973) also reported a case example of binge eating which he describes as an obsession-impulse-compulsion pattern. While stimulus control therapy and thought-stopping provided minimal help, delay therapy was successful in eliminating the binge behavior.

One other clinician (Wilson, 1976) has reported patterns of binge eating in clients he treated for obesity. Similarly, he described unsuccessful attempts at changing the frequency or intensity of the binge with standard behavior therapy.

While there is little information in the literature concerning binge eating, it seems to be a phenomenon which may greatly influence weight reduction. The "all-or-none" behavior of bingeing described by dieters is much like that illustrated in experimental studies when restraint has been broken: individuals actually ate more after overeating than after consuming small amounts of food. While some factors which influence the breakdown of restraint (e.g., excessive intake; depression) have been determined, little is known about factors precipitating binge eating for dieters.

Based on the notion that restraint and bingeing may in part be due to the effects of feeling deprived while dieting, the present study examined the association between feelings of deprivation, denial of foods and bingeing.

In addition, the correlation between bingeing and weight loss was analyzed to determine the effect frequent binges may have on weight control.

Finally, frequency of bingeing and the extent to which feeling deprived influenced the behavior was analyzed in relation to various subject selection factors (e.g., sex; age of onset of obesity) treatment groups and scores for restraint and depression

Description of the study.

Taking into account the need for weight control research in the areas outlined, the present study was formulated. The investigation studied 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 (SC-C); Stimulus Control - Individual (SC-I); Affective Control - Couple (AC-C); and Affective Control - Individual (AC-I).

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, instead, encouraged to practice with a significant other of their choice.

A "no-treatment control" group was not included in the study since, at least eight reported studies have included either a no-treatment control or a waiting list control group and have found a weight change of no more than plus or minus two pounds. (Holl and Hall, 1974). Jeffrey's suggestion (1974) to replace a control group by new treatment groups was followed.

The program consisted of twenty-one meetings over a year period. Subjects met once a week for nine weeks, once every other week 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. In similar studies (Brownell, et.al., 1976) monthly meetings have been referred to as weight loss maintenance or booster sessions (Hall, et.al., 1978). In the present study, monthly meetings were held to enhance weight loss maintenance and to encourage continued weight loss. Review of previously learned weight loss methods as well as presentation of new material was included in these monthly sessions.

At the initial meeting and at various points throughout the program, questionnaires were administered to assess eating patterns, restraint, bingeing, depression, marital communication and expectancy for success.

Hypotheses

The hypotheses for this study are divided into three parts: Section One addresses major weight related results; Section Two concerns hypotheses related to restraint; and, Section Three summarizes predictions associated with bingeing, deprivation, and diet-breaking.

Section One: Weight Related Results.

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 to model and encourage poor eating habits as overweight spouses might.

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 reported that male participants lost significantly more than females (Brownell, et.al., 1978; O'Neil, Currey, Hirsch, 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 hypotheses is lacking, many practitioners and researchers (Hirsch and Knittle; 1971; Nisbett, 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 had explored this age group.

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. 5. 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 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, Beinvenu, 1970; and General Expectancy for Success, Hale and Fibel, 1976) were administered to participants to measure changes in depression, communication skills and expectancy for success.

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

Section Two: Restraint.

Restraint scores are comprised of two components: Restraint-History (R-H) concerns diet and weight history, and Restraint-Behavior (R-B) assesses diet behavior and attitudes about food and eating. A Total-Restraint (T-R) score includes both of these scales. The following hypotheses were based on responses to the Restraint Questionnaire administered at the first session and at four months in treatment.

6. Total-Restraint scores will be higher for females than for males. Studies thusfar, (Herman and Polivy; 1975; Polivy and Herman, 1976; Hibscher, 1978; Polivy, 1978) have reported higher median scores for females. However, there has been no differentiation between R-H and R-B and therefore no evidence to determine if the sex difference reflects a more extensive dieting history or more extreme diet-breaking behaviors for females. The distinction in scores is made in the present study, however, due to the lack of previous data, no hypotheses will be made concerning each individual score.

7. For participants classified according to prior attempts at dieting, restraint scores will increase in conjunction with increases in prior attempts reported. In other words, those who report three or more previous dieting experiences will score highest, and those with no prior attempts will score lowest. For R-H, this prediction is based on the notion that individuals who have dieted extensively will report fluctuations in weight history. For R-B, the hypothesis is based on the theory that the experience of dieting may promote an overconcern with dieting and diet-breaking behaviors.

8. Overall, scores for restraint behavior will decrease from administration one to two. The present program is aimed at lessening feelings of deprivation while dieting by presenting positive self-control techniques and the use of "favorite foods" while dieting. Therefore, it is predicted that overconcern with dieting and diet-breaking behaviors will be decreased. Since R-H reflects past experiences, no change is predicted.

Restraint scores and change in scores will also be analyzed for differences among the following groups: adult, adolescent and child onset of obesity; overweight and non-overweight participants; drop-outs and non-drop-outs; and treatment groups. Also, the relationship between weight loss and restraint will be evaluated. However, since no previous research has explored these areas, hypotheses will not be made.

Section Three: Binging, Deprivation and Dietbreaking.

The Binge Questionnaire assesses frequency of binging (overeating excessively with no control), feelings of deprivation while dieting and the relationship of deprivation and denial of foods to dietbreaking. The following hypotheses were based on responses to the Binge Questionnaire which was administered at seven various times during the program.

9. Frequency of binging will correlate negatively with weight loss. Although there is little empirical support for this prediction, clinical reports (Stunkard, 1959; Meyer, 1973; Wilson, 1976) indicate that binging can have extremely negative

effects on weight reduction.

10. Frequency of bingeing will correlate positively with feelings of deprivation and denial of "favorite foods". This prediction is based on the theory that binges occur as a result of feeling deprived while dieting.

Also, frequency of bingeing and the extent to which feeling deprived influences the behavior was analyzed in relation to various factors including sex, age of onset of obesity, treatment, and scores for restraint and depression. No hypotheses are made concerning these variables.

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 person 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 Beinvenu (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).

Restraint Questionnaire (Appendix 9). The Restraint Questionnaire assesses diet and weight history as well as overconcern with dieting and diet-breaking behavior.

In the first study of restraint (Herman and Mack, 1975), five of the original items were found to have item-whole correlations (corrected for item-whole overlap) in excess of 0.15. For these five items, coefficient α was 0.65. Subsequent analyses were based on the restraint score derived from the following five internally consistent items only:

1. How often are you dieting? (rarely; sometimes; usually; always) (Score: 1 - 4)
2. What is your maximum weight gain within a week?
(Score: 1 pt./3 lbs.)
3. Do you eat sensibly before others and make up for it alone?
(never; rarely; often; always) (Score: 0-3)
4. Do you give too much time and thought to food? (never; rarely; often; always) (Score: 0 - 3)
5. Do you have feelings of guilt after overeating? (never; rarely; often; always) (Score: 0 - 3)

In other studies (Herman & Polivy, 1975; Polivy & Herman, 1975; Polivy & Herman, 1976) eleven of the original items were scored:

Restraint Questionnaire

Diet and Weight History

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

Concern with Food and Eating

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

This eleven item scale had substantial internal consistency (coefficient $\alpha = .75$) and the two subscales had internal consistency coefficients of .68 (Diet and Weight History) and .62 (Concern with Food and Eating). The correlation between scores on these two subscales was .48 ($p < .01$) indicating that internal reliability was adequate.

The validity of the scale has thusfar been based on its predictive power. However, the significant correlation between a measure of physiological deprivation and restraint (Hibscher, 1974) lends some evidence of construct validity to the scale.

In the present study, the Restraint Questionnaire was modified slightly to allow for repeated administrations and use during a weight loss program.

Diet and weight history:

1. How many pounds over your desired weight were you at your maximum weight? (Score: 1 point/5 pounds)
2. What is the maximum amount of weight that you have ever lost within one month? (Score: 1 point/5 pounds)

3. What is your maximum weight gain within one week? (Score: 1 point/3 pounds)
4. In a typical week how much does your weight fluctuate (maximum to minimum)? (Score: 1 point/3 pounds)
5. What is the maximum amount of weight that you have ever lost while on a reducing diet? (Score: 1 point/5 pounds)

Diet behaviors, concern with diet-breaking:

6. After eating a "not allowed" food while dieting, how often do you continue on a splurge eating other "not allowed" foods? -- never, rarely, about half the time, usually, always. (Score: 0 - 4)
7. How often do you overeat, especially excessive amounts of "fattening foods"? -- never, rarely, about half the time, usually, always. (Score: 0 - 4)
8. How often do you eat sensibly before others and make up for it alone? -- never, rarely, about half the time, usually, always. (Score: 0 - 4)
9. How often do you give too much time and thought to food? -- never, rarely, about half the time, usually, always. (Score: 0 - 4)
10. How often do you have feelings of guilt after overeating? -- never, rarely, about half the time, usually, always. (Score: 0 - 4)

A History Score was obtained by summing items 1 - 5, and a Behavior Score was obtained by summing items 6 - 10. A total score represents the sum of all ten items.

The questionnaire was administered two times during the present study, Sessions 1 and 12 (initial session and four months).

Binge Questionnaire (Appendix 10) . This questionnaire assesses bingeing, diet breaking and feelings of deprivation through responses to the following questions:

1. How do you feel about your eating habits this week? --
terrible, not so good, O.K., pretty good, great.
2. How often do you feel you overate this week? -- not at all,
once, 2 - 3 times, 4 - 6 times, more than 6 times.
3. How often do you feel you binged (overate excessively with
no control)? -- not at all, once, 2 - 3 times, 4 - 6 times, more
than 6 times.
4. How deprived (due to dieting) did you feel this week? -- not at
all, slightly, fair amount, moderately, extremely.
5. How often did you deny yourself "favorite foods" this week? --
never, rarely, about half the time, usually, always.

If you "broke your diet" this week:

6. How much did you experience feelings of deprivation before diet breaking? -- not at all, slightly, fair amount, much, very much.
7. While diet breaking, how often did you eat foods which you have been denying yourself while dieting? -- never, rarely, about half the time, usually, always.

Scores were summed over questions 2 - 7 to give a total score. Other sub-totals were obtained as follows: Binge Score, Question 3; Deprivation Score, Questions 4 plus 5; Dietbreaking, Questions 6 plus 7.

Participants completed the questionnaire seven times during the program: Sessions 1, 5, 8, 12, 13, 15 and 21.

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 analyses 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 assesses responses to the Restraint Questionnaire in relation to major treatment groups and various sub-groups. Section Three examines dietbreaking and feelings of deprivation through an analysis of the Binge Questionnaire.

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 (I) - 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 (N=13)</u>	<u>SC-C (N=36)</u>	<u>AC-I (N=22)</u>	<u>AC-C (N=66)</u>
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 (N=10)</u>	<u>SC-C (N=20)</u>	<u>AC-I (N=16)</u>	<u>AC-C (N=34)</u>
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	

* $p < .03$

** $p < .0001$

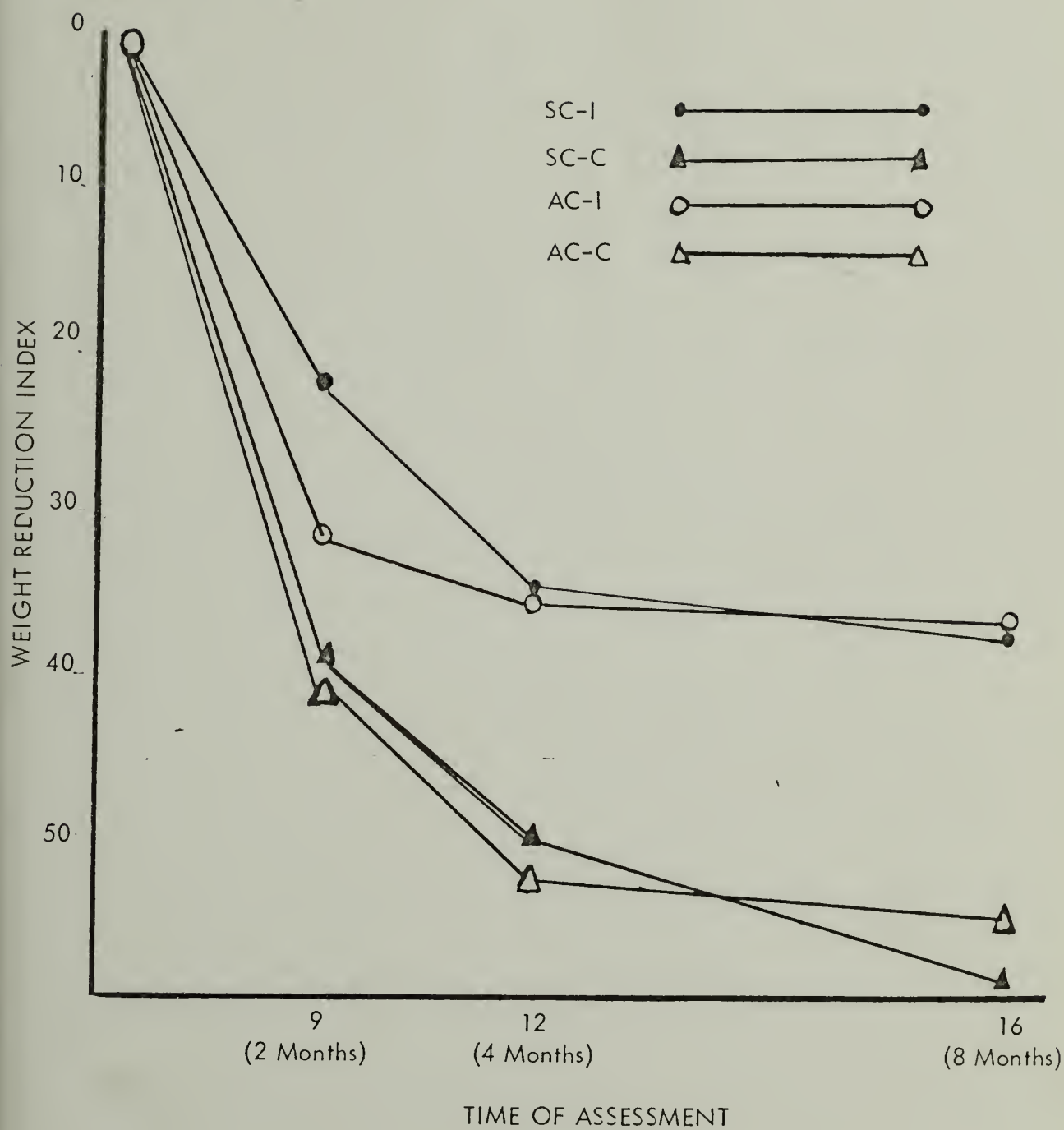


Figure 1. Mean RI By Treatment Group For Analysis 3 (Session 1-9-12-16)

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> (N=9)	<u>SC-C</u> (N=16)	<u>AC-I</u> (N=16)	<u>AC-C</u> (N=30)
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> (N=9)	<u>SC-C</u> (N=16)	<u>AC-I</u> (N=16)	<u>AC-C</u> (N=28)
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

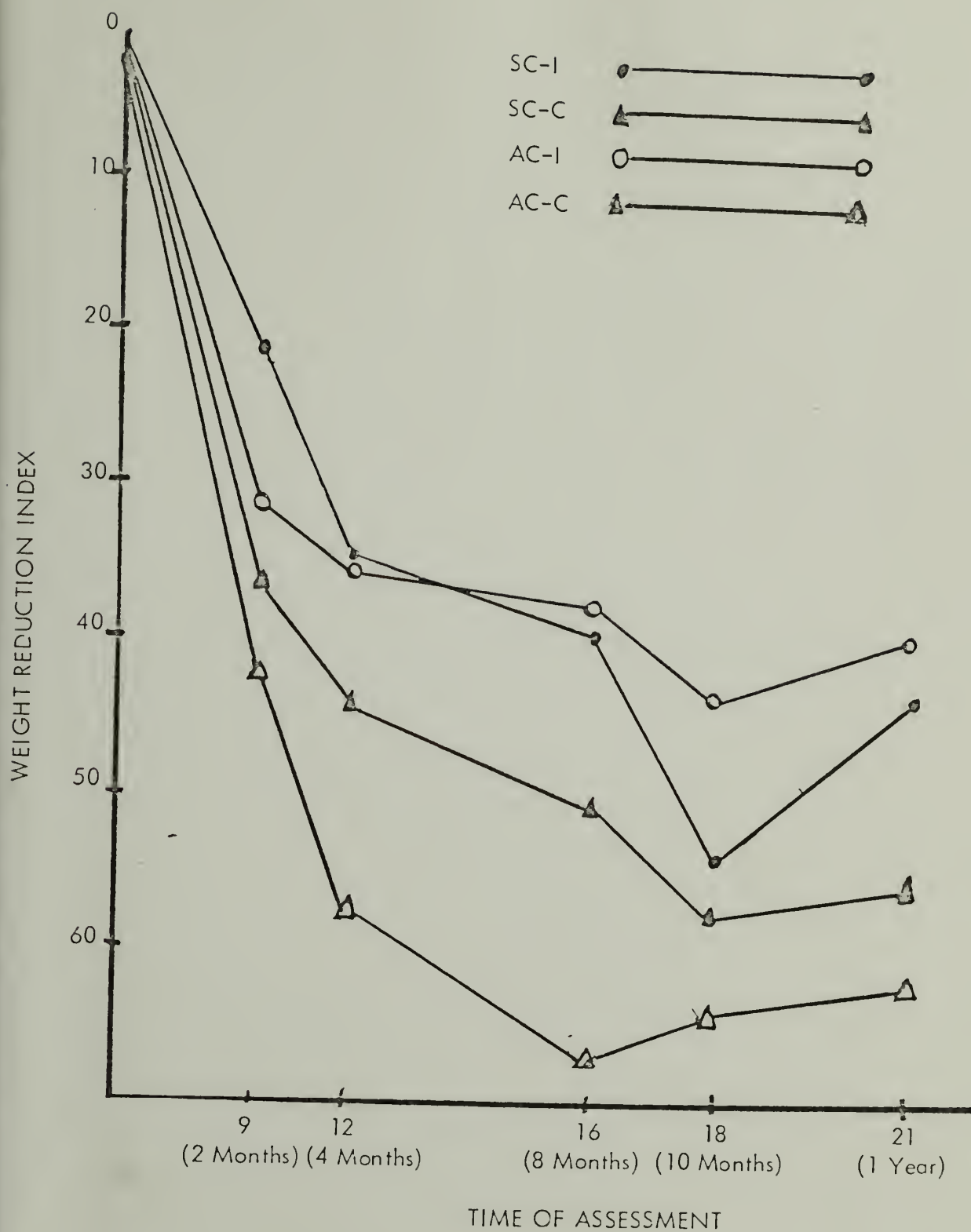


Figure 2. Mean RI By Treatment Group for Analysis 5 (SESSION 1-9-12-16-18-21)

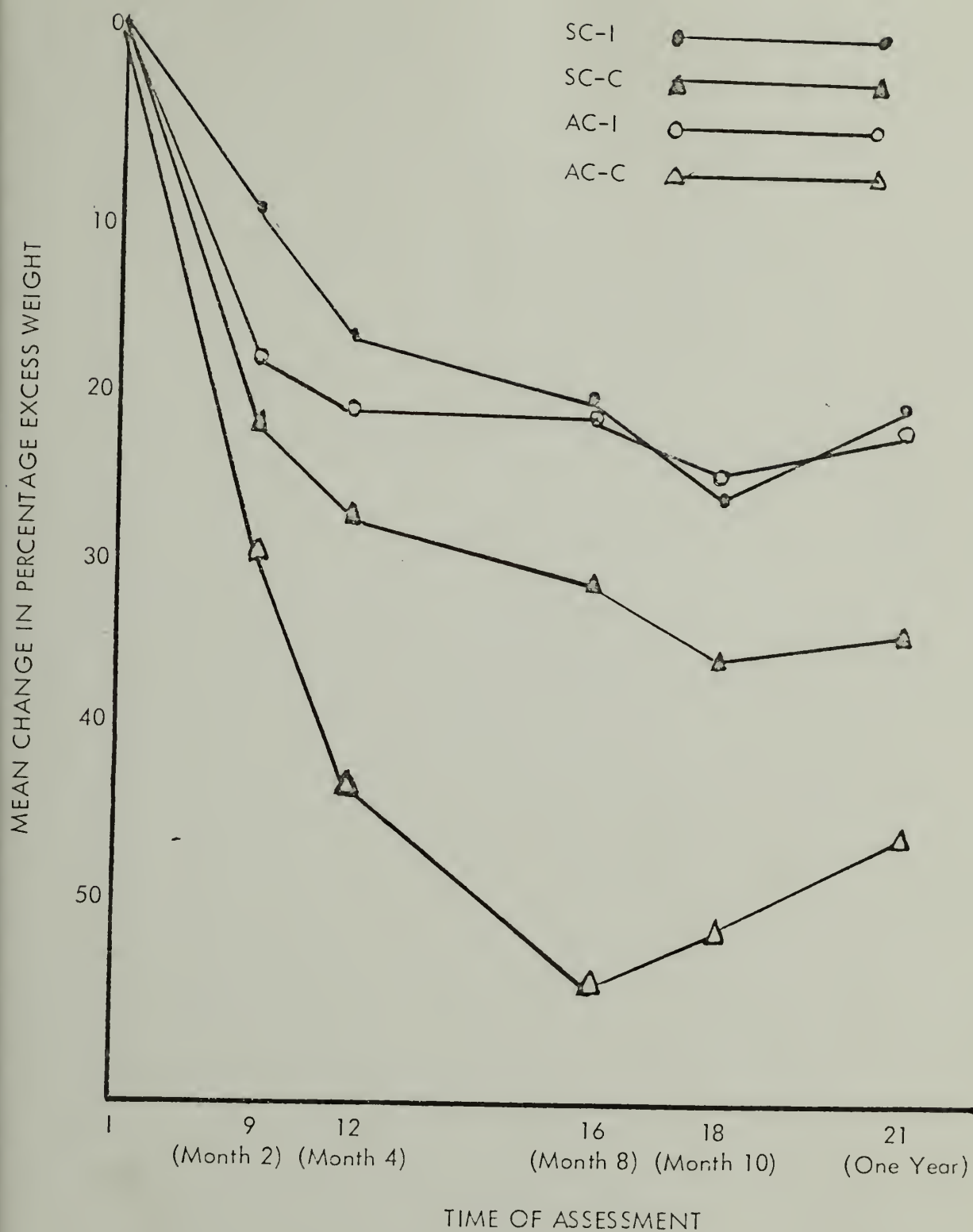


Figure 3. Mean Change in Percentage Excess Weight Lost Among Treatment Groups for Analysis 5 (Sessions 1-9-12-16-18-21)

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 ($F = 3.88$; $df = 1, 95$).

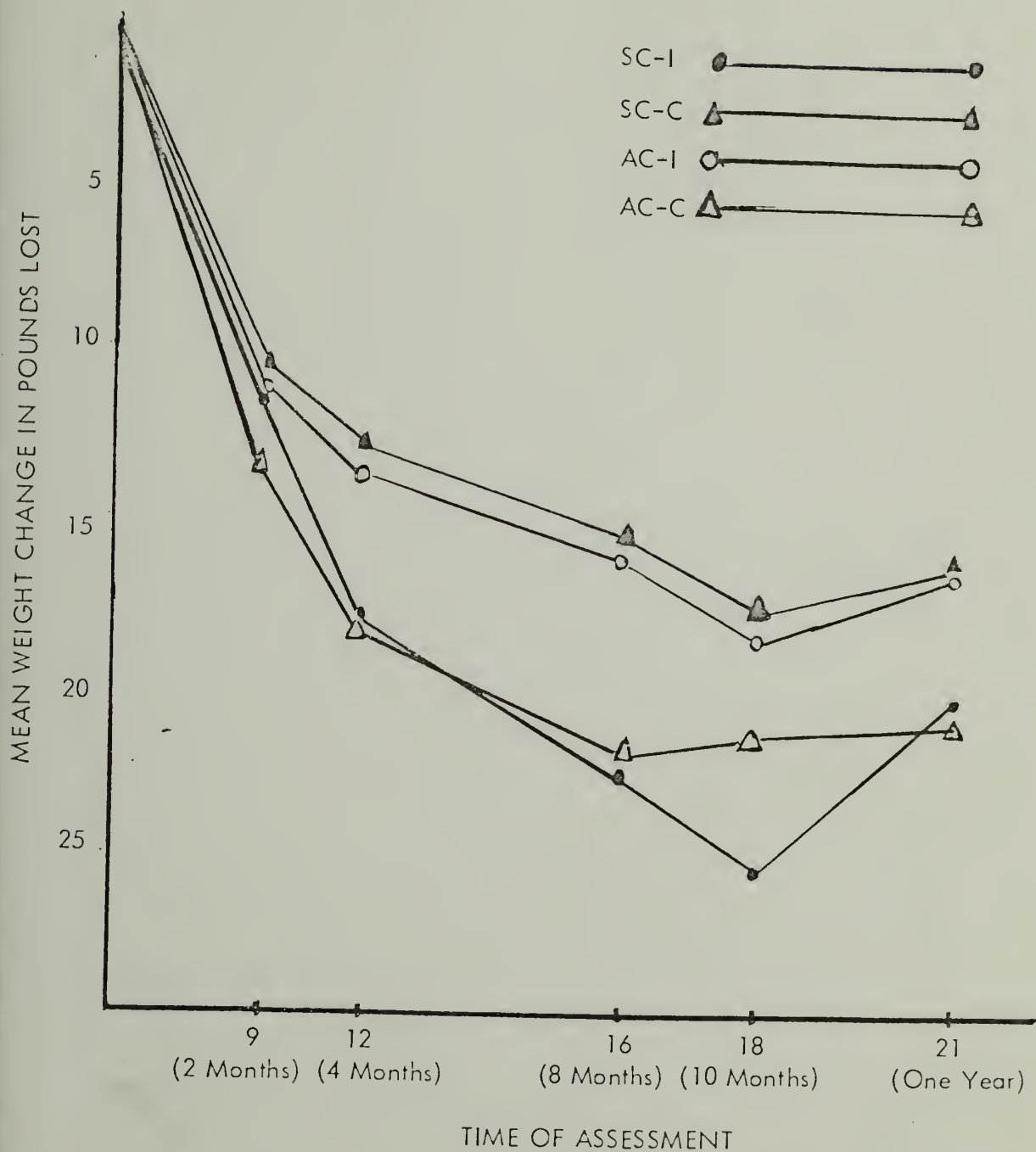


Figure 4. Mean Weight Change in Pounds Lost By Treatment Group For Analysis 5 (Sessions 1-9-12-16-18-21)

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> (N=10)	<u>SC-C</u> (N=17)	<u>AC-I</u> (N=18)	<u>AC-C</u> (N=35)
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	

* $p < .03$

** $p < .0000$

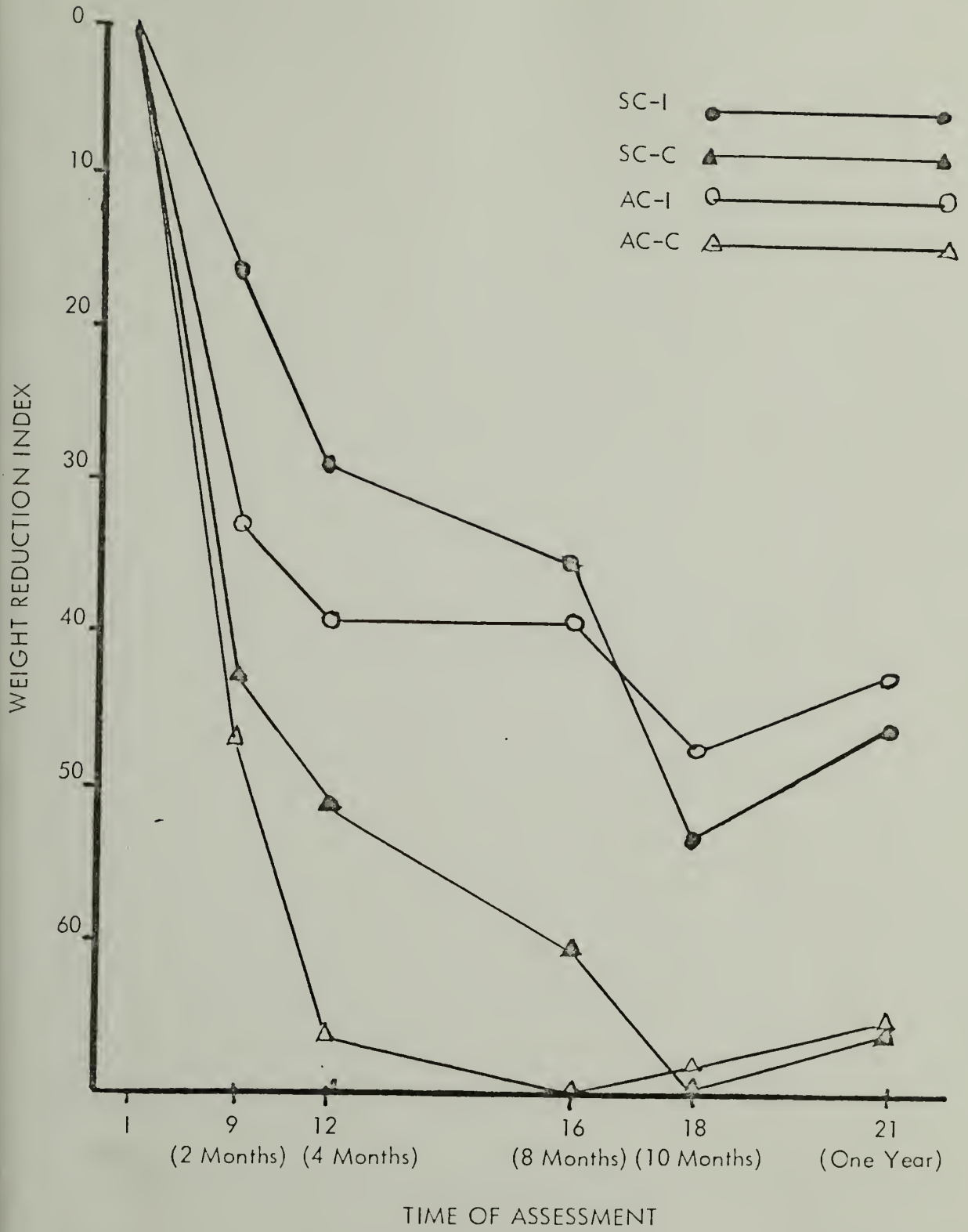


Figure 5. Mean RI by Treatment Group for Females Only, Analysis 5, Sessions 1-9-12-16-18-21

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>	<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>
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
C	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	

* $p < .0024$

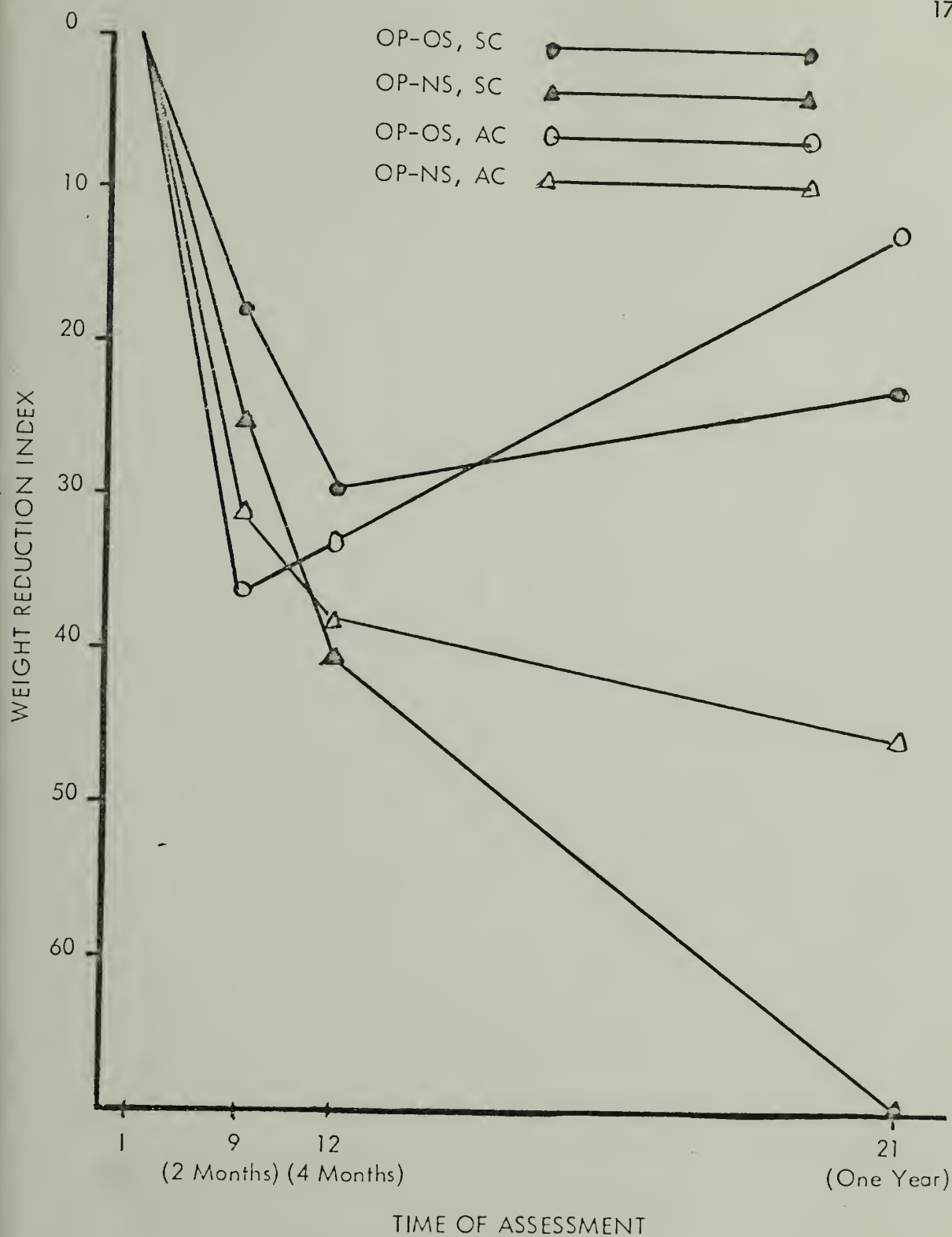


Figure 6. Mean RI for Overweight Participant-Overweight Spouse and Overweight Participant-Non-Overweight Spouse for Stimulus and Affective Control, Individual Groups Only, Analysis 6 (Session 1-9-12-21)

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 < .0008

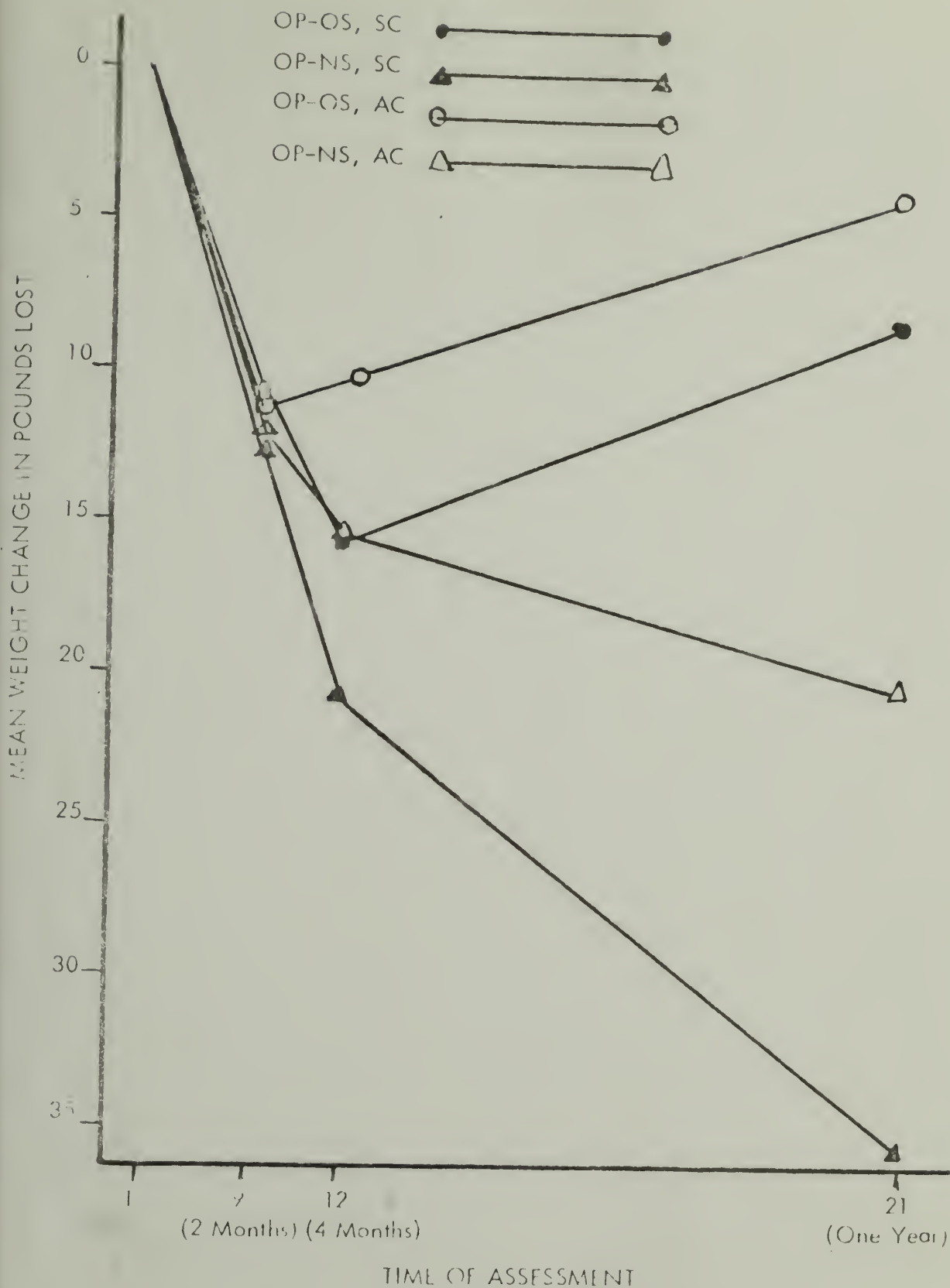


Figure 7. Mean Pounds Lost for Overweight Participant-Overweight Spouse and Overweight Participant-Non-Overweight Spouse for Stimulus and Affective Control Groups, Individuals Only, Analysis 6 (Session 1-9-12-21).

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>
RI	1- 9	24.83	39.79
	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>
RI	1- 9	35.43	41.80	18.00	36.20
	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

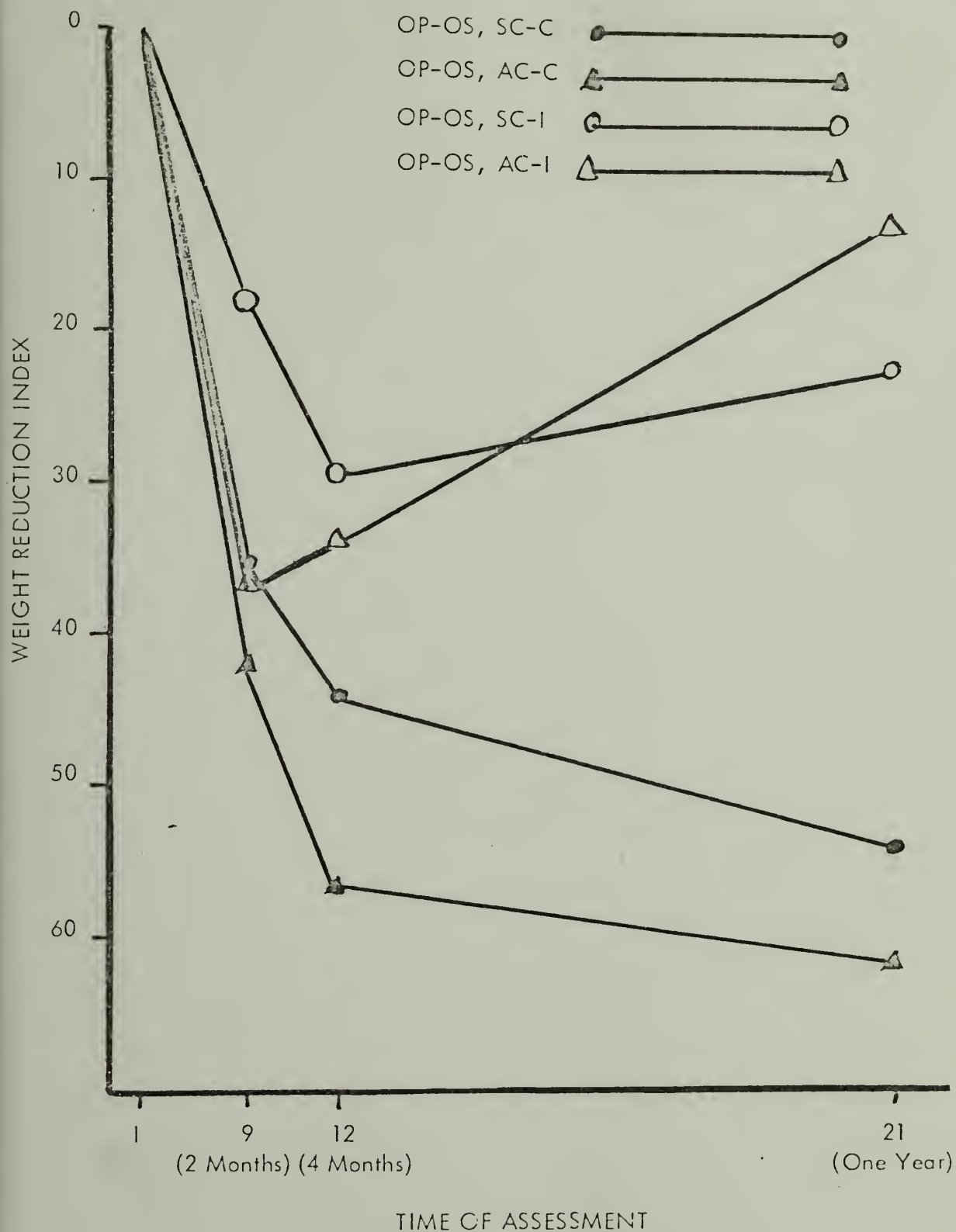


Figure 8. Mean RI for OP-OS Couples and Individuals for Stimulus and Affective Control Groups, Analysis 6 (Session 1-9-12-21).

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.

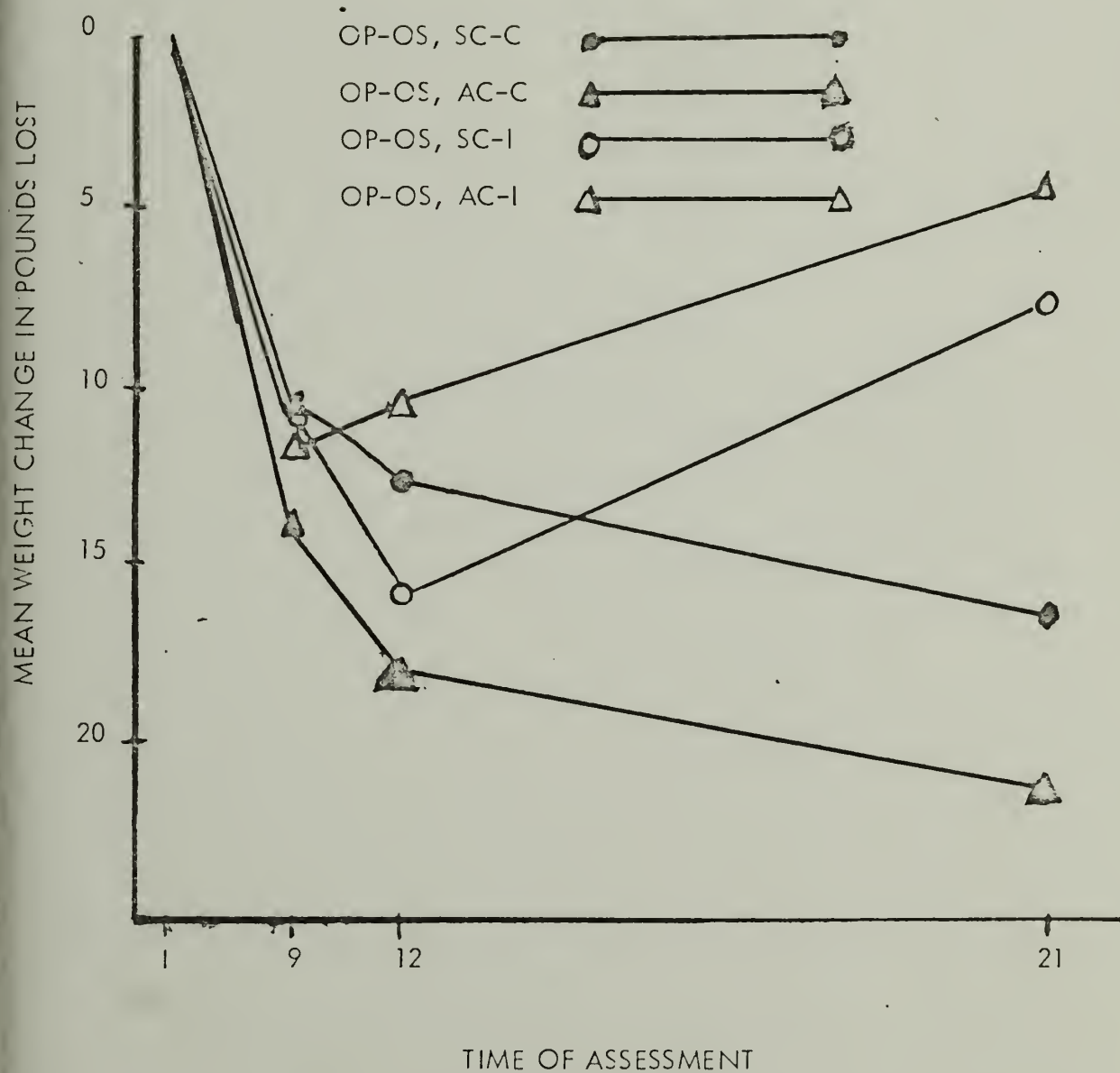


Figure 9. Mean Pounds Lost for Overweight Participant-Overweight Spouse for Couples and Individuals Across Treatment Groups.

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	$p = \text{NS}$
5 (N = 69)	1-9-12-16-18-21	21.31	17.80	3.51	$p = \text{NS}$

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

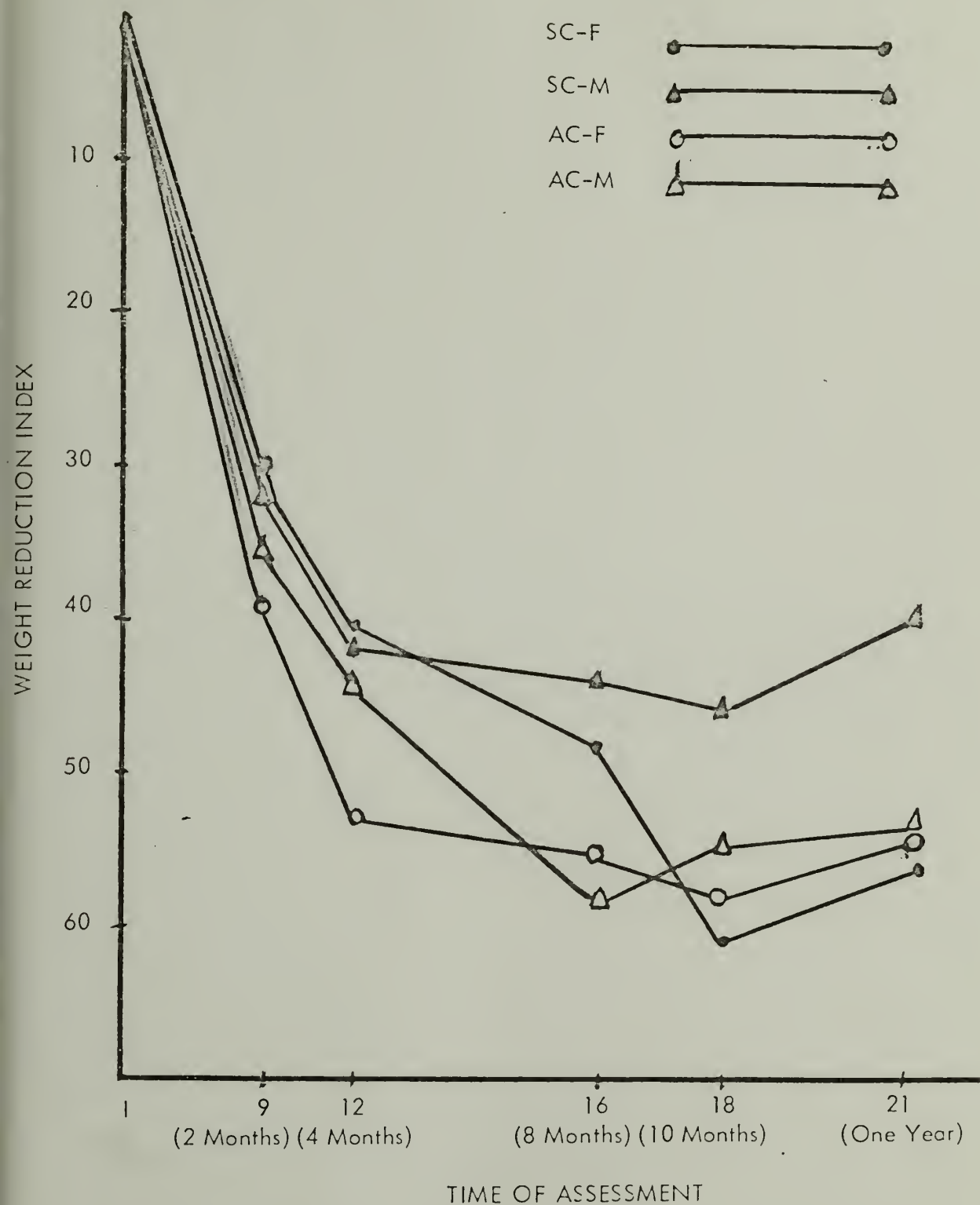


Figure 10. Mean RI By Sex for Analysis 5 (Session 1-9-12-16-18-21)

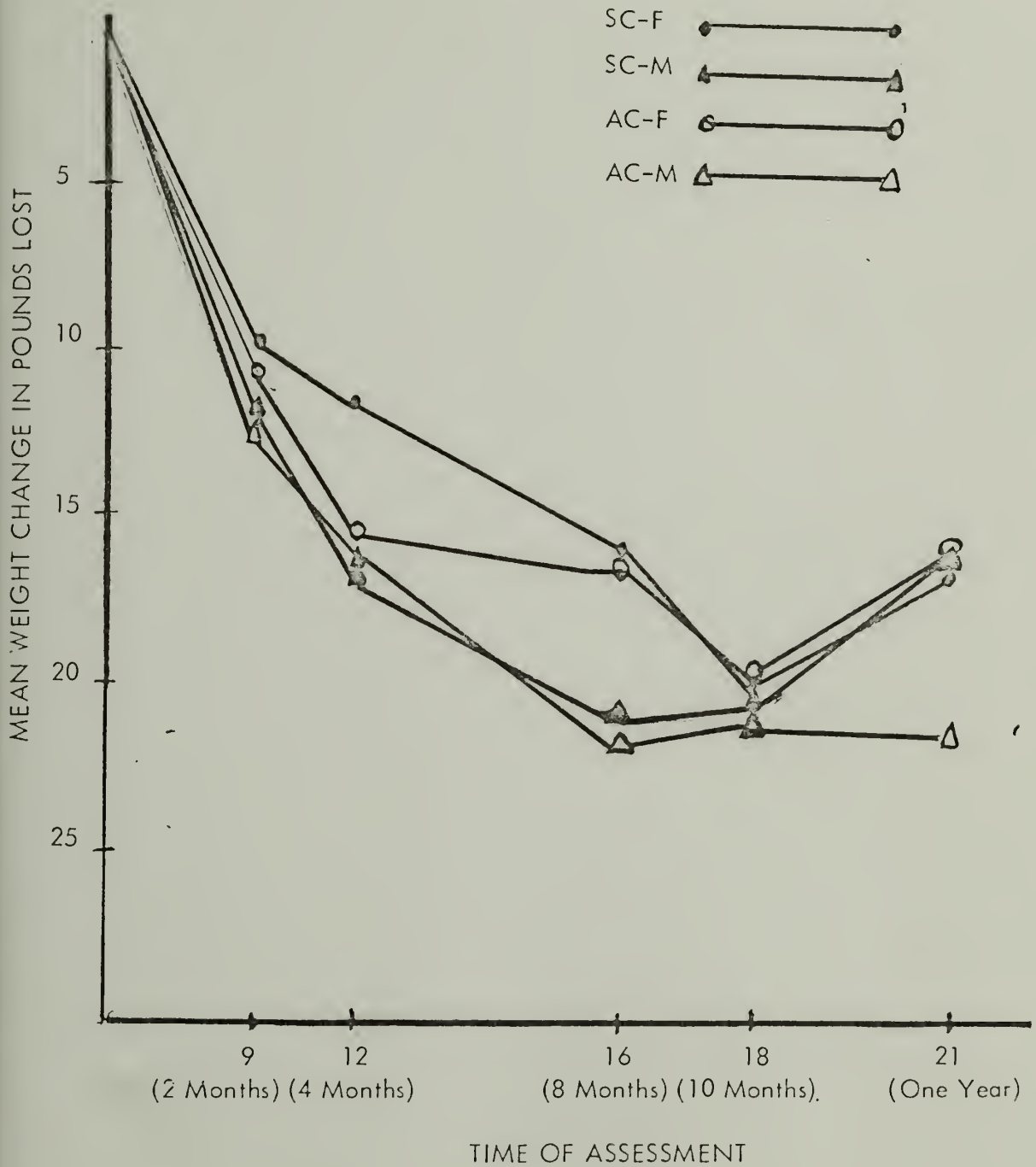


Figure 11. Mean Weight Change in Pounds Lost By Sex for Analysis 5 (Session 1-9-12-16-18-21)

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	

* $p < .0495$

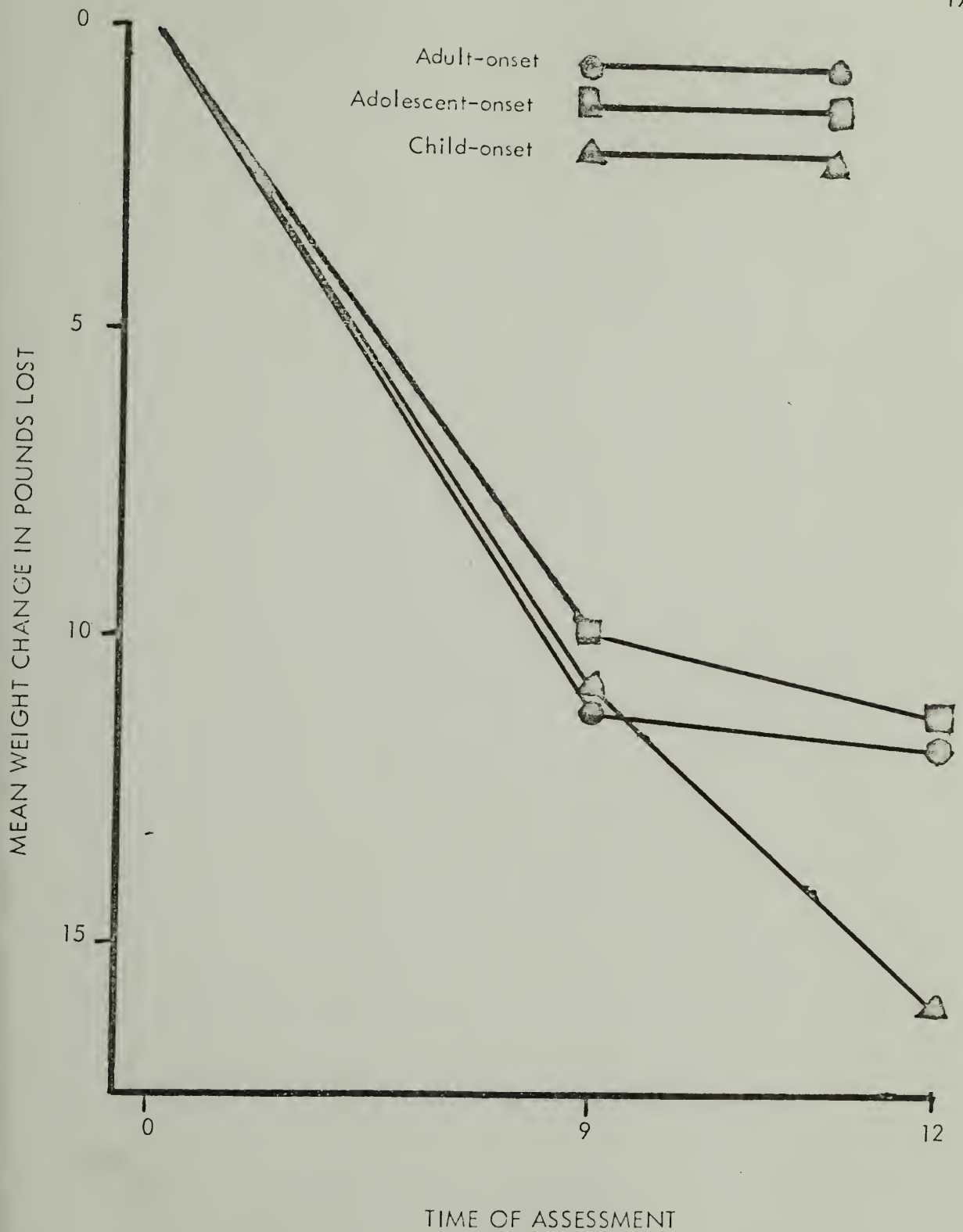


Figure 12. Mean Pounds Lost for Adult, Adolescent and Child Onset Obese for Analysis 2 (Session 1-9-12).

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	

* $p < .0235$

** $p < .0042$

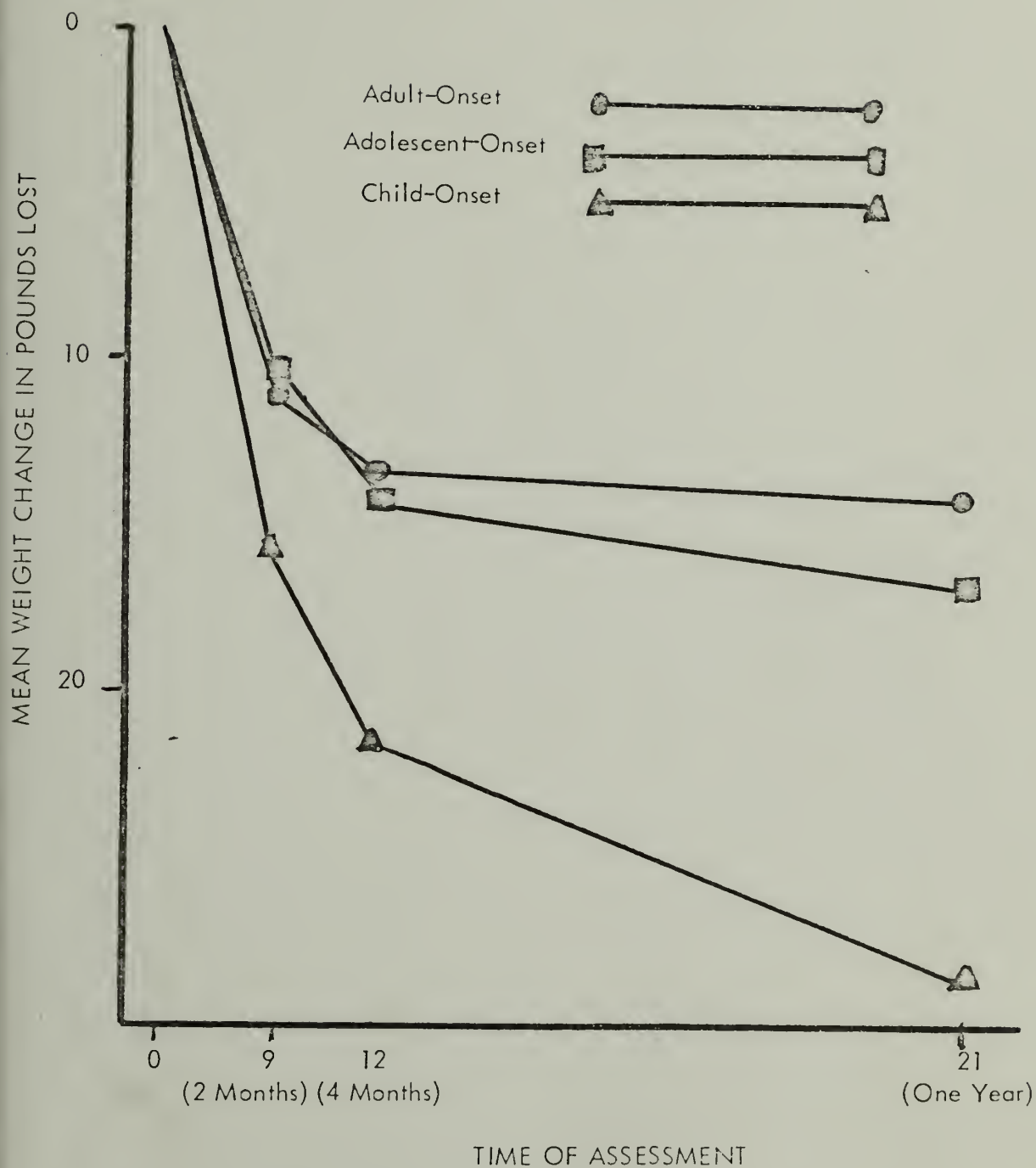


Figure 13. Mean Pounds Lost for Adult, Adolescent and Child Onset of Obesity for Analysis 6 (Session 1-9-12-21)

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 (<u>N=5</u>)	SC-C (<u>N=10</u>)	AC-I (<u>N=12</u>)	AC-C (<u>N=25</u>)
<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)

	SC-I (N=5)	SC-C (N=10)	AC-I (N=12)	AC-C (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 increases 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: Analysis of Restraint

Restraint scores were comprised of two components: Restraint-History (R-H) evaluated diet and weight history, and Restraint-Behavior (R-B) assessed over-concern with dieting and dietbreaking behaviors. A Total Restraint Score (R-T) included both of these scales, and therefore a change in only one component, or a slight change in both, may have been reflected in R-T.

The Restraint Questionnaire was administered at Session 1 and Session 12. Pearson correlation coefficients indicated a positive correlation between R-H and R-B at Administration One ($r = .4245$, $p < .001$) and at Administration Two ($r = .2142$, $p < .015$).

Analyses of responses to Administration One (Initial Restraint) were conducted to evaluate differences in restraint with respect to sex, age of onset and prior attempts at dieting. Also, overweight and non-overweight participants were compared, and a retrospective analysis of drop-outs and non-drop-outs was performed.

All of these variables were analyzed with respect to restraint as measured over both administrations, as well as change in restraint from Administration One-

Two. Additionally, treatment groups were compared in these analyses.

Finally, participants were divided into high and low restraint categories and weight losses were compared.

Initial restraint: Administration one (Session 1). At Session 1, 179 participants completed the Restraint Questionnaire and mean scores were: $R-H = 20.26$; $R-B = 10.23$; and $R-T = 30.12$. With the exception of the analysis of overweight versus non-overweight participants, the following analyses included data for overweight participants only ($N = 156$). For this group, mean scores were: $R-H = 21.54$; $R-B = 10.78$; and $R-T = 32.31$.

Analyses of variance were conducted to determine initial differences among various sub-groups.

Males and females. Of the 156 overweight participants who completed the Restraint Questionnaire at the initial administration, 65 were male and 91 were female. The means for $R-H$, $R-B$ and $R-T$ for males and females are presented in Table 38.

Analyses of variance revealed no significant differences ($F = 1.002$; $df = 1, 154$) between males and females for mean $R-H$. However, the mean $R-B$ was significantly higher ($F = 19.03$; $df = 1, 155$; $p < .0000$) for females than for males, as was mean $R-T$ ($F = 4.34$; $df = 1, 154$, $p < .04$). The analyses of variance for mean $R-B$ and $R-T$ are summarized in Table 39.

Age of onset: Adult, adolescent and child. Of the 143 participants completing the Restraint Questionnaire who were classified according to age of onset, 78 were adult, 28 adolescent and 42 child onset.

TABLE 38

MEAN SCORES FOR RESTRAINT-HISTORY, RESTRAINT-BEHAVIOR AND RESTRAINT-TOTAL: MALES AND FEMALES, ADMINISTRATION ONE

	<u>R-H</u>	<u>R-B</u>	<u>R-T</u>
Males (N = 65)	20.53	9.28	29.81
Females (N = 91)	22.27	11.84	34.09

TABLE 39

ANALYSES OF VARIANCE FOR RESTRAINT-BEHAVIOR AND RESTRAINT-TOTAL: MALES AND FEMALES, ADMINISTRATION ONE

<u>Source</u>	<u>DF</u>	<u>SS</u>	<u>MS</u>	<u>F</u>
<u>Restraint-Behavior</u>				
Between Groups	1	249.62	249.63	19.027*
Within Groups	155	2033.55	13.12	
Total	156	2283.18		

* $p < .0000$

Restraint-Total

Between Groups	1	696.04	696.04	4.344*
Within Groups	154	24675.68	160.23	
Total	155	25371.73		

* $p < 0.0388$

Analysis of variance revealed significant differences among groups for mean R-H ($F = 5.722$, $df = 2, 141$; $p < .004$) and for mean R-T ($F = 5.987$, $df = 2, 141$; $p < .003$) but not for mean R-B ($F = 1.911$, $df = 2, 142$). The analyses of variance for R-H and R-T are summarized in Table 40. Means for all three scores are presented in Table 41.

Bonferroni comparisons of means revealed that child-onset scored significantly higher than adult-onset for R-H ($p < .01$) and for R-T ($p < .01$). The means for child-onset compared to adolescent-onset were also higher, however, these comparisons did not reach significance.

Prior attempts at dieting. As for analyses of weight loss, participants were classified according to number of prior attempts at dieting. For participants completing the initial administration of the Restraint Questionnaire, 4 had never attempted dieting previously, 23 had one prior attempt, 18 had two prior attempts and 62 had three or more prior attempts.

The mean scores for R-H, R-B and R-T for all four groups are presented in Table 42. Examination of the means indicates that all three restraint scores increased in conjunction with prior attempts. For example, mean scores for R-H were 9.95, 15.93, 21.13, and 25.22 for 0, 1, 2, and 3 prior attempts, respectively.

Significant differences among groups were found for all three restraint measures: R-H ($F = 7.612$, $df = 3, 103$; $p < .0001$); R-B ($F = 7.153$, $df = 3, 104$; $p < .0002$); and R-T ($F = 11.240$; $df = 3, 103$; $p < .0000$). A summary of the analyses of variance for the three scores is presented in Table 43.

Bonferroni comparisons of the means revealed significantly higher R-H

TABLE 40

ANALYSES OF VARIANCE FOR RESTRAINT-HISTORY AND RESTRAINT-TOTAL: ADULT, ADOLESCENT AND CHILD ONSET, ADMINISTRATION ONE

<u>Source</u>	<u>DF</u>	<u>SS</u>	<u>MS</u>	<u>F</u>
<u>Restraint-History</u>				
Between Groups	2	1180.91	590.46	5.722*
Within Groups	141	14548.69	103.18	
Total	143	15729.59		

*p < .0041

<u>Restraint-Total</u>				
Between Groups	2	1690.24	845.12	5.987*
Within Groups	141	19901.94	141.15	
Total	143	21592.18		

*p < .0032

TABLE 41

MEAN RESTRAINT-HISTORY, RESTRAINT-BEHAVIOR AND RESTRAINT-TOTAL FOR ADULT, ADOLESCENT AND CHILD ONSET, ADMINISTRATION ONE

<u>Age of Onset</u>	<u>R-H</u>	<u>R-B</u>	<u>R-T</u>
Adult (N = 78)	20.19	10.53	30.72
Adolescent (N = 24)	21.09	10.79	31.88
Child (N = 42)	26.67	11.84	38.48

TABLE 42

MEAN SCORES FOR RESTRAINT-HISTORY, RESTRAINT-BEHAVIOR, AND RESTRAINT TOTAL: PRIOR ATTEMPTS AT DIETING, ADMINISTRATION ONE

<u>Prior Attempts At Dieting</u>	<u>R-H</u>	<u>R-B</u>	<u>R-T</u>
None (N = 4)	9.95	8.40	17.20
One (N = 23)	15.93	8.82	24.76
Two (N = 18)	21.13	10.50	31.63
Three or more (N = 62)	25.22	12.29	37.51

TABLE 43

ANALYSES OF VARIANCE FOR RESTRAINT-HISTORY, RESTRAINT-BEHAVIOR AND RESTRAINT-TOTAL: PRIOR ATTEMPTS AT DIETING, ADMINISTRATION ONE

<u>Source</u>	<u>DF</u>	<u>SS</u>	<u>MS</u>	<u>F</u>
<u>Restraint-History</u>				
Between Groups	3	2085.39	695.13	7.612*
Within Groups	103	9405.84	91.32	
Total	106	11491.22		

*p < .0001

Restraint-Behavior

Between Groups	3	249.63	83.21	7.153*
Within Groups	104	1209.78	11.63	
Total	107	1459.40		

*p < .0002

Restraint-Total

Between Groups	3	3857.79	1285.93	11.24*
Within Groups	103	11783.88	114.41	
Total	106	15641.67		

*p < .0000

($p < .05$) and R-T ($p < .01$) scores for participants with three or more prior attempts compared to no prior attempts. While this same pattern was true for R-B, the difference did not reach significance. Similarly, mean scores were significantly higher for three or more as compared to one prior attempt for R-H ($p < .01$), R-B ($p < .01$), and R-T ($p < .01$). There were no other Bonferroni comparisons which reached significance.

Overweight and non-overweight participants. For this comparison, scores for participants who were not overweight but attending the Couples Groups with their overweight spouse were included. Therefore, scores for 156 overweight participants were compared to scores for 17 non-overweight participants.

The means for R-H, R-B and R-T for both groups are presented in Table 44.

As the large discrepancy in means suggests, overweight participants scored significantly higher than non-overweight participants on all three measures: R-H ($F = 22.83$, $df = 1, 171$; $p < .0000$); R-B ($F = 34.58$, $df = 1, 172$; $p < .0000$); and R-T ($F = 32.96$, $df = 1, 171$; $p < .0000$). A summary of the analyses of variance for all three measures is presented in Table 45.

Drop-outs and non drop-outs. In a retrospective analysis, initial restraint scores were compared for participants who remained in the entire year-long program ($N = 69$) and those who dropped out ($N = 87$) after Session 12. Mean R-H, R-B and R-T scores are presented in Table 46.

As suggested by the similarities of means, the analyses of variance revealed no significant differences among groups for any of the three scores: R-H ($F = .764$, $df = 1, 154$); R-B ($F = 0.070$, $df = 1, 155$); and R-T ($F = 0.444$, $df = 1, 154$).

TABLE 44

MEAN SCORES FOR RESTRAINT-HISTORY, RESTRAINT-BEHAVIOR AND
RESTRAINT-TOTAL: OVERWEIGHT AND NON-OVERWEIGHT
PARTICIPANTS, ADMINISTRATION ONE

	<u>R-H</u>	<u>R-B</u>	<u>R-T</u>
Overweight (N = 156)	21.54	10.78	32.31
Non-Overweight (N = 17)	8.85	4.88	13.73

TABLE 45

ANALYSES OF VARIANCE FOR RESTRAINT-HISTORY, RESTRAINT-BEHAVIOR
AND RESTRAINT-TOTAL: OVERWEIGHT AND NON-OVERWEIGHT
PARTICIPANTS, ADMINISTRATION ONE

<u>Source</u>	<u>DF</u>	<u>SS</u>	<u>MS</u>	<u>F</u>
<u>Restraint-History</u>				
Between Groups	1	2471.32	2471.32	22.83*
Within Groups	171	18507.05	108.23	
Total	172	20978.37		
*p < .0000				
<u>Restraint-Behavior</u>				
Between Groups	1	532.99	532.99	34.58*
Within Groups	172	2650.95	15.41	
Total	173	3183.94		
*p < .0000				
<u>Restraint-Total</u>				
Between Groups	1	5290.45	5290.45	32.96*
Within Groups	171	27445.51	160.50	
Total	172	32735.97		
*p < .0000				

TABLE 46

MEAN SCORES FOR RESTRAINT-HISTORY, RESTRAINT-BEHAVIOR,
AND RESTRAINT-TOTAL, ADMINISTRATION 1:
DROP-OUTS AND NON DROP-OUTS

	<u>R-H</u>	<u>R-B</u>	<u>R-T</u>
Drop-outs (N = 87)	22.33	10.73	31.07
Non Drop-outs (N = 69)	20.55	10.93	31.49

Summary. In analyses of initial restraint, females scored significantly higher than males on mean R-B, indicating that females reported a greater over-concern with dieting and more extreme behaviors after dietbreaking (e.g., feeling guilty after overeating; after dietbreaking, continuing on an eating "splurge"). Mean R-T was also significantly higher for females, reflecting the R-B difference as well as a slightly higher mean R-H score.

Also, child-onset obese scored significantly higher than adult-onset on mean R-H, indicating that child-onset reported greater weight fluctuations (e.g., maximum amount of weight ever lost on a reducing diet; maximum weight gain within one week). The significantly higher mean R-T score for child-onset reflected the R-H difference, as well as a slightly higher R-B score. While child-onset scored higher than adolescent-onset on R-H and R-T, the differences were not significant.

All three main restraint scores increased with increases in reported prior attempts at dieting. Participants reporting no prior attempts had the lowest mean scores, whereas participants with three or more attempts scored highest. R-H and

R-T were significantly higher for three or more as compared to no prior attempts, and the increased R-B score approached significance. All three restraint scores were significantly higher for three or more compared to one prior attempt.

In a comparison of overweight and non-overweight participants, all three restraint scores were significantly higher for overweight participants.

No significant differences in restraint scores were found in a retrospective analysis of drop-outs and non drop-outs.

Change in restraint: Administration One-Two (Session 1-12; 1-4 months). At Session 12, 117 overweight participants completed Administration Two of the Restraint Questionnaire. Mean scores were: R-H = 20.03; R-B = 9.20; R-T = 29.21.

Repeated measures analyses of variance were conducted to determine differences in scores overall among groups as well as differences in change of scores from Administration One-Two.

Males and females. Of the 117 participants who completed both administrations of the Restraint Questionnaire, 68 were female and 49 were male. The means for R-H, R-B and R-T (both administrations) for males and females are presented in Table 47.

Repeated measures analyses of variance revealed no significant differences or changes for R-H. However, analyses did indicate a significant overall decrease in scores for R-B ($F = 10.48$, $df = 2, 230$; $p < .0000$) and for R-T ($F = 5.15$, $df = 2, 230$; $p < .0065$).

Also, overall, females' score for R-B was significantly higher than males ($F = 10.91$, $df = 1, 115$; $p < .0013$), a finding which is consistent with the initial

trend. A summary of the repeated measures analyses of variance for R-B and R-T is presented in Table 48.

There were no significant interactional differences, indicating that scores for males and females did not change in a differential manner.

TABLE 47

MEAN SCORES FOR RESTRAINT-HISTORY, RESTRAINT-BEHAVIOR,
AND RESTRAINT-TOTAL, ADMINISTRATION ONE-TWO:
MALES AND FEMALES

Administration	R-H		R-B		R-T	
	Males (n=49)	Females (n=68)	Males (n=40)	Females (n=68)	Males (n=49)	Females (n=68)
One	19.83	22.54	9.63	11.71	29.46	34.25
Two	20.24	21.59	8.59	10.25	28.83	31.84

Age of onset: Adult, adolescent, and child. Of the 108 participants completing both administrations of the Restraint Questionnaire who were classified according to age of onset, 58 were adult, 16 adolescent, and 34 child onset. The means for R-H, R-B and R-T for all three groups are presented in Table 49.

Repeated measures analyses of variance (summarized in Table 50) revealed a significant overall decrease in R-B ($F = 5.98$, $df = 2$, 210; $p < .0030$) and R-T ($F = 5.15$, $df = 2$, 210; $p < .006$) but not R-H ($F = 1.06$, $df = 2$, 210).

Analyses also indicated overall significant differences among groups for R-H ($F = 3.79$, $df = 2$, 105; $p < .03$) and for R-T ($F = 3.88$, $df = 2$, 105; $p < .02$) but not for R-B ($F = 0.98$, $df = 2$, 105). Bonferroni comparisons of means revealed significantly higher mean R-H scores ($p < .05$) and mean R-T scores ($p < .05$) for

TABLE 48

REPEATED MEASURES ANALYSES OF VARIANCE FOR RESTRAINT-BEHAVIOR AND RESTRAINT-TOTAL, ADMINISTRATIONS ONE-TWO; MALES AND FEMALES

<u>Source</u>	<u>SS</u>	<u>DF</u>	<u>MS</u>	<u>F</u>
<u>Restraint-Behavior</u>				
Mean	33218.07	1	33218.07	1252.41
S	289.45	1	289.45	10.91*
Error	3050.19	115	26.52	
R	112.41	2	56.20	10.48**
RS	2.56	2	1.28	0.24
Error	1233.80	230	5.36	
* $p < .0013$				
** $p < .0000$				
<u>Restraint-Total</u>				
Mean	325829.81	1	325829.81	725.00
S	1155.68	1	1155.68	2.57
Error	51683.12	115	449.42	
R	163.34	2	81.67	5.15*
RS	53.40	2	26.70	1.68
Error	3650.49	230	15.87	

* $p < .0065$

TABLE 49

MEAN SCORES FOR RESTRAINT-HISTORY, RESTRAINT-BEHAVIOR
AND RESTRAINT-TOTAL, ADMINISTRATIONS ONE AND
TWO: ADULT, ADOLESCENT AND CHILD ONSET

Administration	R-H			R-B			R-T		
	Adult N=58	Adolescent N=16	Child N=34	Adult N=58	Adolescent N=16	Child N=34	Adult N=58	Adolescent N=16	Child N=34
One	19.94	20.38	26.22	10.59	10.31	11.76	30.53	30.69	37.99
Two	19.73	19.21	25.51	9.33	10.00	9.97	29.56	29.21	35.48

TABLE 50

REPEATED MEASURES ANALYSES OF VARIANCE FOR RESTRAINT-HISTORY,
RESTRAINT-BEHAVIOR AND RESTRAINT-TOTAL, ADMINISTRATIONS
ONE-TWO; ADULT, ADOLESCENT AND CHILD ONSET

<u>Source</u>	<u>SS</u>	<u>DF</u>	<u>MS</u>	<u>F</u>
<u>Restraint-History</u>				
Mean	116871.20651	1	116871.20651	345.07
O	2566.33527	2	1283.16764	3.79*
Error	35561.96299	105	338.68536	
R	24.63078	2	12.31539	1.06
RO	8.60609	4	2.15152	0.18
Error	2448.75975	210	11.66076	

*p < .0258

Restraint-Behavior

Mean	25580.96466	1	25580.96466	941.90
O	53.23732	2	26.61866	0.98
Error	2851.67626	105	27.15882	
R	64.15512	2	32.07756	5.98*
RO	14.03564	4	3.50891	0.65
Error	1126.58781	210	5.36470	

*p < .003

Restraint-Total

Mean	251808.04791	1	251808.04791	589.37
O	3319.04531	2	1659.52265	3.88*
Error	44861.18354	105	427.24937	
R	168.27955	2	84.13977	5.15**
RO	12.44162	4	3.11040	0.19
Error	3432.96964	210	16.34747	

* p < .0236

** p < .0066

child compared to adult onset. Although child-onset participants scored higher than adolescent-onset for both of these scales, the difference did not reach significance.

Prior attempts at dieting. For participants completing both administrations of the Restraint Questionnaire, 4 had no previous attempts at dieting, 15 had one previous attempt, 14 had two previous attempts and 51 had three or more prior attempts.

The mean scores for R-H, R-B and R-T for all four groups, both administrations, are presented in Table 51.

Repeated measures analyses of variance indicated that overall, there was a significant difference among groups for R-H ($F = 4.71$, $df = 3, 80$; $p < .004$), for R-B ($F = 11.20$, $df = 3, 80$; $p < .0000$) and for R-T ($F = 7.85$, $df = 3, 80$; $p < .0001$). Examination of the means indicated that for each measure the mean increased in conjunction with prior attempts. In other words, means were lowest for no prior attempts and increased for one, two and three or more attempts, with the highest means reported for three or more prior attempts (Table 52).

Bonferroni comparisons of the means indicated that participants reporting three or more prior attempts scored significantly higher ($p < .01$) than those with no attempts or one attempt with respect to R-H. For R-B and R-T, mean differences were in the same direction, and significantly higher ($p < .01$) for three or more attempts as compared to none, one or two attempts.

Analyses also indicated a significant ($F = 3.91$, $df = 2, 260$; $p < .02$) overall decrease in R-B. Examination of the means revealed that scores for R-B decreased for all groups with the largest decrease reported for participants with two prior attempts

TABLE 51

MEAN SCORES FOR RESTRAINT-HISTORY, RESTRAINT-BEHAVIOR AND
RESTRAINT-TOTAL, ADMINISTRATIONS ONE-TWO:
PRIOR ATTEMPTS AT DIETING

Administration	Prior Attempts at Dieting			
	None (N=4)	One (N=15)	Two (N=14)	Three or More (N=51)
			<u>R-H</u>	
One	9.95	15.03	20.71	24.60
Two	13.03	15.20	21.47	23.31
			<u>R-B</u>	
One	7.25	8.86	10.64	12.16
Two	6.75	8.06	7.50	11.27
			<u>R-T</u>	
One	17.20	23.89	31.35	36.76
Two	19.78	23.27	28.98	34.59

TABLE 52

REPEATED MEASURES ANALYSES OF VARIANCE FOR RESTRAINT-HISTORY,
RESTRAINT-BEHAVIOR AND RESTRAINT-TOTAL, ADMINISTRATIONS
ONE-TWO: PRIOR ATTEMPTS AT DIETING

<u>Source</u>	<u>SS</u>	<u>DF</u>	<u>MS</u>	<u>F</u>
<u>Restraint-History</u>				
Mean	38306.51337	1	38306.51337	146.59
P	3691.22431	3	1230.40810	4.71*
Error	20904.91333	80	261.31142	
R	12.80711	2	6.40356	1.38
RP	71.45702	6	11.90950	2.56**
Error	744.82478	160	4.65515	

* $p < .0044$

** $p < .0215$

Restraint-Behavior

Mean	9234.18765	1	9234.18765	437.19
P	709.99323	3	236.66441	11.20*
Error	1689.75280	80	21.12191	
R	44.88440	2	22.44220	3.91**
RP	44.00831	6	7.33472	1.28
Error	917.84090	160	5.73651	

* $p < .0000$

** $p < .0219$

Restraint-Total

Mean	85156.08357	1	85156.08357	275.79
P	7268.62819	3	2422.67606	7.85*
Error	24701.81227	80	308.77265	
R	9.85880	2	4.92940	0.45
RP	68.39684	6	11.39947	1.05
Error	1737.09187	160	10.85682	

* $p < .0001$

at dieting.

Also, changes in scores for R-H were significantly different ($F = 11.91$, $df = 2, 160$; $p < .02$) among groups. Examination of the means indicated that while the scores stayed approximately the same for one, two and three or more attempts, the mean for participants reporting no prior attempts increased from 9.95 to 13.03. This finding may have reflected the fact that those with no prior attempts reported at Administration One (Session 1) had a very low diet history, as measured by R-H, since they had never dieted. However, by Administration Two, they had completed four months in a diet program and therefore scores on R-H had increased.

Overweight and non-overweight participants. Non-overweight participants in this analysis were individuals who were not overweight at the beginning of the program (and not participating in weight reduction) but attending the Couples Groups with their overweight spouse, and completed both administrations of the Restraint Questionnaire. Scores for 117 overweight participants were compared to scores for 12 non-overweight participants.

The means for R-H, R-B and R-T for both groups are presented in Table 53. Repeated measures analyses of variance indicated that overall, overweight participants scored significantly higher than non-overweight participants on R-H ($F = 9.15$, $df = 1, 127$; $p < .003$), R-B ($F = 14.59$, $df = 1, 127$; $p < .0002$) and R-T ($F = 13.19$, $df = 1, 127$; $p < .0004$). A summary of the repeated measures analyses of variance for all three measures is shown in Table 54.

The analysis also revealed a significant interaction between restraint and the main variable for R-B ($F = 33.11$, $df = 2, 254$; $p < .05$) and R-T ($F = 3.86$, $df =$

TABLE 53

MEAN SCORES FOR RESTRAINT-HISTORY, RESTRAINT-BEHAVIOR AND
 RESTRAINT-TOTAL, ADMINISTRATIONS ONE-TWO: OVERWEIGHT
 AND NON-OVERWEIGHT PARTICIPANTS

Administration	R-H		R-B		R-T	
	Overweight (N=117)	Non- Overweight (N=12)	Overweight (N=117)	Non- Overweight (N=12)	Overweight (N=117)	Non- Overweight (N=12)
One	21.40	10.21	10.84	5.67	32.24	15.88
Two	21.02	12.00	9.56	6.75	30.58	18.75

TABLE 54

REPEATED MEASURES ANALYSES OF VARIANCE FOR RESTRAINT-HISTORY,
RESTRAINT-BEHAVIOR AND RESTRAINT-TOTAL, ADMINISTRATIONS ONE-
TWO: OVERWEIGHT AND NON-OVERWEIGHT PARTICIPANTS

<u>Source</u>	<u>SS</u>	<u>DF</u>	<u>MS</u>	<u>F</u>
<u>Restraint History</u>				
Mean	34245.03949	1	34243.03949	96.94
O	3233.28744	1	3233.28744	9.15*
Error	44862.93852	127	353.25146	
R	10.92488	2	5.46244	0.49
RO	27.08362	2	13.54181	1.22
Error	2809.40222	254	11.06064	
* $p < .0030$				
<u>Restraint-Behavior</u>				
Mean	8601.55277	1	8601.55277	268.06
O	468.09541	1	468.09541	14.59*
Error	4075.19658	127	32.08816	
R	2.19529	2	1.09764	0.20
RO	33.11002	2	16.55501	3.07**
Error	1369.97009	254	5.39358	
* $p < .0002$				
** $p < .0482$				
<u>Restraint-Total</u>				
Mean	77169.10734	1	77169.10734	165.22
O	6161.86086	1	6161.86086	13.19*
Error	59316.87127	127	467.06198	
R	8.64336	2	4.32168	0.28
RO	120.01667	2	60.00834	3.86**
Error	3951.03702	254	15.55526	

* $p < .0004$ ** $p < .0224$

2, 254; $p < .02$). Examination of the means indicated that while scores on both measures decreased for overweight participants, the opposite was true for non-overweight individuals. In fact, all three restraint scores for non-overweight participants increased from Administration One to Two. Bonferroni comparisons of the means indicated that scores for R-B and R-T did, however, remain significantly different ($p < .01$) at Administration Two for overweight and non-overweight participants.

Drop-outs and non drop-outs. Restraint scores were compared for participants who remained in the entire year-long program ($N = 61$) and participants who dropped out after Session 12 ($N = 56$).

Mean scores for R-H, R-B and R-T for both groups are presented in Table 55. Repeated measures analyses of variance indicated no significant differences ($F = .50$, $df = 1, 115$) among groups and no significant overall change in mean scores ($F = 0.49$, $df = 2, 230$) for R-H.

However, the analyses for R-B did reveal a significant overall change in scores ($F = 6.10$, $df = 2, 230$; $p < .00$) and a significant interaction between restraint and the major variable ($F = 3.39$, $df = 2, 230$). Bonferroni comparisons of the means indicated that while R-B scores did not differ significantly for drop-outs and non drop-outs at the first administration, the difference was significant at Administration Two ($p < .05$). Examination of the means in Table 55 illustrates that while drop-out scores remained very similar across administrations, the R-B score for non-drop-outs decreased significantly.

The analysis for R-T indicated no significant differences among groups ($F = .86$, $df = 1, 115$), but a significant overall change ($F = 6.10$, $df = 2, 230$;

TABLE 55

MEAN SCORES FOR RESTRAINT-HISTORY, RESTRAINT-BEHAVIOR AND
RESTRAINT-TOTAL, ADMINISTRATIONS ONE-TWO:
DROP-OUTS AND NON-DROP-OUTS

Administration	R-H		R-B		R-T	
	Drop-Out (N=56)	Non-Drop-Out (N=61)	Drop-Out (N=56)	Non-Drop-Out (N=61)	Drop-Out (N=56)	Non-Drop-Out (N=61)
One	22.33	20.55	10.73	10.93	33.07	31.49
Two	21.64	20.45	10.11	9.05	31.74	29.50

$p < .003$) in scores. Examination of the means indicated that R-T decreased overall, a result which probably reflects a combination of the slight decrease in R-H as well as the significant decrease in R-B for non-drop-outs.

A summary of the analyses of variance for R-B and R-T is presented in Table 56.

Treatment groups. Repeated measures analyses of variance were conducted across treatment groups (SC-I, $N = 11$; SC-C, $N = 32$; AC-I, $N = 15$; AC-C, $N = 59$).

No significant differences among groups were revealed for R-H or R-T. However, for R-B, there was a significant overall change in scores ($F = 4.97$, $df = 2, 226$; $p < .008$). Examination of the means (Table 57) indicated that mean R-B scores for each group decreased from One-Two. A summary of the repeated measures analyses of variance is presented in Table 58.

Analyses also revealed that mean R-B scores, overall, for participants in Individuals Groups (mean = 11.50) were significantly higher ($F = 8.11$, $df = 1, 113$; $p < .005$) than for participants in Couples Groups (mean = 9.53). This difference was also significant initially with Individuals scoring higher than Couples ($F = 10.93$, $df = 1, 152$; $p < .001$). These results may reflect the higher proportion of females in Individuals Groups, since, overall, females scored higher on R-B than males.

Weight loss. Overweight participants were split at the median (R-H, 19; R-B, 9) of the total sample of restraint scores for overweight participants.

In a comparison of R-H scores (Administration Two, Session 12) and pounds lost at Session 12, high restraint (> 19) participants lost significantly more weight

TABLE 56

REPEATED MEASURES ANALYSES OF VARIANCE FOR RESTRAINT-BEHAVIOR
AND RESTRAINT-TOTAL, ADMINISTRATIONS ONE-TWO;
DROP-OUTS AND NON-DROP-OUTS

<u>Source</u>	<u>SS</u>	<u>DF</u>	<u>MS</u>	<u>F</u>
<u>Restraint-Behavior</u>				
Mean	35199.50680	1	35199.50680	1227.48
D	41.87717	1	41.87717	1.46
Error	3297.76386	115	28.67621	
R	115.30180	2	57.65090	11.04*
RD	35.35878	2	17.67939	3.39**
Error	1201.00020	230	5.22174	
* $p < .0000$				
** $p < .0355$				
<u>Restraint-Total</u>				
Mean	341525.77934	1	341525.77934	748.87
D	392.74120	1	392.74120	0.86
Error	52446.05898	115	456.05269	
R	195.79375	2	97.89687	6.10*
RD	13.77659	2	6.88830	0.43
Error	3690.10917	230	16.04395	

* $p < .0026$

TABLE 57

MEAN SCORES FOR RESTRAINT-BEHAVIOR, ADMINISTRATIONS
ONE-TWO; TREATMENT GROUPS

Administration	SC-I (N=11)	SC-C (N=32)	AC-I (N=15)	AC-C (N=59)
One	11.45	9.75	12.67	10.85
Two	10.36	9.34	12.00	8.90

TABLE 58

REPEATED MEASURES ANALYSES OF VARIANCE FOR RESTRAINT-BEHAVIOR,
ADMINISTRATIONS ONE-TWO; TREATMENT GROUPS

<u>Source</u>	<u>SS</u>	<u>DF</u>	<u>MS</u>	<u>F</u>
Mean	25751.14844	1	25751.14844	955.48
B	38.00906	1	38.00906	1.41
I	218.51336	1	218.51336	8.11*
BI	27.57336	1	27.57336	1.02
Error	3045.46801	113	26.95104	
R	52.84887	2	26.42443	4.97**
RB	3.57681	2	1.78840	0.34
RI	0.93783	2	0.46891	0.09
RBI	11.64008	2	5.82004	1.09
Error	1201.98542	226	5.31852	

* $p < .0052$

** $p < .0077$

(mean = 16.83) than low restraint (≤ 19) participants (mean = 11.42) ($F = 3.51$, $df = 1$, 127; $p < .002$). However, with respect to RI, low restraint participants had a larger RI (mean = 41.82) than high restraint participants (mean = 38.96), although this difference failed to reach significance ($F = 1.47$, $df = 1$, 127). The fact that low restraint participants had a significantly higher ($F = 3.47$, $df = 1$, 154; $p < .001$) mean RC (mean = 4.356) than high restraint participants (mean = 2.752) can clarify these findings. High restraint participants were significantly more overweight than low restraint participants, and therefore, even though they lost significantly more pounds by Session 12, this was not reflected in RI, since they had more excess weight to lose.

For R-B, there were no significant differences between high (> 9) and low (≤ 9) restraint participants with respect to pounds lost ($F = 1.09$, $df = 1$, 137) or RI ($F = 1.06$, $df = 1$, 137) at Session 12.

Summary. In analyses of sex, age of onset, prior attempts at dieting, and treatment groups, R-B decreased significantly from Administration One to Two. In other words, overall scores assessing overconcern with dieting and excessive diet-breaking behaviors decreased from Session 1-12.

Over both administrations, females scored significantly higher with respect to R-B, a finding which is consistent with initial results.

Also, similar to initial analyses, R-H and R-T scores, overall, were significantly higher for child as compared to adult-onset obese, indicating that child-onset participants reported greater fluctuations in weight. While the scores for child-onset were also greater than those for adolescent-onset, the differences were not significant.

The overall results for comparisons of groups varying according to prior attempts at dieting paralleled initial findings. All three restraint scores increased in conjunction with number of prior attempts. That is, participants reporting no prior attempts scored lowest and those with three or more scored highest. Means for R-H were significantly higher for three or more attempts compared to zero or one. Scores for R-B and R-T were significantly higher for three or more attempts compared to zero, one or two attempts. Also, while R-H scores remained similar across administrations for participants reporting one to three previous attempts, there was a significant increase for those with no previous dieting experiences. These findings may have reflected the fact that by Administration Two, these individuals had completed four months of their "first" diet, and therefore reported different weight fluctuation experiences.

As was true for initial results, overweight participants scored significantly higher than non-overweight participants on all three restraint measures. However, there was a significant interaction between the main variable and change in R-B and R-T. While scores decreased for overweight participants from Administration One-Two, they increased for non-overweight participants.

Retrospective comparisons of overall drop-outs and non-drop-outs indicated no significant differences or change in scores for R-H. While the two groups did not differ initially with respect to R-B, at Administration Two, scores for non-drop-outs had decreased significantly while those for drop-outs had remained the same.

While there were no significant differences overall or in change in scores for R-H or R-T among treatment groups, R-B, over both administrations was significantly

higher for Individuals Groups as compared to Couples Groups. This difference was consistent and may have reflected the greater proportion of females in Individuals Groups, since their overall R-B score was significantly greater than for males.

In terms of weight loss, while participants with high Restraint-History scores lost significantly more pounds by Session 12, those with low Restraint-History scores had a higher RI. These ambiguous results can be explained by the fact that high restraint participants had a significantly greater RC initially and therefore more weight to lose than low restraint individuals. Therefore, a greater weight loss would not necessarily be reflected by RI. No significant differences in high versus low Restraint-Behavior were found in terms of pounds lost or RI at Session 12.

Section Three: Analyses of the Binge Questionnaire

Analyses of the Binge Questionnaire were carried out with the following purposes: 1) to investigate the relationships among questionnaire components (e.g., evaluation of the correlation between bingeing and feeling deprived); 2) to assess the correlation between questionnaire components and weight loss; and 3) to compare overall scores on the Binge Questionnaire among treatment groups and various sub-groups; and 4) to compare responses to the Binge Questionnaire with scores on the Restraint Questionnaire, Beck Depression Inventory, and Program Evaluation Questionnaire.

The Binge Questionnaire was administered to overweight participants at Sessions 1, 5, 8, 12, 13, 15 and 21 (Administrations 1-7). The sum of scores for Administrations 2, 3, and 4 is used as a total for some analyses in order to provide

a sufficient sample size for specific sub-groups. A total score for all seven administrations is indicated for various other analyses.

Binge Questionnaire: correlational analyses.

Correlations between questionnaire components. Correlational analyses were used to investigate the relationships among the following questionnaire components from responses to the Binge Questionnaire over all seven administrations:

- A. Binging (BNG)
- B. Feeling deprived due to dieting (DEP)
- C. Denying yourself favorite foods (DEN)
- D. Feeling deprived before dietbreaking (DEP-DB)
- E. While dietbreaking, eating foods denied (DEN-DB)
- F. Total BNG + DEP + DEN (T-BDD)
- G. Total DEP-DB + DEN-DB (T-DB)

Significant correlations are summarized in Table 59. According to the analyses, binging correlated positively ($r = .47$) with feeling deprived before dietbreaking.

Also, participants who reported feeling deprived due to dieting scored high on denying favorite foods while dieting ($r = .41$), feeling deprived before dietbreaking ($r = .60$) and while dietbreaking, eating foods denied ($r = .55$). Therefore, feeling deprived due to dieting correlated highly ($r = .70$) with the total dietbreaking score.

Each of the dietbreaking questions (feeling deprived before dietbreaking;

TABLE 59

SIGNIFICANT CORRELATIONS BETWEEN COMPONENTS
OF THE BINGE QUESTIONNAIRE

<u>BNG</u>		
DEP-DB	.47	$p < .05$
<u>DEP</u>		
DEN	.41	$p < .03$
DEP-DB	.60	$p < .01$
DEN-DB	.55	$p < .03$
T-DB	.70	$p < .004$
<u>DEP-DB</u>		
T-BDD	.65	$p < .005$
<u>DEN-DB</u>		
T-BDD	.57	$p < .03$
<u>T-BDD-</u>		
T-DB	.76	$p < .001$

NOTE: BNG = Binging
 DEP = Feeling Deprived Due to Dieting
 DEN = Denying Yourself Favorite Foods
 DEP-DB = Feeling Deprived Before Dietbreaking
 DEN-DB = While Dietbreaking, Eating Foods Denied
 T-BDD = Total BNG + DEP + DEN
 T-DB = Total DEP-DB + DEN-DB

while dietbreaking, eating foods denied) correlated positively ($r = .65$ and $.57$, respectively) with the total BDD score (binging, deprivation and denial).

Finally, the highest correlation was found between the total score for binging, deprivation and denial and the total score for dietbreaking.

Correlations with weight measures. Correlational analyses were used to investigate the relationship between the binge score (BNG), total deprivation score (T-DEP = feeling deprived due to dieting + denying yourself favorite foods) and total dietbreaking score (T-DB = feeling deprived before dietbreaking + while dietbreaking, eating foods denied) with RI and pounds lost.

These scores were summed over Administrations 2, 3 and 4 (Sessions 5, 8 and 12) and compared to weight measures at Session 12. The correlation between RI and BNG was negative ($r = -.2651$), though not significant. However, those participants reporting higher BNG scores lost less weight in terms of pounds lost ($r = -4.027$; $p < .03$). There were no significant correlations between either weight measure and T-DEP or T-DB.

Also, scores were summed over Administrations 2 - 7 (Sessions 5, 8, 12, 13, 15 and 21) and compared to weight measures at Session 21. Analyses revealed a significant negative relationship between both RI ($r = -.4929$; $p < .009$) and pounds lost ($r = -.4276$; $p < .026$). These results indicated that those participants who reportedly binged more, tended to lose significantly less weight.

Summary. Many components of the Binge Questionnaire correlated positively with specific items. Participants who reported feeling deprived before dietbreaking tended to binge more. Individuals who reported feeling deprived due

to dieting also felt deprived before dietbreaking. Similarly, those participants denied themselves favorite foods, and then ate these foods while dietbreaking. The two highest positive correlations reported were: feeling deprived due to dieting correlated positively with the total dietbreaking score (feeling deprived before dietbreaking and eating foods denied); and the total score for bingeing, deprivation and denial correlated highly with the score for dietbreaking.

Bingeing correlated negatively with pounds lost at Session 12 and with both RI and pounds lost at Session 21. These results indicated that individuals who reportedly binged more, lost significantly less weight.

Total Binge Questionnaire score. Comparisons were made among various sub-groups for scores on the Binge Questionnaire summed over Administrations 2, 3 and 4 (Sessions 5, 8 and 12, respectively).

Males and females. Of the 84 participants completing Administrations 2, 3 and 4 of the Binge Questionnaire, 36 were male and 48 were female.

Analyses of variance (Table 60) indicated that the mean total score for females (53.10) was significantly higher ($F = 9.556$, $df = 1, 82$; $p < .003$) than the mean for males (48.92).

TABLE 60

ANALYSIS OF VARIANCE FOR TOTAL BINGE SCORE
(ADMINISTRATIONS 2, 3, 4): MALES AND FEMALES

Source	SS	DF	MS	F
Between Groups	360.72	1	360.72	9.556*
Within Groups	3095.23	82	37.75	

* $p < .0027$

Treatment groups. Total scores were compared for participants in the four treatment groups who completed Administrations 2, 3 and 4: SC-I, $N = 8$; SC-C, $N = 21$; AC-I, $N = 15$; AC-C, $N = 40$.

Analyses of variance (Table 61) revealed no significant differences ($F = 1.041$, $df = 1, 80$) in mean scores for Stimulus Control Groups (mean = 50.07) and Affective Control Groups (mean = 51.96).

However, the mean score for participants in Individuals Groups (53.54) was significantly higher ($F = 4.195$, $df = 1, 80$; $p < .04$) than for Couples Groups (50.12). This significance may reflect the differential sex distribution between Individuals and Couples Groups (initially there were 7 males and 37 females in Individuals Groups and 65 males and 63 females in Couples Groups) since females, overall, scored significantly higher on the total score.

Other analyses. Analyses of variance revealed no significant differences in mean Total Binge Score for Drop-outs and non-Drop-outs ($F = .533$, $df = 1, 82$).

- Also, no significant differences in mean Total Binge Score among the various categories of prior attempts at dieting were found ($F = 2.243$, $df = 3, 56$).

Summary. For Administrations 2, 3 and 4 summed, analyses revealed significantly higher mean Total Scores (taking into account bingeing, deprivation, denial and dietbreaking behavior) for females. While participants in Individuals Groups scored significantly higher than those in Couples Groups, this result may simply have reflected the larger proportion of females to males in the Individuals Groups; this sex difference did not exist for Couples Groups.

No significant differences in Total Scores were revealed for drop-outs and

TABLE 61
ANALYSES OF VARIANCE FOR TOTAL BINGE SCORE
(ADMINISTRATIONS TWO, THREE, AND FOUR):
TREATMENT GROUPS

<u>Source</u>	<u>SS</u>	<u>DF</u>	<u>MS</u>	<u>F</u>
Main Effects	237.45	2	118.73	2.954
BC	41.83	1	41.83	1.041
IC	168.59	1	168.59	4.195*
2-way Interactions	4.37	1	4.37	0.109
BC IC	4.37	1	4.37	0.109
Explained	240.68	3	80.23	1.996
Residual	3215.27	80	40.19	
Total	3455.94	83	41.64	

*p < .044

non-drop-outs or among categories of prior attempts at dieting.

Analyses with restraint, depression and program evaluation.

Restraint. Participants were split at the median ($R-H = 19$, $N = 62$; $R-B = 9$, $N = 58$) of the total sample of restraint scores.

In a comparison of Restraint-Behavior scores (Administration Two, Session 12) and Binge scores (Administration 4, Session 12), analyses revealed a significantly higher ($t = 3.40$, $df = 118$; $p < .001$) mean BNG score for high restraint participants (mean = 2.22) than for low restraint participants (mean = 1.64). Also, high restraint individuals (mean = 4.77) tended to score higher ($t = 1.87$, $df = 95$; $p < .06$) on T-DB than low restraint participants (mean = 4.18). Differences for T-DEP did not reach significance.

There were no significant differences for high and low restraint-history scores with respect to bingeing.

Beck depression inventory. Participants were split according to Beck's criteria (1972) for high and low depression scores (high ≥ 10 ; low < 10).

In a comparison of depression scores (Administration One, Session 1) and Binge Scores (Administration 4, Session 12), analyses revealed a significantly higher ($t = 2.16$, $df = 107$; $p > .03$) mean BNG score for high depression participants (mean = 2.26) than for low depression participants (mean = 1.82). Also, high depression individuals (mean = 5.17) scored significantly higher ($t = 2.41$, $df = 85$; $p < .02$) on T-DB than low depression participants (mean = 4.12).

Differences for T-DEP did not reach significance.

Program evaluation. Responses to two questions which were part of the

program evaluation (Session 12) lend some validity and reliability to items on the Binge Questionnaire.

Question 104 on the Weight Factors Scale assessed the extent to which bingeing had a negative influence on weight loss. Overall, responses to this question correlated negatively ($r = -.226$) with weight loss at Session 12, a finding which is consistent with results reported for correlations between bingeing (as reported on the Binge Questionnaire) and weight loss.

Also, analyses of variance revealed significant differences ($F = 2.695$, $df = 4, 74$; $p < .04$) among groups responding to Question 104, with those responding highest (bingeing had an extremely negative influence) having the highest mean Total Binge Score (56.80) and those responding "no influence" the lowest mean Total Binge Score (49.41).

Similarly, analyses of variance indicated significant differences ($F = 2.876$, $df = 4, 94$; $p < .03$) among groups responding to Question 104 with respect to Total BNG (summed over Administrations 2, 3 and 4), with those reporting a highly negative influence of bingeing on Question 104 scoring highest (mean = 6.8) and those reporting "no influence" scoring lowest (mean = 5.2).

A second question assessed the importance of learning not to deprive oneself while dieting. Responses correlated positively ($r = .3854$, $p < .002$) with RI at Session 21, indicating that those who learned not to be deprived while dieting lost significantly more weight.

Summary. For Administrations 2, 3 and 4 summed, high restraint-behavior participants, compared to low restraint, scored significantly higher on BNG and T-

DB, but not on T-DEP. The same distinctions were true for high depression, compared to low depression, participants. In other words, participants who were high Restraint-Behavior or high depression reportedly binged more, felt more deprived before dietbreaking, and while dietbreaking, ate foods they had been denying themselves.

Responses to a question assessing the influence of bingeing on weight loss revealed a negative correlation; those who reported more difficulty with bingeing tended to lose less weight.

Also, comparisons between scores for this question and Total Scores on the Binge Questionnaire as well as the Total BNG score indicated consistency among responses: those reporting a highly negative influence of bingeing scored highest and those reporting "no influence" scored lowest.

Finally, results indicated that those participants who learned not to be deprived while dieting tended to lose more weight with respect to RI by Session 21.

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 = .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 hindrance.

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 and Sjostrom, 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: Restraint

Studies of restraint, or the intentional restriction of intake and the behavioral consequences which follow, have indicated that the process of dieting can influence overeating in a paradoxical manner. Through pre-load manipulations, investigators (e.g., Herman and Mack, 1973) have shown that restrained eaters, or chronic dieters, actually ate more after overeating than after eating small amounts of food. Oppositely, unrestrained eaters, or non-dieters, responded by eating very little after large pre-loads and moderate amounts after small pre-loads. In a study of perception of caloric intake, Polivy (1975) demonstrated that the overeating of restrained eaters was cognitively controlled: they overate when they believed that their diets had been broken by a "fattening" pre-load. Further investigations have outlined other factors which negatively influence dieting ability in a similar manner for restrained individuals. These include anxiety (Herman and Polivy, 1975) and depression (Polivy and Herman, 1976).

The initial theoretical rationale for the notion of restraint stemmed from Schacter's externality theory (1971) that eating is controlled primarily by external stimuli for the obese as opposed to internal physiological mechanisms. Herman and Mack (1973) hypothesized that externality may be a consequence of dieting, a

prominant activity of the obese and other restrained eaters. Nisbett's set-point theory was then considered in an attempt to explain the overeating demonstrated in studies of restraint. It was hypothesized that dieting is an active inhibitory response motivated by societal pressures to reduce to a level which is below biological set-point and therefore a deprived state. Since the lower weight may be biologically inappropriate, dieting ability is precarious and easily thwarted by various influences.

The theoretical rationale presented for restraint in the present study was explained also in terms of deprivation. However, the deprivation referred to is psychological, as opposed to physiological in nature. It was hypothesized that restraint originates from feelings of deprivation while dieting. Although this particular theory was not tested directly, an attempt was made to implement weight loss techniques which minimized feelings of deprivation and therefore to determine if restraint can be altered.

- Furthermore, the two distinct components of the Restraint Scale (dieting and weight history, R-H; and concern with dieting and dietbreaking behaviors, R-B) were analyzed separately in order to differentiate the influence of weight fluctuations and past dieting history from current behaviors.

Change in restraint. As predicted in Hypothesis 8, overall Restraint-Behavior scores decreased significantly from Administration One to Two. In other words, over-concern with dieting and dietbreaking (e.g., feeling guilty after overeating; after dietbreaking, continuing on a "binge") reportedly decreased by four months

of dieting. It might be argued that dieting, then, cannot account for restraint, since it decreased for participants who were in a weight reduction program. However, the majority of participants in this program had previous experiences with dieting which included such methods as diet pills, fad diets, and programs like "Weight Watcher's." All of these methods, to some extent, stress deprivation and limitations in food choice. Few, if any of the participants, had attempted to diet with the kinds of techniques involved in the present study. Aside from stressing positive self-control methods, and using an exchange dietary program which included all types of foods, the participants were instructed to eat their "favorite foods" and to be sure to include foods in their diet plan (e.g., ice cream; beer) which they would want to have when they reached their goal weight. Although there is no way to determine if these factors actually accounted for the decrease in Restraint-Behaviors, the present study indicates that these attitudes and behaviors can be altered significantly. Furthermore, it may be the specific type of diet followed as opposed to simply the process of restricting calories which may influence the formation of restraint.

As expected, there was no overall decrease in Restraint-History. This score assesses weight fluctuations and due to the historical nature of some questions (e.g., what is the maximum amount of weight that you have ever lost on a reducing diet?) would not necessarily change over time. While there was a significant overall decrease in Restraint-Total, this result reflects the change in Restraint-Behavior previously discussed.

Correlations with weight loss. In order to analyze the relationship between restraint and weight loss, scores were split at the median and participants were categorized as High or Low Restraint. While participants with High-Restraint-History scores lost significantly more pounds by Session 12 (or four months in treatment), those with Low-Restraint-History scores lost proportionately more weight, as evidenced by a larger Reduction Index. These ambiguous results can be explained by the fact that High-Restraint-History participants had a significantly greater initial Reduction Coefficient and therefore more weight to lose than Low-Restraint-History individuals. Therefore, a greater weight loss would not necessarily be reflected by RI.

No significant differences in weight loss were found between participants scoring high and low with respect to Restraint-Behavior. This finding is somewhat surprising considering the overeating behaviors which are measured by R-B; individuals who scored high on items such as continuing to binge after dietbreaking might be expected to lose less weight than participants who report infrequent overeating behaviors. However, other components of the Restraint-Behavior scale (e.g., feeling guilty after overeating) may in fact be necessary for successful dieting. Item analyses as well as correlations between change in restraint and weight loss will be necessary to understand how these restrained behaviors influence weight reduction. Furthermore, studies of the relationship between restraint and weight maintenance may provide additional insight, since some dieting behaviors which positively influence weight loss may have the opposite affect on weight maintenance. For example, dieters who limit food intake severely during a diet often report a rapid weight gain after ending the diet, when they overeat excessively to "make up for" the deprivation

experienced while dieting.

Analyses for sub-groups. Analyses of initial restraint, overall restraint and change in restraint were also conducted to evaluate differences in Restraint-Behavior and Restraint-History for various sub-groups.

Retrospective comparisons of drop-outs and non-drop-outs lend support to the notion that the decreases in restrained eating behaviors which were emphasized throughout this program may have positively influenced continued participation and weight loss. While drop-outs and non-drop-outs did not differ initially with respect to R-B, at Administration Two, scores for non-drop-outs had decreased significantly while those for drop-outs had remained the same. In other words, scores at Session 12 for participants who later dropped out were significantly higher than those for participants who completed the entire program. Drop-outs had not reported a decrease in overconcern with dieting and dietbreaking behaviors but non-drop-outs had changed significantly. Furthermore, since these drop-outs had lost significantly less weight than non-drop-outs by Session 12, the comparatively greater restrained behaviors for drop-outs may have negatively influenced their performance. However, this explanation is merely conjecture and since there were no differences in weight loss for High and Low Restraint-Behavior participants, analyses of the effect of change in restraint on weight loss will be necessary to interpret these findings accurately.

At the first administration, females scored significantly higher than males with respect to R-T, a finding which is consistent with Hypothesis 6. Over both administrations, this difference was in the same direction, but did not reach

significance. Across other studies of restraint (Herman and Polivy, 1975; Polivy and Herman, 1976; Hibscher, 1978; Polivy, 1978) females have also scored higher than males; however, no evidence has been provided concerning which components of the scale accounted for this elevation. In the present study, there were significant differences in Restraint-Behavior for males and females, but not for Restraint-History. These results indicate that females reported more behaviors which involve overconcern with dieting but did not differ in terms of weight history. This discrepancy may in part be explained by the significant initial differences between men and women with respect to body weight and RC. In the beginning of the present study, men weighed more and were proportionally more overweight than women. Therefore, their responses to some R-H questions (e.g., What is your maximum weight gain in one week) may have been higher than those for females. On the other hand, if females, according to R-B, exhibit more concern with dieting, their responses to other R-H questions (e.g., What is the maximum amount of weight that you have ever lost within one month) may have been higher than those for males. In other words, the two factors measured by R-H questions, weight fluctuations and diet history, may not necessarily correlate closely. Thus, differential responses to these components may have "evened" the scores for males and females.

The fact that women reported a greater overconcern with dieting (and consequently more extreme dietbreaking behaviors) is not surprising given the seemingly greater societal pressure for women to be thin. Evidence suggests that there is also a greater incidence of other eating disorders (e.g., anorexia nervosa) for females as compared to males (Bruch, 1973).

For initial and overall analyses, overweight participants scored significantly higher than non-overweight participants on all three restraint measures. These findings are in direct contrast to results of other studies concerning restraint (Herman and Mack, 1973; Polivy and Herman, 1975) in which restraint scores did not differ significantly in relation to weight. However, in the past, the correlation between restraint and obesity has been reported as positive, though not significantly so (Herman and Mack, 1973). While these authors did report that restraint, rather than obesity, was the best predictor of eating behavior, they also noted the logical expectation that obese individuals, if sampled more extensively, would be found to be more restrained since they have experienced more societal pressure to reduce. In the only other study of restraint involving a large sample of obese participants, Hibscher also reported that there were few obese individuals who rated themselves as unconcerned about their weight and as unrestrained eaters within his possible subject pool. From a physiological theory of restraint, the higher restraint scores for obese individuals could be attributed to a state of biological deprivation due to being below set-point as a result of dieting. In explanations for restraint involving the theories of psychological deprivation, restraint would be seen as a consequence of feelings that the obese person should be continually depriving him/herself due to societal pressures to reduce.

The uniformly low restraint scores reported for normal weight participants is also somewhat contrary to previous findings of a fairly wide range of scores for a normal-weight population. However, in past research, the normal-weight participants were non-dieters and dieters, whereas the normal-weight participants in the

present study were only non-dieters (attending the program with their overweight spouse but not actually dieting). Since unrestrained eaters exhibit little concern about dieting, the non-dieters in the present study would logically score low on the Restraint Scale. Also, these non-overweight participants comprise a specific sub-group, since they are all married to overweight individuals, and this factor may have affected their scores.

One additional difference between overweight and non-overweight participants involved the change in restraint scores from Administration One to Two. While scores for R-B (and thus R-T) decreased for overweight participants, they increased significantly for non-overweight participants. While these non-overweight participants were not dieting (and thus R-H scores did not change as they did for those participants who were dieting for the first time), it seems that their concern about overeating did increase. A possible explanation for this change is that these individuals were made more aware of their eating behaviors as a result of participation in the group meetings and therefore became somewhat more restrained in their behavior.

While there were no significant differences overall for R-H or R-T among treatment groups, R-B, over both administrations, was significantly higher for Individuals Groups as compared to Couples Groups. Since this difference existed at the beginning of the program, it most likely reflected the greater proportion of females in Individuals Groups, since the R-B score for females was significantly higher than for males.

Concerning age of onset of obesity, Restraint-History and Restraint-Total

scores (initially and in overall analyses) were significantly higher for child-onset participants as compared to adult-onset obese. While the scores for child-onset were also greater than those for adolescent-onset, the differences were not significant. The elevation in these scores for child-onset obese indicates that they reported greater fluctuations in weight and diet history. However, as mentioned in the previous discussion of sex differences, these components may be quite distinct and therefore interpretation of the findings requires caution. The fact that there were no significant differences among groups with respect to Restraint-Behavior suggests that age of onset does not influence the development of overconcern with dieting or dietbreaking behaviors.

The findings discussed thus far and the discrepancies between analyses of Restraint-History and Restraint-Behavior for age of onset categories have important implications for the theoretical rationales used to explain restrained eating behavior. Herman (1975) suggests that the overeating of High-Restraint participants in the various studies of restraint relates directly to the set-point theory; dieting ability for individuals who are below set-point and therefore biologically "starved" is disrupted by various manipulations, and the overeating which ensues is an attempt to satiate their undernourished fat cells. If this were the case, then juvenile-onset obese, who have more fat cells (Salans, 1974; Stern and Greenwood, 1974) and are therefore more susceptible to this biological starvation when reducing their weight, would be expected to exhibit a higher degree of restrained behavior as compared to adult-onset obese. To date, there has been no evidence to support this hypothesis and in the present study, child-onset obese did not differ in terms of restrained

eating behaviors reported. Furthermore, the fact that restraint reportedly decreased significantly during this program is opposite to what would be expected if physiological factors, due to a biological "underweight" caused by dieting, accounted for the development of restraint.

The results for comparisons of groups varying according to prior attempts at dieting support Hypothesis 7. All three restraint scores were increased in direct relation to number of prior attempts. That is, participants reporting no prior attempts scored lowest and those with three or more previous experiences with dieting scored highest. Means for R-H were significantly higher for three or more attempts compared to zero or one; means for R-B and R-T were significantly higher for three or more attempts compared to zero, one or two previous dieting experiences. Therefore, participants with three or more previous attempts at dieting seem to represent a distinct category with respect to restraint. Fifty-one of the total 84 participants whose scores were analyzed for these comparisons were reportedly in this category. Similarly, since multi-attempt dieters are common to research projects and obesity clinics, these findings may have important clinical implications.

The elevation in Restraint-History for the more experienced dieters implies that these individuals report greater weight fluctuations (e.g., weekly weight ranges) and reflect their extensive weight change history. The greater Restraint-Behavior scores indicate that these dieters experience more overconcern with dieting (e.g., guilt after overeating) and more extreme dietbreaking behaviors. As Nash (1976) suggests, the effects of failure in previous attempts to reduce may account for the differences noted for this group of dieters. The experience of

failure generally has an overall effect of depressing performance. Furthermore, it is the subjective perception of failure, whether due to failure to reach goal weight or to maintain the loss, which seems critical. In the present study, the individuals with many previous dieting attempts may have perceived themselves as failures and thus exhibited more guilt and more extreme abandon of control after dietbreaking. In other words, they may easily resort to the "what the hell . . . I've already blown it" syndrome.

Results of the present study suggest that the number of past experiences with dieting may be a potent factor in determining eating behavior during future attempts at weight reduction. Other researchers have also concluded that substantial previous dieting experience is one of the most salient indicators for potential adverse emotional reactions to dieting. Neither commercial weight reduction programs nor behavioral methods take into account an individual's dieting history and perceptions of the experience in treatment planning. However, since results of the present study indicate that restrained overeating behaviors can be decreased, multi-attempt dieters, in particular, may benefit from methods which aid in this process.

One additional finding related to prior dieting attempts concerns the change in R-H scores from Administration One to Two. While these scores remained similar across administrations for participants reporting zero to three (or more) previous attempts, there was a significant increase for those with no previous dieting experiences. These findings most likely reflected the fact that by Administration Two, these individuals had completed four months of their "first" diet and therefore

reported a change in their weight fluctuations.

In summary, the results of this study indicated that restrained eating behaviors were more extreme for various groups of individuals including overweight participants, drop-outs, women and multi-attempt dieters. Results also revealed that for participants remaining in the program, Restraint-Behaviors decreased. While there is no conclusive evidence for how this change occurred, the type of diet methods used may have positively influenced these behaviors.

The implications for treatment which derive from this change are quite opposite to those stemming from other studies of restraint. Herman (1975) concluded that high-restraint individuals are in a biologically deprived state as a result of dieting, and therefore weight reduction may be inappropriate and detrimental. These comments resemble those of other investigators (Court and Dunlap, 1957; Grinker, 1973) who recommend dieting for the adult-onset obese, but advise against weight reduction for the juvenile-onset individual because of biological resistance and consequent adverse emotional reactions.

However, there is far from conclusive evidence that adverse emotional or behavioral responses of restrained dieters or child-onset reducers result directly from efforts to achieve set-point. In the present study, child-onset obese lost significantly more weight than adult-onset obese and improved in various self-report measures of psychological states. Furthermore, child-onset obese did not report significantly higher restrained behaviors. The fact that Restraint-History was greater for both early age of onset participants and multi-attempt dieters, but Restraint-Behavior was greater only for the latter group, suggests that restrained eating behaviors

relate more directly to number of previous dieting experiences than to weight history.

Results of the present study suggest that the deleterious effects of reducing may be influenced by the manner in which the weight is lost. If restrained behaviors can be minimized during a weight loss program, then it seems that weight reduction per se may not be the "culprit" but that the process used to reduce may be of ultimate importance.

An alternative explanation for restrained overeating, based on feelings of deprivation, may determine some of the factors related to type of program used which can influence reactions to dieting. This theory gains some support from analyses of bingeing.

Section Three: Bingeing

Bingeing (defined in the present study as overeating excessively with no control) is a behavior which closely resembles the switch-like eating triggered in studies of restraint. A Binge Questionnaire was administered in the present study to provide more information about a behavior which, according to clinical case reports, can greatly affect weight control.

Results of the present study did coincide with these reports in that bingeing correlated negatively with weight loss, a finding which also supported Hypothesis 9. After four months in treatment, participants who reportedly binged more tended to lose significantly less weight in terms of pounds lost (the correlation with RI was negative, though not significant). After one year in treatment, the negative correlations between pounds lost and RI were both significant.

These findings are consistent with observations made by Stunkard (1959), as a result of his clinical work with obese patients who binged. Although he noted that these individuals may only eat a portion of their total calories in this manner, the consistency of the behavior made a significant contribution to the production and maintenance of their obesity. Although the pattern of bingeing behavior, including actual frequency and amount of food consumed, cannot be determined for participants in the present study, results indicated that bingeing may have had a negative influence on weight loss performance.

Based on the theory that bingeing is due, at least in part, to feelings of deprivation while dieting, the Binge Questionnaire was designed to assess feelings of deprivation in general and directly before dietbreaking, as well as denial of favorite foods. Responses to the various components of the questionnaire were compared.

Many positive correlations between components of the "Binge Questionnaire" were significant. As predicted in Hypothesis 10, participants who reported frequent bingeing also reported feeling deprived before dietbreaking. Participants who reported feeling deprived due to dieting in general, denied themselves favorite foods and then ate these foods while dietbreaking. Therefore, feeling deprived due to dieting correlated highly ($r = .70$) with a total dietbreaking score. Similarly, the total score for bingeing, feeling deprived and denying favorite foods correlated highly ($r = .76$) with the total dietbreaking score. Although these results are limited by the nature of correlational findings, evidence suggests a strong relationship between feelings of deprivation and dietbreaking.

As discussed previously, there is little information published, on a clinical or experimental basis, about binge eating. However, the few case studies presented (Stunkard, 1959; Meyer, 1973; Wilson, 1976) have one important commonality: the bingeing pattern is difficult to change with standard procedures for treating obesity. The results of the present study offer one possible explanation for the difficulty reported in successfully decreasing bingeing through traditional weight control methods. Although caloric deprivation is inherent to the process of dieting, feelings of deprivation seem to correlate positively with bingeing, and may be as detrimental as the physiological deprivation experienced. Standard treatment programs, while offering positive self-control techniques, do not typically address the individual's feelings of self-deprivation throughout the process of dieting.

In one report of successful treatment of bingeing, a method was used which focused on the individual's specific experiences of anxiety. In delay therapy (Meyer, 1973), a patient was instructed to call her therapist immediately whenever she felt unable to control the impulse to binge. During the conversation, the patient received support and agreed to call again if she felt unable to control the impulse. Gradually, the delay contract was broadened to include delay strategies such as taking a walk or visiting a friend. After the first month, she reported no more binges, and after three months had lost 29 pounds. Furthermore, seven months after the end of treatment progress had been maintained. While this treatment is discussed in terms of delaying an impulse, the procedures also provided pleasant alternatives to bingeing. While there is no evidence to determine actually why treatment was successful, the delay of impulse may have been sufficient to

interrupt the binge pattern. However, it is equally likely that the positive experiences performed in place of bingeing may have altered feelings of deprivation.

The results of the present study do not necessarily infer a causal relationship between feeling deprived and bingeing. As mentioned previously, no objective information was collected concerning frequency of bingeing or amount of food consumed. Nonetheless, individuals reported that they felt they had binged and these dieters also felt deprived. There is evidence which indicates that cognitions may, in fact, greatly influence eating behavior. In studies of restraint (Polivy, 1976), merely the perception that a dieter had overeaten was enough to initiate a binge. Mahoney and Mahoney (1978) refer to this cycle (overeating because one has overeaten) as cognitive claustrophobia.

In an attempt to distinguish individuals who may potentially be at higher risk for problematic bingeing while dieting, comparisons of a total score for all items on the Binge Questionnaire were made among various sub-groups. The only analyses which revealed significant effects concerned sex differences: females scored significantly higher than males. While participants in Individuals Groups scored significantly higher than those in Couples Groups, this result probably reflected the larger proportion of females to males in the Individuals Groups as compared to the approximately equal number of males and females in Couples Groups. While the higher score for females is consistent with their higher Restraint-Behavior scores, these results should be interpreted with caution since the total binge score takes into account bingeing, feelings of deprivation, denial of favorite foods and diet-breaking behaviors. A detailed analysis of each item would be necessary to

determine which specific factors are actually reported to be higher for females.

Such analyses of responses to individual components of the Binge Questionnaire were conducted in relation to the responses to the Restraint Questionnaire. There were no significant differences for participants with high or low Restraint-History scores. However, high-Restraint-Behavior participants reportedly binged more, felt more deprived before dietbreaking, and while dietbreaking, ate foods they had been denying themselves.

The same results were significant for analyses of depression, with participants who reported a high depression score binging more and feeling more deprived. Although traditionally, practitioners have associated loss of appetite with depression, Polivy (1978) found that high-restraint individuals did, in fact, overeat if they were depressed.

The results which indicated a significant positive relationship between binging and restrained overeating behaviors are not surprising: these behaviors seem to have various factors in common. First, binging is usually reported as a solitary activity (Stunkard, 1959). Similarly, restrained overeaters report "eating sensibly before others and making up for it alone". Also, Polivy and Herman (1976) have indicated that the experimentally induced overeating following large pre-loads is not triggered for restrained eaters when an experimenter is present. Second, expressions of self-condemnation are associated with binging (Stunkard, 1959) and restrained overeating (feeling guilty after overeating). Third, a preoccupation with food and weight is characteristic of the binger (Meyer, 1973; Wilson, 1976) and the restrained individual (do you give too much time and thought to food?).

Finally, the overeating pattern is cyclical and switch-like. In one case reported by Stunkard (1959) an individual often resorted to continuing his binge at restaurants after consuming all of his grocery purchases. Similarly, restrained eaters reportedly continue on an eating splurge after they feel their diet has been broken. Furthermore, the analyses of bingeing in relation to restraint suggest that restrained eating behaviors may also be associated with feelings of deprivation since the high restraint respondents reported feeling more deprived before dietbreaking.

Implications for treatment and future research. From these comparisons, it appears that bingeing and restrained overeating are similar and complex patterns and thus, it is not surprising to find that clinicians report difficulty in treating individuals with these problems. According to the findings of the present study, weight control procedures which help to minimize feelings of deprivation may aid in this process. As Schonitzer and Harmatz (1976) reported, the use of "favorite foods" may be one simple step toward this end. This technique is based on the premise that foods denied during a strict diet acquire a high-drive status; the state of psychological deprivation may increase the desire for foods not allowed. Once an individual begins to attempt to satiate this desire, overeating ensues. Therefore, incorporation of moderate amounts of favorite foods into a diet plan may be a way to dilute the feelings of deprivation. According to their findings, this technique facilitated weight maintenance. Analyses of responses to the Binge Questionnaire in the present study also support this method, since individuals who binged reported denying themselves favorite foods and then eating these foods while dietbreaking.

Other strategies used in the present program included an exchange diet which prescribed foods of all types, techniques which emphasized positive self-control as opposed to denial, and discussions of binge eating and how to handle it without feeling deprived. For example, dieters were instructed to decrease binge eating by gradually reducing the amount of food eaten. In the Stimulus Control Groups, participants were instructed in the principles of shaping behavior; instead of eating ten cookies during a binge, a participant was first advised to try to limit the binge to eight cookies, and then to work gradually toward total control of the binge. In the Affective Control Groups, participants were instructed to use positive self-talk and to control the behavior through the use of statements such as "I choose not to binge at this time".

While these techniques may have helped the dieters to control bingeing, there is no empirical evidence from this study to determine the effectiveness of these various treatment components. Furthermore, the fact that some participants did report bingeing, according to the Binge Questionnaire, suggests that more effective methods for controlling bingeing need to be developed.

As mentioned previously, standard behavioral methods do not seem to be successful in the treatment of bingeing. Commenting on the advantages for individualized treatment plans, Wilson (1976) emphasized the need to go beyond situational control for bingeing. He noted that for his patients the eating pattern between binges differed from what is often assumed to be the "obese style". Individuals did not snack inappropriately and their normal daily intake was not necessarily in excess. For two clients who had participated in standard behavioral programs, these

techniques seemed to aid in controlling eating between binges, but did not significantly alter bingeing behaviors. Bingeing seemed to be related to lack of coping skills, stressful life events, and negative self-concepts. Wilson concluded that treatment of bingeing should focus on interpersonal and cognitive factors which influence overeating, as opposed to change of eating behaviors.

While delay therapy was successful in one case report (Meyer, 1973), as mentioned previously, there was no isolation of the effective components of this treatment approach. The delay itself may have been sufficient to disrupt the bingeing pattern, but the therapist variable or the pleasurable consequences of alternative behaviors may also have been potent facilitative factors.

Although it would be tempting to detail experimental projects for investigation of these possible methods to alter binge eating, these suggestions would be premature. The lack of knowledge concerning this pattern of eating appears even more salient in light of the results of the present study. If, in fact, bingeing does interfere with weight control (and these results require further replication), the next step is to define bingeing and its antecedents more specifically. Do negative feelings other than those of deprivation initiate binges? How frequent are binges? How much food is typically consumed? How does a binge terminate? What does an individual experience following a binge? Polivy (1976) noted that when restrained eaters were bingeing, their estimate of quantities consumed was significantly less than what they had actually eaten. Are bingers' perceptions and cognitions distorted during the process? In the present study, participants who reported comparatively high levels of depression binged significantly more than those who were

not depressed. Is depression a sign of high risk for problems with bingeing? What part do cognitions (e.g., feeling defeated because of losing less weight than expected this week) play in initiating a binge? Stunkard (1959) identified three distinct patterns of binge eating. Further research is also necessary to investigate specific patterns of bingeing and their unique antecedents.

Many parallels have been made between Restraint-Behaviors and bingeing in this discussion, both in empirical results and clinical analyses. Experimental investigations have indicated that restraint or chronic dieting, has significant negative influences on overeating. Bingeing may also be, at times, a reaction to the rigid control which many dieters feel is necessary for weight loss. In future investigations of restraint, bingeing and their interrelationship, both self-report measures could benefit from refinement and expansion. As mentioned previously, the two components of the Restraint Questionnaire are best taken separately. Also, the Restraint-History questions may require separation into diet and weight history assessment and evaluation of present weight fluctuations. Given the differential results related to number of prior dieting attempts, information related to previous dieting attempts (including number of attempts, type of program and assessment of success or failure) may prove to be an essential addition to the questionnaire.

Analyses of the Binge Questionnaire point to numerous items which should be added for future use. These include specific information concerning frequency of bingeing and detailed accounts of amount and type of food consumed, as well as ratings of a variety of feelings and circumstances which seem to initiate the behavior and accompany termination of the binge. There is slight evidence provided

in the present study to support the validity and reliability of this measure through a program evaluation question which assessed the extent to which bingeing had a negative influence on weight loss. Analyses revealed that responses to this item paralleled responses to the Binge Questionnaire. Also, responses to the program evaluation item correlated negatively with weight loss, a finding which is consistent with results from the Binge Questionnaire. However, further controlled studies to test the reliability and validity of this measure as it develops will be essential.

Finally, both the Restraint and Binge Questionnaire could be enhanced by objective data concerning these behaviors. While the self-report information is clearly valuable, it is limited. For example, if an individual's perception of amount of food eaten during a binge is distorted, as suggested by Polivy (1976), then information from the binger and an observer will be necessary to determine how much food is actually consumed during a binge. Since bingeing and restrained overeating typically occur when a dieter is alone, accurate data may be difficult to obtain. However, in further investigations of the effects of participation of significant others on weight loss, a spouse or family member may be able to provide some of this information.

The data provided by these questionnaires with spouse participation may add greatly to the understanding of overeating patterns that can defeat dieting efforts.

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, 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, and initial analyses concerning breakdowns in dieting.

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.

Behavior therapy has focused mostly on helping individuals to diet successfully and to control eating habits. Little attention has been paid to the factors which induce a breakdown in dieting. In the present study, the clinical and theoretical aspects of restrained overeating and bingeing were assessed.

Results indicated that restrained overeating (switch-like eating which appears to be related to overconcern with dieting) was more extreme for females, overweight participants, drop-outs and multi-attempt dieters. However, in overall analyses, these restrained-behaviors decreased by four months in treatment, indicating that overeating patterns can be altered. While no conclusive evidence was presented to explain how this change occurred, it was suggested that the type of diet methods used may have positively influenced these behaviors.

In analyses of bingeing or overeating excessively with no control, it was determined that participants who binged frequently lost significantly less weight. Results also revealed a strong relationship between bingeing and feelings of deprivation and denial of specific foods. Furthermore, results indicated a significant positive relationship between bingeing and restrained overeating.

Clinical reports have demonstrated that traditional behavior therapy has not proven successful in the treatment of bingeing. As mentioned previously, the

initial success of behavior therapy for the treatment of obesity has recently been questioned due to clinically insignificant and short-term weight losses. The fact that binge eating correlated negatively with weight loss in the present study suggests one explanation for the recent lack of progress of behavioral methods; if these techniques do not aid a dieter in controlling binges, then the positive influence of the methods may be negated.

Behavioral approaches are based on the theory that eating for obese individuals is externally controlled. While this theoretical perspective has instigated stimulus control procedures, strict adherence to this model may now be limiting the search for other essential components of a successful treatment program. Recent investigations are challenging the theory of externality. Instead, there is mounting evidence to suggest that cognitions, self-concept, body image, the general ability to cope with stress, and beliefs about therapeutic strategies may be the best predictors of eating behavior.

Researchers have also used a few limited biological concepts to explain the deleterious emotional effects of weight reduction which have been reported. Based on evidence that some individuals have a greater number of fat cells, theorists have assumed that the potential biological deprivation which results from weight loss is responsible for adverse reactions to dieting. Furthermore, some practitioners have interpreted these theories as evidence that weight reduction is contraindicated for these individuals. The evidence, however, is far from conclusive that adverse emotional reactions to dieting result directly from the biological demand to satiate rather than deplete fat cells. Instead, results of the present study suggest that

adverse reactions to dieting may, in part, be due to psychological factors such as feelings of deprivation. Also, results revealed that adverse behaviors decreased and that psychological state improved during weight reduction. Furthermore, results suggest that the manner in which weight is lost may be of ultimate importance in influencing reactions to dieting.

As research proceeds in the area of weight control, it becomes more obvious that obesity is not a single condition with a single etiology. Efforts to explain the entire phenomena with one theoretical approach seem to push recommendations far beyond knowledge. Instead, attempts to isolate distinctive cognitive and behavioral patterns will help to identify all of the possible variables which maintain the problem. From an assessment of an individual's specific problems, therapeutic techniques which are tailored to the client's needs can be implemented. According to the results of the present study, counteracting the negative effects of restraint and feelings of deprivation may be essential components of a weight control program for individuals who are so severely controlled that the rigidity can actually initiate overeating. On the other hand, for individuals who lack the self-control necessary for effective dieting, a goal of treatment may be to increase restraint.

Research which isolates effective treatment components is paramount to the success of treatment for obesity. However, due to the complex nature of the problem, it is becoming increasingly important to avoid broad generalizations derived from valid but limited findings. Furthermore, strict adherence to one primary theoretical framework may slow the progress toward the successful treatment of obesity.

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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 committment, 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?

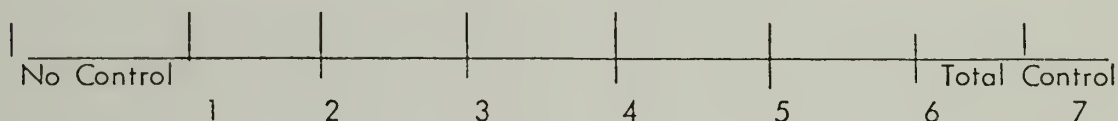
5. How many pounds do you want to lose? _____
What is your ideal weight? _____
6. Why do you want to lose weight (list most important reason first):
 - a. _____
 - b. _____
 - c. _____
 - d. _____

Weight Reduction Program
Questionnaire - Page 2

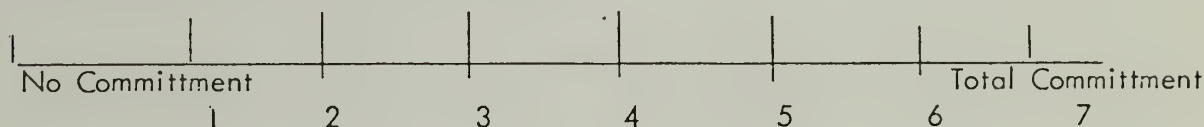
e. _____

(PLEASE PLACE A CHECK ON THE LINE TO MOST CLOSELY APPROXIMATE HOW YOU FEEL)

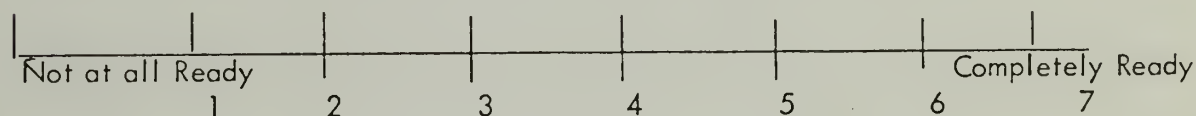
7. How much control do you feel you have in losing weight?



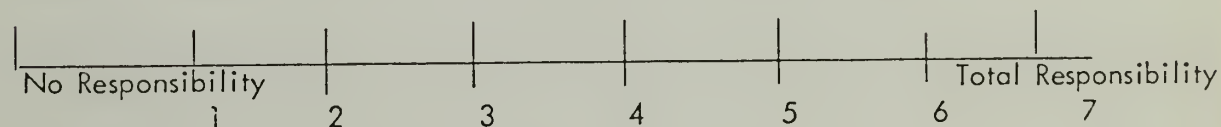
8. How committed are you to losing weight?



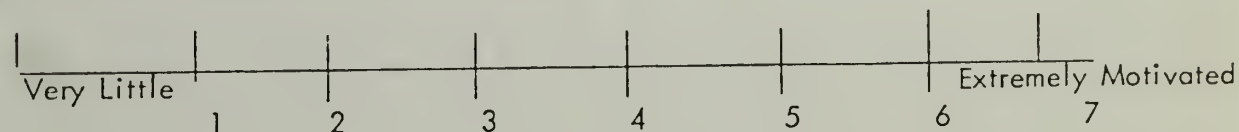
9. How ready are you to participate in this weight reduction program?



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	1	2	3	4	5	6	Very Much 7

B. Male Parent

None	1	2	3	4	5	6	Very Much 7

C. Female Parent

None	1	2	3	4	5	6	Very Much 7

D. Friend

None	1	2	3	4	5	6	Very Much 7

E. Sibling

None	1	2	3	4	5	6	Very Much 7

F. This Weight Control Group

None	1	2	3	4	5	6	Very Much 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 binging					
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

Restraint Questionnaire

Name: _____ Date: _____ Group: _____

1. How many pounds over your desired weight were you at your maximum weight? _____

2. What is the maximum amount of weight that you have ever lost within one month? _____

Why did you lose the weight? (Reducing diet, reasons of health, change of environment, etc.) _____

3. What is your maximum weight gain within one week? _____

4. In a typical week how much does your weight fluctuate (maximum to minimum?) _____

5. Have you ever been on a reducing diet? _____ No _____ Yes

- If yes, answer questions 6 - 15

If no, go to question 16

6. How often are you dieting?

_____ Never _____ Rarely _____ About half the time _____ Usually _____ Always

7 - 9 After eating a "not allowed" food while dieting, how often do you:

7. Continue on a splurge eating other "not allowed" foods?

_____ Never _____ Rarely _____ About half the time _____ Usually _____ Always

8. Stop eating for an extended period of time in order to compensate?

_____ Never _____ Rarely _____ About half the time _____ Usually _____ Always

Restraint Questionnaire - Page 2

9. Return directly to diet?
 _____ Never _____ Rarely _____ About half the time _____ Usually _____ Always
10. How often do you overeat, especially excessive amounts of "fattening foods?"
 _____ Never _____ Rarely _____ About half the time _____ Usually _____ Always
11. Are you dieting now? _____ No _____ Yes
12. Which type of diet do you usually use?
 _____ Cut out desserts and sweets
 _____ Programmed diet (such as Weight Watchers)
 _____ Single food diet (such as protein diet)
 _____ Skip meals, stop eating
 _____ Medication, injections, commercial drugs
13. What is the maximum amount of weight that you have ever lost while on a reducing diet? _____
14. How much would a weight fluctuation of five pounds affect the way you live your life?
 _____ Not at all _____ Slightly _____ Fair amount _____ Much _____ Very much
15. How often do you eat sensibly before others and make up for it alone?
 _____ Never _____ Rarely _____ About half the time _____ Usually _____ Always
16. How often do you give too much time and thought to food?
 _____ Never _____ Rarely _____ About half the time _____ Usually _____ Always
17. How often do you have feelings of guilt after overeating?
 _____ Never _____ Rarely _____ About half the time _____ Usually _____ Always

Restraint Questionnaire - Page 3

18. How conscious are you of what you are eating?

___ Not at all ___ Slightly ___ Fair amount ___ Moderately ___ Extremely

19. How conscious are you of what others eat?

___ Not at all ___ Slightly ___ Fair amount ___ Moderately ___ Extremely

20. Which meals do you eat regularly?

___ Breakfast ___ Lunch ___ Dinner

21. How often do you eat between meals?

Appendix 10

Binge Questionnaire

Name _____ Date _____

1. How do you feel about your eating habits this week?
(1) terrible (2) not so good (3) O.K. (4) pretty good (5) great
2. How often do you feel you overate this week?
(1) not at all (2) once (3) 2-3 times (4) 4-6 times (5) more than 6 times
3. How often do you feel you binged (overate excessively with no control)?
(1) not at all (2) once (3) 2-3 times (4) 4-6 times (5) more than 6 times
4. How deprived (due to dieting) did you feel this week?
(1) not at all (2) slightly (3) fair amount (4) moderately (5) extremely
5. How often did you deny yourself "favorite foods" this week?
(1) never (2) rarely (3) about half the time (4) usually (5) always

If you "broke your diet" this week:

6. How much did you experience feelings of deprivation before diet-breaking?
(1) not at all (2) slightly (3) fair amount (4) much (5) very much
7. While diet-breaking, how often did you eat foods which you have been denying yourself while dieting?
(1) never (2) rarely (3) about half the time (4) usually (5) always

