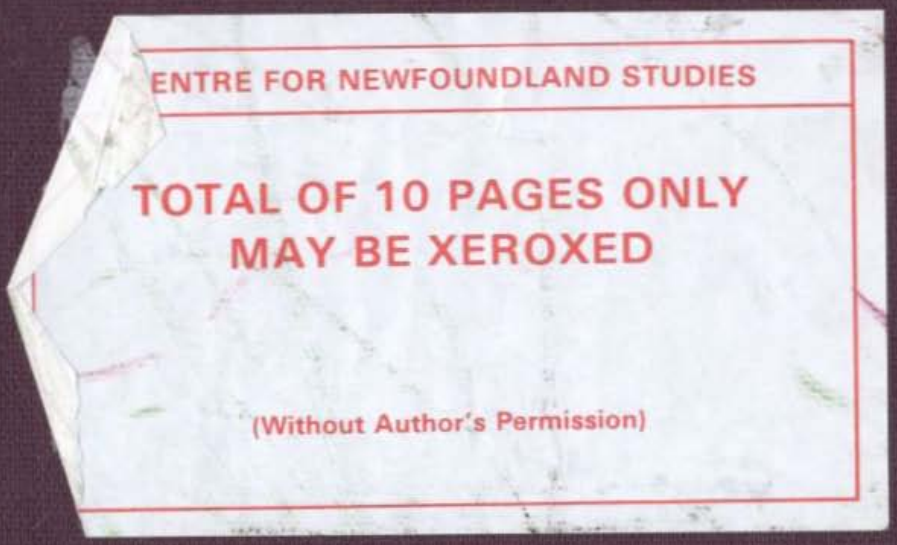
PARENTAL PARTICIPATION IN BEHAVIOR THERAPY FOR ASOLECENT OBESITY



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PARENTAL PARTICIPATION IN BEHAVIOR THERAPY FOR ADOLESCENT OBESITY

by

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A Thesis submitted in partial fulfillment
of the requirements for the degree of
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Abstract

Obesity is a common problem among adolescents. Traditional treatment methods have not produced longterm weight losses. Behavior therapy has been found to produce more easily maintainable weight losses as it requires the client to make permanent changes in weight related behaviors. The inclusion of a parent in many types of therapies has been found to augment treatment results. Recently a behavior therapy parent group has been found to facilitate adolescent weight loss.

The present study was designed to determine whether parent involvement in an adolescent weight loss program through a bibliotherapy format would aid in weight reduction. Twenty-one subjects were recruited through newspaper and radio announcements. All subjects were at least 20% overweight, were not involved in other weight loss programs and had a parent willing to attend weekly meetings. Subjects were randomly assigned to one of the following treatments: behavior therapy with or without bibliotherapy parent involvement or a nutrition control condition. Treatment was conducted over an eight week period. Follow-up assessments were held one and two months posttreatment. The behavior therapy programs followed the standard guidelines and did not give a specific diet list.

The nutrition control group followed Canada's Food Guide.

Repeated measures analyses of variance of pounds lost revealed no significant effects for group membership ($F<1$; df=2/15), time ($F=1.07$; df=3/45), or the interaction ($F<1$; df=6/45). Nor were significant effects found in changes in percent overweight for groups ($F<1$; df=2/15), time ($F=1.35$; df=3/45) or the interaction ($F<1$; df=6/45). Examination of posttreatment group means revealed that the average weight changes of the child alone behavior therapy group and the nutrition control group were highly similar. These groups were combined to form a control group against which the results of the parent group were compared. One-way analyses of variance on percent overweight change revealed significant between group differences at posttreatment ($F=4.56$; df=1/16; $p<.05$) and follow-up II ($F=6.07$; df=1/16; $p<.10$). Group differences aproached significance at follow-up I ($F=4.33$; df=1/15; $p<.10$).

It was concluded that behavioral principles can be effectively conveyed to parents in a bibliotherapy format and that this type of parent involvement facilitates weight loss. The validity of the prediction that a child alone behavior therapy condition would lose more weight than a nonspecific control group was questioned.

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To Dr. David Hart for his consideration and criticism. To Mary Walsh for her assistance in conducting the treatment groups. Also to Liz O'Brien, physiotherapist at the Janeway Child Health Center, for the use of the exercise circuit program she had developed.

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Obesity is a common problem among children and adolescents today. It is estimated that 10-25% of the children in the U.S.A. have an excessive accumulation of fat with their bodyweight exceeding the norm by at least 20% (Abraham and Nordseick, 1960; Abraham, Collins and Nordseick, 1971; Johnson, Burke and Mayer, 1956; Karpoweitz and Zeis, 1975). Forbes (1975) reported an increasing average weight among American adolescents during the past quarter of the century.

Precise epidemiological data are impossible to obtain as definitions of obesity vary. Obesity is usually defined as a certain percentage overweight based on normative data obtained by measuring a sample of a population. The trouble with this method is that the norm for a given population may be one of obesity when compared to a sample from another population. Another problem in the measurement of obesity is that there is no set biological criterion of how much fat constitutes obesity. A further complication is that the terms 'overweight' and 'obese' are often mistakenly interchanged. The term 'obese' is interpreted as overfat yet a person may have an inordinately large lean body mass leading to overweight. Therefore 'overweight' does not necessarily imply 'obesity'. In adolescents the appropriateness of a given weight is difficult to determine since weight varies as a function of age, stature, body

build, sex and socioeconomic status. Norm tables on the weight status of adolescent populations often fail to control for these factors. Regardless of these methodological difficulties, obesity is visibly recognized as an important health problem.

Complications Associated with Obesity

Many adults requesting treatment for obesity for medical reasons are over 40 years old. They manifest such diseases or complications as hypertension, diabetes, gallbladder disorders, myocardial or brain infarction, spondylosis or other deformation of the skeletal system (Simic, 1980). The preventive medicine viewpoint recommends treating obese people during their youth in order to avoid these later maladies. In an illustration of the longevity of obesity Abraham and Nordseick (1960) reported that in adults who had been obese between the ages of 10 and 13, 86% of the males and 80% of the females were still overweight twenty years later. In a comparable sample who, twenty years earlier, had been normal weight children, 42% of the males and 18% of the females were obese. Stunkard and Burt (1967) report that the odds against an overweight child becoming a normal weight adult are 4 to 1 at age twelve and increase to 28 to 1 by the end of adolescence. The task of weight reduction would therefore be more easily accomplished

if tackled before the end of adolescence.

The pressure by society towards leaness as a criterion for social acceptability is but one other reason recommending the early reduction of excess weight. Obesity can have devastating social and emotional consequences (Stimbert and Coffey, 1972; Coates and Thoresen, 1978). For example, it has been shown that obese girls are less likely to be accepted to college when a personal interview is a requirement for admission (Canning and Mayer, 1966). Obesity has been associated with a poor self-concept (Sallade, 1973) and disturbed family interactions (Hammar, Campbell, Campbell et al., 1972). It has also been determined to be a contributor to body-image disparagement in later life (Stunkard and Burt, 1967; Stunkard and Mendelson, 1967).

Conventional Treatments for Obesity

For treatment to be considered successful a client should lose a clinically significant amount of weight and be able to maintain this loss. The treatment should also be cost efficient and without adverse side effects. For further discussion of criteria for success see Wilson (1977).

In summing up the efficacy of non-behavioral treatments for adult obesity, Stunkard (1958) stated that, "Most obese persons will not remain in treatment, of those who do remain in treatment, most will not lose much weight, and of those who do lose weight most will regain it." This conclusion has recently been reaffirmed (e.g., Bierich, 1978; Coates and Thoresen, 1978).

Treatment of obesity in adolescents through conventional means has produced results as disappointing as those found for adults similarly treated, (see Stunkard and McLaren-Hume, 1959). Eighty percent of all children treated by purely dietetic means will remain or soon become fat again (Bierich, 1978).

Dietary approaches have been criticized as ineffective in the long run and therefore an ineffecient use of patient and professional time. Anorectic drugs have been found to be of little use other than for short-term maintenance of weight loss and are dangerous in that they can be addictive or abused. An exercise programme alone is of some value, although weight losses are small and the still obese client tends to discontinue exercising once a structured programme ends. Therapeutic starvation has many deleterious side effects, e.g., electrolytic imbalance, lowering of adrenal function, and as it is most often carried out in a

restricted environment, such as a hospital, the effects are short-lived since the patients return to their old eating style upon release. Another one of the traditional treatments is jejeunoileal bypass surgery. This has been reserved for cases of intractable obesity as it can have many serious, adverse side effects, e.g., severe diarrhea, hypocalcemia, infection. For a more complete review of conventional methods the reader is referred to review articles by Coates and Thoresen (1978) and Bierich (1978).

Behavior Therapy for Obesity

In contrast to the results of traditional treatment those of behavior therapy for adult obesity have been relatively consistent and positive (Stunkard and Mahoney, 1976). Bellack (1977), in his review of adult treatment studies, concludes that programs involving stimulus control and supplemental reinforcement have consistently resulted in clinically significant weight losses which have generally been maintained over short follow-up periods. With adolescents there are only a few studies using behavior therapy, all of which have had promising results. Behavior therapy treatment for obesity in adolescents has been found to be effective (Gross, Wheeler and Hess, 1975; Rivinus, Drummond and Combrinck-Graham, 1976); to be more effective than a no treatment waiting-list control (Aragona, Cassidy

and Drabman, 1975; Kingsley and Shapiro, 1977; Weiss, 1977; Wheeler and Hess, 1976); and to be more effective than nonspecific treatment (Coates and Thoresen, Note 1). A simplified form of behavior therapy has been found to be more effective than a social-nutrition group, which met to discuss weight loss, or a waiting list control group in the treatment of obesity in moderately retarded adolescents (Rotatori and Fox, 1980).

Energy Balance

From the behavioral perspective obesity is viewed as caused by a positive energy balance. Energy intake and expenditure are seen as influenced by events in the immediate environment. These events can be modified to effect a more appropriate energy balance. The accumulation of excess energy can be due to any of the following factors; high intake, low output, or a problem in metabolism. A metabolic problem is detected in less than 1% of all cases of obesity. This explanation is easily eliminated by a thorough physical examination which includes a blood test for thyroid or adrenocortical dysfunction.

Within the energy balance framework, it is not known whether most children accumulate fat due to excess intake of calories or decreased output. Early studies reported that

obese adolescents consumed significantly fewer calories than non-obese peers (Cahn, 1968; Johnson, Burke and Mayer, 1956; Maxfield and Konishi, 1966; Mayer, 1968, 1975; Stefanic, Heald and Mayer, 1959). Some of these same studies also noted that the obese adolescents were less active than their peers (Johnson et al., 1956; Mayer, 1968, 1975; Stefanic et al., 1959). The problem with these reports is that aside from Mayer's (1968) study, using motion picture analysis of actual time in motion while performing specific sports activities, the results of all of these studies were based on self and/or parental reports. In spite of their subjectivity they concluded that inactivity accounted for the obese groups calorie surplus.

Other studies using objective measures, e.g., pedometers and continuous heart rate monitoring, found no difference between the activity level of obese and non-obese subjects (Bradfield, Paulos and Grossman, 1971; Maxfield and Konishi, 1966; Stunkard and Pestka, 1962; Wilkinson, Parklin, Pearloom et al., 1977). A recent study (Waxman and Stunkard, 1980) made use of intensive observation of four obese boys and non-obese controls by impartial observers. At school non-obese classmates served as controls. At home a brother less than two years apart in age was the control. It was found that the obese boys expended as much energy at home and more energy outside the home. The obese boys took

in significantly more calories than their non-obese controls at lunch and suppertime. Bruch (1940), in a study using subjective measures, also reported that obese adolescents ate more than non-obese peers.

More objective data must be collected before a decision can be made about which of the sides of the energy equation, intake or output or both, to focus on in the treatment of adolescent obesity. To date the data from studies using objective measures do not provide support for the claim made by some researchers that obese children are less active that their peers. As yet there has been only one adequately objective study of relative food intake. Waxman and Stunkard (1980) reported that obese children ate more than matched controls. The previously cited studies using either self or parental report indicated that obese children consumed fewer calories. The results of these other studies cannot be used as evidence in the decision of whether intake or output is responsible for the onset of obesity as there were no validity checks done on the reports.

In the literature there have been reports supporting both increased intake and decreased output of energy as causing obesity. As yet there is no proof that either is to blame. The only truly objective study (Waxman and Stunkard, 1980) found higher calorie intake for their obese subjects.

Regardless of causation both decreasing intake and increasing output would lead to weight loss. The extent to which either should be focused on in therapy depends on the individual client's habits at that point in time.

Behavior Therapy Methods

In the treatment of obesity advising a client simply to eat less and exercise more is not sufficient. Obese people may have well established bad habits which are stronger than their good intentions to change. Behavior therapy endeavours to effect changes in energy intake and output through modification of the stimuli controlling these acts. In the first practical application of behavior modification to the treatment of obesity Stuart (1967) modified the functional analysis approach to overeating proposed by Ferster, Nurnberger and Levitt (1962). He successfully treated eight obese subjects with his self-control programme. All other behavioral treatment packages proposed since then have been based on the same underlying premise. The premise is that a change in maladaptive eating behaviors will lead to weight loss and that these behaviors can be changed through contingency management.

The first step taken in a behavioral weight reduction program is to monitor and record all eating and exercise

behaviors, their antecedents and consequences. The self-monitoring record of food intake, called a food diary, provides individualized data which the therapist can use to identify: the inappropriate stimuli which cue eating; the topography of the eating response itself; and the positive or negative reinforcers which maintain the eating habits. In therapy, changes are introduced gradually: to reduce the cues which trigger eating, called stimulus control; to change the act of eating; and to modify the consequences of eating. Alternatives to eating are identified and reinforcement of these behaviors by the clients themselves and by others is programmed.

Ginsburg and Mayer (1977) suggest that an exercise diary can be used in much the same way. Behaviors which facilitate exercising and reinforcers for these behaviors are identified. This information is used to set up a contingency management program to increase exercise by decreasing the saliency of the cues and reinforcers for not exercising and increasing those cues and reinforcers which promote it.

Parental Participation in Treatment

As long ago as 1894, Witmer used significant adults in a child's environment to implement a variety of remediation

programs. It is not clear if he trained parents to work with their own children. It is known that parents have been used as psychoanalytic agents. For example, in 1909, Freud enlisted the help of "Little Hans'" father in his treatment. Since that time other psychoanalysts have used parents as active therapeutic agents in the home (e.g., Rangell, 1952; Ruben and Thomas, 1947). Parents have been actively involved in the treatment of their children by client-centered counseling approaches (e.g., Fuchs, 1957; Pechey, 1955). Family therapy also involves parents in the treatment process, (e.g., Levine, 1964; Minuchin, 1965). It can be seen that adherents to various therapeutic models have long been aware of the value of parental participation in therapy. With the re-emergence of behavior therapy in the early 1960s (Graziano, 1975) much more research has occurred in this area.

Graziano (1977) states that utilizing parents may be the single most important development in the child therapy field. In a 1972 review, Berkowitz and Graziano concluded that parent training approaches have been applied in considerable variety to virtually all child behavior problems. Graziano (1977) lists the following childhood problems where the training of parents in a variety of behavior modification techniques have been successfully used in treatment: asthma; seizures; self-injurious behavior;

wearing dental braces; eneuresis; encopresis; complex syndromes such as autism, childhood schizophrenia; excessive crying; aggressive behavior; hyperactivity; manipulative behavior; juvenile delinquency; school phobias; speech training. This same reviewer, in 1977, remarked that there had been as yet little research in the area of childhood obesity, despite the apparent appropriateness of parental training. In 1974 O'Dell concluded "There does not appear to be any class of overt child behavior that parents cannot be trained to modify" (p. 421).

There is no well-defined age at which a child becomes an adolescent. A parent may have less influence over an older child (adolescent) who is learning to assert independence but it is true that even with teenagers parents still maintain a great amount of control over the child's environment. Therefore, when treating adolescents it would seem to be important to take into consideration that they may have less control over the stimuli in their environment than an adult does. They may be limited in the extent to which they can control the cues for eating, e.g., they usually do not buy groceries, cook or serve their own meals. Patterson et al. (1967) suggest that for the effects of any social engineering programme to generalize and persist, the members of the child's social environment need to be taught

proper reinforcement schedules. Children can be greatly influenced by the reinforcement received from their parents. These observations suggest that it may be important to include the parents in any weight-related behavior change programme, especially the parent in charge of food acquisition and preparation.

To date the few studies done with obese children and adolescents have all made note of the extent of parental cooperation. Rivinus et al. (1976) in their uncontrolled study of a mother and child treatment group achieved a decrease in the percent overweight in all of their pre-teen subjects, aged 8 to 13. They state that active family involvement particularly of mothers may be an important factor for success. In another uncontrolled study, Gross et al. (1976) report obtaining the best results for those of their 13 to 17 years old subjects who had strong family cooperation.

Using more objective data Mahoney and Mahoney (1976) also found a positive correlation (.92 at 10 weeks , .63 at 2 years) between weight loss and social support. Their social support score was based on family attendance at group meetings, as well as reports of encouragement and cooperation and was an average of the independent ratings of four therapists. Aragona et al. (1975) worked with the

parents of 5-11 years old children using either response cost or response cost plus reinforcement with a weight loss criterion. They found both of these conditions of equal utility and better than a waiting list control. Coates and Thoresen (Note 1) also trained the parents of their two teenage female subjects in behavior modification principles as part of their behavioral treatment package and achieved results better than for a non-specific treatment subject with equally intensive family involvement. Rotatori and Fox (1980) used the parents of their moderately retarded adolescents as lay therapists. They achieved better results for their behavior therapy group than for a social nutrition group which also had parental participation.

There have been two studies done which directly assess the role of parents in treatment. Kingsley and Shapiro (1977) using 10 and 11 years old children achieved equally good results for their child alone, mother-and-child together and mother alone groups. All lost more weight than the waiting list controls. There was a tendency for the mother and child group to have regained less weight at a 20 week follow-up. Weight losses in all groups were small, an average of 3.5 pounds in 8 weeks.

Kelman, Brownell and Stunkard (Note 2) conducted a 16 week study with three treatment groups; child alone (C),

mother and child together (MC), and mother and child separately (M-C). Their subjects, ages 12 to 15, averaged 178.5 pounds in weight. They found that members of the M-C group lost significantly more weight (an average of 20.5 +/- 4.9 pounds) than the members of the C alone group (6.9 +/- 2.8 pounds). The MC group was not significantly different from either one (13.9 +/- 5.6 pounds). The authors note that the weight losses were greater in their study than in the Kingsley and Shapiro study and that this would allow the effects of parental participation to be discerned.

The results of Kelman et al. (Note 2) cannot be taken as definitive proof of the utility of training parents separately from children, as these results were achieved in only this one study. The losses in their mother-child separately group, an average of 20.5 lbs. in 16 weeks, are indeed clinically as well as statistically significant.

For an adult population, Stuart and Davis (1972) stress that it is a myth that a weight loser can achieve his goals alone, "he controls neither the etiology nor the maintenance of his obesity ... to ask for help in harnessing the forces of social influence in the service of weight control is in the essence of practicality" (p.202).

The research done with an adult population to examine

the role of training a spouse or significant other in behavior modification techniques has had positive results. Brownell, Heckerman, Westlake, Hayes and Monti (1978) trained spouses with better results for this group than an untrained but cooperative group even at 6 months follow-up. Saccone and Israel (1978) and Israel and Saccone (1979) found that using a significant other to reinforce eating behavior change was more effective than no involvement and that the difference persisted at twelve month follow-up. Mahoney and Mahoney (1978) found a positive correlation between degree of family support and successful weight management. Fremouw and Zitter (1980) and Pearce, LeBow and Orchard (Note 3) also found that spouse involvement enhanced weight loss. The only researchers which have not found support for including a family member failed to ensure family participation, i.e., no assignments were required of them (Wilson and Brownell, 1978).

To date studies done using behavior therapy with adolescents have had statistically but seldom clinically significant results. A longstanding trend in the treatment of childhood problems has been the inclusion of a parent. Recent research, with an adolescent population suggests that parental participation augments behavior therapy for obesity but this has been directly tested in only two studies (Kelman et al., Note 2; Kingsley and Shapiro, 1977).

Weight losses in the parent-child alone group of Kelman et al.'s (Note 2) study were greater than in most others, an average of 1.3 pounds per week compared to an average loss of .56 pounds per week for other researchers. The adult literature suggests that the inclusion of a significant other in the treatment of obesity is an important factor.

These empirical results along with the theoretical support for external control as strengthening the capacity for self-control (Kanfer and Karoly, 1972) suggest that the role of parental involvement in the treatment of adolescent obesity should be to enhance weight loss.

Bibliotherapy versus Group Treatment

In bibliotherapy components of a treatment program are transmitted to a client in a written format. If it were to be found that parents could be taught behavior modification principles from written material then treatment time could be significantly reduced. Therapy would then be available to parents who are unable to attend sessions. The literature suggests that bibliotherapy may be an effective way to communicate the information necessary to implement a weight control program for an adult.

In support of this suggestion it has been found that in

the treatment of obese adults bibliotherapy can be as effective as in-person group treatment (Dilley, Balch and Balch, 1979; Ferstl, Jokusch and Brengleman, 1975; Hagen, 1974; Hanson, Borden, Hall and Hall, 1976). Dilley et al. (1979) obtained equivalent results, at both posttreatment and follow-up, for two bibliotherapy groups and a group treated by a trained therapist in a group meeting format. Members of the bibliotherapy groups were weighed by and picked up their assignments from either an untrained undergraduate or a trained therapist. Both of these bibliotherapy groups received feedback by way of comments written on their completed assignments by a trained therapist.

Hagen (1974) used four groups: bibliotherapy by mail, bibliotherapy plus in-person group instruction, group instruction alone and a wait list control. For the three treatment groups he obtained weight loss results which did not differ from one another at posttest and a four week follow-up. All treatment groups lost significantly more weight than the controls. The only difference among the treatment groups was that the subjects rated the bibliotherapy alone as less helpful. In this study contact with the bibliotherapy by mail group occurred on only three occasions: at pretreatment, posttreatment and follow-up.

Hanson et al. (1976) found a low contact bibliotherapy group which met only three times to be as effective as a high contact bibliotherapy group which met ten times. Both these conditions were as effective in producing weight loss as an in-person group instruction condition. The three treatment groups lost more weight than no treatment or placebo controls.

Brownell, Heckerman and Westlake (1978) found conflicting results. In their study there was a difference between a face-to face treatment group which met weekly for ten weeks then monthly for six months and a bibliotherapy treatment group which received the same treatment manual and met six times to be weighed. These between group differences disappeared at a six month followup.

Fernan's (Note 4) study clarifies the discrepancy between Brownell et al's (1978) results and those of the other researchers. He found that there was no difference between the results of previous studies using in-person treatment and his bibliotherapy group which involved a moderate level of personal contact. There was a difference in weight loss between group contact and bibliotherapy conditions when the only form of communication in bibliotherapy was the comments written on the assignments returned to the clients. This true bibliotherapy consisting

of written communication contact only was less effective than bibliotherapy with opportunity to contact the therapist. These results suggest that there is a small but highly significant amount of personal contact found in bibliotherapy studies which have results equivalent to face-to-face treament (Stunkard and Brownell, 1979).

Overall the results of the bibliotherapy studies reviewed indicate that adults are capable of learning the information necessary to be able to implement their own behavioral weight loss programs. The parents of obese adolescents may benefit just as much, in terms of knowledge gained about behavior therapy and ability to facilitate their children's programs, from written instructions and assignments as they would from group instruction. Bibliotherapy works as well as in-group treatment with adult subjects when they are given the option of being able to contact a therapist when they desire to do so. If proven successful, bibliotherapy would be more cost-efficient and more widely applicable. Children with cooperative parents unable to attend meetings would be able to benefit from parental education.

The Present Study

As mentioned earlier it is well known that obesity is a

common problem among adolescents today. "It has been found that the chances of successful weight reduction are higher at the beginning than at the end of adolesence. The medical, social and emotional consequences of being obese are also less severe at the start of adolesence. This suggests that weight reduction should be easier to accomplish and more beneficial, from a preventative viewpoint, if it is undertaken early in adolesence.

There are many different methods of weight reduction which have been used with adolesents. Each of them has their own problems but one common to all is the lack of longterm maintenance of weight loss. Behavior therapy is a relatively new treatment for obesity. It requires clients to practice new behaviors in order to change their old habits and therefore programs a weight loss maintenance strategy from the very first treatment session. It has been found to be successful with adolescents but often the weight loss results are more significant to the researcher than to the client.

Adult behavior therapy weight loss programs have been improved by including a significant other who works with the client in the home. It seems particularly important for adolescents to have this type of co-operation because they are very unlikely to have control over food related

activities in the home. Lacking control could cause some trouble when trying to implement behavior changes in a behavior therapy program. It is therefore suggested that a parent should be involved in the program. Parents have been found to be assets in other types of therapy and recently in behavior therapy for adolescent obesity. The purpose of the present study is to determine the effect of including a parent in the behavioral treatment of obesity.

When considering the role parents should play in their child's weight loss program it is useful to consider the results of including significant others in adult programs. The type and degree of involvement of significant others in adult programs suggests that for their involvement to be effective it must be ensured. This can be done by requiring some type of concrete proof, e.g., written records. The only researcher who failed to find significant results for a group which included a significant other was also the only researcher who failed to require his significant others to do any assignments. It therefore seems necessary to ensure that the parents are participating in the program. This could be done by requiring them to attend weekly meetings and submit assignments or to read bibliotherapy materials and submit written assignments.

Adults have been successful in implementing their own

weight management programs based on information conveyed by bibliotherapy. It is suggested that they could be successful in implementing programs for their children by using bibliotherapy materials. Weekly written assignments would ensure that they had read and understood the material for the week. The use of written assignments is preferred because it does not impose time constraints on parents and it does not require them to travel to meetings. If the program is successful it could be used with families with a busy time schedule or without ready transportation.

The choice of what to include in the program is based on the packaged programs and the time period available. All behavior therapy programs for obesity focus on changing the cues which cause inappropriate eating, modifying the act of eating itself and programming reinforcement of appropriate eating habits plus increasing physical activity levels. Some programs also prescribe specific diet guidelines. There is only one comprehensive manual written specifically for an adolescent population with a companion manual for parents, the one by Kelman et al. (Note 5). This manual describes a sixteen week program which involves specific diet guidelines. The present study is of an eight week program with the aim of being able to have it administered during the fall and spring terms of school, between examination periods. This shorter program focuses on more

general behavioral principles. Some of this information is taken from Ferguson's (1975) "Learning to Eat" manual with the main portion coming from Kelman's manuals.

In the evaluation of the effectiveness of treatment of obesity a waiting-list control group is not adequate. Members of a waiting-list control group may not try to lose weight and in fact may actually gain weight since they know that they will have to change their eating habits in the near future. In order to be able to assess the effectiveness of a behavior therapy program without parent involvement it is necessary to have an equally credible treatment group to control for non-specific factors. A nutrition-exercise group can meet this requirement.Both nutrition counselling and exercising have been found to be useful but not sufficient components of weight reduction programs (Stunkard and Mahoney, 1976). It is thought that this type of treatment will be found to be as credible as the behavior therapy treatment.

The measure of success in the study is weight change. It is therefore necessary to have some idea of how much the weight of each group member would change due to normal growth in adolesence. For this reason growth charts (in Collipp, 1980) will be used and the weight changes of all subjects will be interpreted taking these changes into

consideration. Each client's ideal weight will change with the passage of time, so that if the participants merely maintain their pretreatment weights there will be reductions in their percent overweight. Percent overweight expresses weight change among subjects in a directly comparable fashion. Change in percent overweight is therefore the measure of interest in this age group where subjects would normally be expected to gain different amounts of weight because of normal growth.

To test the equality of the three treatments in expectancy for improvement a credibility assessment will be done in the last treatment session. Items will be taken from the Client Rating Questionnaire (Paul, 1966) to assess therapist characteristics. Satisfaction with the program will be determined by willingness to choose to do the program if given the chance to decide again and to recommend it to an overweight friend. The expectation of how much weight should have been lost if all program components were adhered to will also be assessed.

It is predicted that the parent involvement group will lose more weight than the child alone behavior therapy group and that the child alone behavior therapy group will lose more weight than the nutrition control group.

METHOD

Subjects

Subjects between the ages of 11-16 were solicited by newspaper advertisements and radio announcements. The advertisement requested that subjects be between the ages of 12 and 15, at least 20% overweight, and have a parent willing to attend weekly meetings (see Appendix A). All subjects were required to not be enrolled in any other weight reduction programs or have any medical contraindications to losing weight. The small response to the program necessitated relaxing the age selection criteria so as to include both 11 and 16 years old children.

Subjects were given a basic outline of the program over the phone. If they expressed an interest in the program and professed to meet the requirements in the advertisement, they were assigned an interview time. All subjects were required to attend this screening interview where the program was explained to them. They were asked to deposit $20 to be used to reinforce homework completion and attendance and to purchase necessary supplies. Both the parent and the teenager's willingness to attend weekly meetings was ascertained. Parents also had to be willing to alternatively read weekly handouts and do homework

assignments or to be in a group where parents were not actively involved. The teenagers were informed of the requirement of keeping a food diary and questioned about their willingness to complete it. They were also required to state at least two positive reasons for wanting to lose weight. The client, parents and group leader signed a contract committing themselves to changing weight related behaviors (see Appendix B). Medical clearance forms (Appendix C), a weight history form (Appendix D) and a one week supply of food diary forms (Appendix E) were supplied along with instructions for their use. These were to be returned at the first group session. All clients were weighed and had their height measured at this time.

After all interviews were completed clients were randomly assigned to either one of the two behavior therapy treatment groups or to the nutrition control group. Initially there were seven clients in each group. Group composition were as follows: seven girls, ranging in age from 13-16 years old, in the parent involvement group; five girls and two boys, 12-16 years old, in the child alone behavior therapy group; six girls and one boy, aged 11-15, in the control group.

Apparatus

Detecto-Medical balance beam scales were used to weigh clients. Lange skinfold calipers and Harpenden skinfold calipers were used to measure triceps skinfold thicknesses. Exercise performance test measures were made using a hand held stopwatch.

Procedure

Triceps skinfold measurements were taken at the first and last treatment session. At the first and every subsequent group session clients were weighed, had their homework and food diaries checked and money refunded before the start of the days lesson. After the topic for the week had been presented there was a 20 minute exercise period. All meetings lasted approximately one and one quarter hours. Clients were supplied with new food diary forms weekly and completed diaries were collected.

Week One

For all students at the first meeting the weight questionnaire, medical release forms and food diaries were collected. Exercise circuits were established (Appendix F) and exercise diaries distributed (See Appendix G). Problems

associated with the completion of any forms were resolved. Clients were given a Food Management Quiz (Appendix H) to complete.

In addition to filling out the quiz and establishing an exercise circuit the nutrition control group was asked to name the four food-groups and some items contained in each of them.

The parent bibliotherapy group received a handout on exercise circuits. A Food Management Quiz (Appendix I) was sent to them with instructions to complete it before reading the other materials. Parents were instructed to read the introductory materials on: behavior change, an explanation of the rationale of the behavioral approach to weight control, a program description, a brief description of the behavioral model, how to shape new eating patterns, and the effects of modeling. They were given an outline of the material covered in class. Four homework questions were assigned. Every week the assignments were sent home to the parent with their child. Assignments were to returned the following week with their child.

Week Two

At the second session teenagers were informed of their

ideal weight. Weight graphs with a charted weight loss goal of one pound per week were distributed. This was the first of three weeks focusing on cue elimination. The location of eating was discussed and clients were given the homework assignment of eating only in their designated eating place. Other homework included changing their regular seat at the table, eating at the same time each day and doing nothing else while eating.

The nutrition control group received further information on the four food groups and instruction on how to fill out a food diary which rated adherence to Canada Food Guide guidelines (Appendix J). They also received a simplified exercise diary (Appendix K).

Parents were asked to examine their child's handout on their ideal weight. Parents received a handout covering the following topics: awareness of their child's eating patterns, internal versus external signals to eat, and teenager's new behaviors for week two. Parents were asked to eat only at one place and at the same time each day. They were also assigned four homework questions.

Week Three

All groups saw a movie, "The Real Talking Singing

Action Movie About Nutrition". For the behavior therapy groups week three dealt with cue elimination. Clients were taught how to make the act of eating a conscious one by requiring them to only eat food they have asked for. They were also shown how to make a small quantity of food look larger by using a smaller plate and utensils. In order to reduce the number of cues to eat they were instructed to remove serving dishes from the table, to leave the table immediately after eating, and to store food out of sight.

The nutrition control group completed a quiz on myths about dieting and discussed their answers. They were given a summary of what answers were correct.

Parents were asked to assist their child in locating a small plate and utensils and to set the smaller utensils in their child's place. Parents were given a handout covering the following topics: your child's weight control program and your attitude, the ABC's of behavior, and teenagers new behaviors for week three. Parents were given the assignment of modeling leaving the table as soon as they finished eating, not offering food to their teenager, removing serving dishes from the table, and storing food out of sight. Five homework questions were also assigned.

Week Four

In the behavior therapy groups week four focused again on cue elimination. Teenagers were instructed to set some food aside to be thrown away at each meal, to divide their meal into two portions and eat only what they need, and to minimize contact with food.

The nutrition control group received information on what to choose for a snack and saw a movie entitled "Snacking: Garbage in Your Gut".

During week four the parent handout covered the following topics: your teenager's rate of progress, a review of the previous weeks material, and teenager's new behaviors for week four. Parents were assigned the tasks of: setting some food aside, clearing food directly into the garbage when a meal is over, and not asking their child to dispense food. Five homework questions were assigned.

Week Five

For students in the behavior therapy groups week five was concerned with snacking. Clients were taught how to choose snacks wisely. A "Vest Pocket Calorie Counter" booklet was given to each participant. Homework involved

applying all the techniques learned previously to snacking, e.g., putting down the food between bites, etc., as well as, the new behaviors of preceding a snack with a glass of water, checking the calorie content of a snack and planning ahead of time what you will eat for a snack.

The nutrition control group received a handout on tips on eating out and preparing food. They were encouraged to come up with some new ways of handling these situations. Exercise circuits were upgraded for all groups.

Parents received a handout on snacking and the teenagers new behaviors for week five. The necessity of having nutritious, low-calorie snacks was outlined. Parents were asked: to model snacking in their designated eating place; to help their teenager select low-calorie, high bulk food to be eaten as the first part of a snack or meal; not to buy food that requires little preparation; and to eliminate liquids usually consumed with the main meal. Four homework questions were also assigned.

Week Six

All students received a lecture on exercise and energy expenditure. Suggestions for increasing both programmed and routine exercise were given. Students then saw the movie,

"You and Your Food", which emphasized the importance of exercise, as well as reviewing the basic food groups.

Parents received a handout covering the importance of exercise, routine exercise, programmed exercise, and teenagers' new behaviors for week six. Parents were given four homework questions.

Week Seven

For behavior therapy students week seven involved an explanation of behavior chains, how they are formed and can be broken. A behavior chain is a step-by-step breakdown of the activities and feelings which lead to a specific action, in this case unnecessary eating. Clients constructed their own behavior chain and list of alternate activities. Teenagers were asked to rearrange their schedules so that they would be engaged in other activities during the times when inappropriate eating occurred, to avoid feelings that lead to eating, to delay eating 10 to 15 minutes and to carry no change and little cash when away from home. Homework involved listing situations where they applied this strategy. Behavior therapy students received the same information previously given to the nutrition control group on eating out and preparing meals, but less time was spent on reviewing the handouts. They also completed a dieting

and nutrition quiz based on myths about dieting in Brownell (Note 6) (see Appendix L).

The nutrition control group completed another quiz on myths about dieting and nutrition. A discussion of which answers were correct and why followed. A handout giving reasons for the correct answer was distributed.

Parents received a handout covering developing incompatible behaviors, helping your child feel good about him or herself, goal-setting, and teenager's new behaviors for week seven. The concept of breaking a behavior chain by performing an alternate activity was explained. Homework involved helping their child list activities that could be used to break a chain, planning their day around times when their child will be hungry, and helping their teenager avoid feelings that prompt hunger. Four homework questions and an eating habits questionnaire were assigned.

Week Eight

For all students this week, the final week, focused on maintenance. Maintenance checklists were given to the behavior therapy students. All teenagers were requested to fill out program evaluations and take an eating habits quiz. The final exercise assessment was held and prizes were

awarded for exercise improvement and weight loss. Students were reminded about the follow-up weigh-in to be held in four weeks time.

In the parent bibliotherapy group members received a handout explaining the importance of practicing the new habits established during the program. Parents were encouraged to contact the group leaders at any time in the future if they had any questions concerning the program that they were continuing with their child. They were also reminded of the fact that the teenagers would be returning in one month's time for the first of their two posttreatment weigh-ins.

Follow-ups

Four weeks after treatment ended all students were weighed and had their heights measured. Behavior therapy students were given a course review to read and were questioned about their use of the behavioral techniques it listed. Nutrition control subjects were given a second copy of the Canada Food Guide. At the second follow-up, eight weeks after treatment ended, heights and weights were measured. The students were asked about future plans for weight control and any questions about the course were answered.

RESULTS

Attrition

There were no dropouts in the child alone behavior therapy condition. Two subjects dropped out of the parent involvement group, both within the first three weeks of treatment. One subject in the nutrition control group attended the interview and paid the deposit but failed to show up for the treatment program. Data from these three dropouts are not included in any calculations. After attrition there were seven subjects in the child alone behavior therapy condition, five subjects in the parent involvement group, and six subjects in the nutrition control group.

Pretreatment Characteristics

Pretreatment group characteristics appear in Table I. Percent overweight expresses present weight as a function of present ideal weight. Ideal weights were determined at a given time period for each subject by referring to modified Baldwin-Wood norm tables (in Collipp, 1980). These tables, which give the average weight of an adolescent given their age, sex and height, compare favourably with growth chart norms for Ontario school children (Stenneth and Cram, 1969).

A client's percent overweight is calculated by dividing the difference between the present and ideal weights by the ideal weight and multiplying this total by 100 (Romanczyk et al., 1973). The severity of the weight problems of these clients is illustrated by the average number of pounds over ideal, 45.8. This is a clinically significant amount for a group of adolescents who average 14 years old. The mean percent overweight of 41.7 gives a better representation of how severe a problem is caused by this excess poundage. One-way analyses of variance revealed no significant differences between groups on the measures of pounds overweight ($F<1; df=2/15$) or percent overweight ($F<1; df=2/15$).

Treatment Results

Mean changes in weight and percent overweight are summarized for all groups in Table 2 for the posttreatment, one month and two month follow-ups. Repeated measures analyses of variance of weight change and percent overweight change revealed no significant effects for group membership time or the interaction (see Table 3).

Visual inspection of Figure 1 reveals that there was little difference between the child alone and the control group in percent overweight change. Additional one-way

analyses of variance were performed on the posttreatment, follow-up I and follow-up II data to test the hypothesis that there is a difference between the parent group and the other two groups on the measure of percent overweight change. In these analyses, results from the child alone group were combined with the control group. The small number of subjects in each group made this manipulation statistically wise as the degrees of freedom were greatly increased. Significant treatment effects were observed at post-treatment ($F=4.56$; $df=1/16$; $p<.05$) and follow-up II ($F=6.07$; $df=1/16$; $p<.05$). Results approached significance at follow-up I ($F=4.33$; $df=1/15$; $p<.10$) (see Appendix M).

Tables 4, 5 and 6 present individual data for group members. High interindividual variablity necessitates such a report (Wilson, 1977). The treatment with the best average results may not benefit the greatest number of subjects. One comparison that other researchers (e.g.,Penick, Filion, Fox, and Stunkard, 1971) have used is the group differences in gainers and losers. A higher criterion than simple loss seems to be appropriate, so a criterion of 5% was set to classify our subjects as losers. Inspection of this data reveals that 4/5 members of the parent group decreased their percent overweight by 5%. Only 2/7 members of the child alone group and 2/6 members of the control group achieved losses of this magnitude.

Credibility

One-way analyses of variance were performed on credibility measures. There were no between group differences on a measure of weight loss expected of a participant who adhered to all guidelines, and measures of experimenter competency and likeability (see Table 7).

Table 1

Pretreatment Group Characteristics

	Alone (N=7)			Parent (N=5)			Control (N=6)		
	Mean	(S.D.)	Range	Mean	(S.D.)	Range	Mean	(S.D.)	Range
Age	14.0	(1.5)	12-16	14.2	(1.3)	13-16	13.7	(1.5)	11-15
Pounds Overweight	46.6	(20.1)	19.7-76.6	43.5	(16.4)	33.6-72.5	47.3	(27.3)	27.3-102.5
Weight	153.2	(28.9)	112.8-190.8	157.3	(20.1)	135.0-189.3	157.0	(34.0)	129.3-223.0
Percent Overweight	43.9	(17.9)	20.0-67.1	38.1	(13.6)	29.6-62.0	43.1	(21.3)	23.7-84.3

Table 2

Mean Changes in Weight and Percent Overweight for Groups

Group	N	Posttreatment		Follow-up I		Follow-up II	
		Weight (lbs.)	Percent Overweight	Weight (lbs.)	Percent Overweight	Weight (lbs.)	Percent Overweight
Alone	7	-0.61±5.06	-2.67±3.98	0.04±5.61	-2.96±4.26	1.14±4.49	-2.90±2.65
Parent	5	-5.40±4.77	-7.02±3.61	-4.60±7.39	-7.16±5.42	-4.90±10.66	-8.24±7.23
Control	6	0.04±4.48	-2.27±4.75	1.35±4.95	-1.28±3.85	2.21±4.89	-1.78±4.56

Table 3

Analyses of Variance on Repeated Measures Over Time for Groups

WEIGHT CHANGE (LBS.)

Source	SS	df	MS	F	
Group	15.178	2	7.589	0.186	ns
Subjects	61179.5	15	40.786		
Time	777.404	3	259.135	1.068	ns
Group X Time	1359.79	6	226.632	0.934	ns
Time X Subjects	10916.0	45	242.577		

PERCENT OVERWEIGHT CHANGE

Source	SS	df	Ms	F	
Group	1042.21	2	521.103	0.364	ns
Subjects	21449.9	15	1430.00		
Time	101.794	3	33.931	1.354	ns
Group X Time	139.785	6	23.297	0.929	ns
Time X Subjects	1128.08	45	25.068		

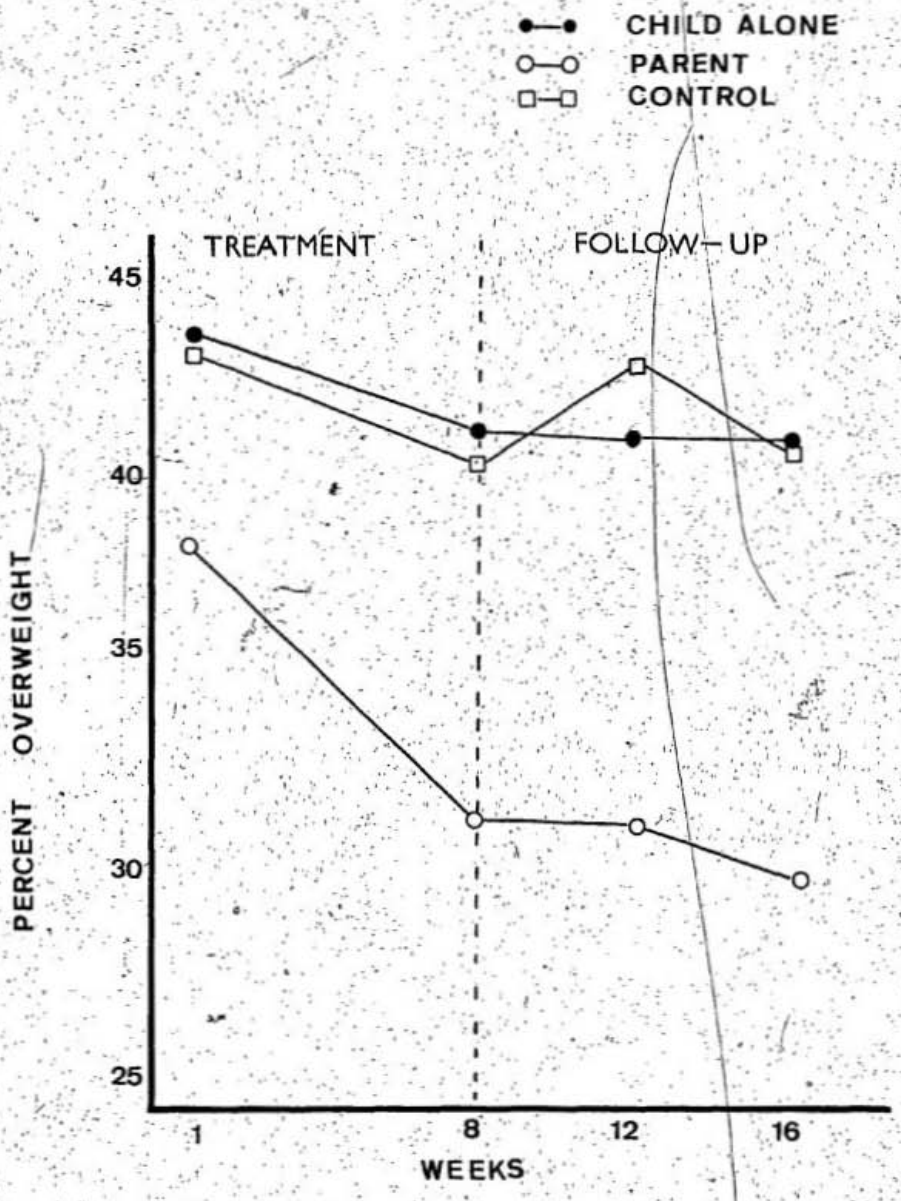

Figure 1. Mean Change in Percent Overweight for Groups

Table 4

Individual Data for Alone Group

S	Age	Sex	PRETREATMENT Weight	Overweight lbs.	Overweight %	CHANGE Weight (lbs.) Post	FI	FII	% Overweight Post	FI	FII
1	13	M	176.50	70.9	67.1	2.75	3.75	5.75	-0.5	-1.1	-0.7
2	16	F	190.75	76.6	67.0	-9.50	-9.25	-8.00	-9.0	-9.0	-8.2
3	16	F	154.50	42.1	37.5	+1.00	2.00	0.50	-2.4	0	-1.5
4	14	F	117.75	19.7	20.0	-2.25	-2.75	2.50	-6.0	-7.4	-3.0
5	13	F	153.50	40.4	35.7	6.75	7.75	3.75	3.3	2.8	-1.9
6	14	F	166.50	39.8	31.4	-2.25	-3.50	0	-3.2	-4.9	-4.2
7	12	M	112.75	36.5	47.8	1.25	2.25	3.50	-1.1	-1.1	-0.8

Table 5

Individual Data for Parent Group

S	Age	Sex	PRETREATMENT Weight	Overweight lbs.	Overweight %	CHANGE Weight (lbs.) Post	FI	FII	% Overweight Post	FI	FII
1	13	F	189.25	72.5	62.0	-1.75	0	5.25	-7.0	-2.7	1.7
2	14	F	156.00	36.1	30.1	-1.00	-1.75	-3.25	-2.3	-3.8	-5.7
3	13	F	135.00	34.5	34.3	-6.00	-2.00	-1.00	-8.7	-6.2	-6.6
4	16	F	147.75	33.6	29.4	-13.00	-17.75	-23.00	-11.9	-16.3	-21.0
5	15	F	158.25	41.0	34.9	-5.25	-1.50	-2.50	-5.2	-2.5	-3.8

Table 6

Individual Data for Control Group

S	Age	Sex	PRETREATMENT Weight	Overweight lbs.	Overweight %	CHANGE Weight (lbs.) Post	FI	FII	% Overweight Post	FI	FII
1	15	F	148.25	38.7	35.3	-4.25	-5.25	-2.75	-4.7	-6.1	-4.3
2	13	M	129.25	33.8	35.3	-3.00		0.75	-7.8		-6.5
3	14	F	144.25	27.3	23.3	1.25	4.75	3.50	4.7	1.7	-0.3
4	15	F	223.00	102.0	84.3	2.00	-1.50	-2.00	0.5	-2.9	-3.0
5	11	F	137.00	40.2	41.5	-3.50	1.50	3.00	-6.2	-2.6	-2.2
6	14	F	160.25	41.5	34.9	1.75	7.25	10.75	-0.1	3.5	6.5

Table 7

Analyses of Variance on Credibility Measures for Groups

EXPECTED WEIGHT LOSS (LBS.)

Source	SS	df	MS	F	
Group	25.508	2	12.754	0.317	ns
Subjects	603.562	15	40.238		

GROUP LEADERS' LIKEABILITY

Source	SS	df	MS	F	
Group	0.087	2	0.044	0.764	ns
Subjects	0.857	15	0.057		

GROUP LEADERS' COMPETENCE

Source	SS	df	MS	F	
Group	0.367	2	0.183	1.289	ns
Subjects	2.133	15	0.142		

DISCUSSION

The present findings provide partial support for the hypothesis that the parent involvement group would lose more weight than both other groups. The hypothesis that the child alone behavior therapy group would lose more than the nutrition control group is not supported. These results are consistent with those of Kelman et al. (Note 2) where subjects in a mother and child separately treatment condition lost significantly more weight than those in a child alone condition.

The results are not in accordance with those studies of adolescents which found greater weight losses for a child alone behavior therapy group than for a control condition (e.g., Aragona et al., 1975; Coates and Thoresen, Note 1; Kingsley and Shapiro, 1977; Weiss, 1977; Wheeler and Hess, 1976). It should be noted that the control groups in all of these studies except Coates and Thoresen's were of a no-treatment waiting list variety. It has been suggested that people who know that they will be "going on a diet" may tend to overindulge during the waiting period. This may have been the case for the above-mentioned studies as it can be seen that there was an average weight gain for control groups. For example, in Weiss' (1977) control group there was an average gain of 4.2 lbs. in 12 weeks. Kingsley and

Shapiro's control group gained an average of 1.9 lbs. in 8 weeks. These weight gains by the control groups members are high even when one considers the fact that adolescence is a period of growth. According to Falkner's (1962) physical growth standards for North American children, Weiss' subjects should only have gained an average of 2 pounds in 12 weeks and Kingsley and Shapiro's subjects 1.3 pounds in 8 weeks. These above average weight gains by control subjects would increase the statistical significance of small losses by members of the treatment groups.

It is difficult to compare the results of the present study with those of Wheeler and Hess (1976) or Aragona et al. (1975) due to the difference in the ages of the subjects. Both groups of experimenters worked with a younger age range. A different problem arises when trying to compare the results of the present study with those of Coates and Thoresen (Note 1). Their non-behavioral control condition consisted of only one subject. Although she was in the age range of the present study and received similar treatment her weight change cannot be used as a standard. High interindividual variability in response to any weight loss program limits the generalizability of Coates and Thoresen's single subject design experiment.

Through the use of a treated control group the present

study possessed the advantage of controlling for nonspecific treatment effects. The weight changes of these subjects are therefore a better standard against which to compare the results of a child alone behavior therapy condition. As was mentioned, to date only Coates and Thoresen have utilized such a control when demonstrating the effectiveness of behavior therapy in the treatment of adolescent obesity. Wilson (1977) in his review of methodological problems in obesity research states "the most basic control group is the no-treatment condition...It is no longer a necessary control in a between group study, and it is definitely not sufficient...Nonspecific treatment control groups are necessary if causal relationships between specific therapeutic techniques and weight loss are to be demonstrated."

A problem often encountered in using a nonspecific treatment control is that of unequal credibility of treatment conditions (Borkovec and Nau, 1972; Kazdin and Wilcoxon, 1976). A credibility assessment was performed in the final treatment session. An assessment done at the end of a program can be affected by the degree of success in treatment. The fact that there was no difference in weight loss between the child alone and control group suggests that any differences in credibility ratings between these groups would be due solely to the clients' evaluations of the

program components. Also, if success in the program had affected the ratings one would predict that the parent involvement group would have rated their treatment more highly.

There were no differences among the three groups on measures of credibility. All clients said that if they had to decide all over again, they would take the course. They also unanimously agreed that they would recommend the course to an overweight friend. There were no between group differences in perceptions of how much weight would be lost by a person who had adhered to all requirements. Nor were there between group differences in the ratings of how likeable and competent the group leaders were.

In light of the finding of equal credibility of treatments it is surmised that the finding of no significant weight change for the child alone and control conditions is due simply to the ineffectiveness of both types of treatments in producing weight losses. Past experience of members of Memorial University's psychology department in using behavior therapy for obesity with Newfoundland teenagers supports this conclusion. The teenage weight control program run jointly with staff members at the local children's hospital has not in the past obtained significant weight losses. This program, while achieving its weight

maintenance, social and educational goals, may have produced weight losses had teenagers been better able to implement at home the behavior therapy principles learned in class. The results of the present study suggest this is true.

Close examination of the literature in the area of teenage obesity reveals a consistent major design flaw in these studies: an inadequate control group. It can therefore be questioned whether the significant weight loss results obtained are due to behavior therapy or methodological inadequacy. On this basis it can also be asked if the prediction of greater weight losses for the child alone behavior therapy group was justified.

The bibliotherapy parent group change in percent overweight at both posttreatment and follow-up II was significantly greater than the change for the other two groups. It can be concluded that presentation of information in a bibliotherapy format is an effective way to convey behavioral principles to parents and that this type of parent involvement facilitates weight loss during treatment and maintenance throughout a relatively short, two-month follow-up period. Kelman et al. (Note 2) obtained similar results during treatment for an in-person parent involvement group. When comparing the results of their 16 week program with those of this 8 week program it can be

noted that their parent and child separate treatment group achieved a greater average weight loss per week, 1.28 lbs. versus .75 lbs. This greater loss suggests that either an in-person format or a longer treatment period may produce better result. Further research varying the length of treatment and type of parental involvement would clarify this question.

The between group difference merely approached significance at follow-up I. The high variability of response to treatment combined with the small number of subjects in the study made difficult the achievement of statistically significant between groups differences. Kingsley and Shapiro (1977) encountered similar difficulty in establishing the effect of including a parent in their behavior therapy for adolescent obesity. Although the variability of all three groups was much the same, inspection of the individual data reveals that the results for the parent group were consistently positive. In the other groups variability was due to both weight losses and gains.

The problem of a small number of subjects deserves further consideration. As was mentioned before obesity is a problem for between 10-25% of American adolescents. There is no reason to suspect that Newfoundland has a smaller

percentage. The question that arises is why was there such a poor response to the program. There may have been a problem in informing potential clients or a lack of interest on the part of obese teenagers. To inform teenagers about the program a newspaper advertisement was run for seven days in the local afternoon daily paper, public service announcements were made for several days on three radio stations and junior high and high school guidance counsellors were informed about the program over the telephone. The program was well advertised. This suggests that perhaps obese teenagers may not be concerned with their physical condition or, if concerned, not sure of what benefit a structured program would be. Future research into teenagers' attitudes about obesity and weight loss programs would help to determine why there was such a small response.

Another problem encountered in the study was that of inadequate norms. Several researchers have suggested that measuring subcutaneous fat provides the best measure of obesity (e.g., Franzini and Grimes, 1976; Seltzer and Mayer, 1965). There were no skinfold norms for total fat composition available for people under 16 years old. The establishment of skinfold norms, which give a measure of 'overfat' as opposed to 'overweight', would be a useful research endeavor. Norms are available which indicate the minimum triceps skinfold measure indicating obesity (in

Collipp, 1980). Triceps skinfold measures were taken at pretreatment to ensure that all clients were 'overfat'. Due to a mix-up in time scheduling the borrowed calipers used in taking the pretreatment measurements were not available at posttreatment. Posttreatment triceps skinfold measurements were taken with a different type of calipers. The variablity in skinfolds over time was too great to be due to change in fat deposits. It is suggested that an experimenter practice with a specific pair of calipers before assuming that they can be used reliably.

The next best norms to use to determine obesity would have been local weight norms. Newfoundland weight norms would have enabled teenagers to compare their weight with the average weight of their peers. This would have facilitated more realistic goal setting and self-evaluation. Again the difficulty was encountered that Newfoundland norms were not available. The weight tables used, revised Baldwin-Wood, were compared with the growth charts used by Newfoundland dieticians (e.g., Stenneth and Cram, 1969) The weight for height values for the 25th, 50th and 75th percentiles of the growth chart compared favourably with the values located for these heights in the weight tables. The growth charts themselves could not be used because values not on a percentile line could not be precisely determined. The variability caused by guessing at a value could have

altered a subjects ideal weight by as much as 10 pounds. Following these considerations it was decided that the Baldwin-Wood weight norm tables were adequate and the best available for our use.

The last difficulty encountered in the carrying out of the research was that of attrition. Of the three clients who dropped out of the study only one had attended more than one session. One client attended the assessment interview and paid the deposit but never attended any sessions because she had no transportation and would not take the bus alone. One of the other drop-outs attended one session but failed to return for any others after getting on the wrong bus the second week. The third client who dropped out did so due to lack of interest in losing weight. This third client, who was the only one to attend more than once, was in the parent involvement group. Her mother did not return her homework assignments so it is thought that there was little cooperation or encouragement from home. The drop-out rate of 14% is not very high in relation to the average rate for obesity programs of 20-80% (Stunkard, 1972).

It is thought that the deposit of $20, refundable weekly for attendance and homework completion, functioned as an incentive for members to attend since the absenteeism rate was low. An overall total of 19 out of a possible 540

or 3.5% of the meetings were missed. All of these absences but one were for medical reasons. This supports the finding of past programs that a deposit reduces attrition (Hagen et al., 1976; Jeffery et al., 1978).

The payment that clients received for homework completion may have helped to produce the high degree of compliance to the written course requirements. Only two of the final 18 participants failed to return all of the required assignments. One of these assignments was a quiz sent home to the parent and the other was a pretreatment questionnaire which the client at first said she had filled out and later said she had lost. There was no objective way to assess the clients compliance with the requirements for behavior change. Self-report record sheets were given out weekly. These were invariably returned with endorsement made of all assigned behavior changes.

In conclusion, the hypothesis that the child alone behavior therapy group would lose more weight than the nutrition control group was not supported. Based on consideration of methodological flaws in the studies on which this prediction was based it may not have been justified. The hypothesis that the parent involvement group would lose more weight than both of the other groups was supported at posttreatment and the second follow-up.

Results merely approached significance at the first follow-up, possibly due to the small sample size. The main problems encountered in conducting this study were the lack of appropriate skinfold norms and the small number of teenagers who wanted to participate.

Reference Notes

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APPENDIXES

Appendix A

ATTENTION OVERWEIGHT TEENAGERS

A teenage fitness/weight control program will be offered under the supervision of members of the M.U.N. Psychology Department.

If you

- are between 12 - 15 years of age
- are 20% overweight or more
- have a parent willing to attend weekly meetings

Then call 737-7671 for further information.

Appendix B
Teenage Fitness / Weight Reduction Contract

The teenage fitness program will focus on establishing new habits that lead to weight loss and ultimately to the maintenance of a desired weight. Information about how to change eating and exercise habits will be presented weekly to a small group of teenagers. In order to establish new habits and break old ones, new behaviors must be practiced daily.

To ensure the success of my participation in this program I, _____, agree to:

1. Keep a food and exercise diary so I can pinpoint the habits I need to change.
2. Use the information conveyed in weekly meetings to outline plans for changing my eating and exercise habits and do my best to stick to these plans.
3. Attend weekly meetings and participate in class discussions and exercises.

I, _____, parent of the above-named teenager, promise to assist him/her in his/her effort to change habits. I agree to:

1. Deposit $20 which will be refunded to my son/daughter for attendance and completion of homework assignments.
2. Read over the food diary with my son/daughter weekly to check for habits that are contributing to his/her weight management problem
3. Encourage physical exercise by _____ with my son/daughter as often as possible.
4. Try to remove temptations to eat from my child's surroundings.
5. Attend weekly meetings or complete assignments as required.

I, _____, agree to:

1. Present a weight reduction program which, according to the recent reserach, is most likely to bring about weight management.

2. Examine each teenager's food diary weekly and help him/her formulate plans for changing habits.

3. Be available for telephone consultation at 737-8048.

Date _____

_____ _____

Parent's signature Teenager's signature

_____

Group Leader's signature

Appendix C
Physician Permission Form

Memorial University of Newfoundland
Psychology Department

Teenage Fitness / Weight Reduction Clinic

_____ is planning to participate in the Psychology department's behavior therapy program for gradual and controlled weight reduction. I have examined this teenager and have / have not found him / her in sufficiently good health at this time to participate in such a program.

Comments: _____

_____

_____

_____

Doctor's signature

_____

Date

Appendix D

Weight History Questionnaire

Name _____ Sex ___ Age ___ Birthdate _____

Address _____ Telephone _____

Weight History

1. Your present weight _____ Height _____
2. Describe your present weight. (circle one)

   very overweight slightly overweight average
3. Are you dissatisfied with the way you look at this weight?

   satisfied completely some neutral some dissatisfied very
4. At what weight have you felt your best or do you think you would feel your best? _____
5. How much weight would you like to lose? _____
6. Do you feel your weight affects your daily activities?

   no some often extreme
7. Why do you want to lose weight at this time? _____

   _____
8. Have there been times in the past when you have been overweight? If so, explain. _____

   _____
9. What do you do for physical exercise and how often do you do it?

   Activity (e.g., swimming) Frequency (daily, weekly..)

   _____

   _____

   _____

   _____
10. Have you ever tried to lose weight before? If so, how? Were these methods effective? _____

    _____

    _____

11. What usually goes wrong with your weight loss programs?

Medical History

12. When did you last have a complete physical examination?

13. Who is your current doctor?

14. What medical problems do you have at the present time?

15. What medications or drugs do you take regularly?

16. List any medications, drugs or foods you are allergic to:

17. List any hospitalizations or operations. Indicate how old you were at each hospital admission.

age reason for admission

18. List any serious illnesses you have had which have not required hospitalization. Indicate how old you were during each illness.

age illness

19. Describe any of your medical problems that are complicated by excess weight.

20. List any psychiatric contact, individual counseling, that you have had or are now having.

age _____ reason for contact and type of therapy

_____

_____

Social History

21. Circle the last year of school attended:

1 2 3 4 5 6 7 8 9 10 11
grade school high school

other _____

22. Describe your father's weight while you were growing up.

overweight underweight
very slightly average slightly very

23. Describe your mother's weight while you were growing up.

overweight underweight
very slightly average slightly very

24. List your brothers' and sisters' ages, sex, present weights, heights, and circle whether they are overweight, average or underweight.

age sex weight height overweight underweight

_____ very slightly average slightly very

_____ very slightly average slightly very

_____ very slightly average slightly very

25. Please add any additional information you feel may be relevant to your weight problem. This includes interactions with your family and firends that might sabotage a weight loss program, and additional family or social history that you feel might help us understand your weight problem.

_____

_____

_____

_____

_____

Appendix E

FOOD DIARY Week ____ Day of the Week _____ Name _____

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

M/S: Meal or Snack H: Degree of Hunger (0=none, 3=maximum)

Appendix F
Exercise Circuit Program

These exercises will help you use up calories, as well as tighten up various muscles (e.g., arms, stomach, back, hips and legs).

To Count: Each return to the starting position counts as one.

1. Stride Jumps

Start by standing with arms at sides, and feet together (Figure 1 A). Jump up and land with arms sidewards to shoulder height and feet apart (Figure 1 B). Jump again and return to starting position.

Figure 1 A

Figure 1 B

2. Push-ups.

Start by lying on your stomach with hands directly under shoulders and legs straight (Figure 2 A). Keep hands and knees in contact with the floor but push body off the floor until arms are straight. Keep body straight as well (Figure 2 B). Slowly lower body to starting position by bending elbows. Progress to pushing up with just hands and toes in contact with the floor (Figure 2 C).

Figure 2 A

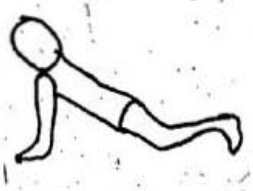

Figure 2 B

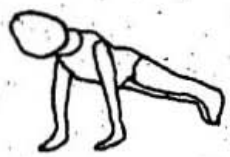

Figure 2 C

3. Step-ups.

Start by standing facing a step (Figure 3 A). Step up onto the step with both feet (Figure 3 B) then step down again.

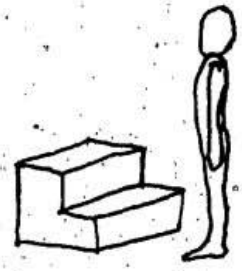

Figure 3 A

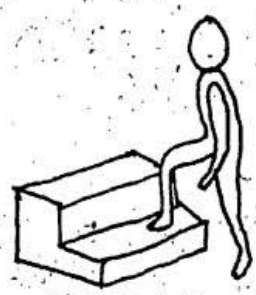

Figure 3 B

4. Sit-ups.

Start by lying on your back with knees bent and arms over head (Figure 4 A). Raise arms forward lifting head and shoulders up until chest is touching knees (Figure 4 B). Slowly lower yourself to starting position. Progress to doing sit-ups with hands tucked behd head (Figure 4 C).

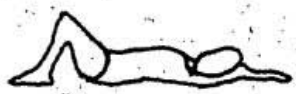

Figure 4 A

Figure 4 B

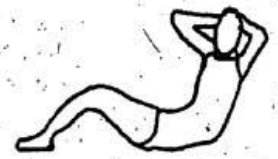

Figure 4 C

5. Burpees.

Start by standing with arms at sides and feet together (Figure 5 A). Squat down until hands are touching floor (Figure 5 B). Kick legs out behind you until arms and legs are straight (Figure 5 C). Return to squatting position (Figure 5 B). then stand up.

Figure 5 A

Figure 5 B

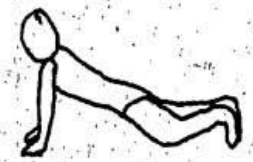

Figure 5 C

6. Side jumps.

Place a piece of tape about two feet long on the floor. Start by standing on the right side of the tape. Keep feet together and hop to the left side of the tape then back again.

These six exercises can be done in what is called a "circuit" which is based on individual exercise tolerance. This is the best way to use up calories. Please read these instructions completely before beginning the circuit program.

Testing for number of repetitions:

1. First do as many repetitions of each exercise as you can within the time limit set in Table I. It is important to do each exercise properly and completely and to do them at your own pace.

2. Record the number of repetitions you did for each exercise in Table I.

3. After testing each exercise wait at least two minutes before testing another exercise so that you are rested and can do as many repetitions as you are capable of.

4. Divide the number of repetitions in half and record in Talbe I. This is the number of repetitions you do when you put the exercises together to form a circuit.

Table I.

	Test and Exercise Time	Maximum Repetitions	1/2 Maximum Repetitions
Stride Jumps	30 sec		
Push-ups	30 sec		
Step-ups	60 sec		
Sit-ups	60 sec		
Burpees	60 sec		
Side Jumps	30 sec		

Circuit Program

1. Complete each exercise within the same time limit as was used for the test doing 1/2 as many repetitions as was done in the test. Note that they can therefore be done slower.

2. Do not rest between each exercise.

3. Complete the entire exercise regime three times. This should take approximately 13 1/2 minutes.

4. When this program becomes easy progress by doing more repetitions per exercise or by doing each exercise faster so that the entire regime may be repeated four times within 13 1/2 minutes.

Appendix G

EXERCISE DIARY Week _____ Name _____

Day	Exercise	Time (in minutes)	When morn	aft	eve	Where	With Who	Class Exercises yes	no

Appendix H
Teenager Food Management Questionnaire

Directions: Write the letter (a), (b) or (c) to indicate the answer that most represents your food habits.

I. PREPARING FOOD

1. (a) Do others usually prepare your food, or (b) do you usually prepare your own food? _____.

2. Do you (or others) usually prepare (a) high-calorie meals or (b) low-calorie meals? _____.

3. Do you (or others) usually prepare (a) quantities of food for more than one helping per person or (b) quantities sufficient for only one helping? _____.

II. SERVING FOOD

1. (a) Do others usually serve your food, or (b) do you usually serve your own food? _____.

2. Do you usually serve (a) more than you need, or (b) a moderate portion? _____.

3. Do you usually serve yourself (a) second portions or (b) only one portion? _____.

4. Usually (a) are bowls or food containers on the table or (b) left in the kitchen? _____.

III. EATING

1. Do you put (a) a large or (b) a small quantity of food on your spoon or fork? _____.

2. Do you chew your food (a) rapidly or (b) slowly? _____.

3. Do you usually (a) put more food into your mouth before you have finished swallowing or (b) wait until you have swallowed all the food in your mouth before you take another bite? _____.

4. Do you (a) eat so fast you don't have time to enjoy the flavour of your food or (b) do you eat slowly enough to enjoy it thoroughly? _____.

5. Do you (a) eat all the food in front of you or (b) stop eating when you're full, even though there's food on your plate? _____.

III. CLEANING-UP

1. After eating do you (a) sit around or (b) leave the table? _____.

2. After finishing the main dish do you (a) leave the leftovers on the table or (b) clear the table before having dessert? _____.

IV. SNACKING

1. Do you snack (a) frequently (more than two times daily) or (b) occasionally (less than twice a day)? _____.

2. Do you snack (a) large quantities of food (e.g., a sandwich and a piece of cake) or (b) small quantities of food? _____.

3. Do you snack mostly on (a) high-calorie foods (e.g., cookies) or (b) low-calorie foods (e.g., apples, celery and carrots)? _____.

Appendix I
Food Management Questionnaire

Directions: Write the letter (a), (b) or (c) to indicate the answer that most represents your food habits.

I. BUYING FOOD

1. Do you usually go to the grocery store (a) without a written food list, (b) with some ideas in your head about what to buy (but no list), (c) with a written food list? _____.

2. Do you usually buy (a) whatever meets your fancy in the aisles and on the shelves, (b) more than you originally had on your list, (c) from your food list only? _____.

3. Do you usually shop (a) when you are hungry, (b) whenever you need to, (c) when you are not hungry? _____.

4. Do you usually purchase (a) more than you need of most foods, (b) excess quantities of some foods, (c) only moderate quantities of food? _____.

5. Do you buy mostly (a) high-calorie foods, (b) a combination of high-and low-calorie foods, or (c) low-calorie nutritious foods? _____.

II. STORING FOOD

1. Do you usually store food in (a) transparent accessible containers in the refrigerator, (b) whatever is handy, or (c) in opaque (non-see-through) difficult-to-reach containers in the refrigerator? _____.

2. Do you usually store food in (transparent, easy-to-reach containers in the cupboards, (b) whatever is handy, or (c) in opaque difficult-to-reach containers in the cupboards? _____.

3. Do you (a) usually have food available on the kitchen countertop, in the living room, or in the TV room, (b) sometimes have food available on the kitchen countertop, in the living room, or in the TV room, or (c) almost never leave food on the kitchen countertop, in the living room, or in the TV room? _____.

III. PREPARING FOOD

1. (a) Do you usually prepare your child's food, or (b) does he/she usually prepare his/her own? _____.

2. Which are usually prepared (a) high-calorie meals or (b) low-calorie meals? _____.

3. Do you (or your child) usually prepare (a) quantities of food for more than one helping per person or (b) quantities sufficient for only one helping? _____.

IV. SERVING FOOD

1.(a) Do you usually serve your child's food, or (b) does he/she usually serve him/herself? _____.

2. How much is usually served (a) more than is needed, or (b) a moderate portion? _____.

3. Do you usually serve (a) second portions or (b) only one portion? _____.

4. Are (a) food containers usually on the table or (b) left in the kitchen? _____.

Appendix J

FOOD DIARY Week_____ Day of the Week _____ Name _____

Foods Eaten	Amount	Milk	Meat	Fruit/Vegetables	Bread/Cereals	Fats	Extras
6 am - 11 am							
11 am - 4 pm							
4 pm - 9 pm							
9 pm+							
Your Diet Total							
Canada's Food Guide Recommends							

Appendix K

EXERCISE DIARY WEEK _____ NAME _____

	Class Exercises (yes or no)	Other Exercises (amount and type)
Friday		
Saturday		
Sunday		
Monday		
Tuesday		
Wednesday		
Thursday		

Appendix L
Dieting and Nutrition Quiz

T or F 1. Food should not be eaten just before bedtime because the body will not burn the calories.

T or F 2. Since my parents are fat it is in my genes -- I can not lose.

T or F 3. It is harmful to lose weight then gain it back.

T or F 4. Skipping meals helps to lose weight.

T or F 5. If I stay on a diet I will not lose weight every week.

T or F 6. By eating less, my stomach will shrink.

T or F 7. Fat people are not gluttons.

T or F 8. Hormones are usually useless in helping dieters to lose weight.

T or F 9. Cellulite and fat are the same thing.

T or F 10. The Atkins diet, the Stillman diet and the Scarsdale diet are safe and effective.

T or F 11. Fasting is the quickest way to lose weight.

T or F 12. Large doses of Vitamin C will prevent colds.

T or F 13. Excess weight is not due to excess water, so water pills are not helpful.

T or F 14. Potatoes are fattenin.

T or F 15. Butter is less fattening than margarine.

T or F 16. Dieters should watch out for catsup, mayonnaise and other condiments.

T or F 17. Toasting bread lowers the calories.

T or F 18. Most vegetables are low in calories.

T or F 19. Grapefruit burns up fat.

T or F 20. Starch is not the culprit when it comes to being overweight.

T or F 21. Inexpensive and expensive cuts of meat are of equal nutritional value.

T or F 22. The more vitamins and protein you take in the better.

T or F 23. High fat foods are good for a diet because they curb appetite.

T or F 24. Natural foods are no better than regular foods for a diet.

T or F 25. Yogurt i good for a diet.

T or F 26. High fiber foods like bran help you lose weight.

T or F 27. Honey and sugar are just as good for a dieter.

T or F 28. Whole wheat bread is less fattening than white bread.

T or F 29. Exercising decreases your appetite.

T or F 30. By exercising right, I can reduce in certain spots.

Appendix M

Analyses of Variance on Percent Overweight Change for Parent Group versus Combined Control Group

POSTTREATMENT

Source	SS	df	MS	F	
Group	74.280	1	74.280	4.556	p<.05
Subjects	260.885	16	16.305		

FOLLOW-UP I

Source	SS	df	MS	F	
Group	84.800	1	84.800	4.329	p<.10
Subjects	293.841	15	19.590		

FOLLOW-UP II

Source	SS	df	MS	F	
Group	131.068	1	131.068	6.074	p<.05
Subjects	345.249	16	31.578		