The Prediction of Success-Failure and Terminating-Remaining in the Bibliotherapy Treatment of Obesity

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The Prediction of Success-Failure and Terminating-Remaining in the Bibliotherapy Treatment of Obesity

A Thesis in Psychology by David John McKay

Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Arts August, 1978
Abstract

136 obese adults, 119 females and 17 males, all at least 15% over their ideal weight, participated in a ten week self-administered bibliotherapy treatment of obesity. The study examined the relationship between socio-economic status, locus of control, field dependence and their interaction terms and success-failure and terminating-remaining in a totally self-administered behavioural self-help treatment. A multiple regression data analytic strategy was used for data analysis. Significant relationships were found between locus of control and total number of lessons completed and success-failure. Also, significant relationships were found between participants' age and locus of control and terminating-remaining. The marginal results of the Rotter (1966) I-E scale were discussed in terms of the failure of the scale to discriminate a self-control dimension of internal control. The results of the age variable were discussed in terms of increased health consciousness and illness proneness of the older obese person. The strong effect of the total number of lessons completed was discussed in terms of turning from demographic and personality predictors to behavioural predictors, with particular emphasis on single subject research designs to determine the important behavioural dimensions which prevent staying in treatment.
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Finally, the author owes a great debt to his parents, who did everything humanly possible to facilitate the whole process of pursuing a career in psychology.
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OBESITY AND FACTORS RELATED TO IT

A survey of epidemiological studies of obesity (Osancova and Hejda, 1975), using a criterion of 20% over ideal weight to define obesity, established the incidence of obesity in America at 20% for males and 30% for females in the over-thirty age group. Less conservative estimates are associated with a figure of 80 million obese people in America (Stuart and Davis, 1972). Further, although Canadian evidence is sketchy (Osancova and Hejda, 1975), there is no reason to believe that the incidence of this health problem in Canada varies from the American figures (Lalonde, 1975). Obviously, obesity has reached epidemic proportions in North America. The great concern about this epidemic is not without foundation, since obesity is associated with a general decrease in physical conditioning (Lalonde, 1975) and diseases of the heart and arteries, cirrhosis of the liver, diabetes and other assorted complications (Mahoney and Mahoney, 1976). As with any health care problem, concern over the years has sparked a search for etiological factors. In obesity, this search has taken three distinct approaches: (1) psychological; (2) biological; and (3) social.

Although various psychological formulations have been postulated (Leon and Roth, 1977), most recently, the search has centered on eating style variables, with two trait-oriented hypotheses under investigation, external cue sensitivity (Schacter, 1971) and the restraint hypothesis (Herman, 1975).

The external cue sensitivity theory postulates that the obese do
not respond to internal food cues, as normals do, but eat in response to external, environmental cues. Although widely researched (Schacter, 1971, Schacter and Rodin, 1974), the validity and generalizability of the hypothesis has been challenged by Leon and Roth (1977), Milich (1975) and Wooley and Wooley (1975).

The restraint versus non-restraint hypothesis contends that the important dimension is deviation from a biologically determined set point or ponderostat. The theory suggests that the hyperplastic, the person with an overabundance of overfilled or normal fat cells, may be at a biologically normal weight. However, he may be overweight based on a statistical criterion. Consequently, successful dieting may be biologically abnormal and represent a form of self-starvation. Accordingly, the hyperplastic individual can maintain normal weight only through exercising restraint. Therefore, differences between the obese and those with normal eating styles will emerge only when restraint is accurately measured. Although differences between restrained and unrestrained eaters has been documented (Herman, 1975), Coates (1977) has offered a social-learning explanation for the restraint hypothesis and the status of the theoretical formulation is at present not clear.

The biological theories have argued in favour of genetic transmission, differing metabolic rates, neuroanatomical aberrations, and hyperplasticity and hypertrophy. Although not to be discounted, no one or combination of factors seems capable of accounting for the epidemic of obesity in America (Mahoney and Mahoney, 1976; Stuart and Davis, 1972).

In contrast to the two previous etiological approaches, there appears to be a strong relationship between social psychological factors, particularly socio-economic status, and obesity. Moore, Stunkard and Strole (1962) presented the following results regarding obesity, socio-
economic status and age. They noted "a striking relationship between socio-economic status and obesity", with 30% of the lowest class women being obese, while 4% of the highest class women were obese. In addition, the same tendency was noted for men, although the relationship was less strong. Further, obesity increased with age for both sexes, with the relationship again being less pronounced in men. Goldblatt, Moore and Stunkard (1965), in a reanalysis of the same data, noted a relationship between social mobility and obesity, with upwardly mobile females being less obese than downwardly mobile females.

Silverstone (1968), using the social class index of the General Registrar's Office of the United Kingdom, found that obesity was related to both age and socio-economic status. The prevalence of obesity increases with age for both sexes, but particularly so for women. In addition, not only was the frequency of obesity higher in the lower socio-economic groupings, but the degree of obesity was much greater than in the higher groupings. Taking both age and sex together, obesity was more prevalent amongst older women in the lowest classes than in any other grouping.

Silverstone (1970) evaluated the various contribution of socio-economic status, age and sex to obesity via a multiple regression. The three variables together have a significant relationship as a set to obesity ($R = 0.35$, $p < 0.001$). The partial correlations of age, social class and sex are: $(r = 0.26, p < 0.001)$, $(r = 0.17, p < 0.002)$ and $(r = 0.14, p < 0.01)$. An additional study (Baird, Silverstone, Grimshaw and Ashwell, 1974) also found a disproportionate number of obese females in the lower socio-economic classes.

Herman (1973), using a sample of 400 subjects from a university health maintenance clinic, found obesity was related to educational level. In her study, both sexes with less than 12 years of formal education were
more obese than those with more than 12 years of education. Garn et al. (1977), in a survey of 5,000 adults, using a measure of socio-economic status based on level of education and total income, found a relationship between socio-economic status and obesity dependent on sex. Obesity for men increases as socio-economic status increases; however, the exact reverse is true for women. In addition, social class is related to dieting behaviour, with 11% of Americans in the upper class, but 25% of dieters belonging to this group (Wyden, 1968).

This evidence indicates that social class and age are important in the etiology of obesity. In addition, the construct of locus of control and field dependence have been investigated in relationship to obesity. The results of Held and Snow (1972), Leon and Chamberlain (1973) have shown a non-significant relationship between the locus of control scale and obesity. However, the locus of control scale has been related to socio-economic status, with increased internality being associated with increased socio-economic status, Franklin (1963) cited in Lefcourt (1976).

Karp and Pardes (1965) used a battery of three perceptual field dependence measures, Rod and Frame Test, Body Adjustment Test and The Embedded Figures Test, Short Form, to determine the relationship between obesity and field dependence. The results indicated significant relationships between the Rod and Frame Test ($t = 2.29, p < .05$) and The Embedded Figures Test ($t = 4.29, p < .01$) and obesity. However, Pliner (1973) has noted that the sampling technique, using a self-selected group who had entered obesity treatment, might account for these significant differences. In support of this argument, further studies to determine the relationship between obesity and field dependence, Glass et al. (1969) and Linton et al. (1972), have failed to replicate the results of Karp and Pardes (1965).
Each etiological investigation or theoretical approach has spawned a treatment modality based on the initial analysis: psychoanalytic formulations beget psychoanalytic therapies; emotional adjustment hypotheses dictate insight-oriented individual or group psychotherapies; and behaviour analysis calls for a behaviour therapy for obesity.

Within the behavioural framework, there has been a new twist added to the treatment of obesity—the behaviourally-oriented do-it-yourself treatment manual. According to the manual titles, permanent weight control is within any motivated person's grasp. You can take it off and keep it off by simply reading, and following the approach of any one of the widely available treatment manuals. However, the question of who can be a winner at the weight loss game, for a totally self-administered therapy, is as yet unknown.

This thesis is an attempt to determine whether demographic and personality measures can predict treatment success for one particular weight reduction manual, as well as the tendency to terminate prior to its completion. An initial overview of the treatment of obesity will be provided, followed by a review of design problems and the bibliotherapy treatment of obesity. Following this, comprehensive reviews of dropping out of obesity research, and the prediction of success-failure, and terminating-remaining in obesity research will be presented.

**OVERVIEW OF OBESITY TREATMENT**

In response to the problem of obesity or overweight, those affected have sought out various traditional treatments over the years. These traditional approaches to weight loss can be divided into three distinct treatment strategies. The dieting approach includes self-help
groups (such as TOPS, Take Off Pounds Sensibly, or Weight Watchers), calorie restraint, which includes medically prescribed and fad diets, prolonged fasting, therapeutic starvation and the meal frequency approach. The psychological approach includes psychotherapy, of either the supportive or intrapsychic type, and hypnosis. The medical approach includes drug therapy regimens and surgical interventions.

The self-help group is the most commonly available structured form of intervention (Nash, 1976). The traditional dieting approach of restricted quantities, special foods and fad diets is by far the most popular, with 9.5 million Americans reporting active dieting, and 16.5 million reporting weight watching (Wyden, 1968).

Howard (1975) reported that a weight loss of 19.8 pounds achieved through self-help groups over 26 weeks is a substantial improvement over the results achieved by general practitioners who employed a calorie restraint method. In addition, Stunkard (1972) has concluded that, although variability in treatment success was high, self-help groups like TOPS achieved results that were equal to, or better than, those obtained by a physician who specialized in the treatment of obesity. It has been demonstrated that fad diets such as Atken's (1972) are effective as a function of calorie restraint, rather than the theoretical rationales offered (Chlouverakis, 1975). Further, the meal frequency approach has been demonstrated to be ineffective (Finkelstein and Fryer, 1971; Howard, 1975), and prolonged fasting and therapeutic starvation, although spectacular in producing initial weight loss, have not been demonstrated to be effective in maintaining weight loss (Leon, 1976). In addition, these methods have been criticized by Howard (1975) for the excessive costs due to hospitalization during therapy, and for producing serious physiological imbalances over the course of treatment.
The psychological approach of group psychotherapy of the supportive or intrapsychic type has also not been associated with successful weight loss, while individual psychotherapy and hypnosis have illustrated efficacy only in isolated cases (Leon, 1976).

The pharmacological and surgical approaches have fared little better. Stunkard and MacLearn-Hume (1959) have concluded that drug therapy is ineffective in producing weight loss, while Leon (1976) has concluded that design variables such as duration of treatment and dosage levels were so disparate that evaluations were impossible. Internal bypass surgery, although successful in producing great amounts of weight reduction, has not led to changes in either eating habits or calorie intake. Further, it continues to be associated with ongoing complications (Chlouverakis, 1975) and is only recommended for the grossly obese, and then only as a therapy of last resort (Leon, 1976).

In contrast to the traditional approaches, the behavioural approach to obesity, originally formulated by Ferster, Nurnberger and Levitt (1962), has demonstrated substantial promise when compared to alternate treatment modalities. Jordan and Levitz (1973) and Levitz and Stunkard (1974) have demonstrated that behaviour modification, conducted by either a TOPS group leader or a professional therapist, was more successful in producing weight loss than the traditional TOPS program. Ost and Gotestam (1976) obtained results which indicated that behaviour modification is superior to either a drug therapy regimen (Fenfluramine) or a waiting line control group.

The behaviour modification approach is based on the assumption that obesity is usually the result of an excess intake of calories over expenditure. This therapy assumes that excessive eating behaviours are learned and can be unlearned through the application of operant principles,
based on instrumental conditioning, and respondent principles based on classical conditioning (Deese and Hulse, 1968). Recent reviews of the literature (Abramson, 1973, 1977; Bellack, 1975a; Hall and Hall, 1974; Leon, 1976; and Stunkard and Mahoney, 1976) clearly indicate the superiority of this approach. These reviews also focus on the necessity of developing predictors to discriminate the successful from the unsuccessful and the terminators from the remainers in behavioural treatment programs for obesity.

**BEHAVIOURAL METHODS OF WEIGHT CONTROL: METHODOLOGICAL PROBLEMS AND THE BEHAVIOURAL TREATMENT OF OBESITY**

The reviews of the behavioural treatment of obesity (Abramson, 1973, 1977; Bellack, 1975a; Hall and Hall, 1974; Leon, 1976; and Stunkard and Mahoney, 1976) acknowledge that there are major design problems surrounding the adequate control of therapist characteristics, expectations, and placebo effects. In addition, while generally agreeing on the value of the self-management of obesity, they acknowledge that subject selection, method of assessing the amount overweight, and the length of follow-up are in need of improvement.

**Subject Selection:** Although some recent studies have utilized research participants from the community (Ashby and Wilson, 1977; Kingsley and Wilson, 1977; Mahoney, Rogers, Straw and Mahoney, 1977; Stalonas, Johnson and Christ, 1978; and Wilson and Brownell, 1977), most have relied on subjects recruited from a young highly-motivated and moderately overweight college population (Hagen, 1974; Wollersheim, 1970). This research participant sample has caused Mayer (1968) to speculate that there exists a population of moderately overweight individuals who can reduce without
the aid of health professionals. Studies that solicit research participants from a young, moderately overweight population may be tapping this population and providing exaggerated figures on efficacy. The major reviews have stressed the need for more representative samples in testing the efficacy of the behavioural treatment methods for obesity.

The Measurement and Presentation of Weight Loss Information: Various measures have been used to assess the amount overweight: surface measures, which include height and weight tables, and measurements of percentage body fat (Stuart and Davis, 1972). The surface tests and anthropometric measurements, with the exception of the height and weight tables, have been rejected as being too inaccurate for scientific purposes. In addition, measurements of fat as percentage of body weight require elaborate testing facilities not available to many researchers. Accordingly, almost universally, researchers have tended to use height and weight tables, particularly those developed by the Metropolitan Insurance Company (1959).

However, the mode of presenting these data, pounds lost over treatment, has been troublesome. A variety of measures, including pounds lost, percentage of body weight lost, change in percentage overweight, rate of loss, arcsin conversions of proportion of body weight lost, residual change scores and a reduction index, have been identified by Bellack and Rozensky (1975). Although no one method is free of bias, the researcher's choice of a dependent variable should recognize the following criteria: (1) the measures selected should be compatible with the data analytic strategy; (2) the measures should accurately represent treatment effects; and (3) they should allow for comparability among studies, a point which has been stressed by Jeffrey (1975).

The reduction index (Feinstein, 1959) combines weight goal (target
weight), amount of weight over the target weight, weight loss, and the amount of weight remaining to be lost, into a single index. This index avoids the major problem of pounds lost by not taking the initial weight into account. However, it suffers from the same problem which besets the method employing change in percentage overweight scores or proportion of body weight lost—the determination of an ideal weight which is known to be biased towards lighter research participants. It does, however, represent the most sensitive measure for presentation of weight loss information and presents a percentage change score which can be compared to other studies. In addition, several recent research studies (Ost and Gostestam, 1976; Stalonas, Johnson and Christ, 1978; and Brownell et al., 1976) have used the reduction index, but none of these studies have explored the relationship between the index and other dependent measures.

The determination of the target or ideal weight is still a problem. Metropolitan Insurance Company Height and Weight Tables (1959) (Appendix A) offer ranges for ideal weight for frame size by sex but provide no criteria for assessing frame size. In addition, according to Mayer (1968), they do not accurately represent national norms; the weights given for men are nine to ten pounds too low, while those for women are three to four pounds too low. In spite of these difficulties, research studies have utilized the Metropolitan Insurance Company Tables as a basis for assessing overweight.

Follow-up and Weight Loss Maintenance: Most studies have used a follow-up period of less than thirteen weeks (Leon, 1976) with only a few using a reasonable period of 26 weeks or longer (Brightwell and Sloan, 1977). This regrettable lack of follow-up may be due to any number of factors of which a few are identified: (1) a belief in treatment efficacy;
(2) poorly designed studies; (3) difficulty in getting participants to return to follow-up; and (4) the belief that long-term follow-up may not reflect treatment effects (Paul, 1969). Whatever the reason, of the few studies that have used extended follow-up, the results are mixed. Some studies illustrate successful weight maintenance, with a follow-up in which no client therapist contact transpires over the intervening period, while others do not (Brightwell and Sloan, 1977). The failure of subjects, even within the same treatment conditions, to maintain weight loss has caused some speculation concerning the possibility of a partially different process in weight loss versus weight loss maintenance (Kingsley and Wilson, 1977).

Of equal importance to the need for substantial periods of non-contact follow-up is the need to develop techniques that will aid successful clients to maintain their weight loss. One interesting approach has been the use of booster sessions in which participants are seen at regularly scheduled intervals over the follow-up period. These sessions are used to check on client progress and to attempt to reinforce treatment gains and review treatment components. Hall, Hall, Borden and Hanson (1975) compared four types of maintenance techniques and demonstrated that a self-monitoring or a booster system in which the original therapist continued with a client was superior to either a booster system in which a new therapist was used, or a non-contact control. Kingsley and Wilson (1977) demonstrated the superiority of a booster session system over simple weigh-in checks at three, six and twelve months in both individualized and group therapy for obesity. In a further study, Ashby and Wilson (1977) evaluated the effects of content and frequency of booster sessions, using structured behavioural booster sessions at two and four week intervals. This was compared to unstructured non-specific booster
sessions utilizing the same contact intervals, and to a no-treatment control. The study, which was conducted in two replications, revealed non-significant effects for either content or frequency of booster sessions.

Bibliotherapy Treatment of Obesity: The bibliotherapy treatment of obesity is a cost efficient mode of therapy which typically involves the distribution of materials to the obese under varying amounts of professional contact.

Studies in the behavioural treatment of obesity can be divided between those studies that use a group meeting with a verbal presentation format (Harris, 1969; Harris and Bruner, 1971; and Wollersheim, 1970) and those that use written treatment materials with various amounts of therapist contact. Although most studies have used the first format, an ever growing number of studies (Glasgow and Rosen, 1978) have utilized a bibliotherapy format. The bibliotherapy format is of interest for two reasons. Firstly, it involves a substantial savings of therapist time, and secondly, a number of programs are publicly available. Those which are widely available to the public include: Fanburg and Synder (1975), How To Be A Winner At The Weight Loss Game: The Behaviour Modification Way To Lose Weight And Keep It Off Forever; Jeffrey and Katz (1977), Take It Off and Keep It Off: A Behavioural Approach to Weight Loss and Healthy Living; Johnson and Stalonas (1978), Permanent Weight Loss: The Behavioral Alternative; Mahoney and Mahoney (1976), Permanent Weight Control: A Total Solution To The Dieter's Dilemma; and Stuart and Davis (1972), Slim Chance in a Fat World: Behavioural Control of Obesity. Other bibliotherapy treatments have been developed but are not widely disseminated: Brownell (1976), Butler Hospital Weight Control Manual; Ferguson

In a review article, Glasgow and Rosen (1978) divided client reliance upon therapist contact into three groups: self-administered treatment in which the client utilizes materials without the aid of a therapist; minimal contact in which the therapist provides some assistance in interpreting materials, and a therapist-administered program in which clients have regularly scheduled contact with a therapist, who focuses, clarifies and elaborates upon the material. Beyond the experimental design issues, such as controlling for placebo effects and equating manuals for treatment rationales and procedures, the largest question facing bibliotherapy treatment is empirical validation under varying amounts of therapist contact.

Studies can be divided on the basis of written versus verbal presentations of treatment materials. In addition, studies can be distinguished by the use of experimenter control (Hall, 1972) and those that are self-controlled or self-managed (Harris, 1969; Wollersheim, 1970). Although the two are not perfectly dichotomous (Hall and Hall, 1974), characteristically in the experimenter-controlled programs, the therapist reinforces or punishes client weight loss or gain through the payment or collection of money according to a predetermined contract. The therapist acts as a director as opposed to a teacher. The self-managed programs involve clients reinforcing or punishing their own behaviour, through monetary or other means, according to a predetermined
schedule. In this approach, the client is active as opposed to being passive.

In an early study to evaluate the effects of an experimenter-managed condition as compared to a refundable and non-refundable contingency contract for therapist-administered bibliotherapy, a precursor to the Jeffrey and Katz manual (Jeffrey and Katz, 1977) (Jeffrey and Mahoney, 1974) was utilized. The results indicated no significant differences between groups at post treatment, with all groups losing an average of six pounds over the seven weeks of treatment. However, the self-control subjects maintained their weight loss during a six week follow-up while the experimenter-controlled subjects did not.

Recently, Stalonas, Johnson and Christ (1978) utilized the Johnson and Stalonas manual (Johnson and Stalonas, 1978) in a therapist-administered study which compared the basic behavioural manual to the conditions of manual plus contingency contracting, manual plus exercise and manual plus both contingency contracting and exercise. The results indicated a significant weight loss of 10.7 pounds from pre to post treatment but no significant differences between groups either at post treatment or three month follow-up. However, at a one year follow-up, the basic behavioural program was the only condition which did not maintain its weight loss. Subjects in this condition experienced an average weight gain of 4.7 pounds from the three month to the one year follow-up.

In a recent study, Mahoney, Rogers, Straw and Mahoney (1977) evaluated the Mahoney and Mahoney (1976) manual under therapist-administered and minimal contact conditions. The results indicate that both groups lost equal amounts of weight over the course of treatment. In two earlier studies, designed to evaluate the effectiveness of the components of a bibliotherapy treatment package under therapist-
administration, Mahoney, Moura and Wade (1973) and Mahoney (1974) evaluated an early version of the Mahoney and Mahoney manual (Mahoney and Mahoney, 1976). In the initial study, Mahoney, Moura and Wade (1973) provided results which supported the superiority of a therapist-administered self-reward condition over a "self-administered stimulus control procedure without contingencies". It should be noted that this later treatment condition, bibliotherapy stripped of most behavioural components, was designed to function as a no-treatment control and in no way adequately represents a validation of bibliotherapy under self-administration. In a follow-up study, Mahoney (1974) utilized the same therapist-administered procedure to evaluate self-monitoring, self-reward for weight loss or habit change and a no-treatment control. The results supported the superiority of a therapist-administered bibliotherapy package which stressed self-reward of habit change over other treatment conditions. A one year follow-up utilizing a mail-in data collection procedure supported the superiority of the habit change condition over the treatment conditions.

The Stuart and Davis manual for weight control (Stuart and Davis, 1972) has been tested by Balch and his research associates under varying amounts of therapist contact. Balch and Ross (1974) found a therapist-administered treatment condition superior to a "partial treatment group", composed of treatment dropouts, and a no-treatment control. Research participants in the therapist-administered conditions lost 10.6 pounds over the nine weeks of treatment, and a further 3.3 pounds over a six week follow-up. In a study that compared the same program under a variety of therapist and minimal contact conditions, Lindstrom, Balch and Ross (1976) found that bibliotherapy was as effective under minimal contact as it was under a variety of therapist-administered conditions. All treatment
conditions were significantly more effective than a no-treatment control. In addition, Balch and Balch (1976), reported in Glasgow and Rosen (1978), found that success in therapist-administered treatment was independent of the professional affiliation of the therapist (i.e., psychologists versus social workers versus nurses), with comparable weight losses being demonstrated by all groups. Further, Dilley (1977), cited in Balch, Balch and Dilley (1977), reported that a self-administered bibliotherapy program with college students was as effective at both post treatment and six month follow-up as both therapist-administered and minimal-contact bibliotherapy.

In a study to evaluate the ability of the Hagen, Wollersheim and Paul (1970) bibliotherapy treatment manual to produce eating habit change, Hagen (1974), using highly-motivated, moderately overweight college students, compared a minimal contact and therapist-administered condition to a group therapy treatment condition and a no-treatment control. After ten weeks of treatment, the groups registered 13, 15, 11.94 and 1.8 pounds weight loss respectively. This indicated that a bibliotherapy package accompanied by minimal contact was as effective as group therapy treatment for obesity. However, the Hagen (1974) study suffers from three serious shortcomings: (1) an unrepresentative subject population; (2) a biased dependent variable (i.e., pounds lost); and (3) a lack of follow-up.

The manual developed by Hagen et al. (1970) was also tested by Fernan (1973) in a study in which self-administration and minimal contact were compared under varying material distribution strategies, lesson by lesson on a weekly basis versus receipt of the manual in its entirety. The results of the study are obscured by a number of facts: (1) five out of eight members of the control group had access to a copy of the treatment manual and these participants lost 39 of the 46 pounds lost by
the control group; (2) 42% of the subjects had dropped out of treatment by the end of the ten weeks and an additional 27% had dropped out at the four month follow-up. Therefore, the results were not computed on the same subjects at the two post treatment data check points; (3) the study again utilized an unrepresentative subject population (i.e., young, motivated and moderately overweight students). An analysis of covariance for pounds lost and percent overweight indicated that the minimal contact condition, with weekly distribution of material, had significantly greater weight loss and change in percentage overweight than the other conditions at both post test and four month follow-up. However, as Fernan pointed out, had the control group not been biased it seems likely that the other treatment conditions would have differed significantly from the no-treatment control group.

In an additional study, Tobias and MacDonald (1977) compared the Hagen et al. (1970) manual under self-administration, self-determination (a willpower condition), behavioural contracting for tangible rewards, an effort group (a waiting line control) and a no-treatment control. The results indicated that both the behavioural contracting and the self-administered bibliotherapy group lost significantly more weight than the various no-treatment control groups but they did not differ from each other.

Hanson, Borden, Hall and Hall (1976), using overweight adults, compared the Hanson manual (Hanson, 1973) under the following treatment conditions: (1) conventional self-management; (2) programmed text therapist-administered; (3) programmed text minimal contact; (4) an attention placebo control; and (5) a no-treatment control. The results indicate that the three treatment conditions differed significantly from the two no-treatment controls but not from each other at post treatment
or ten week follow-up, but these significant differences were not maintained at one year follow-up.

Brownell, Heckerman and Westlake (1976) have criticized the previous study for: (1) using an unreliable follow-up procedure, a phone contact at one year; (2) using a ten week treatment period when recent research indicated the need for booster sessions; (3) having high premature termination rates of 21% in the bibliotherapy condition; and (4) less than optimal weight losses. The first two criticisms are appropriate but not particularly potent, since as previously pointed out, follow-up is not a strong point of any of the obesity studies. In addition, only three studies, Ashby and Wilson (1977), Hall et al. (1975) and Kingsley and Wilson (1977), have attempted "comprehensive treatment packages" and the impact of booster sessions is as yet unclear. Augmenting the caution suggested by the previous results is the recent, although undemonstrated, suggestion that weight loss skills may be particularly different from weight loss maintenance skills.

Further, although the premature termination rates are high (i.e., 21%), they are not out of line from the behavioural literature in which the premature termination rates run from zero to eighty-four percent in self control studies (Hall and Hall, 1974). They are at the lower end of the termination rates for the non-behavioural literature which runs from twenty to eighty percent (Stunkard and MacLearn-Hume, 1959). Further, the weight losses for the bibliotherapy condition were a mean of -5.42% from initial body weight. Since the mean initial body weight was 212 pounds, this group lost on the average 11.4 pounds, which is hardly insignificant over a ten week period.

The previously discussed design problems prompted Brownell et al. (1976) to compare an overweight non-college-age population under the
following conditions: (1) group behavioural therapy approach to weight control; (2) minimal contact bibliotherapy; and (3) a waiting line control with a fifty-dollar therapy charge, a twenty-five dollar attendance deposit, plus a thirty-dollar charge for follow-up services. The results indicated the superiority of the group therapy procedure over the bibliotherapy group, with the differences being maintained at three month follow-up but not at one year. The results have prompted Brownell et al. (1976) to conclude that bibliotherapy is not as effective as a group therapy treatment for obesity. However, Hagen et al. (1976) have suggested an interaction between data deposit size and weight loss. These results suggest that the higher the data deposit, the lower the weight loss. The weight losses in Brownell et al. (1976) bibliotherapy condition were less than optimal, 4.3 pounds over ten weeks of treatment.

An extensive research program, using an unidentified self-help manual, has been conducted by Bellack and his graduate students. Bellack, Schwartz and Rozensky (1974) compared therapist-administered bibliotherapy and a minimal contact bibliotherapy to a self-administered group, using a ten-dollar refundable data deposit contingent on attendance. The results indicated that both contact conditions differed from the self-administered condition but not amongst themselves. This study, like the Hagen (1974) research, suffered from an unrepresentative subject population and the lack of long-term follow-up. Bellack (1976) assessed the varying contributions of self-monitoring and self-reinforcement under self-administered and minimal contact conditions. He found that the results of the Bellack, Schwartz and Rozensky (1974) study were not replicated, with self-reinforcement conditions losing significantly more weight than the self-monitoring conditions.

This review indicates that behavioural bibliotherapy studies have been evaluated under varying amounts of therapist contact and that attempts
to determine the effectiveness of treatment components has been attempted. Of the studies directly designed to test validation of the bibliotherapy approach under varying amounts of therapist contact, substantial evidence exists to support a cost efficient approach to weight reduction (Hagen, 1974; Hanson et al., 1976). Further, the efficacy data with the exception of Bellack et al. (1974), Brownell et al. (1976) and Fernan (1973) supports the use of a totally self-administered therapy program (Dilley, 1977; Tobias and MacDonald, 1977).

**THE DROPOUT PROBLEM IN OBESITY RESEARCH**

The problem of dropping out of treatment, although acknowledged as serious (Hall and Hall, 1974; Leon, 1976; and Stunkard and MacLearn-Hume, 1959) has rarely been the subject of empirical investigation. An examination of the dropout literature reveals a number of pertinent questions and methodological concerns. The questions are: who drops out of treatment? can they be categorized into one or more distinct groups? why do they leave treatment—for therapeutic or extratherapeutic reasons? do treatment dropouts seek alternate sources of help or do they regard their problem as insoluble? is the dropout necessarily a treatment failure? and finally, in what way can knowledge of this process aid therapists in improving their programs?

The methodological issues are centered around categorization problems. Into which of three categories does the dropout fit: the client who fails to commence treatment after the initial appointment is made; the client who is expelled from treatment; or the client who refuses to return to treatment for whatever reason? Further, the point at which the client drops out of therapy and the rapidity of the process may be important parameters. Terminators may be distinguishable from remainers
on a number of other variables. These include: specific demographic, personality or behavioural descriptors of clients accepted for therapy in a setting; what type of therapy the setting offers; which type of therapy the client is assigned to; the length of the therapy and the cost of therapy or financial contingencies for attendance.

The research literature on the behavioural approach to obesity deals with patients who refuse to return to therapy as opposed to those who never come or who are expelled from treatment. Further, these studies do not distinguish the point at which a client drops out nor do they adjust for the number of previous formal treatment exposures.

Various criteria have been used to identify dropouts in the behavioural group therapy treatment of obesity. Balch and Ross (1974, 1975) used a 75% attendance criterion over 12 sessions, Hall et al. (1974, 1975) defined a dropout as one who missed two group meetings or two subsequent make-up meetings over 10 weekly sessions. Hagen et al. (1976) used an 80% criterion over 12 sessions given in a six week period and Wallston et al. (1976) used a 100% criterion over eight sessions. Ignoring the absence of consistent criteria for identifying dropouts, a review of existing data indicated that the dropout rates range from 0 to 83% in behavioural treatment studies of obesity (Hall and Hall, 1974).

Some studies have utilized a data deposit system to maintain subject participation or motivation. The evaluation of the effectiveness of a data deposit system is complicated by the fact that varying amounts of money have been used: $10.00 (Abrahms and Allen, 1974; Bellack, Rozensky, and Schwartz, 1974; Bellack, Schwartz and Rozensky, 1974; Romanczyk, 1974; Romanczyk et al., 1973); $30.00 (Tirell and Scott, 1975); $35.00 (Jeffrey, 1974; Mahoney, 1974); $40.00 (Carter, Rice and DeJulio, 1977); $55.00 (Ashby and Wilson, 1977). In addition, direct therapy charges have been
used in some studies: $50.00 (Brownell et al., 1976); $150.00 (Brownell et al., 1977) and $225.00 (Jeffrey et al., 1978).

In order to study the relationship between the size of the data deposit and attrition rate, Hagen, Foreyt and Durham (1976) used three groups of moderately overweight females under the conditions of $20.00, $5.00 and no data deposit. Their behavioural program consisted of a combination of the Hagen et al. (1970) bibliotherapy manual and covert sensitization. The results indicated that there were significant differences in attendance among the groups with one, six and nine dropouts respectively. Also, for those who maintained attendance, the higher the deposit, the less weight loss was achieved. The $20.00, $5.00 and no-deposit groups lost a mean of 4.3, 7.0 and 8.2 pounds respectively over 12 sessions in six weeks. Although the differences were not statistically significant, they could reflect the differential attrition of unsuccessful weight losers. While speculation exists concerning the cause of attrition (i.e., people losing the least weight tending to drop out first), the data strongly suggest that differential attrition rates across treatments can lead to false statements of effectiveness, a point which has been previously made by Bakeland and Lundwall.

The studies clearly designed to test bibliotherapy treatments under varying amounts of therapist contact have never adopted consistent criteria to define a dropout. Those studies using the Hagen program have had variable results. Hagen (1974), Fernan (1973) and Tobias and MacDonald (1977) used no data deposit system and had 0%, 42% and 33% dropout rates at the post treatment weigh-in, while Bellack, Schwartz and Rozensky (1974), using a different manual and a $10.00 refundable deposit, had a 20% dropout rate. In addition, Hanson et al. (1976), using the Hanson
(1973) manual and no data deposit, had a 21% dropout rate in his bibliotherapy condition. Further, Brownell et al. (1976), with $40.00 therapy charge, had a 9% dropout rate in his bibliotherapy condition.

THE PREDICTION OF SUCCESS-FAILURE IN OBESITY RESEARCH

The prediction of success-failure in obesity research is an important problem. Experience in psychotherapy has shown that certain clients receive more benefit from specific types of approaches than others, and accordingly, psychotherapy clients cannot be treated as a homogenous group (Garfield, 1971; Kiesler, 1971). Following an analysis of treatment components (Bellack, 1976b) and theoretical explanations (Herman, 1975; Mahoney, 1975), these authors have suggested that the obese are not a homogenous group and that they demand varying treatment approaches. The search for variables that might predict responsiveness in treatment for these varying groups has taken two different strategies: an empirical search for traditional predictive demographic, personality and weight history variables, versus an analysis of the competence of individuals with respect to the skills of self-control.

Demographic Variables

Sex: In a review of the non-behavioural obesity treatment programs, Stunkard and MacLearn-Hume (1959) concluded that success in treatment was significantly related to sex, with males being significantly more successful than females. In addition, other studies using varying treatment approaches--individual versus group dietary instruction (Cormier, 1972); a liquid-formula diet with outpatients (Feinstein, Dole and Schwartz, 1958); and behavioural group therapy (Harris, 1969; Musante and Perelman, 1974, cited in Weiss, 1977)--provide evidence to support this contention.
However, the results are far from unequivocal. Utilizing a behavioural treatment format, Ferguson (1976), Hall et al. (1974), Mahoney et al. (1977) and Wing and Jeffrey (1976) reported non-significant relationships between sex and success in treatment. Nor have negative results been limited to the behavioural approach. Both Glennon (1966), utilizing a short hospitalization followed by outpatient treatment, and Silverstone and Cooper (1972), utilizing a low carbohydrate diet, have reported non-significant results. In addition, Weiss (1977) has suggested that the significant differences found between sexes may be subject to alternative explanations. Discounting methodological errors, confounding of variables and lack of uniform and appropriate criteria, it appears that males were significantly heavier than females at treatment outset, leading to greater weight loss (Murry, 1975). In addition, males lose more weight than females in individual versus group therapy, suggesting the possibility of a sex by treatment interaction.

**Age of Onset:** It has been suggested by Salan (1974) that age of onset of obesity may be an important predictor of success in treatment. According to this argument, people become obese in one of two general ways. Firstly, by an increase in the numbers of fat cells (hyperplastic) or secondly, by an increase in the size of their fat cells (hypertropic). In the early years of life up to the onset of puberty, excess energy is stored by increasing the number of fat cells. At the onset of puberty, the body stops building new fat cells and the excess energy is stored by enlarging the fat cells. Accordingly, people who are obese at the onset of adolescence not only have more fat cells, but those cells may be larger than normal. In addition, the number of fat cells are fixed at this time, so the prepuberty onset of obesity may place the potential dieter in a less than enviable position.
Although the area is plagued with inconsistencies due to varying definitions of juvenile-onset obesity, some conclusions do emerge. In a comparison in which age of onset for adult obesity was defined as 20 years of age, Jeffrey et al. (1976) found no significant differences between juvenile- versus adult-onset obese. In addition, Mahoney et al. (1977) found no significant difference between either age of onset of obesity or number and size of fat cells in the successful treatment of obesity via behaviour therapy. However, McReynolds and Lutz (1974) and Borden (1974), cited in Weiss (1977), reported significant correlations (.44 and .50, respectively) between age of onset and success in treatment. In addition, Young et al. (1955) classified 52% of the childhood obese and 15% of the adult-onset obese as failures, while 30% of the childhood obese and 57% of the adult obese were classified as treatment successes. Mullins (1958), using 30% loss of excess weight as a criterion for success, and being a "fatty" during school years as the criterion for juvenile onset, reported 63% of the juvenile onset were treatment failures as compared to 39% of the adult-onset obese.

Other Demographic Measures: A myriad of other demographic predictors have been explored, including the following: social class and age (Borden, 1974; Glennon, 1966; Mahoney et al., 1977; Mees and Keatzer, 1967; Shipman and Plesset, 1963; Silverstone and Cooper, 1972; Vincent et al., 1976); marital history and social support (Wing and Jeffrey, 1976); current marital status and obesity of parents (Quereshi, 1975; Mahoney et al., 1977); educational status (Glennon, 1966; Vincent et al., 1976); religion and ordinality (Rohrbacher, 1973); ethnicity (Shipman and Plesset, 1963; Wisenberg and Fray, 1974); social support systems (Mahoney et al., 1977). However, relationships between these variables and success in treatment were small or non-significant. In conclusion, with the exception of age of
onset, clear and important relationships between demographic variables and success in treatment have not been found.

Personality Predictors

Locus of Control: The internal-external locus of control scale (Rotter, 1966) has been used to predict success at weight reduction. The results of the work of Bellack, Schwartz and Rozensky (1974); Bellack, Rozensky and Schwartz (1974); Rodin et al. (1977); Vincent et al. (1976), which do not report correlations between I-E and success, have shown no relationship between these variables. However, Balch and Ross (1975) reported a correlation of .22 with success at weight loss, using females with a mean age of 39.5 years. In addition, Ley et al. (1975), cited in Rodin et al. (1977) also reported a significant relationship between locus of control and success in treatment. The Levinson IPC Scale (Levinson, 1972) has been used by Tirell and Scott (1975) and they reported a correlation of .30 with success at weight loss.

Also, Abrahms and Allen (1974) and Jeffrey (1974) have investigated shifts in internal-external locus of control scores over the course of treatment. Abrahms and Allen (1974) reported no change in internal-external locus of control scores, whereas Jeffrey (1974) reported significant increases in client internality for his self-control refundable contingency group.

In related work, Young (1973) tested the ability of the internal-external locus of control scale to predict success in a bibliotherapy approach to self-control of smoking. The scale was unable to successfully discriminate the successful from the unsuccessful. Schallow (1975) used a post hoc quartile split to define the 14 most successful and the 14 least successful self-modifiers. He then compared the two groups in terms
of the internal-external locus of control scale. The study indicated that successful self-modifiers were significantly more internal than those who were unsuccessful although the self-modification projects were not identified.

In conclusion, although the data are far from equivocal, the existing research indicates some basis for assuming a relationship between the locus of control scale and success in self-control programs for weight loss.

Other Personality Measures: Myriads of personality measures have been explored in relation to predicting success in the treatment of obesity. The results can be divided into measures which have no predictive power, those measures which have yielded inconsistent results, those tests which are predictive but as yet unreplicated, and those tests for which results have been replicated. Those variables found to have no significant relationship to success in treatment are: subjective rating scales of anxiety and depression (Silverstone and Lascelles, 1966); questionnaires assessing general level of tension and depression (Harris, 1969); Pittsburgh Social Extraversion-Introversion Scale, IPAT Anxiety Scale, and situation-specific anxieties (Wollersheim, 1970; Hagen, 1974); MMPI and clinical impression (Penick et al., 1971; Jeffrey and Christensen, 1975); State and Trait Anxiety Scale and motivation (Bellack, Schwartz and Rozenzky, 1974); The Group Embedded Figures Test (Elliot and Denny, 1975); Maudsley Personality Inventory (Jeffrey and Christensen, 1975); Marlowe-Crown Scale of Social Desirability and Eysenck Neuroticism Scale (Vincent et al., 1976), Beck Depression Inventory, Marital Adjustment Test, Restraint Questionnaire (Mahoney et al., 1977); and Comrey Personality Scale (Rodin et al., 1977).
In addition, the Taylor Manifest Anxiety Scale has yielded inconsistent results, with Janda and Rimm (1972) and Stunkard and MacLearn-Hume (1959) reporting negative results, while Shipman and Plesset (1963) reported a significant relationship between the scale and success in treatment.

A number of unreplicated studies provide evidence for the relationship of the following psychometric measures and success in treatment: neuroticism as measured by the Cornell Medical Index (Cauffman and Payne, 1961; Silverstone and Solomon, 1965); anxiety and depression, using the anxiety and depression scales of the MMPI (Shipman and Plesset, 1963); real and ideal body image drawings (Manno and Marston, 1972); Gauthier Personality Tendency Test (Cormier, 1972); ratings of self and father on the Mitchill Adjective Rating Scale (Quereshi, 1975); and Ross items (Ratings of Self Status), ability to express anger, control of one's environment, a happy childhood, slim friends, and a personal commitment to weight reduction (Quereshi, 1977). Also, although the overall relationship between the Edwards Personal Preference Scale and success was not found, a relationship between the scale's consistency scale and success has been reported (Payne et al., 1970).

Recently, Mahoney et al. (1977) found that cognitive factors (healthy thoughts and images concerning weight reduction), energy balance knowledge (knowledge of calories and caloric expenditures) and percentage fat (initial percentage of fat) were significantly correlated, .41, -.43 and -.60 respectively, with success. In addition, the three factors, as a set, had a multiple correlation of .73 and an adjusted $R^2$ of .48 with success in treatment.

Beyond individually non-replicated studies, success has been related to level of emotional adjustment as measured by the Bell Adjustment
Inventory. In three studies, two of which suffer from small numbers of subjects (Darling and Summerskill, 1953; Summerskill and Darling, 1955) and one of which suffers from a post hoc analysis (Darling and Summerskill 1953), the Bell Adjustment Inventory has been used to predict weight loss. All studies found that obese clients who were rated as being better adjusted by the inventory were substantially more successful in treatment.

In conclusion, with the exception of the Bell Adjustment Inventory and the set of factors identified by Mahoney et al. (1977), which as yet are unreplicated, the search for psychometric predictors has been disappointing.

**Personal Weight History**

Factors related to personal weight history, past attempts at dieting, eating patterns, familial characteristics and activity levels have also been investigated. Wing and Jeffrey (1976) have reported low but significant relationships between social support and weight reduction ($r = .26, p<.05$). However, other studies (Borden, 1974; McReynolds and Lutz, 1974, cited in Weiss, 1977; Silverstone and Cooper, 1972) have failed to replicate these findings. Borden (1974), cited in Weiss (1977), has reported that success in treatment was negatively related to previous weight control attempts at both three and six month follow-up ($r = -.53, p<.03; r = -.57, p<.03$, respectively). In addition, successful participants were able to cite more reasons for losing weight at the two follow-up check points ($r = .57, p<.05; r = .68, p<.05$, respectively).

Most other work in the area has been uniformly negative with non-significant relationships between weight loss and pretreatment eating patterns (Mahoney, 1974; McReynolds and Lutz, 1974; Wollersheim, 1970), prior dieting or previous treatment attempts (Bellack, Schwartz and
night eating syndrome (Stunkard and MacLearn-Hume, 1959), perceived causes of obesity (Mahoney, 1974), placement in preferred or non-preferred treatment (Murry, 1976), and activity level (Mahoney et al., 1977; McReynolds and Lutz, 1974; Wollersheim, 1970).

An exception to this parade of negative results has been the work of Quereshi (1975, 1977). In an analysis of KOPS (Keep Off Pounds Successfully) versus TOPS (Take Off Pounds Sensibly) treatment failures, he found, based on ROSS Scales, that success in self-help treatment was related to activity level, keeping high-calorie foods out of reach, number of meals eaten, speed of eating, and non-preference for high-carbohydrate foods. However, emotional brittleness and an unhappy childhood were indicators of failure.

In addition, Quereshi (1977) and Rodin et al. (1977) have presented limited evidence to suggest that success in treatment may be related to cue salience, with clients who are less externally responsive being more successful.

**Self-Reinforcement Style**

The analysis of the component skills of self-control, particularly self-reinforcement, has demonstrated some promise in the prediction of success. The self-control process has been conceptualized by Kanfer (1971) as a three stage closed loop process involving self-monitoring, self-evaluation and self-reinforcement by either overt or covert means.

Bellack (1975) used a paradigm in which subjects were asked initially to self-evaluate accuracy on a recognition task involving nonsense syllables. Following this first stage, the conditions of self-reinforcement and self-punishment were applied to the same task. In
phase one, there were no significant differences between internals or externals, as measured by the locus of control scale, on task accuracy, but internals were consistently and significantly more accurate in evaluating both their correct and incorrect responses. In phase two, the results were duplicated for phase one, and it was further determined that internals administered significantly more self-reinforcement and significantly less self-punishment than externals. For the externals, rates of self-reinforcement and self-punishment were a function of lower self-evaluations rather than reinforcement criteria. These results suggested that internals will be significantly more successful than externals in situations that require self-evaluation and self-reinforcement.

Rozensky and Bellack (1974) examined the self-reinforcement and self-punishment behaviours of previously successful versus previously unsuccessful self-controllers using a modified version of the previously described procedure. The results indicate that successful self-modifiers administered significantly more self-reinforcement and significantly less self-punishment than those who were unsuccessful. Rozensky and Bellack (1976) compared high versus low self-reinforcers, as determined by the same procedure, under the conditions of (1) self-control, (2) external-control and (3) a minimal contact group for weight loss. The results indicated that self-control clients lost significantly more weight than those in the external control or minimal contact conditions and that the external control conditions did not differ from the minimal contact condition. However, the self-reinforcement style x treatment interaction was significant with low self-reinforcers doing moderately well in both treatment conditions but high self-reinforcers doing extremely well in the self-control program but poorly in the external control program. Bellack, Glanz and Simon (1976) used a time estimation test to divide
clients into high versus low self-reinforcers. Clients were asked to rate the interval of time between two buzzers and were also asked to rate the accuracy of their estimates with grades from A to F. High versus low self-reinforcers were compared under the conditions of (1) minimal contact, (2) a counter-balancing of self-reinforcement and self-punishment and (3) self-punishment and self-reinforcement. The results indicated that high self-reinforcers lost significantly more weight than low self-reinforcers during the program and were able to maintain these losses over a five week follow-up period. The low self-reinforcers started to put on weight immediately after treatment. These results confirm that clients who are more successful at weight loss are better self-reinforcers. In addition, the ability to successfully use self-reinforcement has been linked to the internal-external locus of control scale (Bellack and Tillman, 1974) which, as noted earlier, may be of possible use in the prediction of success in treatment. Further, the locus of control scale may be preferable for the assessment of self-reinforcement skills in a clinical setting since it is less time-consuming than procedures such as verbal recognition tasks and time estimation tests.

PREDICTION OF DROPPING OUT IN OBESITY RESEARCH

Few studies have examined the relationship between demographic, personality and situational variables in the premature termination of obesity therapy. In the non-behavioural literature, where premature termination rates are significantly greater than in the behavioural programs (Levitz and Stunkard, 1974), there are two relevant studies. Seaton and Rose (1965) determined that premature termination from an outpatient dietary advice clinic was not significantly related to sex, age or occupation but was related to percentage overweight, with those 20 pounds
over ideal weight terminating significantly earlier than those under 20 pounds overweight. Further, the type of presenting medical problem appeared to be a factor. Clients with diagnosed diabetes tended to remain significantly longer.

Nash (1976) used a sample of two hundred defaulters from a commercial weight control program, of whom one hundred had previously defaulted from the same program. She determined that premature termination was not significantly related to age of onset of obesity, nor to percentage overweight, but was related to previous treatment exposures, with rejoins dropping out significantly more often than new joins. However, the point of drop-out was not significantly related for the two groups. Although the point of drop-out was not significantly related, there appears to be a time effect, with 6% of the clients dropping out after the first session, 23% by the fourth session, 47% by the eighth session, 66% by the twelfth session, 72% by the sixteenth, 79% by the twentieth and 82% by the twenty-fourth session.

Some evidence to aid in variable selection can be gleaned from the drop-out literature in general and the psychotherapy literature in particular. In his review of the dropout from individual long-term psychotherapy at out-patient clinics, Brandt (1965) concluded that such great variations in independent measures have been used (type of therapy, client population, length of therapy, fee structure and frequency of contact, etc.) that meaningful comparisons were impossible. Even taking into account the morass of complications, it is evident from his review of the literature that the majority of clients who terminated did so after the first four sessions. Garfield (1971) supported this contention, citing that well over 50% of clients who terminate do so within the first eight sessions. His review of actuarial prediction indicated that
terminators tend to be from a lower socio-economic class and have less education than remainers, while the variables of age, sex and diagnostic category are unable to distinguish the two groups.

Psychometric prediction, using psychodynamically-oriented techniques and tests, has yielded contradictory evidence (Garfield, 1971). The Terminator-Remainer Scale (Lorr, Katz and Rubinstein, 1958), which initially showed some promise, has recently been demonstrated to distinguish terminators from remainers on the basis of social class and not psychological characteristics (Stern, Moore and Gross, 1975).

The expectancy literature (Garfield, 1971) supports the contention that those who harbor misconceptions about psychotherapy and their role in it tend to be terminators. Lorion (1974), in a review of patient and therapist variables in the treatment of low-income patients, supports the contention of misconception on both the part of the therapist and the patient in producing early termination in low-income patients. Bakeland and Lundwall (1975) reviewed six areas of psychological treatment for early termination and concluded that the following fifteen characteristics accounted for premature termination in relevant studies they reviewed: (1) social isolation and/or unaffiliation; (2) therapist attitudes and behaviour; (3) discrepancies between patient and therapist treatment expectations (accounted for 100% of dropping out in some studies); (4) passive-aggressive behaviour; (5) family attitudes and behaviour; (6) motivation; (7) behaviour and/or perceptual dependence; (8) psychological mindedness and/or denial; (9) symptom levels and symptom relief; (10) socio-economic status; (11) sociopathic features; (12) alcoholism and/or major drug dependence (accounting for 83 - 88% of dropping out in some studies); (13) age; (14) sex; and (15) social status (accounting for 60 - 75% of terminators in other relevant studies).
Only one study has specifically attempted to distinguish terminators from remainers in the behavioural approach to obesity. Balch and Ross (1975) used the internal-external locus of control scale to distinguish terminators from remainers. They found a correlation of .41 between internality and remaining, using 34 females as subjects and a criterion of 75% attendance over 12 sessions to distinguish the two groups.

A perusal of the Bakeland and Lundwall (1975) predictors reveals that the concept of field dependence-independence has been used with some success to distinguish terminators from remainers. The use of field dependence-independence is of interest because it uses a similar concept system to the internal locus of control scale (Vernon, 1972). However, an empirical relationship between the two measures has not been demonstrated (Lefcourt and Telegdi, 1971; McIntire and Dreyer, 1973; and Rotter, 1966).

The construct of field dependence-independence refers to the ability of an individual to disembed an object from a perceptual field. The field dependent individual is strongly dominated by the overall organization of the surrounding field and experiences its parts as being fused. The field independent person, on the other hand, is not dominated by the overall organization and is able to distinguish the figure from the ground. On a higher order scale, Witkin et al. (1962) distinguish between the global versus articulated person. The global person is the field dependent person. These individuals have the tendency to accept the organization of things as given. The articulate or field independent person is able to reorganize the field or his experience.

A variety of measures, e.g., The Embedded Figures Test, The Rod and Frame Test, and the Body Articulation Test, have been used to determine the perceptual dependence-independence of people. The Group Embedded Figures Test is a modification of the Embedded Figures Test for mass
testing. It is composed of 18 items which have been derived and modified from the Gollschaldt figures, and was standardized on a group of 168 males and 169 females who were college students. The Group Embedded Figures Test is a speed test. Accordingly, a parallel form correlation for sections with a Spearman-Brown prophecy formulae correction is an appropriate method for estimating reliability. Using this method, the test has a reliability coefficient of .82. Validity has been assessed in two ways. Firstly, Witkin et al. (1971) reported, using a counterbalanced method, that the second section of the Group Embedded Figures Test under group administration correlated with the third section of the Embedded Figures Test under individual administration at -.82 for males and -.63 for females. Secondly, correlation between the Group Embedded Figures Test and the Portable Rod and Frame Test are -.39 for males and -.34 for females. In both cases, negative correlations are to be expected since scoring is in the reverse fashion.

Field dependence, as determined by the auto-kinesis effect, has been used to predict hospital elopement in alcoholics (Voth, 1965), and also in adult psychiatric patients (Cancro, Voth and Voth, 1968). Using eight weeks of staying in treatment to distinguish remainers from terminators, Karp, Kissin and Hustymer (1970) were able to distinguish alcoholic terminators from remainers in insight-oriented group therapy, based on the Embedded Figures Test as a measure of field dependence. Trainor (1972), using the Group Embedded Figures Test as a predictor of completion of a residential encounter group, found that the test was able to successfully discriminate terminators from remainers in a population who had problems with alcoholism and drug abuse.

In addition, it has been suggested that a combination of the internal-external locus of control scale and field dependence-independence
would be useful in predicting independence-related behaviours (Deever, 1967). In an initial study, Lefcourt and Telegdi (1971) examined the performance of congruent (high internal, field-independent or high external, field dependent, and incongruent (high internal, field dependent and high external, field independent) college students on three measures of cognitive activity: The Remote Associates Test (Mednick and Mednick, 1967); Barrons Human Movement Threshold InkBlot Test (Barron, 1955); and The Incomplete Sentence Blank (Rotter and Rafferty, 1950). The results indicated that congruent subjects out-perform incongruent subjects on all measures. This has caused the authors to speculate that congruency of expectations and perceptual abilities leads to better personality adjustment, and that such people are more aware of opportunities and more readily perceive information. Tobacyk, Broughton and Vaught (1975) have directly tested the first speculation, using 132 college students as subjects and a Q sort to determine the discrepancies between real and ideal self. The results supported the hypothesis that congruent individuals are better adjusted than incongruent individuals. They further suggest that the combination of the two variables might be a higher order construct which one could call "perceptual-expectancy style".

OVERVIEW OF THE RESEARCH

The proliferation of differing approaches to obesity therapy, group therapy versus self-administered bibliotherapy raises the question of assignment of clients to treatment based on personality characteristics or other variables. Therefore, the determination of client characteristics which best suit assignment to a specific mode of therapy, in terms of success-failure and staying in treatment, are important questions if we are to maximize the returns of our therapeutic endeavours. Accordingly,
this thesis will identify the relationship between the pretreatment measures of socio-economic status, internal-external locus of control, field dependence-independence and success-failure and terminating-remaining in the self-administered bibliotherapy treatment of obesity.

Social class is one of the few demographic variables to be consistently associated with premature termination in therapy. However, the amount of variance in early termination that social class can account for has rarely been explored. This study will examine the relationship between social class and early termination in terms of the amount of variance explained.

The internal-external locus of control scale has also been related to the problem of premature termination in the group therapy treatment of obesity with an $r^2$ of 16.5% (Balch and Ross, 1975). Also, as previously discussed, the internal-external locus of control scale has been used with contradictory findings in the prediction of success-failure in the group therapy treatment of obesity. This scale is a measure of the ability to self-reinforce with a high frequency (Bellack, 1975b), a cornerstone of successful self-modification of obesity (Rozensky and Bellack, 1976). For these reasons, a further study might delineate the relationship between the internal-external locus of control scale and success-failure at weight loss and terminating-remaining in the treatment of obesity.

The construct of field dependence-independence has been related to success at independence-related behaviours like self-modification (Witkin et al., 1962). It has also been related on an empirical level to the problem of premature termination from the treatment for alcoholism and drug abuse. Here, in this project, it is anticipated that field dependent research participants will prematurely terminate significantly
more frequently than those participants who are field independent.

The interaction of the internal-external locus of control and field dependence-independence known as congruence and incongruence has been suggested as a predictor of independence-related behaviours. This interaction of expectancies and perceptual style has never been explored in relation to the prediction of success-failure or terminating-remaining in the treatment of obesity. Therefore, the present research project will determine whether congruent research participants are more successful at weight loss than incongruent research participants. Thus, these specific hypotheses will be investigated.

**HYPOTHESES**

**TERMINATING-REMAINING**

**DEMOGRAPHIC VARIABLES**

Hypothesis: it is hypothesized that research participants who come from a lower socio-economic class as determined by the Blishen Scale (Blishen, 1967; Blishen and McRoberts, 1976) will terminate significantly more often than those from a higher socio-economic class.

**PSYCHOMETRIC MEASURES**

Hypothesis: it is hypothesized that research participants who are field dependent will terminate significantly more often than participants who are field independent.

**SUCCESS-FAILURE**

**PSYCHOMETRIC MEASURES**

Hypothesis: it is hypothesized that research participants who are congruent will be more successful at losing weight than those participants who are incongruent.
METHOD

Research Participants: The research participants were 119 females and 17 males who met the following criteria: (1) literate, as determined by self-report; (2) over 15% overweight, as determined by the Metropolitan Insurance Company Height and Weight Tables (1959); (3) had no history of hormonal or metabolic disorders; (4) had not participated in a weight-reduction program in the last six months and were not taking diet pills concurrently; and (5) were willing to post a $20.00 data-final weigh-in deposit.

Research participants were solicited by a series of newspaper advertisements and stories announcing "A New Approach To Weight Control" from the period of September, 1977 to February, 1978 in two medium-sized cities in south central Ontario. The research participants ranged in age from 17 to 62 years (\(\bar{x} = 39.47, \text{S.D.} = 10.93\)). They had varying marital backgrounds with 80% married, 9% separated or divorced, 9% single and 2% widowed. Their educational backgrounds were also widely varied, with educational status ranging from grade seven to a variety of post-secondary educational experiences. The participants for whom a number grade was obtained (people who had completed anywhere from one to thirteen years formal education) had a mean of 11.17 years of schooling, with a standard deviation of 2.56. In addition, 25% of the research participants had post-secondary educational experience (i.e., registered nursing training, teachers' college, community college).

Participants reported that the duration of their weight problem
varied in length from one to 53 years ($\bar{x} = 17.77$, S.D. = 9.58), with 15.3% of the sample reporting that they had always had a weight control problem. Participants tended to describe themselves as "professional dieters" and 37% of the sample reported prepuberty onset of obesity. Moreover, 89% of the research participants had been considering entering treatment for over one year and 82% reported that they had successfully dieted in the past but had now relapsed.

Independent Measures: The following pretest measures were administered to the participants: (1) a Demographic Questionnaire (Appendix B), which gathered information regarding sex, age, marital status, educational level, length of time overweight, success of previous weight control attempts and age of onset data; (2) a Socio-Economic Index (Blishen and McRoberts, 1976) (Appendix C), which provides a ranking of 343 Canadian occupations. The Blishen scale is based on the Pineo and Porter Scale (Pineo and Porter, 1967), in which 204 occupational titles were ranked according to their prestige. Since the scale is based on a male labour force, the potential of rating discrepancies between males and females is possible. Guppy and Siltanen (1977) had subjects rank 93 occupational titles in two ways: (1) sex not specified, i.e., bookbinder versus bartender, or (2) sex specified as either male or female, i.e., male bookbinder versus female bartender. The results indicate a high correlation of .98 between the traditional occupational scales (Pineo and Porter) and their Ontario Scale, and correlations between the traditional scale and those scales with sex specified in a comparable range. However, the correlations between these two prestige rankings when sex is specified is .90. This indicates a slight discrepancy in rankings. Although there are discrepancies between the male and female rankings, the correlations are high enough to indicate
substantial agreement. Research participants in the study were asked to circle the title of their appropriate occupational categories. If the present occupation of the research participant was not listed, he/she was asked to complete the scale based on his/her previous occupation. If the research participant was not employed (e.g., housewife, a category not listed), he/she utilized the occupational status of his/her spouse. The range of values in the scale is from 14.3963 (hunting, trapping and related occupations) to 75.2846 (administrators in teaching and related fields). The range of socio-economic ratings in the study was from 23.0027 (farmers) to 74.2831 (optometrists), with a $\bar{x} = 47.7518$, and a S.D. = 15.8320;

(3) The Internal-External Locus of Control Scale (Rotter, 1966), which consists of 29 forced-choice items and is designed to measure a generalized attitude, belief or expectancy concerning the relationship between a person's behaviour and reinforcement. The instrument was administered prior to and following treatment; (4) The Group Embedded Figures Test (Witkin, Oltman, Raskin and Karp, 1971), which is a perceptual test designed to measure field dependence-field independence; and (5) the height to the nearest inch and weight to the nearest pound in indoor clothing was obtained on a standard physician's balance scale.

**Dependent Measures:** The reduction index (Feinstein, 1959) was used to express the change in weight as well as pounds lost. The reduction index is equal to the percent of excess weight $x$ relative initial obesity, as determined by the Metropolitan Insurance Height and Weight Table (1959). In addition to weight, this index takes into account height, amount overweight and weight goal, which will be defined as target weight (for the table of target weight and weight ranges, see Appendix A).
The reduction index is as follows:

\[ RI = \frac{W_l}{W_s} \times \frac{W_i}{W_t} \times 100 \]

with \( W_l \) = weight lost, \( W_s \) = surplus weight, \( W_i \) = initial weight, and \( W_t \) = target weight.

Treatment Program: The treatment program is a modified version of the Hagen (1970) program. This program is based on the approach developed by Wollersheim (1970), which analyzes current eating behaviours and modifies them through the application of learning principles. The format of ten lessons contained in the manual is as follows: Part I is an introduction to and the development of specific principles and techniques, including examples demonstrating how these techniques can be utilized by research participants. Part II is composed of review questions based on the materials presented in Part I. Part III contains specific assignments which the research participant is to carry out. Part IV consists of a daily log which is to be filled out shortly after supper each day. This daily log includes goal setting for the following day and evaluation of the day's programs. Finally, Part V contains a weekly evaluation of the helpfulness of the content of that particular lesson. Part I is kept by the research participant, while Parts II, III, IV, and V are returned at specific predetermined points in the program to the researcher.

The following behavioural principles are introduced over the first five weeks of the program: Lesson I, building positive associations concerning eating control, keeping records of eating behaviours and shaping behaviours; Lesson II, developing appropriate stimulus control of eating behaviours and manipulating deprivation and satiation; Lesson III, rewarding the development of self-control and developing personally meaningful
ultimate aversive consequences (UAC's) of overeating; Lesson IV, obtaining reinforcers from areas of life other than eating, increasing satisfaction on an interpersonal level and increasing satisfaction in leisure time activities; Lesson V, establishing behaviours incompatible with eating and utilizing response chaining; and Lessons VI to X are devoted to continued review and application of those techniques.

Data Deposit and Final Weigh-in Deposit: A twenty dollar deposit was collected from research participants at the initial meeting. Fifteen dollars was allotted to the data deposit and five dollars was allotted as a final weigh-in deposit. The data deposit was returned at the rate of three dollars for each two lessons returned in time as specified in the program (Appendix D).

The final weigh-in deposit was returned when research participants returned to the final weigh-in meeting and were weighed and retested. All monies forfeited by the research participants for not meeting the program criteria were forwarded to the charity or agency of their choice.

General Procedure: Research participants attended a general meeting at which they were informed of the nature and purpose of the research program, the structure of the treatment manual and the data-final weigh-in deposit system. After this presentation (Appendix E), the investigator answered general questions concerning weight control and the bibliotherapy approach to weight loss. Then, two copies of the treatment package were circulated throughout the meeting to further familiarize interested persons with the manual. After the question period, the investigator invited all those interested to join the research program. At this point, the investigator left the meeting for a five minute period to allow people to consider the program and decide if they wished to participate. Upon returning, the
investigator asked those who were uninterested to leave and the assessment battery was administered, and height and weight data were collected.

**STATISTICAL ANALYSIS**

Multiple regression procedures were used to analyze the data because, unlike the ANOVA model, regression procedures do not require the dichotomizing of continuous variables with the resultant reduction of information.

The multiple regression approach has three alternative data analytic strategies: (1) the simultaneous model, (2) the hierarchical model, and (3) the stepwise model.

**The Simultaneous Model.**

This is the conventional model of multiple regression correlation in which all of the variables are entered and treated simultaneously. This model is recommended when there is no logical or theoretical basis for considering one variable prior to the other. The data analytic strategy provides the best linear estimate of the dependent variable for the $k$ independent variables and is suited for use in estimating $Y$ values for other samples of the same population. The relationship between the independent variables can be explained in terms of partial and semipartial correlations (Cohen and Cohen, 1975).

**The Hierarchical Model.**

This model enters independent variables cumulatively in a specific order which has been decided by the researcher and is dependent on the purpose and the logic of the research. This model is used when there are logical or theoretical reasons for considering one variable prior to the other. These reasons may be causal priority, research relevance, and
multicollinearity of structural properties, which include the case of interactions. The contribution of each independent variable is analyzed in terms of the variance added by that particular independent variable relative to the variance explained by the independent variables already in the equation. Thus, at each stage in the regression, the results would differ, depending upon the original ordering of the independent variables prior to analysis. In the final step, with all independent variables introduced, the regression equation is the same for both the simultaneous and hierarchical models (Cohen and Cohen, 1975).

The Stepwise Model.

This model selects variables at each step in the analysis based on the squared semipartial correlations and includes variables in the order of their contribution to the explained variance. The stepwise model stops including independent variables when they stop making a statistically significant contribution to the explained variance. The stepwise model is recommended when the research goal is entirely or primarily predictive as opposed to explanatory, when cross validation utilizing a new sample will be undertaken, or when large numbers of independent variables are being used. A k to n ratio of one to forty is recommended as a minimum. However, it is not recommended for exploratory research because it removes decision-making responsibilities for variable inclusion from the researcher. Also, it is not recommended when multicollinearity is encountered or when too many independent variables are under investigation (Cohen and Cohen, 1975).

The Present Analysis.

In multiple regression analysis, interaction terms (e.g., \(u \times v\)) are carried by the product terms but they are not synonymous with product
terms. A product term can become the interaction when the u and v have been linearly partialled out of the product term. Therefore, the interaction is correctly represented by the following expression: \( u \times v = uv \). Accordingly, the three way interaction is a generalization of the two way case. This distinction between product terms and interactions and the correct method of partialling is important because in partialling \( uv \) from u and v, we steal variance from the u and v. However, if we enter the u and v prior to the uv product term, then the effects of the u and v are partialled out and the product term becomes the interaction (Cohen and Cohen, 1975).

Cohen and Cohen (1975) recommended that if some independent variables were clearly prior to others for logical or structural reasons (for example, the inclusion of main effects before interaction terms), then these variables should be entered into the analysis hierarchically by groups or sets. However, a stepwise procedure should be computed within the sets. Thus, the analysis would be primarily hierarchical between sets of independent variables and stepwise within the sets of variables.

This analytic strategy was suited to the problem under investigation. The variables of socio-economic status (u), internal-external locus of control (v) and field dependence-independence (w) were entered as main effects. The two way interactions \( u \times v, u \times w \) and \( v \times w \) were entered as the second set, and the three way interaction was entered as the third set. The statistical significance of the main effects and interactions was determined by the F test to see whether the independent variables added significantly to the explained variance.

All independent variables in the analysis were continuous variables. The dependent measures of success-failure were operationalized in
terms of the reduction index and weight loss; and terminating-remaining
was operationalized in terms of the total number of lessons completed.
RESULTS SECTION

A total of 136 research participants were recruited for the study. However, only 92 returned for the final weigh-in. To allow the calculation to be computed on the same set of data, a listwise deletion for cases with missing information was selected for the data analysis. Accordingly, the data analysis for success in treatment was performed using 88 cases, while the analysis for terminating treatment was conducted on 131 cases. In the first analysis, four participants failed to provide socio-economic information. The second analysis also excluded the same participants with the addition of one more who failed to provide the required information and did not return to the final weigh-in.

Success in treatment was evaluated by means of two measures: the reduction index and pounds lost. The means, standard deviations and intercorrelations of the independent variables and these two dependent variables are presented in Table 1. The mean socio-economic status scores (SES), $\bar{X} = 47.75$, S.D. = 15.83, differed from those presented by Blishen (1967) for Ontario in 1961, $\bar{X} = 39.61$, S.D. = 12.35. The mean in this study is somewhat shifted to the upper end of the socio-economic scale.

The scoring of locus of control scale is in the direction of externality, with low scores indicating internality. The scoring of The Group Embedded Figures Test is in the direction of field independence, with low scores indicating field dependence.

The pretest scores on the locus of control are very similar to the normative sample $\bar{X} = 7.83$, S.D. = 3.82, as compared to $\bar{X} = 8.15$ for males
### TABLE I

**INTERCORRELATIONS FOR REDUCTION INDEX AND POUNDS LOST (N = 88)**

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>( \bar{x} )</th>
<th>S.D.</th>
<th>SES</th>
<th>IE</th>
<th>FDFI</th>
<th>TOTAL NUMBER COMPLETED</th>
<th>REDUCTION INDEX</th>
<th>POUNDS LOST</th>
</tr>
</thead>
<tbody>
<tr>
<td>SES</td>
<td>47.7518</td>
<td>15.8320</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IE (PRETEST)</td>
<td>7.8295</td>
<td>3.8214</td>
<td>- .24740*</td>
<td>1.00000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FDFI (PRETEST)</td>
<td>8.2727</td>
<td>5.4598</td>
<td>.31774*</td>
<td>- .02197</td>
<td>1.00000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL NUMBER COMPLETED</td>
<td>6.6932</td>
<td>3.5795</td>
<td>.03509</td>
<td>- .28705*</td>
<td>- .11330</td>
<td>1.00000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>REDUCTION INDEX</td>
<td>-28.2892</td>
<td>28.5240</td>
<td>- .00789</td>
<td>.21133*</td>
<td>- .01431</td>
<td>- .59149</td>
<td>1.00000</td>
<td></td>
</tr>
<tr>
<td>POUNDS LOST</td>
<td>10.3966</td>
<td>10.8192</td>
<td>- .07072</td>
<td>- .19934</td>
<td>- .01187</td>
<td>.56555</td>
<td>-.89973</td>
<td>1.0000</td>
</tr>
</tbody>
</table>

\[
t = r\sqrt{\frac{n - 2}{1 - r^2}}
\]

\[
t = 1.988 \text{ for 86 df} \quad p = .05 \text{ two-tailed test}
\]
and \( \bar{X} = 8.42 \) for females, with 3.88 and 4.06 the respective standard deviations. However, the mean and standard deviations for the Group Embedded Figures Test, \( \bar{X} = 8.27, \) S.D. = 5.46, were substantially dissimilar from the standardization sample \( \bar{X} = 12.0 \) for males and \( \bar{X} = 10.8 \) for females, with standard deviations of 4.1 and 4.2 respectively. These results indicate that not only is our sample more variable, but that they are also substantially more field dependent than the college standardization sample.

The intercorrelations of the independent variables, socio-economic status (SES) and locus of control (IE), \( r = -.24740, \) socio-economic status and field dependence (FDFI), \( r = .31774, \) and the locus of control and total lessons completed (COMPTNT), \( r = -.28705, \) were significant at the .05 level, \( t = 2.37 (86), t = 3.11 (86) \) and \( t = 2.78 (86) \) respectively. These results indicate that research participants higher in socio-economic status were significantly more internal and field independent than those of a lower socio-economic background. In addition, internality was significantly related to completing more lessons over the course of treatment. The correlation between the reduction index and pounds lost was \( r = -.899, \) \( t = -19.28, p<.05. \)

The initial question postulated was whether or not success in treatment, as measured by the reduction index (Feinstein, 1959), could be predicted from the demographic and personality variables. In addition, total lessons completed was entered last as an additional set to see whether or not any variance left unexplained by the demographic and personality variables could be accounted for by the inclusion of this variable. The results of this analysis for the reduction index are presented in Table 2.

The range of reduction indices was \(-105.03 \) to \(+37.64 \) (\( \bar{X} = -28.21; \) S.D. = 28.52) and indicates a great deal of variability between success rates for the participants in treatment. The regression analysis indicated
TABLE 2
HIERARCHICAL REGRESSION BETWEEN SETS AND STEPWISE REGRESSION WITHIN SETS FOR THE REDUCTION INDEX

<table>
<thead>
<tr>
<th>SET</th>
<th>VARIABLES</th>
<th>$R^2$</th>
<th>$R^2$ INCREMENT</th>
<th>F RATIO (a)</th>
<th>df</th>
<th>SIMPLE R</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>IE</td>
<td>.04466</td>
<td>.04466</td>
<td>4.02*</td>
<td>1,86</td>
<td>.2113</td>
</tr>
<tr>
<td></td>
<td>SES</td>
<td>.04676</td>
<td>.00210</td>
<td>F&lt;1</td>
<td>2,85</td>
<td>-.00789</td>
</tr>
<tr>
<td></td>
<td>FDFI</td>
<td>.04743</td>
<td>.00067</td>
<td>F&lt;1</td>
<td>3,84</td>
<td>-.01431</td>
</tr>
<tr>
<td>2</td>
<td>SES x FDFI</td>
<td>.05765</td>
<td>.01023</td>
<td>F&lt;1</td>
<td>4,83</td>
<td>-.00695</td>
</tr>
<tr>
<td></td>
<td>SES x IE</td>
<td>.05834</td>
<td>.00069</td>
<td>F&lt;1</td>
<td>5,82</td>
<td>.19094</td>
</tr>
<tr>
<td></td>
<td>IE x FDFI</td>
<td>.05842</td>
<td>.00007</td>
<td>F&lt;1</td>
<td>6,81</td>
<td>.11128</td>
</tr>
<tr>
<td>3</td>
<td>SES x IE x FDFI</td>
<td>.05885</td>
<td>.00043</td>
<td>F&lt;1</td>
<td>7,80</td>
<td>.11653</td>
</tr>
<tr>
<td>4</td>
<td>COMPTNT</td>
<td>.36991</td>
<td>.31107</td>
<td>39.00*</td>
<td>8,79</td>
<td>-.59149</td>
</tr>
</tbody>
</table>

Note: Conventions outlined here apply to subsequent tables

(a) The F ratio is

$$F = \frac{R^2y.12 - k_1 - Ry^2.12 - k_2}{(k_1 - k_2)} \div \frac{(1 - Ry^2.12 - k_1)/(N - k_1 - 1)}$$

where

- $R^2y.12 - k_1$ = The squared multiple correlation coefficient for y - for $k_1$
- $R^2y.12 - k_2$ = The squared multiple correlation coefficient for y - for $k_2$
- $k_1$ = number of independent variables of the larger $R^2$
- $k_2$ = number of independent variables of the smaller $R^2$
- $N$ = total number of cases

* $p < .05$
a significant relationship between locus of control, $F = 4.02$ (1,86 df) and the reduction index. None of the other main effects or interactions were significant. The $R^2$ change indicated that 4.4% of the variance in the reduction index can be explained by the locus of control scale. The addition of lessons completed significantly increased the amount of variance explained. The lessons completed variable was significant with an $F = 39.00$ (8,79 df) and accounted for 31% of the variability in the reduction index. Hence, approximately 35% of the success in treatment is attributable to the combined effects of internality and lessons completed over treatment.

A similar analysis was undertaken utilizing the same data analytic strategy for pounds lost. These results are presented in Table 3. The range of pounds lost was 40.50 lost to 18.30 pounds gained, with a mean weight loss of 10.31 pounds and a standard deviation of 10.81. The data analysis revealed a significant relationship between lessons completed and pounds lost, $F = 35.02$ (8,79 df). This variable was the only significant predictor of pounds lost. Unlike the analysis for the reduction index, the locus of control variable did not account for sufficient variability in pounds lost to be statistically significant.

Terminating-remaining was measured in terms of the total number of lessons completed. The means, standard deviations and intercorrelations of the independent variables and the dependent variable are presented in Table 4. The mean socio-economic status scores, $\bar{X} = 47.25$, S.D. = 14.77, differed from those presented by Blishen (1967) for Ontario in 1961. As previously noted, the sample was somewhat shifted to the upper end of the socio-economic status scale. The pretest scores on the locus of control scale were very similar to the normative sample, $\bar{X} = 7.95$, S.D. = 3.75. The mean and standard deviation for the Group Embedded Figures Test, $\bar{X} = 8.39$, S.D. = 5.40, were both substantially dissimilar from the standardization
TABLE 3
HIERARCHICAL REGRESSION BETWEEN SETS AND STEPWISE REGRESSION WITH SETS FOR POUNDS LOST

<table>
<thead>
<tr>
<th>SET</th>
<th>VARIABLES</th>
<th>R²</th>
<th>R² INCREMENT</th>
<th>F RATIO</th>
<th>df</th>
<th>SIMPLE R</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>IE</td>
<td>.03974</td>
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<td>1.86</td>
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<td></td>
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<tr>
<td></td>
<td>FDFI</td>
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<td>.00062</td>
<td>F&lt;1</td>
<td>3.84</td>
<td>-.01187</td>
</tr>
<tr>
<td>2</td>
<td>SES x FDFI</td>
<td>.06246</td>
<td>.00686</td>
<td>F&lt;1</td>
<td>4.83</td>
<td>-.05314</td>
</tr>
<tr>
<td></td>
<td>SES x IE</td>
<td>.06557</td>
<td>.00311</td>
<td>F&lt;1</td>
<td>5.82</td>
<td>-.23668</td>
</tr>
<tr>
<td></td>
<td>IE x FDFI</td>
<td>.06829</td>
<td>.00264</td>
<td>F&lt;1</td>
<td>6.81</td>
<td>-.10505</td>
</tr>
<tr>
<td>3</td>
<td>SES x IE x FDFI</td>
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<td>.00178</td>
<td>F&lt;1</td>
<td>7.80</td>
<td>-.13427</td>
</tr>
<tr>
<td>4</td>
<td>COMPTNT</td>
<td>.35563</td>
<td>.28564</td>
<td>35.02*</td>
<td>8.79</td>
<td>-.56535</td>
</tr>
</tbody>
</table>

* p < .05
<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>$\bar{x}$</th>
<th>S.D.</th>
<th>SES</th>
<th>IE</th>
<th>FDFI</th>
<th>TOTAL LESSONS COMPLETED</th>
</tr>
</thead>
<tbody>
<tr>
<td>SES</td>
<td>47.2511</td>
<td>14.7741</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IE (PRETEST)</td>
<td>7.9466</td>
<td>3.7464</td>
<td>- .15134</td>
<td>1.0000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FDFI (PRETEST)</td>
<td>8.3893</td>
<td>5.3945</td>
<td>.26631*</td>
<td>- .02484</td>
<td>1.0000</td>
<td></td>
</tr>
<tr>
<td>TOTAL NUMBER COMPLETED</td>
<td>5.054</td>
<td>4.0370</td>
<td>.04026</td>
<td>- .13717</td>
<td>.08008</td>
<td>1.0000</td>
</tr>
</tbody>
</table>

\[ t = \frac{r \sqrt{n - 2}}{\sqrt{1 - r^2}} \]

\[ t = 1.979 \text{ for } 129 \text{ df} \quad \text{p} = .05 \]
sample. The present sample was more field dependent than the college standardization sample.

An examination of the intercorrelations revealed only one significant correlation. Socio-economic status was significantly correlated with field dependence, $r = .26631$, $t = 3.14$ (129 df). Again, participants with higher socio-economic backgrounds were significantly more field independent.

The participants in the study completed a range of lessons from 0 to 10 with a $\bar{X} = 5.05$, S.D. = 4.04. The data for the total number of participants completing each lesson are presented in Figure 1. An examination of the data for the total number of lessons completed revealed that participants began to drop out of treatment prior to the beginning of the program, with 19.1% of participants not sending in the first lesson. The drop out rate per lesson continued to be high, with 31.6% not sending in the second lesson and 42.6%, 46.3%, 50.0%, 53.7%, 59.6%, 60.3%, 64.0% and 70.6% not sending in the next eight lessons respectively. In addition, of the 44 participants who did not attend the final weigh-in session, 43.1% never sent in the first lesson, 22.7% sent in only the first lesson, and 18.1% sent in just two lessons. In total, 83.9% of the participants who did not return for the final weigh-in either never started the program or dropped out of treatment relatively early. The remaining missing participants, 16.1%, dropped out at various other points over the course of the ten week program.

Of the participants who dropped out early, four who completed 0 lessons, nine who completed only one lesson and six who completed two lessons returned for the final weigh-in. The ranges of weight losses were +11.7 (gained) to -16.8 (lost) for 0 lessons completed; +18.5 (gained) to -10.5 (lost) for one lesson completed; and +4.0 (gained) to -14.0 (lost) for two lessons completed, with means of -4.94, -.96 and -1.0 pounds lost respectively.
NUMBER OF PARTICIPANTS THAT COMPLETED EACH LESSON

Number of Participants

120
110
100
90
80
70
60
50
40
30
20
10

Number of Lessons

1
2
3
4
5
6
7
8
9
10

fig 1
The data analytic strategy previously described was employed to analyze the total number of lessons completed, using an n of 131. The results are presented in Table 5. The analysis revealed no significant main effects or interactions for the overall number of lessons completed.

An examination of the scattergrams from the previous analysis revealed that 25 research participants did not even send in the first lesson of the program. In addition, only one of those participants who did not send in the first lesson sent in the second lesson. However, she did not forward any lessons beyond this point. Accordingly, it seemed likely that those who signed up, but did not send in the first lesson, might represent a distinct population from those who signed up and actually completed one or more lessons. Hence, a more sensitive analysis appeared to be called for. In the first analysis, an attempt was made to distinguish those that signed up but did not complete the first lessons from those who completed the first lesson. Accordingly, the dependent variable was transformed by dummy coding into 0, those who did not complete the first lesson, and 1, those who did complete it. When two groups are created through dichotomizing of a dependent variable, the analysis is a multiple regression to predict group membership, and it is known as a discriminant analysis. In the second analysis, an attempt was made to predict how many lessons a research participant would complete if he had completed the first lesson.

The first analysis is presented in Table 6. The results reveal no significant relationships for main effects. However, the interaction of socio-economic status and locus of control was significant, $F = 4.04$ (4,126 df), as was the interaction of locus of control and field-dependence-independence, $F = 2.41$ (5,125 df).

These results indicate that the interaction of socio-economic status and locus of control accounts for 3% of the variance. The correlation
### TABLE 5
HIERARCHICAL REGRESSION BETWEEN SETS AND STEPWISE REGRESSION WITHIN SETS FOR TOTAL LESSONS COMPLETED

<table>
<thead>
<tr>
<th>SET</th>
<th>VARIABLES</th>
<th>$R^2$</th>
<th>$R^2$ INCREMENT</th>
<th>F RATIO</th>
<th>df</th>
<th>SIMPLE R</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>IE</td>
<td>.01881</td>
<td>.01881</td>
<td>2.47</td>
<td>1,109</td>
<td>-.13713</td>
</tr>
<tr>
<td></td>
<td>FDFI</td>
<td>.02578</td>
<td>.00698</td>
<td>F&lt;1</td>
<td>2,128</td>
<td>-.08008</td>
</tr>
<tr>
<td></td>
<td>SES</td>
<td>.02767</td>
<td>.00189</td>
<td>F&lt;1</td>
<td>3,127</td>
<td>-.04026</td>
</tr>
<tr>
<td>2</td>
<td>SES x FDFI</td>
<td>.03118</td>
<td>.00351</td>
<td>F&lt;1</td>
<td>4,126</td>
<td>-.03381</td>
</tr>
<tr>
<td></td>
<td>SES x IE</td>
<td>.03413</td>
<td>.00295</td>
<td>F&lt;1</td>
<td>5,125</td>
<td>-.11023</td>
</tr>
<tr>
<td></td>
<td>IE x FDFI</td>
<td>.03428</td>
<td>.0015</td>
<td>F&lt;1</td>
<td>6,124</td>
<td>-.14408</td>
</tr>
<tr>
<td>3</td>
<td>SES x IE x FDFI</td>
<td>.04026</td>
<td>.00597</td>
<td>F&lt;1</td>
<td>7,123</td>
<td>-.10703</td>
</tr>
</tbody>
</table>
**TABLE 6**

HIERARCHICAL REGRESSION BETWEEN SETS AND STEPWISE REGRESSION WITHIN SETS FOR GROUP MEMBERSHIP

(0 = does not send in the first lesson; 1 = sends in the first lesson)

<table>
<thead>
<tr>
<th>SET</th>
<th>VARIABLES</th>
<th>$R^2$</th>
<th>$R^2$ INCREMENT</th>
<th>F RATIO</th>
<th>df</th>
<th>SIMPLE R</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SES</td>
<td>.01008</td>
<td>.01008</td>
<td>1.31</td>
<td>1,129</td>
<td>.10042</td>
</tr>
<tr>
<td></td>
<td>IE</td>
<td>.01380</td>
<td>.00372</td>
<td>F&lt;1</td>
<td>2,128</td>
<td>.04510</td>
</tr>
<tr>
<td></td>
<td>FDFI</td>
<td>.01523</td>
<td>.00143</td>
<td>F&lt;1</td>
<td>3,127</td>
<td>.06410</td>
</tr>
<tr>
<td>2</td>
<td>SES x IE</td>
<td>.04584</td>
<td>.03061</td>
<td>4.04*</td>
<td>4,126</td>
<td>.05131</td>
</tr>
<tr>
<td></td>
<td>IE x FDFI</td>
<td>.06385</td>
<td>.01801</td>
<td>2.41*</td>
<td>5,125</td>
<td>.01983</td>
</tr>
<tr>
<td></td>
<td>SES x FDFI</td>
<td>.06401</td>
<td>.00016</td>
<td>F&lt;1</td>
<td>6,124</td>
<td>.10182</td>
</tr>
<tr>
<td>3</td>
<td>SES x IE x FDFI</td>
<td>.07626</td>
<td>.01225</td>
<td>1.63</td>
<td>7,123</td>
<td>.04448</td>
</tr>
</tbody>
</table>

* p < .05
between the socio-economic status and locus of control for group 0, those who did not send in the first lesson, is $r = .179$, $t = .854$ (24 df) and is non-significant. However, the correlation between the two variables for group 1, those who sent in the first lesson, is $r = -.238$, $t = 2.499$ (105 df) and is significant. An analysis of the scattergrams for both groups revealed that participants who were from a higher socio-economic status and internal were those who sent in the first lesson.

The interaction of locus of control and field-dependence-independence accounted for 1.8% of the variance for those who sent in the first lesson. The correlation between the locus of control scale and The Group Embedded Figures Test for group 0 is $r = .225$ n.s. In addition, the correlation between these two variables for group 1 is $r = -.10$ n.s. An examination of the scattergrams indicated a very slight relationship for those participants who were internal and field-independent. They tended to complete the first lesson. However, the other congruent group, field-dependent-external, tended not to complete the first lesson. Together, the two interactions accounted for 4.9% of the variance in forwarding the first lesson.

The second analysis is presented in Table 7. The results of the analysis revealed two significant main effects. Locus of control accounted for 5.6% of the variance in lessons completed when we have selected for those cases in which the first lesson or more is completed. This effect was significant, $F = 6.21$ (1,104 df) and indicated that those who scored lower on the I-E scale (i.e., more internal) were more likely to complete more lessons.

The field-dependence-independence variable was also significant, $F = 4.3$ (2,103 df) and accounted for an additional 3.8% of the variance in lessons completed. This indicates that those who scored lower on The Group Embedded Figures Test (i.e., more dependent) tended to complete more lessons.
TABLE 7
HIERARCHICAL REGRESSION BETWEEN SETS AND STEPWISE REGRESSION WITHIN SETS FOR THE TOTAL NUMBER OF LESSONS COMPLETED, IF THE PARTICIPANTS FORWARD THE FIRST LESSON

<table>
<thead>
<tr>
<th>SET</th>
<th>VARIABLES</th>
<th>R²</th>
<th>R² INCREMENT</th>
<th>F RATIO</th>
<th>df</th>
<th>SIMPLE R</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>IE</td>
<td>.05635</td>
<td>.05638</td>
<td>6.21*</td>
<td>1,104</td>
<td>-.23745</td>
</tr>
<tr>
<td></td>
<td>FDFI</td>
<td>.09427</td>
<td>.03789</td>
<td>4.31*</td>
<td>2,103</td>
<td>-.16953</td>
</tr>
<tr>
<td></td>
<td>SES</td>
<td>.09559</td>
<td>.00132</td>
<td>F&lt;1</td>
<td>3,102</td>
<td>-.02979</td>
</tr>
<tr>
<td>2</td>
<td>IE x FDFI</td>
<td>.10951</td>
<td>.01391</td>
<td>1.58</td>
<td>4,101</td>
<td>-.23606</td>
</tr>
<tr>
<td></td>
<td>SES x FDFI</td>
<td>.11996</td>
<td>.01046</td>
<td>1.19</td>
<td>5,100</td>
<td>-.13251</td>
</tr>
<tr>
<td></td>
<td>SES x IE</td>
<td>.12865</td>
<td>.00868</td>
<td>F&lt;1</td>
<td>6,99</td>
<td>-.20591</td>
</tr>
<tr>
<td>3</td>
<td>SES x IE x FDFI</td>
<td>.12870</td>
<td>.00005</td>
<td>F&lt;1</td>
<td>7,98</td>
<td>-.19306</td>
</tr>
</tbody>
</table>

* p = <.05
Together, locus of control and field-dependence-independence accounted for 9.4% of the variance in lessons completed when those who failed to complete any lessons were dropped from the analysis. Neither socio-economic status nor any interaction terms contributed significantly towards accounting for additional variance in lessons completed once locus of control and field-dependence-independence had entered the regression.

Additional analysis: In addition to the primary predictors, data on age, pre- versus post-puberty onset of obesity, past success at weight loss, etc., were gathered via a demographic questionnaire. An intercorrelation matrix of these variables was produced and an examination of these intercorrelations, using t tests, revealed that none of the variables had a significant relationship with the reduction index. However, the variable of age correlated with the total number of lessons completed, $r = .3324$, $t = 3.99$, $p .05$. None of the other variables correlated significantly with total number of lessons completed. Accordingly, it was decided to enter age as a main effect to see if it contributed significantly to the prediction of group membership. It was found that age did not contribute significantly, $F = 1.47 (1,129)$ n.s. However, with its addition, the interaction of socio-economic status and locus of control only accounted for 0.6% of the variance explained, even though it remained significant, $F = 4.14 (5,125)$. In addition, the interaction of locus of control and field-dependence-independence, congruence-incongruence, was now no longer significant, $F = 1.93 (6,124)$ n.s.

Following the same procedure, the age variable was added to the analysis of the total number of lessons completed, if the participant had forwarded the first lesson. The results of the analysis revealed two significant main effects. The age variable was significant, $F = 19.32$
<table>
<thead>
<tr>
<th>SET</th>
<th>VARIABLES</th>
<th>R^2</th>
<th>R^2 INCREMENT</th>
<th>F RATIO</th>
<th>-df</th>
<th>SIMPLE R</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AGE</td>
<td>.15703</td>
<td>.15703</td>
<td>19.37*</td>
<td>1,104</td>
<td>.39027</td>
</tr>
<tr>
<td></td>
<td>IE</td>
<td>.18716</td>
<td>.03013</td>
<td>3.82*</td>
<td>2,103</td>
<td>-.23745</td>
</tr>
<tr>
<td></td>
<td>FDFI</td>
<td>.19020</td>
<td>.00904</td>
<td>1.15</td>
<td>3,102</td>
<td>-.16953</td>
</tr>
<tr>
<td></td>
<td>SES</td>
<td>.19631</td>
<td>.00011</td>
<td>&lt;.01</td>
<td>4,101</td>
<td>-.02979</td>
</tr>
<tr>
<td>2</td>
<td>IE x FDFI</td>
<td>.20830</td>
<td>.01199</td>
<td>1.51</td>
<td>5,100</td>
<td>-.23606</td>
</tr>
<tr>
<td></td>
<td>SES x FDFI</td>
<td>.21755</td>
<td>.00925</td>
<td>1.17</td>
<td>6,91</td>
<td>-.13251</td>
</tr>
<tr>
<td></td>
<td>SES x IE</td>
<td>.22577</td>
<td>.00822</td>
<td>1.04</td>
<td>7,98</td>
<td>-.20591</td>
</tr>
<tr>
<td>3</td>
<td>SES x IE x FDFI</td>
<td>.22692</td>
<td>.00115</td>
<td>&lt;.01</td>
<td>8,97</td>
<td>-.19306</td>
</tr>
</tbody>
</table>

* p < .05
(1,104 df), and accounted for 15.7% of remaining in treatment when only those cases which had begun treatment were included. This indicated that the older the participants, the longer they remained in treatment. The locus of control scale was also significant, $F = 3.82$ (2,103 df) and accounted for 3.0% of the variance in lessons completed. Those who scored lower on the scale, internals, remained in treatment longer. However, field-dependence-independence was no longer significant, $F = 1.15$ (3,102 df) n.s. In addition, neither socio-economic status or the other interaction terms contributed significantly towards explaining lessons completed. In total, the variables of age and locus of control contributed 18.7% towards explaining the total number of lessons completed. These results indicated that participants who were older or who were internal completed more lessons.

**Pretest, Posttest Measures:** A change score for locus of control and field-dependence-independence was calculated by subtracting the pretest scores from the posttest scores. The pretest, posttest means, standard deviations and differences between the means are presented in Table 9. An examination of the table reveals that there are significant changes in both the locus of control, $.91 \ t = 3.15$, and field-dependence, $-1.64 \ t = -5.54$. This indicated that scores on the locus of control scale became more internal and scores on the field-dependence scale became more field independent.
TABLE 9
PRETEST, POSTTEST, MEAN, STANDARD DEVIATIONS AND CHANGE SCORES FOR
LOCUS OF CONTROL SCALE AND THE GROUP EMBEDDED FIGURES TEST (N = 91)

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>PRETEST</th>
<th>POSTTEST</th>
<th>CHANGE SCORES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( \bar{x} )</td>
<td>S.D.</td>
<td>( \bar{x} )</td>
</tr>
<tr>
<td>IE</td>
<td>8.00</td>
<td>3.89</td>
<td>7.08</td>
</tr>
<tr>
<td>FDFI</td>
<td>8.20</td>
<td>5.38</td>
<td>9.84</td>
</tr>
</tbody>
</table>

\[ t = 1.987 \quad 90 \text{ df two-tailed} \]
DISCUSSION

Experts in the field of obesity (Howard, 1975; Mahoney and Mahoney, 1976) generally agree that weight loss in the range of 1 to 1 1/2 pounds per week is ideal. Weight losses in excess of this rate involve such serious nutrient restrictions that they result in serious health hazards for people. The average weight loss in the present study was 10.31 pounds over ten weeks or 1.03 pounds per week. This result compared favourably with those reported by other researchers using the same ten week program.

Wollersheim (1970) reported 10.33 pounds lost by her behavioural group, and Hagen (1974) reported 12.0 pounds lost by his minimal contact clients. In addition, the present results were slightly higher than the 7.95 pounds lost reported by Tobias and MacDonald (1977) in a self-administered bibliotherapy program and the 6.1 pounds lost reported by Fernan (1973) in a self-administered bibliotherapy condition. However, Fernan's minimal contact group experienced weight losses comparable to participants in the present study (i.e., 10.5 pounds lost).

Although reduction indices were not available for other studies, since most researchers have failed to report their choice of target weights, the loss of -28.2092, or roughly 30%, of the client's weight loss goal based on ideal weight, was a reasonable achievement considering the time period involved. The standard deviation was 10.8 for pounds lost and 28.5240 for the reduction index. These indicate that, although treatment was reasonably effective for most participants, there was substantial variability among clients. This variability in treatment effectiveness
has been noted by Bellack (1977). In addition, this finding underlines the importance of individual differences in response to obesity treatment.

Characteristically, the search for predictor variables has been an after thought and of secondary importance to the investigation of other hypotheses in obesity research (Weiss, 1977). In addition, these investigations have used simple correlations to explain the relationships between the variables and success in treatment (Jeffrey, 1976). This study was a clear departure from this approach. It was a statistically powerful, multivariate analysis of a number of predictor variables and their interaction terms, utilizing a large number of participants.

The attempts to predict success-failure based on demographic and personality predictors was disappointing. The Locus of Control Scale (Rotter, 1966) was the only personality measure which significantly correlated with the reduction index. However, it did not correlate significantly with pounds lost, nor was the hypothesized relationship between congruence-incongruence and either the reduction index or pounds lost significant. Although the relationship between an internal orientation on the locus of control scale and the reduction index was significant, locus of control made only a minimal contribution, 4.4%, towards explaining success in treatment. In addition, it was not significantly related to pounds lost in this study, although Balch and Ross (1975) have reported a relationship, 4.8% of the variance explained, between locus of control and pounds lost.

Although initially hypothesized as an efficient predictor of independence-related behaviour, success in self-administered bibliotherapy treatment of obesity is not related to the skills of cognitive alertness, or self-reliance, as measured by the interaction of locus of control and field-dependence-independence. It appears that success in self-control programs is related to the ability to persevere in treatment, which appears
to be related to behavioural characteristics.

In contrast to the small variance accounted for by the demographic and personality characteristics, the number of lessons completed during treatment contributed significantly, 31%, towards explaining success in treatment. Obviously, clients must remain in treatment and practise the behaviours associated with weight reduction to ensure success. In addition, the fact that the clients persisted to varying degrees in a highly-structured treatment program cannot be discounted. Accordingly, it suggests that client behaviours and reactions to the program over the course of treatment may be more important in predicting success than demographic and personality factors.

The attempts to predict terminating-remaining were equally dissatisfying, with none of the demographic or personality variables related to the total number of lessons completed. An analysis of participants to determine if those who sent in the first lesson could be discriminated from those who did not send in the first lesson indicated relationships between the interaction of socio-economic status and locus of control, with 3.1% of the variance accounted for, and the interaction of locus of control and field-dependence-independence, with 1.8% of variance accounted for in sending in the first lesson. However, the addition of the age variable in the later analysis indicated that the only significant interaction is the one between socio-economic status and locus of control and it explained only 0.6% of the variance in sending in the first lesson.

The analysis to predict terminating-remaining for those who sent in the first lesson was somewhat more successful. The analysis indicated a significant relationship between locus of control, with 5.5% of the variance accounted for, and field-dependence-independence, with 3.8% of remaining in treatment accounted for. However, the addition of the age variable to this
analysis substantially altered the analysis. The age variable contributed 15.7% towards explaining remaining in treatment and the locus of control variable accounted for only 3.0% of remaining in treatment. The relationship between locus of control and terminating in the two analyses was 5.5% and 3% respectively, and this was in direct contrast to the 16.8% of variance accounted for by the locus of control variable in the Balch and Ross (1975) study. Interestingly, the hypothesized relationship between socio-economic status and terminating was not found in any of the analyses, although this result may have been due to the initially higher socio-economic status of participants as compared to the means presented by Blishen for Ontario in 1961.

The interpretation of such marginally-significant effects for locus of control, field-dependence-independence and the interaction of socio-economic status and locus of control demand some caution. In interpreting the relationship between locus of control and success in treatment, the question of dependent variable sensitivity must be addressed. Previous research which has used both measures (Brownell et al., 1976) indicates that the reduction index produces the largest F values and accordingly, is the most sensitive of the measures. In addition, the relationship between locus of control and age, and field-dependence-independence and age, cannot be discounted. Both of these personality measures are associated with shifts accompanying increased age.

People tend to become more internal as they grow older (Lefcourt, 1976); correspondingly, they also tend to become more field-independent with age (Witkin et al., 1962). In both analyses of terminating, the introduction of the age variable led to the reduction of the contributions of locus of control and field-dependence to explaining remaining in treatment.

As noted, the interpretations of such small $r^2$ demands careful attention. The results of this study demonstrated that locus of control was
only minimally related to success in treatment and required a sensitive analysis to indicate the relationship. It is interesting that a construct such as locus of control, which has such intuitive appeal and some empirical support for skills thought to be important in self-control, e.g., delay of gratification, improved attention skills, and awareness of the person's circumstances (Lefcourt, 1976) has such a marginal relationship to success.

The construct of internal-external locus of control (Rotter, 1966) was conceived as the degree to which the individual perceives a consequent event following his own behaviour as dependent on his own abilities or skills. Accordingly, externals attribute success to chance or fate, while internals attribute success to their own efforts. The locus of control scale was originally constructed as a unidimensional measure of this factor. However, since its inception, a more thorough investigation of the scale (Mirels, 1970; Reid and Ware, 1973, 1974) has revealed the existence of two subscales within the original scale. In the Reid and Ware (1974) analysis, the scales were identified as fatalism, the extent to which luck, fate, or fortune are perceived as determinants of one's personal goals, achievements or outcomes; and social systems control, the extent to which the individual has control over sociopolitical institutions. Reid and Ware (1974) have emphasized that the major difference between the two scales is the source of control. In both cases, the individual is the target of control by external agents. In addition, they argued that the locus of control scale confounds self or personal references, with references concerning others and fatalism. Accordingly, the fatalism scale and social system scale can be conceived as having interpersonal and extrapersonal dimensions. However, the dimension of self-control is concerned with control over one's impulses, desires and wishes and is dependent on internal referents. Accordingly, it can be conceived of as an intrapersonal dimension (Schlegel and Crawford, 1976).
The locus of control scale as constructed by Rotter (1966) does not have a measure of internal referents or a self-control dimension. Accordingly, the weak relationship between locus of control and the reduction index, a measure of success, may be attributable to the scale used in the study.

Accompanying the minimal relationship of participants' internality to success in treatment, participants' change scores on both the locus of control scale and The Group Embedded Figures Test shifted significantly in the direction of internality and field-independence respectively. However, given the insensitivity of the locus of control scale and the non-significant relationships between field-dependence and success, these shifts in scores may have been due to regression toward the mean to some extent.

In the field of obesity treatment, good predictors for success are nonexistent. An investigation to determine the relationship of internal locus of self-control and success in treatment is much needed. Although only a fledgling activity, the potential of pretraining patient internality (Wallston and Wallston, 1973) provides further impetus for such an investigation. In addition, the similarity of means between the participants and the standardization sample provide further support for the findings of Karpowitz and Zeis (1975) and Martin et al. (1975), which indicated that the obese do not differ from the normals on locus of control. It also indicated that the relationship between weight loss and locus of control is not dependent on age as suggested by Rodin et al. (1975).

Participants dropped out of treatment prior to sending in the first lesson and continued to do so at very high rates over the course of the ten lessons. The demographic and personality variables were singularly unsuccessful in the initial prediction of terminating-remaining based on zero to ten lessons and only minimally useful, accounting for .5% of the
variance, in discriminating those who would send in the first lesson. However, the variable of age, which had previously been found to have no relationship to remaining in treatment (Seaton and Rose, 1965), accounted for 15.7% of the variance explained and locus of control accounted for an additional 3.0%. Together they were very useful in predicting dropping out once the first lesson was sent in. The failure of Seaton and Rose to find a relationship between age and remaining in treatment may be due to the lack of variability in the sample they studied. The results of the present success-failure analysis revealed that success was dependent on staying in treatment, but most participants completed only five lessons. Why did so many people leave treatment so early and in addition, what conclusions can be drawn about the early terminators?

With the exception of one participant, all 25 people who received a manual and did not forward the first lesson never started treatment. This finding is consistent with Bakeland, Lundwall and Shanahan (1973), whose research on immediate dropouts indicated that those who miss the first appointment do not make the effort to continue treatment. The present results substantiate this finding; however, the reasons for failing to begin treatment are not clear from the data. Post treatment discussions identified a number of possible explanations. Participants reported that they were too busy to always record their behaviours; they felt that filling in daily logs and establishing goals for the next day was too time consuming. Others reported that they just fell behind or lost interest. In addition, some participants reported difficulty in using some techniques and lack of effectiveness for others. Further, other clients reported difficulty in comprehending the material presented, and the effects of perceived satisfaction and rate of weight loss cannot be discounted. On the other hand, some clients did report that they enjoyed the extensive record keeping and
enjoyed the challenge of applying a new approach to their weight problem.

The initial time-related difficulties stressed the importance of having the time to devote to treatment and suggested that either time available, or the ability to make time available, may be related to staying in treatment and success. In addition, this also suggested that successful self-administered self-help manuals must have a balance between too much structure and too much work and adequate structure, which ensures that the prescribed behaviours be followed. Further, an investigation of the readability of bibliotherapy manuals and greater attention to organization and journalistic clarity to ensure continued perseverance may also be fruitful avenues of exploration.

The question of what happens to the treatment dropout remains vague. Limited evidence suggests that those who drop out of treatment early lose little weight. However, post treatment discussions with clients suggested that although clients stopped the record keeping and forwarding lessons, they continued to attempt to apply the weight reduction technology to their problem. The long term implications await the collection of follow-up data.

For those participants who started treatment, remaining in treatment is related to age, with older people remaining longer, and locus of control, with internals remaining longer. The success of older and internal people in remaining in treatment may be due to two factors. The older participants are quite likely conscious of a decline in health associated with age and the relationship of obesity to heart problems. These factors may be sufficient to motivate remaining in treatment. The internal participants' success, like the older participants', may be health-related. Internals are more likely to be health-knowledge conscious and health-oriented (Wallston and Wallston, 1973), as this health orientation coupled with the ability to delay gratification may be sufficient to keep internals in treatment.
On a more general level, the questions of attempting to predict the successful from the unsuccessful and the terminators from the remainers via demographic and personality measures must be addressed. Given the scale of the obesity problem in North America (Osancova and Hejda, 1975; Stuart and Davis, 1972) and our failure to isolate traits or attributes that characterize the obese (Leon and Roth, 1977), it seems in retrospect to be naive to think that the successful or the terminators in treatment might be characterized by a similar type of descriptors, particularly when some evidence suggests that the culprits in producing obesity are eating habits, i.e., eating speed, overconsumption and life style patterns, for example, insufficient exercise (Mahoney and Mahoney, 1976).

In conclusion, one can say that the most effective predictor of success is to maintain clients in behavioural treatment, acknowledging the fact that older and internal participants will persevere.

Most certainly, what is needed is a fresh approach to the question of predictor variables. This research suggests that variables related to remaining in treatment and therefore success are quite likely behavioural and as yet unspecified. A comprehensive investigation of the processes of dieting from a social psychological perspective utilizing a single subject approach (Hernsen and Barlow, 1977) is an appropriate place to begin to identify variables. Also given the poor results of long-term follow-up (Brightwell and Sloan, 1977), and the suggestion that weight loss skills versus weight loss maintenance skills may be very different (Kingsley and Wilson, 1977), the need to pursue variables predictive of long term success is indicated. The establishment of more potent variables and the use of more sophisticated designs, cognizant of the contributions of age and locus of control to remaining in treatment, will certainly help to illuminate the process of terminating-remaining and accordingly, success in treatment.
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APPENDIX A

DESI RABLE WEIGHTS FOR MEN AND WOMEN

FOR MEDIUM FRAME, AGE 25 AND OVER

FOR MEN (weight in pounds in indoor clothes)

<table>
<thead>
<tr>
<th>HEIGHT IN SHOES</th>
<th>MEDIUM FRAME</th>
<th>MIDPOINT</th>
<th>15% OVER MIDPOINT</th>
</tr>
</thead>
<tbody>
<tr>
<td>5' 2&quot;</td>
<td>118 - 129</td>
<td>123.5</td>
<td>142.5</td>
</tr>
<tr>
<td>3&quot;</td>
<td>121 - 133</td>
<td>127.0</td>
<td>146.0</td>
</tr>
<tr>
<td>4&quot;</td>
<td>124 - 136</td>
<td>130.0</td>
<td>149.5</td>
</tr>
<tr>
<td>5&quot;</td>
<td>127 - 139</td>
<td>133.0</td>
<td>155.0</td>
</tr>
<tr>
<td>6&quot;</td>
<td>130 - 143</td>
<td>136.5</td>
<td>157.0</td>
</tr>
<tr>
<td>7&quot;</td>
<td>134 - 147</td>
<td>140.5</td>
<td>161.5</td>
</tr>
<tr>
<td>8&quot;</td>
<td>138 - 152</td>
<td>145.0</td>
<td>167.0</td>
</tr>
<tr>
<td>9&quot;</td>
<td>142 - 156</td>
<td>149.0</td>
<td>171.5</td>
</tr>
<tr>
<td>10&quot;</td>
<td>146 - 160</td>
<td>153.0</td>
<td>176.0</td>
</tr>
<tr>
<td>11&quot;</td>
<td>150 - 165</td>
<td>157.5</td>
<td>181.0</td>
</tr>
<tr>
<td>6' 0&quot;</td>
<td>154 - 170</td>
<td>162.0</td>
<td>186.0</td>
</tr>
<tr>
<td>1&quot;</td>
<td>158 - 175</td>
<td>166.5</td>
<td>191.5</td>
</tr>
<tr>
<td>2&quot;</td>
<td>162 - 180</td>
<td>171.0</td>
<td>196.5</td>
</tr>
<tr>
<td>3&quot;</td>
<td>167 - 185</td>
<td>176.0</td>
<td>202.5</td>
</tr>
<tr>
<td>4&quot;</td>
<td>172 - 190</td>
<td>181.0</td>
<td>208.0</td>
</tr>
</tbody>
</table>

FOR WOMEN (weight in pounds in indoor clothes)

<table>
<thead>
<tr>
<th>HEIGHT IN SHOES</th>
<th>MEDIUM FRAME</th>
<th>MIDPOINT</th>
<th>15% OVER MIDPOINT</th>
</tr>
</thead>
<tbody>
<tr>
<td>4'10&quot;</td>
<td>96 - 107</td>
<td>101.5</td>
<td>117.0</td>
</tr>
<tr>
<td>11&quot;</td>
<td>98 - 110</td>
<td>104.0</td>
<td>119.5</td>
</tr>
<tr>
<td>5' 0&quot;</td>
<td>101 - 113</td>
<td>107.0</td>
<td>123.0</td>
</tr>
<tr>
<td>1&quot;</td>
<td>104 - 116</td>
<td>110.0</td>
<td>126.5</td>
</tr>
<tr>
<td>2&quot;</td>
<td>107 - 119</td>
<td>113.0</td>
<td>130.0</td>
</tr>
<tr>
<td>3&quot;</td>
<td>110 - 122</td>
<td>116.0</td>
<td>133.5</td>
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<td>113 - 126</td>
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<tr>
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<td>116 - 130</td>
<td>123.0</td>
<td>141.5</td>
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<tr>
<td>6&quot;</td>
<td>120 - 135</td>
<td>127.5</td>
<td>146.5</td>
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<td>124 - 139</td>
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<td>151.0</td>
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<td>8&quot;</td>
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<tr>
<td>9&quot;</td>
<td>132 - 140</td>
<td>139.5</td>
<td>160.5</td>
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<tr>
<td>10&quot;</td>
<td>136 - 151</td>
<td>143.5</td>
<td>165.0</td>
</tr>
<tr>
<td>11&quot;</td>
<td>140 - 155</td>
<td>147.5</td>
<td>169.5</td>
</tr>
<tr>
<td>6' 0&quot;</td>
<td>144 - 159</td>
<td>151.5</td>
<td>174.0</td>
</tr>
</tbody>
</table>
APPENDIX B

DEMOGRAPHIC QUESTIONNAIRE

NAME: __________________________________________

________________________________________

ADDRESS: __________________________________

________________________________________

MARITAL STATUS: ____________________________

AGE: __________________________________________

SEX: __________________________________________

OCCUPATION: ____________________________

(1) Can you read English without any problems? Yes No

(2) What was the last successful grade that you completed in school? _________

(3) How long have you had a weight problem? _________

(4) How long have you been considering losing weight? 3 months, 6 months, 1 year, longer

(5) Have you ever successfully dieted in the past? Yes No

(6) Did someone suggest to you that you should come to this weight control project? No one, a friend, a boy/girl friend, a spouse, a relative

(7) How successful do you think you will be at losing weight? not at all, lose a few pounds, lose a substantial amount of weight but not reach your goal, be very successful and reach your goal.
APPENDIX C

SOCIO-ECONOMIC INDEX

Abrading & polishing occs; clay, glass & stone, n.e.c.
Accountants, auditors & financial officers
actors
ad. & illustrating artists
adjusters, claim administrators, medicine & health administrators, teaching & rel. fields advertising salesmen aeronautical engineers agriculturists & rel. scientists air transport operating occs. n.e.c. air transport operating support occs. aircraft fabricat. & assembl. occs. n.e.c. aircraft mechanics & repairmen apparel & furnishings, service occs. n.e.c. architec. & engineering technologists & technicians architects architects & engineers n.e.c. athletes attendants, sport & recreation babysitters baking, confectionery making & rel. occs. barbers, hairdressers & rel. occs. bartenders beverage process occs.
biologists & rel. scientists blasting occs.
boilermakers, platers & structural metal workers bonding & cementing occs; rubb. plast. & rel. prod.
bookbinders & rel. occs.
bookkeepers & acc'ing clerks bookkeeping, account-recording & rel. occs. n.e.c.
brick & stone masons & tile setters bus drivers bus & commerc. machine mechanics & repairmen bus & commerc. machines fabricat. & assembl. occs. nec business services salesmen buyers, wholesale & retail trade cabinet & wood furniture makers captains & oth. officers, fishing vessels carpenters & rel. occs. cellulose pulp preparing occs. chambermaids & housemen chefs & cooks chem. petrol., rubb. plast. & rel. mater. process. occs. n.e.c. chemical engineers chemists civil engineers clay, glass & stone & rel. mat. machin. occs. n.e.c.
clay, glass & stone process.
forming & rel. occs. n.e.c.
coaches, trainers, instructors & mgrs. sport & rec.
coating & caledering occs. chem. & rel. mat.
collectors commerical travellers commissioned officers armed forces common.college & vocational school teachers concrete finishing & rel. occs.
conductors & brakemen railway construction electric & repairmen crushing & grinding occs. chem. & rel. materials crushing & grinding occs. mineral ores cutting & finishing occs; rubb. plast. & rel. prod.
cutting & shaping occs. clay, glass & stone
dancers & choreographers
deck crew, ship
deck officers
dental hygienists, assist. & technic.
dentists dieticians & nutritionists dispensing opticians distil. sublim. & carboniz occs.
chemicals & rel. materials draughtsmen
driver-salesmen e.d.p. equip. operators economists educational & vocational counsellors el. pow. light & wire commun.
equip. erec. i. & r. occs. n.e.c
elec. & rel. equip.-i & r. occs. n.e.c.
electrical engineers electrical equip. fabricat. & assembl. occs.
electrical power lineman & rel. occs.
electron & rel. commun. equip.
operating occs. n.e.c.
electronic & rel. equip. install. & repair. occs. n.e.c.
electronic equip. fabricat. & assemb. occs.
elem. & kindergarten teachers element & sec. school teaching & rel. occs. n.e.c.
elevator operating occs.
engine & boiler room crew. ship engine & rel. equip. fabricat. & assemb. occs. n.e.c.
engineering officers, ship engravers, etchers & rel. occ.
excavating, grading & rel. occs.
excavating, grading, pavings & rel. occs. nec
fabricat. assemb. & repair. occs.
rubb. plast. & rel. prod. n.e.c.
fabricat. assemb. & repair occs.
wood products, n.e.c.
fabricat. assembl. i & r. occs. electric electron & rel. equip.
fabricat. assemb. repair occs. text. fur & leath. prod. n.e.c.
farm machinery operators & custom operators
farm management occs.
farm workers
farmers
filling-grinding.buffing.clean. & polish occs. n.e.c.
filtering, straining & separating occs. chem. & rel. mater.
financial management occs.
fine arts school teachers.
fire fighting occs.
fish canning, curing & packing occs.
fishermen: net, trap & line fishing, hunting, trapping & rel. occs. n.e.c.
flour & grain milling occs.
food & bev. prep. & rel. service occs. n.e.c.
food & bev. & rel. service occs. n.e.c
foremen: air transport op. occs.
foremen: chems. petrol.rubber, plast & rel. mater. proc. occs.
foremen: clay glass & stone & rel. mater. machining occs.
foremen: clay glass & stone process.
forming & rel. occs.
foremen: el. pow. light & wire commun. equip. eriec. i. & r. occs.
foremen: electr. & rel. commun.
equip. op. occcs. n.e.c.
foremen: excavating, grading, paving & rel. occs.
foremen: fabricat. & assemb. occs. metal products n.e.c.
foremen: fabricat. assem. & repair. occs. text. fur & leath. prod.
foremen: fabricat. assemb. i. & r. occs. el. electron. rel. equip.
foremen fabricat. assembl. & repair occs. wood products
foremen: food bev. & rel. process occs.
foremen: forestry & logging occs.
foremen: materials handling & rel. occs. n.e.c.
foremen: mechanics & repairmen exc. electrical
foremen: metal machining occs.
foremen: metal process & rel. occs.
foremen: metal shaping & forming occs. exc. machining
foremen: mineral ore treating occ.
foremen: mining & quarrying incl. oil & gasfield occs.
foremen: motor transp. operating occs.
foremen: oth. construction trades occs.
foremen: oth. crafts & equip. operating occs. n.e.c.
foremen: oth. machining & rel. occs. n.e.c.
foremen oth. process occcs.
foremen: oth. transp. & rel. equip. operating occs.
foremen: other farming, horticult & animal husbandry occs.
foremen: printing & rel. occs.
foremen: product fabric. assem. & repair. occs. n.e.c.
foremen: pulp & papermaking & rel. occs.
foremen: railway transport operating occs.
foremen: stationary engine & util. equip. operat. & rel. occs.
foremen: textile process, occs.
foremen: wood machining occs.
foremen: wood process. Occs. exc pulp & papermaking
foremen: fabric. assem. repair
occs. rubb. plas. & oth. rel.
prod.
forestry & logging occs. n.e.c.
forestry conserv. occs.
forging occs.
forming occs: clay.glass & stone
fruit & veget. canning. preserv.
& packag. occs.
funeral directors embalmers & rel.
occs.
Funeral directors embalmers & rel.
occs.
furnacemen & kilnmen: clay.glass & stone
furriers
gen. mhrs. & oth. senior officials
gen. office clerks
geologists
glaziers
government administrators
guards & watchmen
guides
health diagnosing & treating
occs. n.e.c.
hide & pelt proc. occs.
hoisting occs. n.e.c.
hostesses & stewards, exc. food
& bev.
hotel clerks
hunting, trapping & rel. occs.
 i.t.g. & s. occs. construc. exc.
electrical
 i.t.g. & s. occs. pulp & paper-making
 i.t.g. & s. occs. n.e.c.
 i.t.g. & s. occs. wood process. exc. pulp
& papermaking
 i.t.g. & s. clay. glass & stone machining
 i.t.g. & s. occs. clay. glass & stone
process & forming
 i.t.g. & s. occs. equip. repair exc.
electrical
 i.t.g. & s. occs. fabric. assem. metal
prod. n.e.c.
i.t.g. & s. occs. fabricat. assemb. &
repair wood prod.
i.t.g. & s. occs. food Bev. & rel.
process.
i.t.g. & s. occs. machining n.e.c.
i.t.g. & s. occs. metal machine
i.t.g. & s. occs. metal processing
i.t.g. & s. occs. metal shaping &
forming exc. machining
i.t.g. & s. occs. mineral ore treating
i.t.g. & s. occs. processing n.e.c.
i.t.g. & s. occs. product
fabricat. assem. & repair n.e.c.
i.t.g. & s. occs. textile process-
ing
i.t.g. & s. occs. wood machining
i.t.g. & s. occs. chem. petrol.
rubber, plast. & rel. mater.
proc.
i.t.g. & s. occs. fabric. assem.
i. & r. el. electron & rel. equip.
i.t.g. & s. occs. pow. light &
wire commun. equip. erec. i. & r.
i.t.g. & s. occs. fabr. assem. &
rep. textile. fur & leath. prod.
i.t.g. & s. occs. Fabric. assem.
& repair. rubb. plast. & rel.
prod.
ind. farm const. & oth. mech.
equil. & mach. fabr. & assem.
occs. n.e.c.
indus. farm & construc. machinery
mechanics & repairmen
industrial engineers
inspectors & regulatory officers
govt.
inspectors & regulatory officers
non-govt.
instructors & training officers
n.e.c.
insulating occs. construction
insurance salesmen & agents
insurance bank & oth. finance
clerks
janitors, charworkers & cleaners
jewellery & silverware fab.
analyst. & magistrates
knitting occs.
judges & magistrates
labourers, n.e.c.
labourers, manufacturing
labourers, other industries
laboureres, public administration
& defence
labourers, service
labourers, trade
labourers, transportation &
communication
laundrying & dry cleaning occs.
laundering & dry cleaning occs.
lawyers & notaries
librarians & archivists
library & file clerks
library, file & corr. clerks
& rel. occs. n.e.c.
life sciences technologists &
technic.
locomotive engineers & firemen
log hoisting, sorting, moving & rel. occs.
log inspect. grad. scaling & rel. occs.
longshoremen, stevedores & freight handlers
machine tool operating occs.
machine tool setting-up occs.
mail & postal clerks
mail carriers
management occs. soc. sciences & rel. occs.
management occs. construc. operations
management occs. transport & communications operations
managers, sci. & engineering
managers. hotel, motel & oth. accom.
marine craft fabricat. assemb. & repair occs.
material recording, scheduling & distrib. occs. n.e.c.
materials handling & rel. occs. n.e.c.
materials handling equip. operations
mathematicians, statisticians & actuaries
mechanical engineers
mechanics & repairmen exc. electrical n.e.c.
medical lab. technologists & technic.
melting & roasting occs. mineral cres
members of legis. bodies
messengers
metal extruding & drawing occs.
metal heat treating occs.
metal machining occs. n.e.c.
metal process & rel. occs. n.e.c
metal rolling occs.
metal shaping & forming occs. exc. machining n.e.c.
metal shaping & other machining & rel. occ. n.e.c.
metal smelt, converting & refining furnacemen
metallurgical engineers
metalworking-machine operators n.e.c.
meterorologists
milk process, occs.
milliners. hat & cap makers
mineral ore treating occs. n.e.c.
mining & quarrying incl. oil & gas field occs. n.e.c.
mining & quarrying: cutting, handling & loading occs.
mining engineers
ministers of religion
mixing & blending occs. chemicals & rel. materials
mixing. separating, filtering & rel. occs. mineral ores
motion pictures projectionists
motor transport operating occs. n.e.c.
motor vehicle fabricat. & assemb. occs. n.e.c.
motor vehicle mechanics & repairmen
motormen & dinkeymen. exc.
rail transp.
moulding occs. rubb. plast. & rel. prod.
moulding, coremaking & metal casting occs.
musicians
Newsboys
nuclear engineers
nuns & brothers (w) n.o.r.
nursery & rel. workers
nurses-in-training
nurses. grad. exc. supervisors
nursing aides & orderlies
nursing assistants
nursing, therapy & rel. assist. occs. n.e.c.
occs. in fine & commerc. art. photog. & rel. fields n.e.c.
occs. in lab. & oth. elec. work
oth. process
occs. in lab. & oth. elem. work
forestry & logging
occs. in lab. & oth. elem. work
text. process.
occs. in lab. & oth. elemen. work services
occs. in lab. & oth. elemen. work
excavat. grading & paving
occs. in labour & oth. elemental work
mater. handling
occs. in labour & oth. elemental work
pulp & papermaking
occs. in labouring & oth. element work mineral ore treat.
occs. in labouring & oth. elemen. work metal process
occs. in labouring & oth. elemen. work. print. & rel. n.e.c.
occs. in law & jurispru. n.e.c.
occs. in library. museum & archival sics. n.e.c.
occs. in logging & oth. accomm.
occs. in math. stats. systems anal. & rel. fields n.e.c.
occs. in performing & audio-visual arts. n.e.c.
occs. in physical sics. n.e.c.
occs. in religion n.e.c.
occs. in soc. work & rel. fields n.e.c.
occs. in social sciences n.e.c.
occs. in sport & recreation n.e.c.
occs. rel. to management & administration n.e.c.
occs. lab. & oth. elem. work oth. constr. trades
occs. lab. & oth. elem. work. clay, glass, stone proc. & forming
occs. lab. & oth. elem. work. fabric & assem. metal prod. n.e.c.
occs. lab. & oth. elem. work. fabric. assem. & repair wood prod.
occs. lab. & oth. elem. work mining & quarry, inc. oil & gas fields
occs. lab. & oth. elem. work. chem. petr. rub. plas & rel. mat. proc.
occs. lab. & oth. elem. work. fab. assem. rep. rub.plas. & rel. prod.
occs. lab. & oth. elem. work: food. bev. & rel. proc.
occs. lab. & oth. elem. work: prod. fab. assem. & repair. n.e.c.
occs. lab. & oth. elem. wrk. el. pow. light & wrir. comm. equer. i & r
occs. lab. & oth. elem. wrk. fab. ass. i. & r. el. electron. & rel. equi.
occs. lab. & oth. elem. wrk. wood proc. exc. pulp & papermaking
occs. lab. oth. elem. wrk. fab. ass & rep. text. fur & leath. prod.
occc. occupations in writing n.e.c.
occc. office machine operators
officials & administrators unique to govt. n.e.c.
occc. optometrists
osteopaths & chiropractors

oth. clerical & rel. occs. n.e.c.
oth. construc. trades occs. n.e.c.
oth. crafts & equip. operating occs. n.e.c.
oth. fabricat & assemb. occs. metal products n.e.c.
oth. farming.horticul. & animal husbandry occs. n.e.c.
oth. occs. in architec. & engineering n.e.c.
oth. occs. in medicine & health n.e.c.
oth. occs. in soc. scis. & rel. fields n.e.c.
oth. occs. n.e.c.
oth. process. occs. n.e.c.
oth. prod. fabricat. assemb. & repair occs. n.e.c.
oth. ranks armed forces
oth. rock & soil-drilling occs.
oth. service occs. n.e.c.
oth. teaching & rel. occs. nec
oth. transp. & rel. equip. operating occs. n.e.c.
other managers & administrators n.e.c.
other managers construction
other managers durable good manufacture
other managers. mines & oil wells
other managers.non-durable goods manufacture
other managers. other industries
other managers. service
other managers. trade
other managers.transportation & communication
other sales occs. n.e.c.
packaging occs. n.e.c.

painters, paperhangers & rel. occ
painters, sculptors & rel. artist painting & decorating occs. exc. construc.

paper product. fabricat. & assemb occs.
papermaking & finishing occs.

patternmak. marking & cutting occs. text. fur. & leath. prod.
patternmakers & mouldmakers n.e.c.
paving.surfacing & rel. occs.
personal service occs. n.e.c.

personnel & indus. relations mgmnt. occs.
supervisors oth. occs. in architecture & engineering
supervisors apparel & furnishing service occs.
supervisors bookkeeping acct. recording & rel. occs.
supervisors food & bev. prep. & rel. service occs.
supervisors libr. file & corr. clerks & rel. occs.
supervisors material recording scheduling & distrib. occs.
supervisors nursing occs.
supervisors occs. in libr. museum & archiv. scis.
supervisors occs. in lodging & other accom.
supervisor oth. clerical & rel. occs. n.e.c.
supervisors oth. sales occs.
supervisors oth. service occs.
supervisors recep. info mail & message distrib. occs.
supervisors sales occs. commodities
supervisors sales occs. services
supervisors steno & typing occs.
surveyors
systems analysts & comput. programmers & rel. occs.
tailors & dressmakers
taxi drivers & chauffeurs
teachers of excep. students n.e.c.
technic. in library museum & archival scis.
technical salesmen & rel. advisors
telegraph operators
telephone operators
tellers & cashiers
textile bleaching & dyeing occs.
textile fibre prepar. occs.
textile finishing & calendering occs.
textile process occs.
textile spinning & twisting occs.
textile weaving occs.
textile winding & reeling occs.
timber cutting & rel. occs.
tobacco process occs.
tool & die making operations
translators & interpreters
travel clerks, ticket, station & freight agents
truck drivers
typesetters & compositors
typists & clerk typists
univ. teachers
univ. teaching & rel. occs. n.e.c.
upholsterers
veterinarians
waiters, hostesses & stewards, food & bev.
watch & clock repairmen
water trnsp. operating occs. n.e.c.
weighers
welding & flame cutting occs.
wire commun. & rel. equip. i. & r. occs.
wood machining occs. n.e.c.
wood paternmaking occs.
wood process occs. exc. pulp & papermaking n.e.c.
wood sanding occs.
wood sawing & rel. occs. exc. sawmill
wood treating occs.
writers & editors
occs. in life sciences n.e.c.
APPENDIX D

Agreement

This agreement executed and entered into in duplicate this _____ day of __________________, 1978, by David J. McKay and ___________ is as follows:

For and in consideration for the mutual promises herein contained, the parties hereto agree herewith as follows:

______________ agrees to pay David J. McKay the sum of twenty dollars ($20.00), the receipt of which is hereby acknowledged. This sum will be returned by David J. McKay under the following terms until its total is disbursed. David J. McKay will return to _________________ three dollars ($3.00) for each two lessons, returned on or two days after the date specified in the program, as determined by the postal mark.

Five dollars ($5.00) will be refunded when ________________ comes to the final weigh-in meeting, is weighed and completes an assessment procedure.

_____________________
David J. McKay
Wherever you go in today's world, people are increasingly concerned with both the cosmetic and health value of staying trim and in shape. We are constantly bombarded by ads of T.V., radio and in the newspapers that tell us to lose those few extra pounds that have crept up on us over the last few years. We are told that as a result, we'll be happier, look better, be more attractive to the opposite sex, feel better and enjoy good health, not to mention a longer life.

In response to these kinds of pressures to look better and feel better, various groups have become very interested in techniques of weight reduction. Typically, most weight reduction programs are clinic operations or self-help groups. A therapist, perhaps a nutritionist, physician, psychologist, or interested person, tells those involved in the clinic how to use the techniques and information that has been developed and weekly meetings are conducted until the individuals have been exposed to all the material. An alternative approach to going to a group meeting is to read a weight reduction book or pamphlet and follow its guidelines in your own home. Our weight-reduction research program is based on this latter approach. So instead of the inconvenience of going to a clinic, you can do your own weight reduction program in the convenience of your own home.

This specific home weight reduction program is composed of ten lessons, one for each week of the program and a vacation supplement. Each lesson has five parts and each part is devoted to different purposes.

Part I introduces and develops specific principles and techniques. It shows you through examples how you can use the principles and techniques in your weight reduction program. Part II reviews this material through a
series of short and easy questions. Part III is composed of specific assignments that you are to carry out over the course of the week. Part IV is a daily log which involves goal setting (e.g., how many calories did you eat today and how many are you going to eat tomorrow?). Part V is a short weekly evaluation. So the program takes some work, but it is work done on a daily basis, a daily commitment which will not overwhelm you. The program is constructed so that you keep the first part and mail the other parts to me. This is Parts II, III, IV, and V, which are to be mailed to me on the dates that are designated in the program. In other words, you mail the questions, assignments, daily logs and evaluation to me and you keep the information on how to lose weight.

No doubt some questions have emerged in your minds at this point. I'll try to anticipate two of them: (1) How effective is the program? and (2) Why am I interested in this? In other words, what am I going to get out of it?

The specific program which we are using has been developed for use with overweight college women and they have achieved varying degrees of success with it. The groups involved who have followed the program have typically lost on the average and I repeat, on the average, of 1 to 1 1/2 pounds per week over the course of the program.

Now, to you, 1 to 1 1/2 pound weight loss doesn't sound like much, but weight loss at this rate is recommended by experts in this field.

The second question regarding why I'm interested in this is a little more difficult to answer. The home treatment program has been used, as I have already mentioned, and has produced varying amounts of weight loss in overweight college women. What I am interested in is who can use this program most effectively. I hope to find this out by having participants in the project complete two short psychological tests. These tests are
designed to tell us, in a simplified fashion, how you view the world in terms of your social opinion and perceptual style. The question I'm asking is, "Do differences in these ways of viewing the world relate to your ability to successfully use the home treatment program?"

Now, there are a number of basic requirements people need to meet in order to participate in this program. They are:

(1) be able to read and write English.
(2) be at least 15% over their ideal body weight. (This we will determine later in the evening.)
(3) have no history of hormonal or metabolic deficits.
(4) be willing to post a twenty dollar data deposit.
(5) not have been involved in a formal weight reduction program in the last six months or be taking diet pills concurrently.

Let's go over the criteria one more time. Since it is a written home treatment program, people will have to be able to read and write English. Since we want a representative sample, we would like people who are at least 15% above their ideal body weight. There is little point in trying the program on people who only have to lose four or five pounds. We would like to rule out those people who, for obvious physical reasons, cannot successfully lose weight, that is, those who have hormonal or metabolic problems. Also, we don't want people who are currently taking an alternate treatment program, like diet pills, or who have recently completed an alternative weight control program, and finally, we want people who are willing to post a twenty dollar data deposit. You are no doubt saying to yourself, "Here comes the pitch for the money," or "I knew there had to be a catch somewhere." Well, it is a pitch for money, but not a typical one. If you can remember back to when I described the way the material was laid out, Part I, II, III, IV and V, I said that Part I was to be kept by you
and the remaining portions were to be returned to me. Well, this data deposit is used to ensure that the other sections get returned to me.

You see, one of the problems of doing this kind of research is that everyone is gung ho to join the program, but few people are as enthusiastic about sending in the information that the lowly old researcher, me, needs to evaluate his study. So I have tried to invent a system to get you to send in your data and thus data deposit systems ensure that you make a full commitment to the program.

I would like you to give me twenty dollars and in return I will give you a treatment program, 10 pre-addressed return envelopes for returning your assignments, a calorie counting book and a notebook. Now, for every two assignments returned in time you will receive $3.00 of your money back, so over the course of treatment, you will earn back your $15.00. However, it is not as simple as just returning the assignments. If you will observe the lessons have to be sent back on specific dates so you will have to post the assignment on or within two days of the specified dates as determined by the date on the postmark. If you do not meet the deadline, then the money will be forfeited to a charity of your choice.

"Well, how about the other five dollars?" you are probably asking. It can also be earned back by showing up at the final weigh-in meeting and going through a short assessment procedure. So I get nothing from the research program in terms of money, but I do get my data and that is what is of interest to me. If you participate fully in the program, and get all ten assignments returned on time, at the end of the final weigh-in meeting, you get all your money back and hopefully lose a substantial amount of weight.