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A Contingency Management Program for the Treatment of Overweight

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A CONTINGENCY MANAGEMENT PROGRAM FOR THE TREATMENT OF OVERWEIGHT

by

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Giuliana Guerci

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INTRODUCTION

"Obesity has become in our time a national problem, if not, indeed a national obsession" (Mayer, 1968, p. 1). Body weight is the result of the balance between caloric intake and energy expenditure. The balance is controlled by metabolic rate, which is the result of genetic inheritance, but it is also a result of behavioral factors (eating and exercising) which are controlled by environmental factors (Mayer, 1968; Stuart, 1972). Mayer says:

> "Genetic traits largely determine, if not obesity, at least potentialities for overeating (or underexercising) and obesity. In a society such as ours, where for most people, food is abundant and physical work unnecessary, we have the ideal conditions for genetic potentialities to express themselves, or, as biologists say, for the phenotype (the organism as it appears) to be an expression of the genotype (the organism as its genes alone would determine it to be). While genes may make one susceptible to obesity, the actual overeating, underexercising or both, leading to a positive energy balance, still have to take place before obesity develops." (p. 57)

Usually the therapist has no means of altering the metabolic rate. One important way left to control the caloric intake--expenditure balance, is by means of behavioral factors.

The problem of overeating is usually dealt with in terms of "self-control". Ferster and Perrot (1968); Cautela (1969); Stuart (1970); Holland and Skinner (1961); and Homme (1965) recognize self-control as a set of responses. Ferster and Perrot (1968) consider "self-control" to be"some specific performances which will

lower the disposition to emit the behavior to be controlled." (p. 164) Cautela (1969) uses it to "describe response repertoire in which an individual can make responses to increase or decrease a response probability that is perceived as injurious to the individual himself or to others." (p. 324) This notion can be identified with a "chain of behavior", a sequence of performances where the previous response produces the condition for the next (Ferster and Perrot, 1968). Therefore, it appears that the term "self-control" is an economical device or "label" for talking about a group of observed behaviors. However, after having operationally defined the words, many behaviorists reify the concept of self control, attributing real status to an abstraction. They appear, according to Stuart (1970) to regard self control as a personal virtue and its absence as a personal deficit. He brings as an example Cautela (1969) and Kaufer but then he himself falls back into the pitfall of reification when he says:

> "The first of two requirements for the treatment of overeating must stress environmental management rather than self control because the cues of overeating are environmental rather than intrapersonal." (p. 6)

Self control is control of the environment while lack of self control is control by the environment. The total abolition of the term "self control" and the dealing with the problem of overeating only in behavioristic terms, clarifies the conduct of treatment and reduces risks of wrong interpretation and failure.

Homme (1970) agrees with Ulrich that control of eating behavior

is a behavioral engineering task, i.e.: "arranging the environment so that one gets the behavior one wants" (p. 17). He also says: "Behavioral engineering is a blend of two technologies: the technology of contingency management and the technology of stimulus control. In order to bring a behavior under stimulus control, contingencies have to be properly managed" (p. 17). A contingency management environment provides the specification of behavior to occur, the observation, and the consequation of it, and results in a behavior which, in turn, changes the rest of the environment. "The power and generality of contingency management is by now becoming clearer and clearer" (Homme, 1970, p. 17).

Stuart (1972) divided the literature on behavior control of eating into two categories: respondent and operant. He included most of the works using aversive stimuli in the first category, but many of the studies may also be analyzed in operant terms. Therefore, they could be classified as aversive therapy, which incorporates the three paradigms of punishment, avoidance conditioning and classical conditioning. Wolpe has been reported as the first to present an aversive stimulus (electric shock) to an obese woman when she indicated she was thinking about food. She began to lose weight but the treatment could not be completed. Meyer and Crisp (1964) repeated the experiment with two female inpatients. One lost 80 lbs. in seven and one-half months. The other started to lose weight, but soon refused the treatment and regained weight. Stollack validated the effectiveness of shock delivery associated

with food conversation, in comparison with shock delivery alone. Kennedy and Foreyt (1968) used bad odor as an aversive stimulus in the treatment of a 322 pound woman. She lost 30 pounds in 22 weeks. In 1966 Cautela developed a "covert sensitization" procedure. It consisted of imagining gustatory responses and, soon after, unpleasant events like vomiting. His patient lost 66 pounds at the rate of three pounds per week. Tyler and Straughan (1970) trained subjects to hold their breath when tempted to eat. They compared this technique with Homme's converant method (imagining negative events connected with obesity, prior to engaging in reinforcing events) and with a relaxation control technique. None of the three treatments was successful. Another study using the Homme procedure was done by Horan in 1971 and reported by Stuart (1972). During eight weeks of treatment, an average of 5.66 pound loss was obtained in the experimental group, compared to 3.13 and 2.72 in two control groups. The data of this study show that even though the average loss was greater in the treatment group, four of those subjects gained weight. The data indicate that overweight people are highly individual in their response to any procedure. The study also shows the extent to which subjects reported that they followed the behavioral prescription. There was a steady decrease in the use of the procedure, and a plateau was reached after six weeks. Stuart (1972) reports that weight loss usually occurs at the start of treatment. In the perspective of Horan's data, he suggests that the early loss and later plateau may be attributable to a loss of

effectiveness of the procedure. He also reports that an initial weight loss (2-3 weeks) is mostly due to fluid loss, attributable to nutritional chemistry. It might be possible that the procedure has less effect on the eating behavior when the minor reduction of weight consistutes a smaller reinforcement.

The first paper on the operant treatment of overweight was published by Ferster, Nurnberger and Levitt and reported by Nurnberger and Zimmerman (1970). The approach was to pair the undesirable behavior (overeating) with conditioned aversive stimuli which derive their aversive property from the ultimate aversive consequences of obesity, so that the behavior may also become aversive. The person's own verbal behavior was used as such a conditioned stimulus. After specific training, an extensive repertoire was established so that the subject had uner his control, large amounts of verbal behavior dealing with the consequences of eating (heart trouble, obesity, social criticism). Other techniques suggested by them included keeping records of food intake, scheduling eating at given intervals, gaining stimulus control of all eating, and strengthening activities incompatible with eating. The weight changes recorded over five months in these subjects were 13, 12 and 17 pounds.

Stuart (1970) used the Ferster, Nurnberger and Levitt approach in a somewhat modified form. His contingency management provided a series of interviews where the therapist suggests responses which constituted an alternative to the patients' eating

repetoire. The reinforcement was provided by the patient's experience of success in the control of his own behavior, by the avoidance or escape of the aversive consequences (obesity), and by reassurance of the therapist. The procedure also included Cautela's covert-sensitization session. The average weight loss in eight subjects was .6 pounds per week, over a period of 12 months. The treatment ranged from 19 to 41 sessions. A controlled test of these methods was done by Harris, and reported by Stuart (1972). Twenty-four subjects were assigned to either of two experimental sections or to a control group. The treatment offered in the experimental sections had three components.

1) Training in the use of rewards for refrainint from eating.

2) Training in the analysis of stimuli controlling eating.

3) Training in slowing the rate of eating.

The weight loss of the experimental groups was significantly greater than that of the control group, for the first ten weeks. After ten weeks, one-half of the experimental subjects were placed in a program using Cautela's covert sensitization procedure, but a non-significant difference was found between those two halves testing that procedure. Another experimental evaluation of this method was undertaken by Wollersheim (1970). Seventy-nine subjects were assigned to one of four experimental conditions over a period of 12 weeks. The focal treatment consisted of operant procedures similar to Stuart's techniques. It was compared with social pressure,

"insight" therapy and no-treatment control group. The operant group was superior in weight reduction and reduction of reported frequencies of various overeating behaviors; 50 percent of the subjects in the operant group lost a significant amount of weight.

The third controlled study reported by Stuart was conducted by Penick, Filion, Fox and Stunkard in 1970. It involved a comparison of operant techniques with a psychotherapeutic treatment method. Over twice as many behavior modification patients lost between 30 and 40 pounds, and almost twice as many lost more than 20 pounds. The results found for the behavior therapy group are most remarkable, but considerable variability in the response of patients to behavioral treatment was found in this study (Stuart, 1972). The use of positive reinforcement for weight loss was shown by Bernard (1968) in one case of gross obesity. The treatment was possible since the patient was in a token economy ward. She lost 70 pounds over the course of 17 weeks.

The application of avoidance contingencies to the problem of weight-loss has been illustrated by Zimmerman, in two studies. The procedure involved the programming of artificial aversive consequences contingent upon the individual's failure to lose weight at a prearranged and specified rate. In the first study the aim was a four-week weight loss target based on the avoidance of a small money loss. The target would be renewed over a period of 13 weeks during which the weight loss for the subject was 25 pounds. In the second study the loss of at least one pound at a given weigh-in,

was the appropriate avoidance behavior. Failure to do so led to a $2.00 money loss. Over a four-month period, 13 of 16 subjects lost weight to over 50% of their goal.

Two studies by Horan and Perrick, support the notion that the response of individuals will be idiosyncratic and suggest the need to build into all behavior modification approaches, a means of adapting the techniques to individual differences (Stuart, 1972). The individual differences in weight loss may be attributable to differences in behavioral responses (eating and exercising) and or to differences in biological factors (metabolic rate and fluid retention). In establishing the effectiveness of different procedures in controlled studies, it would be desirable to measure these various sources of individual differences. These individual differences could be used in turn to readjust the procedures, to fit the individual subjects.

METHOD

Subjects:

Thirty-one females participated in the experiment. The age range was 17 to 41 years, the "index of body built" ranged between 2.06 and 4.08 (according to the Davenport's formula reported by Mayer, 1968: the ratio of the weight divided by the square of the height). The range of desired weight loss was 5 - 80 pounds. They were divided into two groups on the basis of body index and base-line daily average caloric intake. Both were greater in the group "fleshy" and smaller in the group "medium" (Table 1). However, differences in the subjects within the same group can be noticed, as shown in Tables 2 and 3. Each one requested to participate on a self referred basis, and reported unsuccessful attempts to lose weight on her own. All of the subjects declared that they were in sound health and would assume the responsibility of maintaining their health.

Apparatus:

The weighing center was a small office space, open on Monday, Wednesday and Friday between 9:00 A.M. and 1:00 P.M. The scale used was a common bathroom scale (Auto-Detecto-Zero). Each subject was provided with a copy of the "Complete ABC Calorie Counter" available at magazine stands, and with a modified version of Stuart's (1967)

food intake monitoring sheets shown in Appendix A.

Procedure:

When the subject first came to the center, a brief explanation of the procedure was given. She was asked to make a minimum deposit of $5.00 to join the program, and to come three times a week for two weeks, in order to obtain a baseline measure of her weight and food-intake. She was told that she would be penalized for not coming, unless it was an excused absence, but that no contingencies were placed on weight loss. She was given a calorie counter and daily food-monitoring sheets and shown how to use them. After two weeks the daily average calorie intake was established, and each subject was assigned a rate of weight loss represented by one of two guidelines. In the first one, the expected weight loss at each check-in was .25 pounds; in the second, it was .5 pounds. The weekly required weight loss was .75 pounds and 1.5 pounds respectively. The subjects with a baseline daily intake greater than 1500 calories were assigned the .5 pound guideline, unless they requested the other (three cases). The remaining were assigned the .25 pound guideline, unless they requested the other (five cases). A restriction of 500 calories was suggested when it would leave an allowance of 1000 calories or more, otherwise the subjects were told: "the allowance is up to you." Each subject was given a "suggested menu plan" (Appendix B) and asked to sign a contract (Appendix C) by which she agreed to the following conditions:

1. To be weighed three times a week, in indoor clothing, without shoes.

2. To stay on the guideline or below it. Two consecutive failures in accomplishing that would cost the loss of a dollar and a new guideline would start at the point reached at that moment.

3. To give the experimenter the completed food-intake monitoring sheets at each weight check. For any failure to do so she would pay a dollar.

4. The penalties would be taken from the original deposit. At the end of the fixed term, she would collect the remainder of it. If she quit, the project for any reason before the end of the term, she would forfeit the deposit which would be contributed to a despised charity.

In case of an excused absence, the subject was asked to bring the food-intake sheets on the next visit, and the time counted on the guideline would be equal to two units (.25 x 2 = .5 or .5 x 2 = 1.0). After reading the intake monitoring sheets and checking the weight, the controller would comment with "good" or "bad" and mention more appropriate foods and/or the possibility of exercising. Praise and scolding were often made, according to the controller s mood, and not consistently. If a subject reached the desired weight, she would have to maintain it. If she failed two consecutive times, she would be penalized, and a new guideline would start, in order to again reach the maintainance value.

RATIONALE

Both dieting and exercising can be considered responses to be learned. The environment can be arranged in order to teach and maintain the desirable responses. The behavioral objectives, the stimuli, and the consequences must be specified. In the present procedure the immediate behavioral objectives are represented by a chain of responses: a) Depositing a sum of money; b) Monitoring quality and quantity of food; and c) Being weighed periodically. The most important feature of the treatment in a weight reduction program is the training in weight monitoring and food intake monitoring. The caloric value is a warning stimulus for the future gain of weight and may develop stimulus control of eating. The chain of behavior is shaped by contingency management. The long range objectives consist of teaching subjects the caloric value of food, and how calories change weight. The ultimate contingencies and consequences applied are:

1. Positive
    a. Weight loss
    b. Social reinforcement (praise)
2. Negative
    a. Loss of money for failure to show up at the Station.
    b. Loss of money for failure to present the food data sheets.
    c. Loss of money for consecutive failures to stay below the guideline.
    d. Loss of deposit for failure to uphold the contract.

e. Contribution of the forfeited money to a despised charity.

f. Social punishment (scolding).

The stimuli are: a) Caloric counter book, b) Suggested menu plan, c) Mention of other diets, d) Exercise suggestions. The final effect of the procedure should be the achievement and maintainance of a desired weight. The subject allows the manager to apply the contingencies by means of a contract. The contract specifies the duration of the contingency management procedure. It is hoped that the procedure strengthens a "behavior functional in obtaining reinforcers when the person leaves the special contingency management environment " (Malott, 1971, p. 3-8). In the case of dieting and exercising this does not usually happen; therefore, the person will be likely to return to the contingency management environment when the effects of overeating and underexercising are functional in obtaining punishers in the natural environment.

RESULTS

Seventy percent of the subjects completed the program in the Fleshy group (Fleshy-Stay) and only thirty-eight percent in the Medium group (Medium-Stay). Table 2 reports individual weight data and caloric intake data for the subjects that did not complete the program (Fleshy Quit group and Medium Quit group). Table 3 shows the accomplishments of each subject and the average of the Stay groups. An average reported caloric reduction of 379 calories per day resulted in a weekly weight loss of .43 pounds for the Medium-Stay group, and an average reported caloric reduction of 596 calories per day resulted in a weekly weight loss of 1.05 pounds for the Fleshy-Stay group. The cumulative weight loss is shown in Figures 1 and 2. A plateau was reached in the Fleshy-Stay group, after six weeks, and in the Medium-Stay group after 4 weeks. The Medium-Stay group, however, had been losing weight in the two-week baseline.

Figures 3 and 4 show the weekly weight loss compared to the reported caloric intake. In the two weeks baseline, the Fleshy-Quit group had an average daily intake of 1680 calories and no weight change. The intake dropped to 910 calories in the first week of diet, and then gradually increased to 1150 in the ninth week. The weight loss was 4.4 pounds in the first week, and decreased to .1 pounds in the eighth week; a gain of weight reappeared in the ninth week. In the Medium-Stay group, an average daily intake of

1270 calories, produced a weight loss of 1.4 pounds in the baseline. A reduction of 280 calories produced a weight-loss of 2.1 pounds in the first week of diet; then, the caloric reduction was maintained, but the weight-loss decreased, and a weight gain reappeared in the sixth week.

A check of the composition of the diet, as reported by the subjects, was attempted. Three samples of the food data sheets were taken for each subject, corresponding to the first three days, last three days and middle three days. The number of 'good' items, as listed in the suggested menu plan, was divided by the total number of food items per day. The results are shown in Table 4. The Fleshy-Stay group showed a slight improvement and generally a better composition of the diet than the Medium-Stay group.

Four subjects achieved their goal, the maintainance line, before the end of the term established for the contract. Two had reached their initial goal and two had changed it. One of the former regained weight and lost the deposit by the end of the term (Figure 5). Figure 6 shows the cumulative weight loss for the subjects of the Fleshy group who forfeited the deposit. (Group Fleshy Quit.) The number of subjects in the group decrease from 3 to 1, as the number of sessions increase. The procedure seemed effective at the time they quit. A similar graph was made for the subjects of the Medium group who quit. Here, the number of subjects decreased from 13 to 3. Again, a plateau developed after 5 weeks (Figure 7). Two of these subjects lost their deposit at the very end of the term.

The weight loss achieved in the first 7 weeks was totally regained by that time (Figure 8).

Figure 9 shows weekly weight loss and caloric intake for group Medium Quit. A caloric baseline intake of 1200 corresponds to a moderate weight loss of .3 pounds. A further reduction of the intake (less than 1000) resulted in an average weight loss of .5 pounds in a five-week period. The later tendency to regain weight corresponds to a tendency to increase the intake, as with group Fleshy-Stay. A similar graph could not be obtained for group Fleshy-Quit because the attendance of those subjects was discontinuous even before they quit.

TABLE 1

GROUP CHARACTERISTICS

Group	N	Body Index	Daily Average Baseline Caloric Intake	Final Weight Loss Goal--lbs
1 - Medium	10	2.52	1207	16
2 - Fleshy	21	2.74	1555	25

TABLE 2

CALORIE AND WEIGHT DATA FOR THE "FLESHY QUIT" AND "MEDIUM QUIT" GROUPS

	Subjects	Weight lbs.	Body Index	Weight loss Goal, lbs	Diet Length (in weeks)	Weight loss lbs.	Dollars Lost	Av. Base-line Caloric Intake	Av. Diet Caloric Intake	Av. Caloric Reduction
Medium Quit Group	S.T.	143		15	1.6	+2	1	1235	1225	10
	T.K.	123	2.22	11	11	1.5	5	1409	907	502
	K.M.	136.5	2.21	12	11	+2.5	4	1089	1200	+111
	C.M.	147	2.26	10	8.6	4.5	5	1317	1124	193
	L.J.	145	2.35	20	8	1	4	1269	1117	152
	L.L.	156.5	2.58	10	8	3	2	1318	901	417
	V.S.	130.5	2.32	10	3	2	0	1270	944	326
	L.M.	145.5	2.40	20	3.3	5	0	1582	797	785
	G.D.	152.5	2.48	10	1	4	0	1118	830	288
	G.N.	136.5	2.07	10	6.6	5.5	0	1102	774	328
	C.C.	154.5	2.73	40	6	+2	5	1028	1018	10
	C.B.	131.5	2.48	10	2	0.5	0	827	632	195
	B.A.	262	4.08	80	5.3	3	2	1218	969	249
Fleshy Quit Group	D.P.	128	2.25	15	1	1	0	1307	--	--
	A.M.	149		15	3	0.5	1	1455	--	--
	G.R.	164.5	3.22	40	4	6.5	0	1521	1043	478

TABLE 3

CALORIE AND WEIGHT DATA FOR THE "FLESHY STAY" AND "MEDIUM STAY" GROUPS

	Subjects	Initial Weight	Body Index	Weight Loss Goal lbs.	Total Weight Loss lbs.	Dollars Lost	Follow-Up Weight Loss-lbs.	Weight-Loss per Week-lbs.	Caloric Reduction	Av.Diet Caloric Intake	Av.Baseline Caloric Intake
Medium Stay Group	R.S.	137.5	2.17	12	4	3		0.4	329	784	1113
	R.R.	121.5	2.23	15	4	2	3	0.4	410	975	1385
	P.K.	112.5	2.20	5	5	1		0.5	93	914	821
	L.V.	131	2.06	10	4	3	6	0.4	999	991	1990
	J.S.	164	2.92	30	3	3		0.3	188	715	903
	P.J.	137.5	2.43	20	-1.5	4		0.1	562	580	1142
	K.D.	141.5	2.23	10	9	1	12	0.9	539	985	1524
	S.J.	136	2.21	15	7.5	1	6	0.7	199	668	867
	Average		2.31	14	4.3			0.43	373	826	1203
Fleshy Stay Group	C.T.	203.5	3.41	60	13.5	1	12	1.4	435	1087	1582
	F.J.	138.5	2.35	12	9	4	9.5	0.9	576	1059	1635
	U.P.	190.5	3.66	55	10	4	4	1	394	876	1270
	W.L.	152.5	2.71	13	10.5	2	7	1.1	410	958	1368
	L.L.	157.5	2.41	20	8.5	4	1	0.3	696	1164	1860
	M.J.	154.5	2.51	20	3.5	4	7.5	0.3	214	1110	1324
	B.D.	148.5	2.22	20	12	2	8.5	1.2	1388	1366	2754
	Average		2.75	28	9.57			1.06	596	1088	1684

FIGURE 1

Mean cumulative weight loss
of the "Fleshy Stay" group.

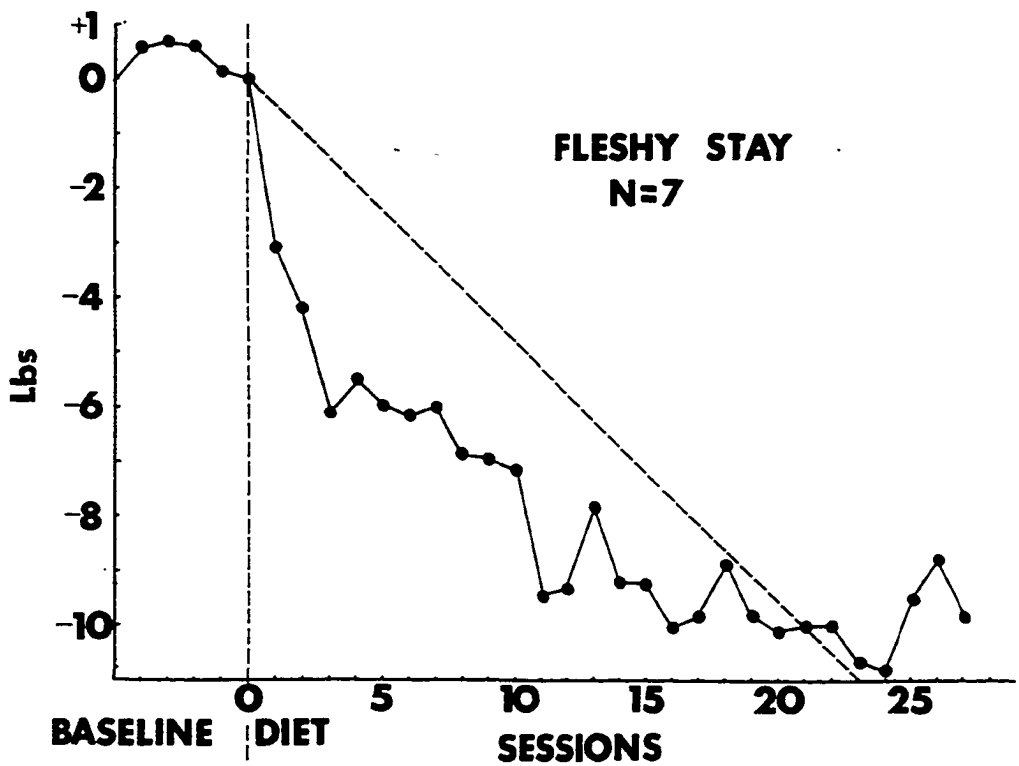


FIGURE 2

Mean cumulative weight loss
of the "Medium Stay" group.

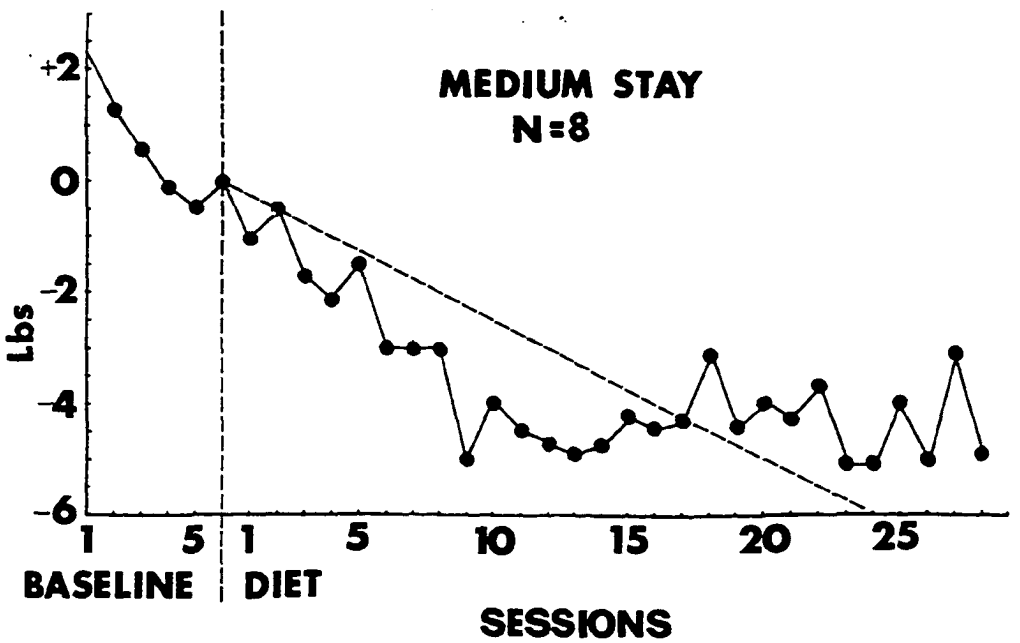


FIGURE 3

Relation between caloric
intake and weight change
in the "Fleshy Stay" group.

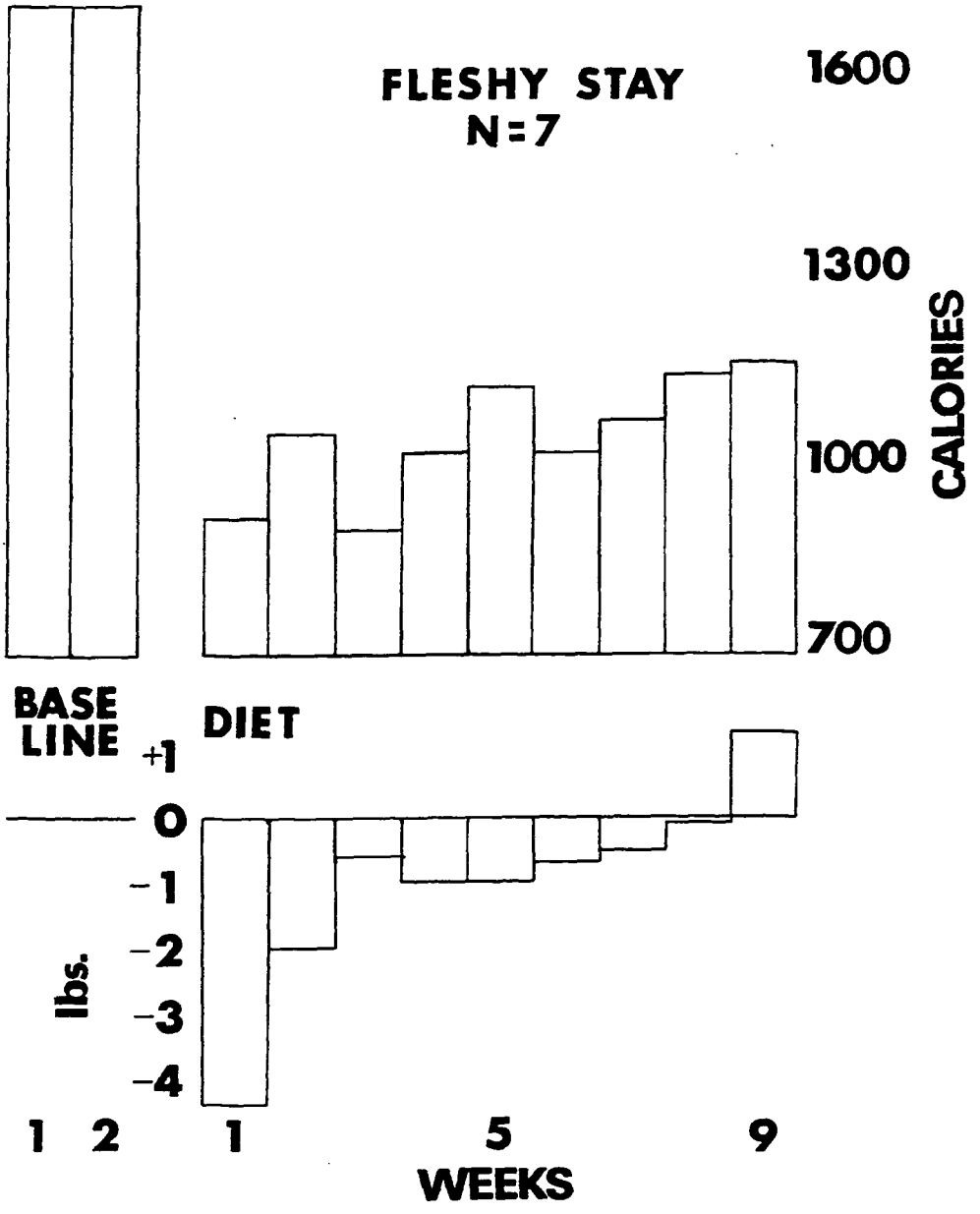


FIGURE 4

Relation between caloric
intake and weight change
in the "Medium Stay" group.

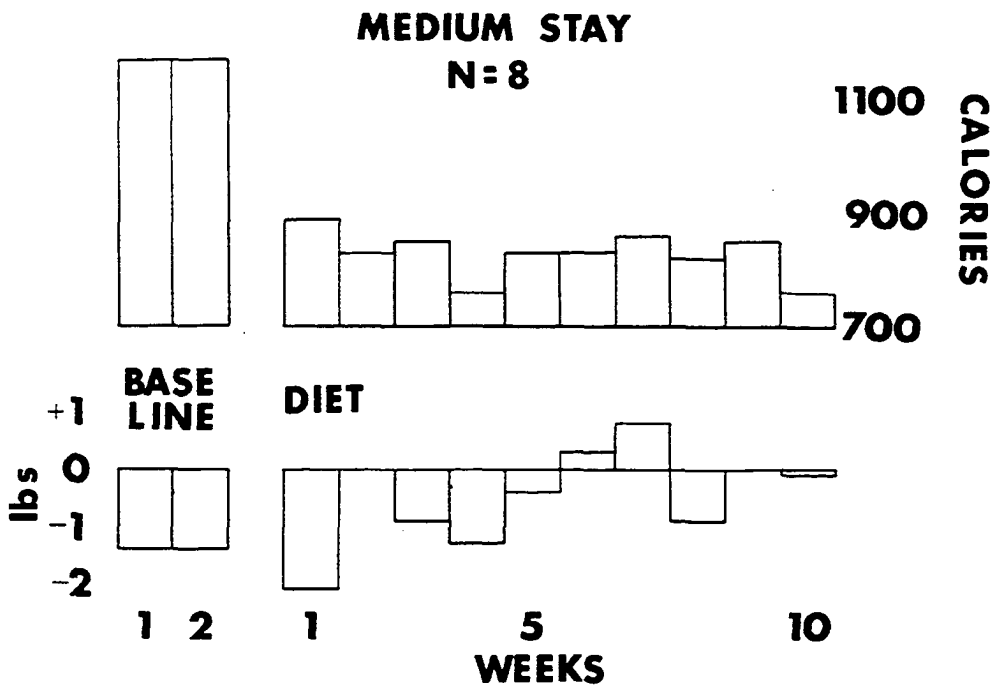


TABLE 4

DIET COMPOSITION

Group	Beginning	Middle	End	Average
"Medium"	.53	.68	.64	.63
"Fleshy"	.76	.71	.93	.80

FIGURE 5

Weight curve for four subjects
under maintainance conditions.

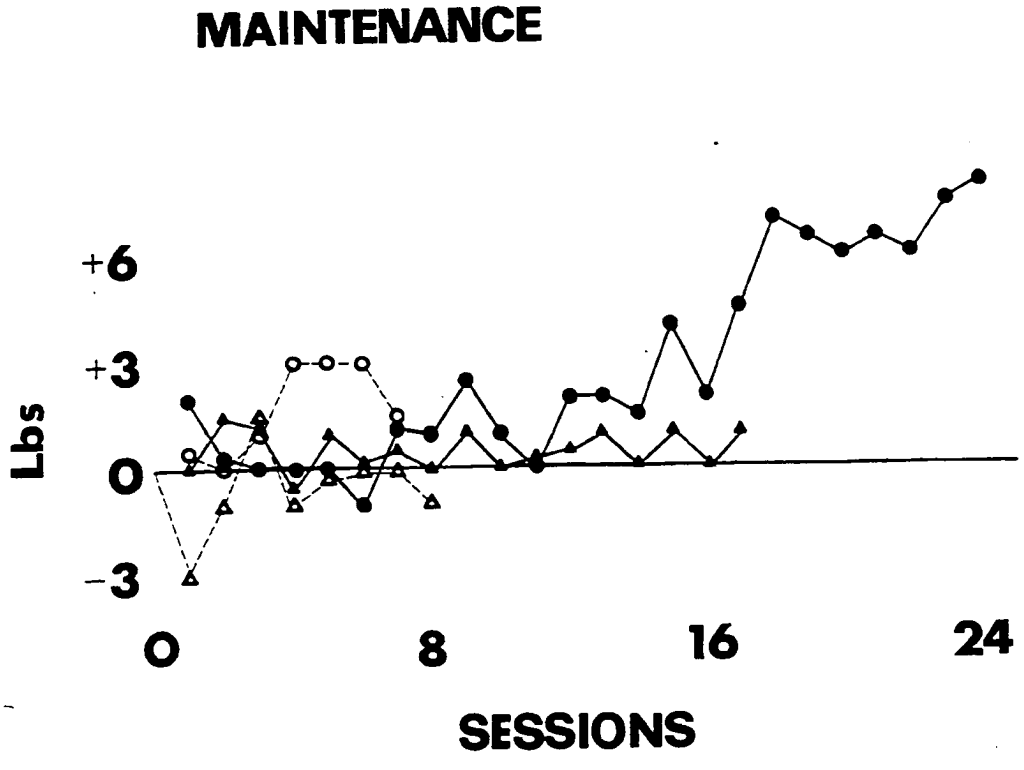


FIGURE 6

Mean cumulative weight loss
of the "Fleshy Quit" group.

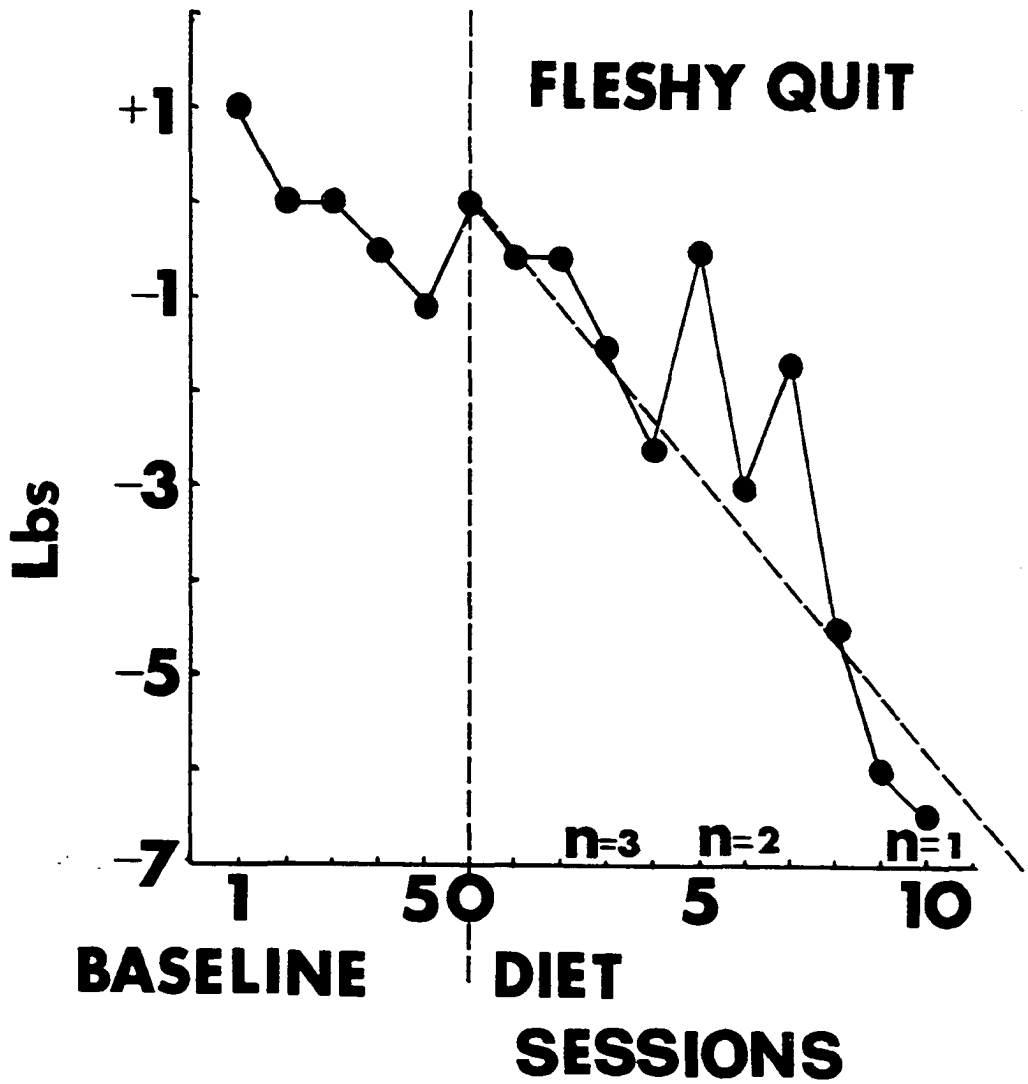


FIGURE 7

Mean cumulative weight loss
of the "Medium Quit" group.

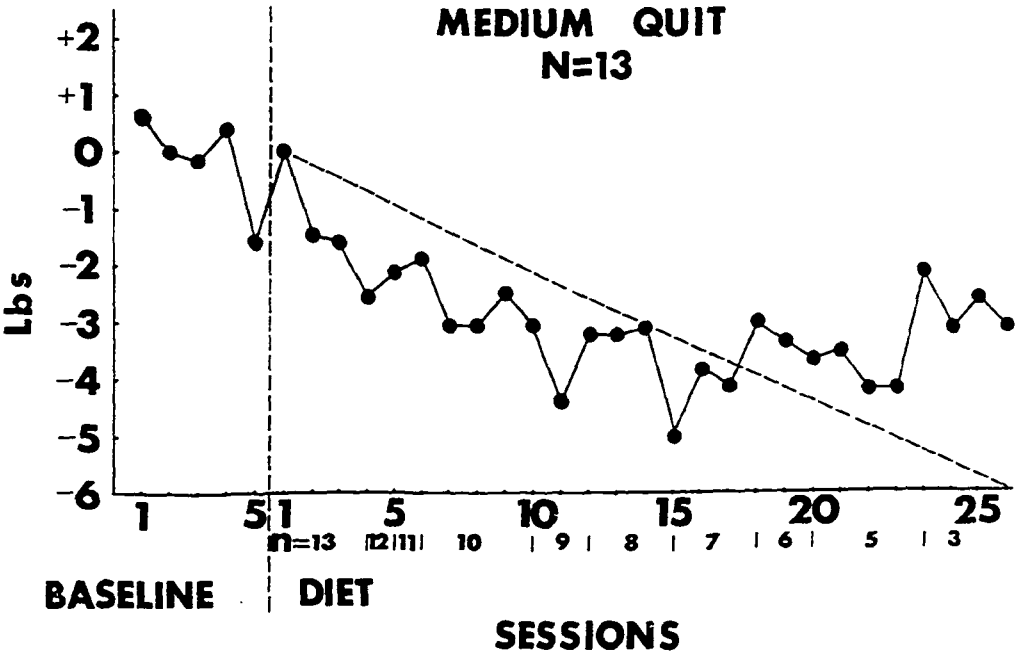


FIGURE 8.

Mean cumulative weight loss for two subjects who lost their deposit at the end of the term.

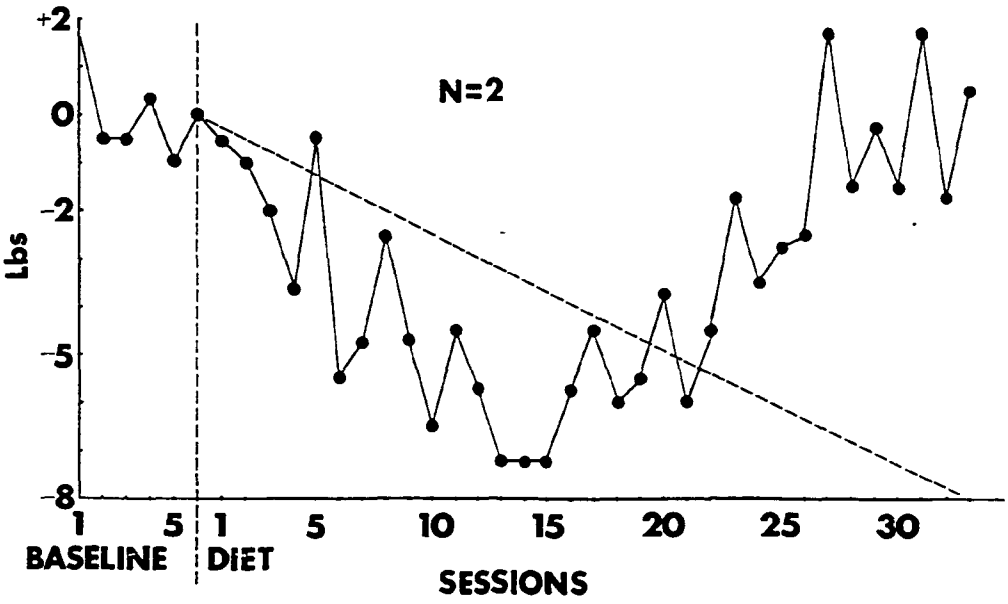
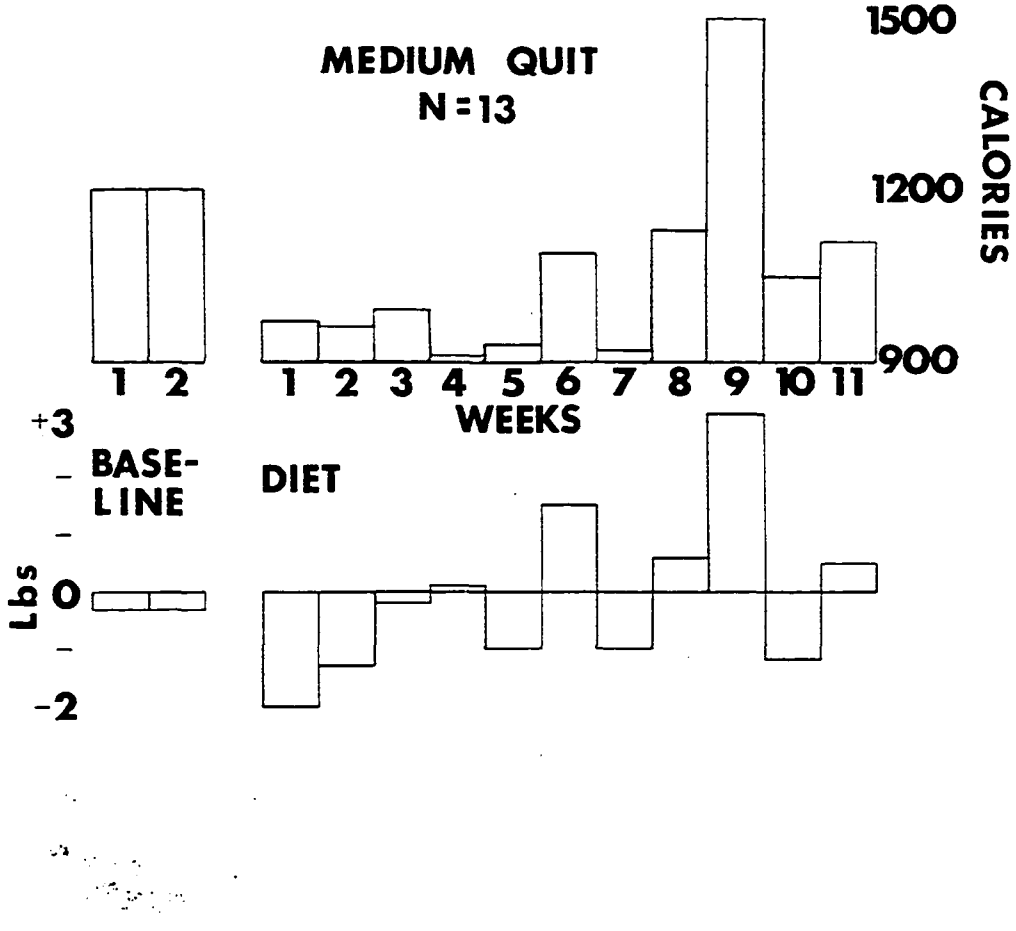


FIGURE 9

Relation between caloric intake and
weight change in the "Medium Quit" group.



DISCUSSION

Treatment of overeating is a necessary but not sufficient condition for the treatment of overweight. Metabolic rate and fluid retention can interfere with the rate of losing weight. The difficulty of monitoring eating and reinforcing appropriate eating, or not eating, leads to the use of aversive consequences contingent upon an increase in weight, even though the application of contingencies to the biological event may not be the necessary consequation of the behavioral event. The use of productive avoidance suggested by Zimmerman, seems the most simple and inexpensive technique using aversive consequences. Yet, few people find it troublesome enough to quit even when they are losing weight (Fleshy Quit group). Besides that, if sufficient avoidance is not accomplished, some subjects stop even the partial efforts of not overeating, and finally escape the treatment. The increasing number of subjects and the high number of sessions in the Medium Quit group, versus the Fleshy Quit group, may account for that. The procedure should therefore be programmed in order to decrease the chances of escape from the treatment and increase the chances of avoidance of overeating for the Medium Quit group. The first purpose can be reached through modification of the deposit. The second adjustment might include individual assessment of the guideline (Different slopes), and number of failures before the penalization occurs. All of these manipulations involve the consequences of behavior and

assume that each subject is able to manipulate the antecedents by himself. This usually occurs. In the present study, the procedure was effective for the subjects whose basic caloric intake was over 1500 calories. The reduction of 500 calories resulted in a weight loss of 1 pound per week, as described in the medical literature (Merck Manual, 1967). A loss of money in this group might have been prevented by a guideline requiring 1 pound, instead of 1.5 pounds loss per week. In any case, it appears that with the fleshy subjects this simple procedure can produce the same results as other more complex procedures, working on the antecedents of behavior. It can also have the same effect as the so-called respondent procedures using aversive stimuli. Actually, a decrease of the behavioral effect is shown after six weeks, as in the Horan study, for the Fleshy Stay and the Medium Quit groups. Those two groups showed a tendency to increase the intake as the number of weeks increased. However, in the Medium Stay group, the loss of weight disappeared after five weeks, even though the intake remained stable (provided that the report was reliable). For the Medium subjects, it is not possible to say whether the contingencies specified by the contract were effective or not, because they were losing weight during the baseline. When their efforts were no longer balanced by the positive reinforcement of weight loss, they were likely to give up; in fact, a high percentage of them left the program. During the baseline the Medium Quit subjects in particular, had the lowest intake, but their weight loss

was also lower than that of the Medium Stay group. For some biological reasons the low intake was not balanced by a satisfactory weight loss. Their eating behavior increased again and finally the deposit became for them less important than the requirements of the program. A similar phenomenon happened in the Fleshy Stay Group. Here, however, the effect of the aversive consequences was such as to keep the caloric intake from reaching the baseline level again.

These findings coincide with those of Borth: accelerated periods of weight loss and plateaus associated with weight maintainance (Stuart, 1972). This maintainance is not at the level desired by the subjects. The increase of the caloric intake in groups Fleshy Stay and Medium Quit demonstrates Stuart's suggestion: "The only pitfalls in the interpretation of weight loss experience, then, are the possibility of premature discouragement resulting from misinterpretation of the predictable scallped pattern of weight loss." (p. 201) Horan's findings can be viewed in the same perspective. In such instances an additional supply of positive contingencies or aversive contingencies, or a modification of the guideline could be planned in order to keep more subjects in the program, and for a longer time. Some follow-up data obtained one month later (Table 3) suggest that some subjects learned to control their weight after having practiced for a period under external control. Others came back for a longer treatment, others set up a similar program with people in their own

environment.

APPENDIX A

Food Intake Monitoring Sheet

NAME:

DATE:

CALORIC ALLOWANCE:

	TIME	FOOD	PT.	CALORIES	COMMENTS
MORNING			SUB	TOTAL	
AFTERNOON			SUB	TOTAL	
EVENING			SUB	TOTAL	
			TOTAL		

APPENDIX B

Diet Suggestions

SUGGESTED MENU PLAN

	FOOD	WOMEN CALORIES	MEN CALORIES
BREAKFAST	fruit or fruit juice	70 (1)	140 (2)
	egg or fish or cheese	80	80
	bread	65 (1)	130
	non-caloric beverage		
	SUB TOTAL	215	350
LUNCH	list #5 or cheese	130 (4 oz.)	130 (4 oz.)
	list #2	50	50
	bread	65 (1)	65 (1)
	non-caloric beverage		
	SUB TOTAL	245	245
DINNER	list #5	200 (6 oz.)	270 (8 oz.)
	list #3 (1 pt.)	75	75
	list #2	50	50
	non-caloric beverage		
	SUB TOTAL	325	395
DAILY	2 glasses skimmed milk	170	170
	fruit	140 (2)	210 (3)
	non-caloric beverage		
	SUB TOTAL	310	380
	TOTAL	1095	TOTAL 1370

LISTS OF FOOD

#1 USE AS DESIRED:

bouillon
carbonated beverages (non-caloric)
herbs - oregano - thyme
horseradish (red or white)
lemon lime
mustard
water
salt, pepper, paprika
seltzer
soy sauce
tea - coffee
unflavored gelatin
vinegar spices

#2 EAT ALL YOU WANT OF THE FOLLOWING:

asparagus
bean sprouts
beet greens
broccoli
cabbage
cauliflower
celery
chinese cabbage
parsley
pimentos
escarole
fennel
green & red pepper
kale
kohlrabi
lettuce
mushrooms
mustard greens
watercress
pickles
radishes
rhubarb
sauerkraut
spinach
zucchini
string beans
cucumber
endive

#3 EAT ONLY ONE PORTION (4 oz.)

artichokes
bamboo shoots
beets
brussel sprouts
carrots
eggplant
green beans
okra
onions
oyster plant
parsnips
peas
pumpkin
scallions
yellow squash
tomato
turnips
pea pods

#4 EAT THREE FRUITS A DAY

EXAMPLE: 1/2 medium size cantelope = 1 fruit
1/4 medium size fresh pineapple = 1 fruit
2 inch wedge honeydew = 1 fruit
1/2 cup berries = 1 fruit

ANY FRUIT IN SEASON EXCEPT:

bananas
grapes
cherries
dried fruits
watermelon
mangos

LIST OF FOOD (CONTINUED)

#5

veal	white fish (fresh)	halibut
beef	bluefish	trout (brook)
brains	oysters	trout (lake)
pike	pheasant	lobster
lamb	butterfish	tuna (fresh or canned)
liver	chicken (remove skin)	
shad	frankfurter	rabbit
eel	salmon (fresh)	crab meat
clams	salmon (canned)	sturgeon (fresh)
carp (fresh)	weakfish	finnan haddie
lungs	sweet-breads (calf-lamb)	
turkey	mackeral	mussels
cod	scallops	shad roe
shrimp	flounder	haddock

Remove all visible fat.
Do not fry.
Do not eat gravies or sauces.

APPENDIX C

Diet Contract

DIET CONTRACT

I _____ agree to the following conditions of the controlled diet procedure:

1. To be weighed at _____ on Monday, Wednesday, and Friday.

2. To stay below a guideline by losing _____ pound every time. If this guideline is exceeded I will pay 1 dollar. If the following time, I lose 1 pound, in order to stay below the guideline, I will get the dollar back. Otherwise, another guideline will be started and I lose the possibility to regain the dollar.

3. To present everytime a food intake monitoring sheet. For any failure to show up at the weigh-in station at the day and time established and to hand the food intake monitoring sheet for the previous days, I will pay one dollar.

4. I will deposit $5 with the weight-reduction project director. The one dollar penalties will be taken from this deposit. At the end of this term, I will collect the remainder of the deposit. If I quit the project for any reason before the end of the term I will forfeit the deposit, which will be contributed to a despised charity.

I am in sound health and assume the responsibility of maintaining my health.

Signature _____

Date _____

REFERENCES

Complete ABC Calorie Counter. Stamford, Conn.: Basic Health Publication, 1955.

The Merck Manual of Diagnosis and Therapy. Rahway, N. J.: Merck, Sharp & Dohme Research Laboratories, 1966.

Cautela, J. R. Behavior Therapy and Self Control: Techniques and Implications. IN C. M. Franks (Ed.) Behavior Therapy: Appraisal and Status. New York: McGraw-Hill, 1969.

Cautela, J. R. Treatment of compulsive behavior by covert sensitization. Psychological Record, 1966, 16, 33-41.

Ferster, C. B. & Perrot, M. C. Behavior Principles. New York: Appleton Century Crofts, 1968.

Holland, J. G. & Skinner, B. F. The Analysis of Behavior. New York: McGraw-Hill, 1961.

Homme, L. E. Perspectives in Psychology XXIV. Control of coverants, the operants of the mind. Psychological Record, 1965, 15, 501-511.

Homme, L. C'de Baca; Cottingham, L. & Homme, A. What Behavioral Engineering Is. IN R. Ulrich, T. Stachnik, J. Mabry (Eds.), Control of Human Behavior. Glenview, Ill.: Scott, Foresman and Company, 1970.

Kennedy, W. A. & Foreyt, J. P. Control of eating behavior in an obese patient by avoidance conditioning. Psychological Reports, 1968, 22, 571-576.

Malott, R. Contingency Management in Education and Other Equally Exciting Places. Kalamazoo; Behaviordelia Inc., 1971.

Mayer, J. Overweight: Causes, Cost and Control. Englewood Cliffs, N. J.: Prentice-Hall, 1968.

Meyer, V. & Crisp, A. H. Aversion therapy in two cases of obesity. Behavior Research and Therapy, 1964, 2, 143-147.

Nurnberger, J. J. & Zimmerman, J. Applied Analysis of Human Behavior: An Alternative to Conventional Motivational Inferences and Unconscious Determination in Therapeutic Programming. Behavior Therapy, 1970, 1, 59-69.

Stuart, R. B. Behavioral Control of Overeating. IN R. Ulrich, T. Stachnik, J. Mabry, Control of Human Behavior.

Stuart, R. B. & Davis, B. Slim Chance IN A Fat World: Behavioral Control of Obesity. Champaign, Ill.: Research Press Co., 1972.

Stuart, R. B. A Three-dimensional Program for the Treatment of Obesity. Pre-print submitted for publication in Journal of Consulting and Clinical Psychology, 1970.

Tyler, V. O. & Straughan, J. H. Coverant control and breath holding as techniques for the treatment of obesity. Psychological Record, 1970, 20, 473-478.

Wollersheim, J. P. Effectiveness of group therapy based upon learning principles in the treatment of overweight women. Journal of Abnormal Psychology. 1970, 76, 462-474.

Zimmerman, J. Application of Productive Avoidance to the Problem of Accelerating 'Productive' Behavior in Humans. Rationale, Some Data and Some Speculations. 1970, unpublished.