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AN EVALUATION OF A WEIGHT-LOSS CONTRACT
WITHIN A WEIGHT CONTROL PROGRAM

by

Brandon L. Hall

A Thesis
Submitted to the
Faculty of The Graduate College
in partial fulfillment
of the
Degree of Master of Arts

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Brandon L. Hall

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Contingency contracts (Homme, Csanyi, Gonzales & Rechts, 1970) specify an agreement between two or more parties to a contingency which states that, following the emission of specific behaviors, certain consequences will follow. Contracts have been used in a variety of areas and have been categorized by Farris and Walton (1975) as instructional, management, and personal. Most instructional contracts involve a teacher contracting with students in an attempt to individualize instruction. Different subjects for which contracting has been used include science (Cunningham & Heimler, 1972), speed reading (Dembo & Wilson, 1973), english (Grimes, 1972) and others. Homme, et al. (1970) have outlined the general technique of contracting within the classroom and have specified rules for contracting, for materials design, and for classroom management.

In the area of management, an individual who already exerts control over another individual as sanctioned by an institution, enters into a contract with the second party with the implicit rationale that specifying a contingency to which all parties agree will lead to more appropriate behavior on the part of the target individual. Contracts in this area have included those between parolee and parole officer (DeRisi, 1971), delinquent and family (Stuart, 1970), and between student and parents/teacher (Cantrell, Cantrell, Hudleston & Woolridge, 1969).

The distinction between management and personal contracts is based on whether the contractee is entering into the contract because

there are already contingencies placed on the target behavior but they alone are not adequate to generate the behavior (personal), or whether, as indicated earlier, the contractee is already under a certain amount of control by the contractor and the contract is one of several possible forms that control may take. Personal contracts have included those for smoking (Tighe & Elliot, 1968), weight control (Mann, 1972; Harris & Bruner, 1971), drug use (Boudin, 1972) and a variety of academic behaviors (Hall, 1974).

Essential Components

The essence of the behavioral contract is the statement of the contingency. Malott (1972) defines a contingency as the relationship between the response and the consequence. It describes an "if, then" sequential relationship. De Risi and Butz (1974) list the following as necessary parts of a contract:

1. the date of the start, end, and renegotiation of the contract
2. target behaviors
3. reinforcers
4. schedule of reinforcement delivery
5. signature of all involved
6. times when progress will be reviewed
7. additional reinforcers for exceptional performance
8. punishers for not meeting the behavioral criteria

The renegotiation and progress check steps are especially important in that they provide for the adjustment of the contract to the individual for maximum effectiveness.

Farris and Walton (1975) list the following as necessary components of the contract:

1. target behaviors
2. conditions
3. criteria for evaluation
4. consequences
5. agreement

They stress the agreement step and the need for client participation in the development of the contract. Their emphasis is in the area of instructional contracts and the agreement is designed to reduce what they indicate is the aversive unilateral control of the classroom.

Homme, et al. (1970), on the other hand, give no format or components for contracts other than that they should simply follow the paradigm "If you do X, you'll get Y."

Guidelines for Contracting

Each reference previously cited also lists certain guidelines to follow in contracting. Homme, et al. (1970) present ten rules to follow in writing the contract. These rules are as follows:

1. Reinforcers should be immediate.
2. Initial contracts should specify small approximations.
3. Reinforce frequently.
4. The contract should generate accomplishment, not obedience.
5. Reinforcement should not precede the behavior.
6. The contract should be fair.
7. The contract should be clear.

8. The contract should be honest.
9. The contract should be positive.
10. Contracting should be used systematically.

George (1970) has presented similar rules for effective contracting. These include:

1. All conditions must be explicitly stated.
2. The contract must be fair.
3. The contract must have mutually acceptable goals.
4. The contract must be reasonable, feasible, enforceable,
5. Performance should be rewarded rather than obedience,
6. The contract should be positive.
7. The contract should be concluded with mutual satisfaction and an assessment of the total contracting agreement.

Farris and Walton (1975) specify guidelines pertaining to the entire contracting situation. They recommend that any contract follow the sequence of development, implementation, and evaluation, and they detail the steps within each of these areas.

In working with contracts in the classroom, Homme, et al. (1970) recommend that the contractor work toward a goal of self-management by the student. Toward this end they recommend a sequence of five types of contracts which gradually shifts the control of the contract. In the first step the teacher determines the task and the reinforcer and in the last step the child determines the task and reinforcer.

Weight Control Research

There have been various estimates of the extent of obesity in the United States. The Public Health Service (undated) has estimated that at least 20% of all people in the U.S. are obese, while the H.E.W. has estimated that 23-68% of all women are obese. At the lowest estimate this means that there are over 40 million obese individuals in the U.S. Besides a reduction in the density of social reinforcement, obesity can result in a variety of serious health problems involving the liver, gall bladder, kidneys, and cardiovascular system (Mayer, 1968). There has been much theorizing as to the causes of obesity (Mayer, 1953; Pennington, 1953), particularly from a psychodynamic point of view (Alexander & Flagg, 1965; Brunch, 1963). However, traditional approaches to the problem, whether medical or psychiatric, have not been generally effective (Stunkard & McLaren-Hume, 1959). One review (Penick, Fillion, Fox, & Stunkard, 1971) found that with traditional treatment only 25% of the subjects lost more than 20 pounds, and only 5% lost 40 pounds. More popular approaches to weight loss such as diet books, diet candies or foods, and reducing devices have never been demonstrated in controlled studies to have generally effective results (Kimbrell, 1975; The Medicine Show, 1971).

Weight control programs based on a behavioral model have been proposed by Ferster, Nurnberger, and Levitt (1962); Goldiamond (1965); and Stuart (1967, 1971). Reviews of the many studies examining the usefulness of such a strategy have found that behavioral techniques have a greater impact on weight loss than traditional approaches

(Stunkard, 1972; Abramson, 1973; Bellack, 1974). The programs that have been derived from a behavioral model include respondent and operant techniques. Each approach will be discussed separately.

Respondent Model. Therapies based on the respondent model have consisted mainly of the use of aversive stimuli paired with food, and the use of covert sensitization. Training consisting of electric shock contingent on approach toward fattening food was used by Meyer and Crisp (1964). One of the two subjects in the case study lost 80 pounds while the other lost none. A similar procedure was used by Stollak (1967) in which he found that therapist contact and food intake diaries were effective, but the addition of contingent or non-contingent shock had detrimental effects. Foreyt and Kennedy (1971) found that six subjects exposed to noxious odors paired with fattening food lost significantly more weight than six control subjects. The authors attribute at least part of the weight change to variables within the study other than the conditioning procedure. They recommend that aversive conditioning be used only with other procedures in a weight loss program.

Covert sensitization consists of the subject being taught to imagine approaching fattening foods and feeling nauseous. Meynen (1970) found no significant difference between groups exposed to covert sensitization, modified systematic desensitization, relaxation, or a control condition. Lick and Bootzin (1972) used two covert sensitization techniques and a control procedure but found no differences between groups. Manno and Marston (1972), on the other hand, found that subjects exposed to either of two types of covert sensitization

experienced significantly greater weight loss than those subjects in the control group.

Operant Model. The first program for obesity based on an operant model was proposed by Ferster, Nurnberger, and Levitt (1962). They provided a behavioral analysis of the eating situation and suggested specific techniques. Although they presented no data, they were later quoted as saying that the results achieved were not very good (Penick, Fillion, Fox, & Stunkard, 1971). Stuart (1967) presented a detailed description of a behavioral program which consisted mainly of self-monitoring and stimulus control procedures. The case study data presented were excellent, and the study was said to have had an "electrifying effect on researchers in the field" (Stunkard, 1972). Since that time several manuals have been published describing various behavioral programs. Each emphasizes the necessity of nutrition education, an exercise program, and what Stuart (1971) calls situation management techniques (Stuart & Davis, 1972; Mahoney & Jeffrey, 1974; Jeffrey, in press; Jeffrey, Christensen, & Pappas, 1973; Christensen, Jeffrey, Pappas, 1973).

These techniques make up the core of most weight control programs reported in the literature (Bellack, 1975; Abramson, 1973; Hall & Hall, 1974). Studies which have examined the efficacy of such techniques versus either a traditional program or a control group have found the behavioral management techniques to be the most effective (Harris, 1969; Wollersheim, 1970; Penick, et al., 1971; Harris & Bruner, 1971).

Other studies have examined the use of contracts to determine whether their use, either alone or in conjunction with other components, would lead to better results. Mann (1972) found dramatic results with a procedure in which subjects could earn back or permanently lose personal possessions depending on whether weight-loss criteria were met. Harris and Bruner (1971) found a contract procedure used alone to be more effective than behavior management techniques. A program consisting of behavioral programming, social control, and a contract procedure was found to be more effective than treatments which consisted of only one or two of these components (Abrahms & Allen, 1974). Although contracting has been shown to be generally effective in the management of obesity, Jeffrey (1974) found that subjects who were allowed to determine their own consequence had a greater weight loss than those who were consequence by the therapist.

Investigations have also examined the effectiveness of self-reward versus self-punishment or self-monitoring. Mahoney, Moura, and Wade (1973) found that those subjects exposed to either of two self-reinforcement procedures lost more weight than those exposed to self-punishment only, and that all subjects did better than those exposed only to self-monitoring. Bellack (1974) found that self-reinforcement in the form of assigning a letter grade to each eating situation was more effective than a similar program which did not use the letter grades.

The present study was designed to replicate previous findings with regard to the usefulness of behavior management techniques for

weight control and to develop a contract for weight loss that would be an improvement on previous attempts by the author (Hall, 1974; Hall & Trainor, 1975). In addition, the study was conducted in order to bring a weight control program to this community and to determine whether such a program could be administered by paraprofessionals. Regardless of how effective a particular technique may be, unless it can be administered by individuals who require little training, it will not have as great an impact on a problem as pervasive as obesity.

METHOD

Subjects

Thirty community residents, seven males and twenty-three females, took part in the present study. They were solicited through newspaper advertisements and radio commercials which offered a free weight control program at the Western Michigan University Department of Psychology. Criteria for subject selection were the desire to lose at least twenty-five pounds, not currently taking part in any other weight control program, not pregnant, and an agreement to sign a contract and deposit \$25. The mean percentage overweight was 39.8% (range 9.4-79%). The mean age was 33.2 years (range 16-61 years).

Setting

The present study was conducted under the auspices of the Behavioral Holding Company, a non-profit contracting service provided to students and area residents. The service was initiated in January of 1974 by three undergraduate students, the author included. Its purpose was to provide mediating contingencies to individuals who desired help in attaining certain behavioral goals and obligations. Over 140 clients worked with 12 contractors on a variety of behaviors including attending a study hall, completing self-paced quizzes, reading journal articles, losing weight, completing homework, and others. The format involved clients placing a cash (or personal possession) deposit with the service and signing a contract. The

contract specified what behaviors were to occur, when they were to be completed, and the fine if the criteria were not met.

In the present study, four undergraduate psychology seniors, three males and one female, served as contractors. Each contractor met with either seven or eight clients in an office of the Department of Psychology. Balance-beam scales (Sears #96G450N) were used to weigh subjects.

Response Definition

The dependent measure used in the present experiment was percent obesity lost. This measure was derived by comparing the subject's starting weight with the weight specified in actuarial tables (U.S. Public Health Service, 1965). These tables listed the 25th, 50th, and 75th percentile weights for individuals based on age, sex, and height. The 50th percentile was used on all clients unless this resulted in a percent obesity which was either less than ten percent (four subjects) or over 90 percent (one subject). In this case the lower or higher percentile, respectively, was used as a reference weight. The rationale for doing this was that great variation occurs within the limits set (age, sex, and height) and the tables do not take into account body frame size, nor where the additional weight is carried. Since all clients declared a desire to lose at least 25 pounds, and since all were considered overweight by the program staff, the adjustments were made to reflect a minimal percentage of obesity.

In determining the percent obesity and the percent obesity lost, the following formulas were used:

$$\frac{(\text{number of pounds overweight})}{(\text{tabled weight})} \times 100 = \% \text{ obesity}$$

$$\frac{(\text{weekly cumulative pounds lost})}{(\text{number of pounds overweight})} \times 100 = \% \text{ obesity lost}$$

The cumulative weight change for each Monday and Thursday were averaged in order to provide a weekly cumulative weight change. If there was only one weigh-in for a particular week, that weight change was used as the weekly mean.

Procedure

The study was conducted over a five month period in the Spring and Summer of 1975. The program consisted of two weigh-in sessions per week, nutrition and diet technique education, a contract for attendance, a contract for weight loss, and self-monitoring of food intake, weight, and exercise.

Weigh-in session (weeks 1 to 43). Contractors met individually with each of their subjects for five to ten minutes on Monday and Thursday evenings. During these sessions the contractor weighted the subject (after having him remove his shoes and any outdoor clothing), and examined the client's self-monitoring sheets. The contractor made suggestions as to how eating habits could be improved and provided social reinforcement for positive comments about weight loss and for good self-report data.

Contract for attendance (weeks 1 to 43). At the first meeting each subject signed a contract for attendance and deposited \$25 with the Behavioral Holding Company. The contract stipulated the following:

1. Any absence, other than during a single two-week vacation, would result in a \$2 fine.
2. Any fine that was not paid at the next weigh-in session would result in an additional fine of 25¢.
3. Fines could not be deducted from the deposit.
4. The contract would be in effect from April 3, 1975 until August 23, 1975.
5. The deposit would be returned following the last weigh-in session if all conditions of the contract were met.

Subjects were told that all fines and forfeited deposits would be kept by the Behavioral Holding Company.

Instructional materials (weeks 1 to 3). Copies of the book Slim Chance in a Fat World (Stuart & Davis, 1972) were distributed to subjects during the first week of the program. At each of the next two sessions, subjects took a quiz over one-half of the book. If at least 90% of the multiple-choice questions were not answered correctly, a remedial quiz was required. The book included chapters on nutrition, exercise, and situation management (self-control procedures), as well as an explanation of each of the self-monitoring forms used in the program.

Graphs (weeks 1 to 43). All subjects were asked to plot their weight each morning and to bring the graph with them to each session.

Food intake sheet (weeks 1 and 2). Subjects were requested to fill out food intake sheets (adapted from Stuart & Davis, 1972) and

to bring them to each session during weeks one and two. This sheet included categories for time of day, type of food, quantity of food, number of calories, and total calories for the day.

Food exchange sheet (weeks 3 to 43). Subjects were asked to fill out food exchange sheets (adapted from Stuart & Davis, 1972) and to bring them to each session. On these sheets food was categorized as either meat, milk, cereal, vegetable, fruit, or miscellaneous. Food in each category was specified in exact serving size so that different items or "exchanges" in that category had the same number of calories. Each subject was given a target daily calorie level and, based on this, two to nine exchanges were allowed daily from each food group. An empty square was provided on the sheet for each exchange allowed and subjects were directed to record the time each exchange was eaten.

Exercise sheets (weeks 4 to 43). After the food exchange sheets had been in use for a week, clients were asked to complete a daily exercise sheet. Exercise was categorized as either light, medium, or heavy depending on the caloric expenditure. For each five minutes engaged in exercise, clients were to place a check in a box next to that category. From this one could compute the total number of calories expended per day.

Weight loss contract (weeks 7 to 43, or 11 to 43). A second contract was presented to the subjects in each of two groups after the program had been in effect for two or three months, respectively. This contract stipulated that one-half pound was to be lost by each

weigh-in session, or a \$3 fine would result. Evidence of the effectiveness of contracting for weight control was cited (Mann, 1972; Hall & Trainor, 1975) and subjects were strongly encouraged to sign the contract. Whether the subject agreed to the second contract or not, the rest of the program was continued.

Experimental Design

A multiple baseline design (Baer, Wolf, & Risley, 1968) across groups was used to evaluate whether the addition of a weight-loss contract to a weight control program would lead to a higher rate of weight loss. Subjects were asked to sign the contract during the week of May 19 for contractors C1 and C2, or during the week of June 16 for contractors C3 and C4. All contracts signed were in effect until the end of the program.

Reliability

Reliability checks were made after the contractor had entered the weight for a particular subject into the raw data log and had returned the scale counterweights to zero. Contractors did not know when a reliability check was to be made. The reliability observer, either the experimenter or another contractor, did not enter the office until the contractor was finished weighing the subject. The second observer would weigh the subject and then record the weight and his initials in the raw data log. The percent agreement was determined by dividing the number of times the two recorded weights were within 1/4 pound of each other (21) by the total number of reliability checks (22). Inter-observer reliability was 95%.

RESULTS

The optional weight-loss contract was presented during the eighth or tenth week of the program. Of the 27 subjects who were still in the program at the 8th week, 13 signed the contract. The reason generally given for not signing the contract was that the individual did not want to gamble with losing any money. Many had already come into contact with the absence contingency (\$2 fine). Of the 13 subjects who signed the contract, four quit the program within five weeks of the signing. When asked why they had quit, subject #1 reported she moved out of town, subject #2 said that it was cheaper to quit than to continually pay the fine for not meeting criterion (\$3 fine), subject #3 said she joined Weight Watchers, and subject #4 gave no reason.

As shown in Figures 1 and 2, there was a drop in weight for eight of the 13 subjects who had signed the contract the week following the contract implementation. There was no clear effect of the contract over time for subjects S1-S4, S6, S8, or S13. Of those individuals for whom there was an effect, contract implementation resulted in a reversal of a weight-gain trend for two subjects (S9 and S5), a decrease in the rate of weight loss for one subject (S12), a slight increase in the rate of weight loss for one, and a dramatic increase in the rate of weight loss for two (S10 and S11).

Seventeen individuals did not sign the weight loss contract, thereby providing an opportunity to evaluate the basic program. Of these 17, three had quit the program by week 8. As shown in Figures 3 and 4, six of the remaining 14 subjects experienced no effect, as

Figure 1. The percent obesity lost as a function of successive weeks under the program and program plus contract conditions.

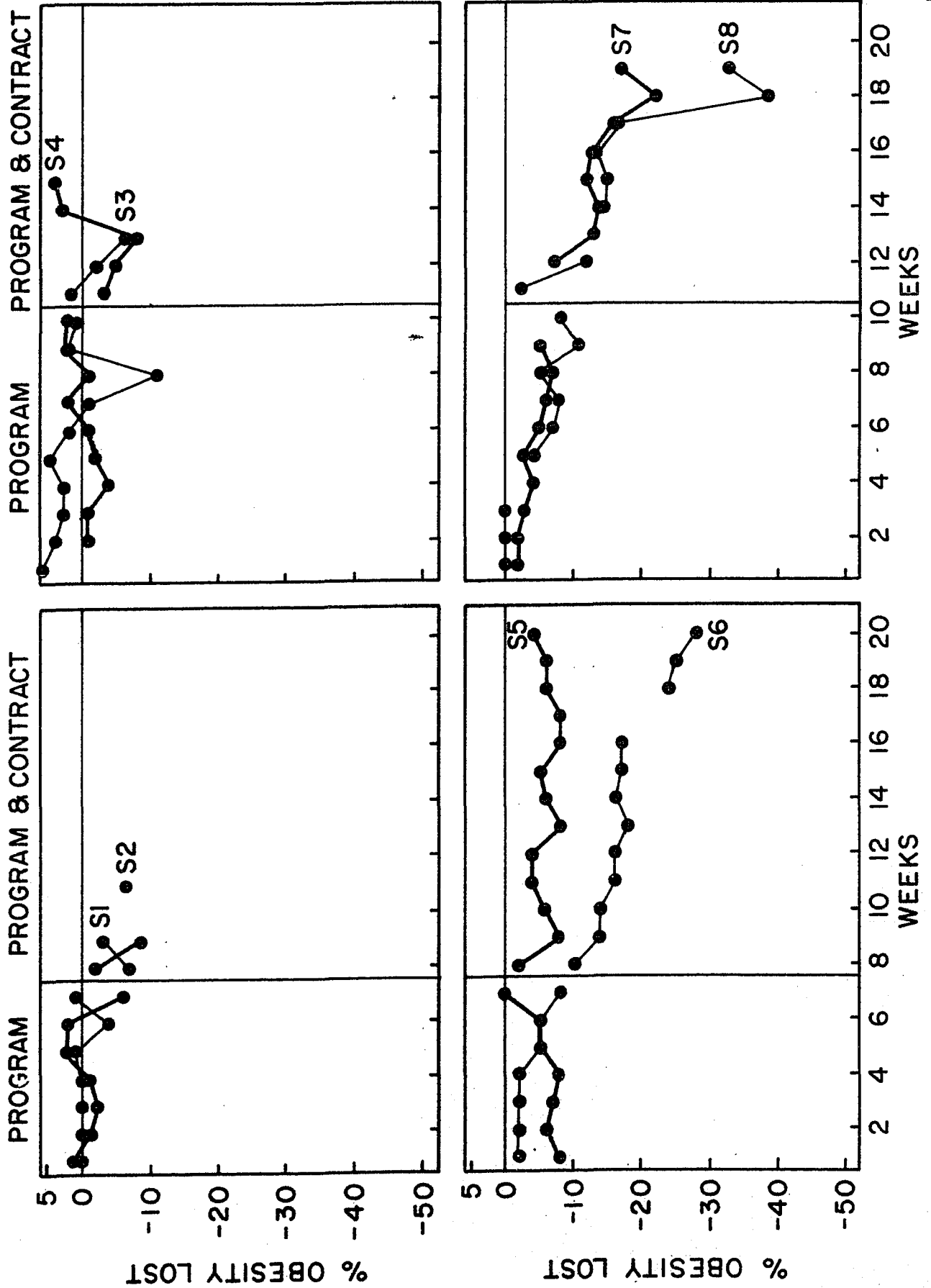


Figure 2. The percent obesity lost as a function of successive weeks under the program and program plus contract conditions.

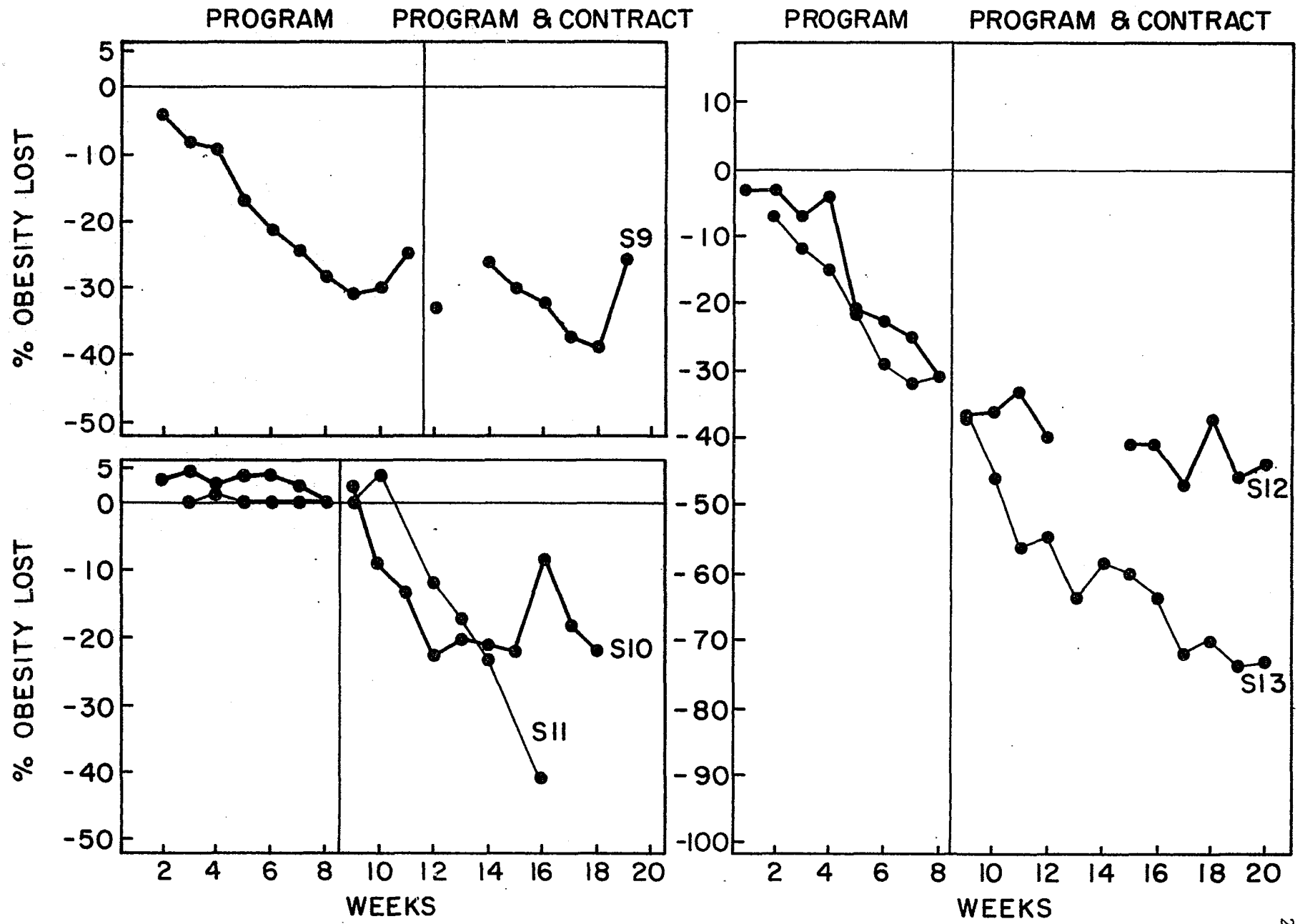


Figure 3. The percent obesity lost as a function of successive weeks under the program only condition.

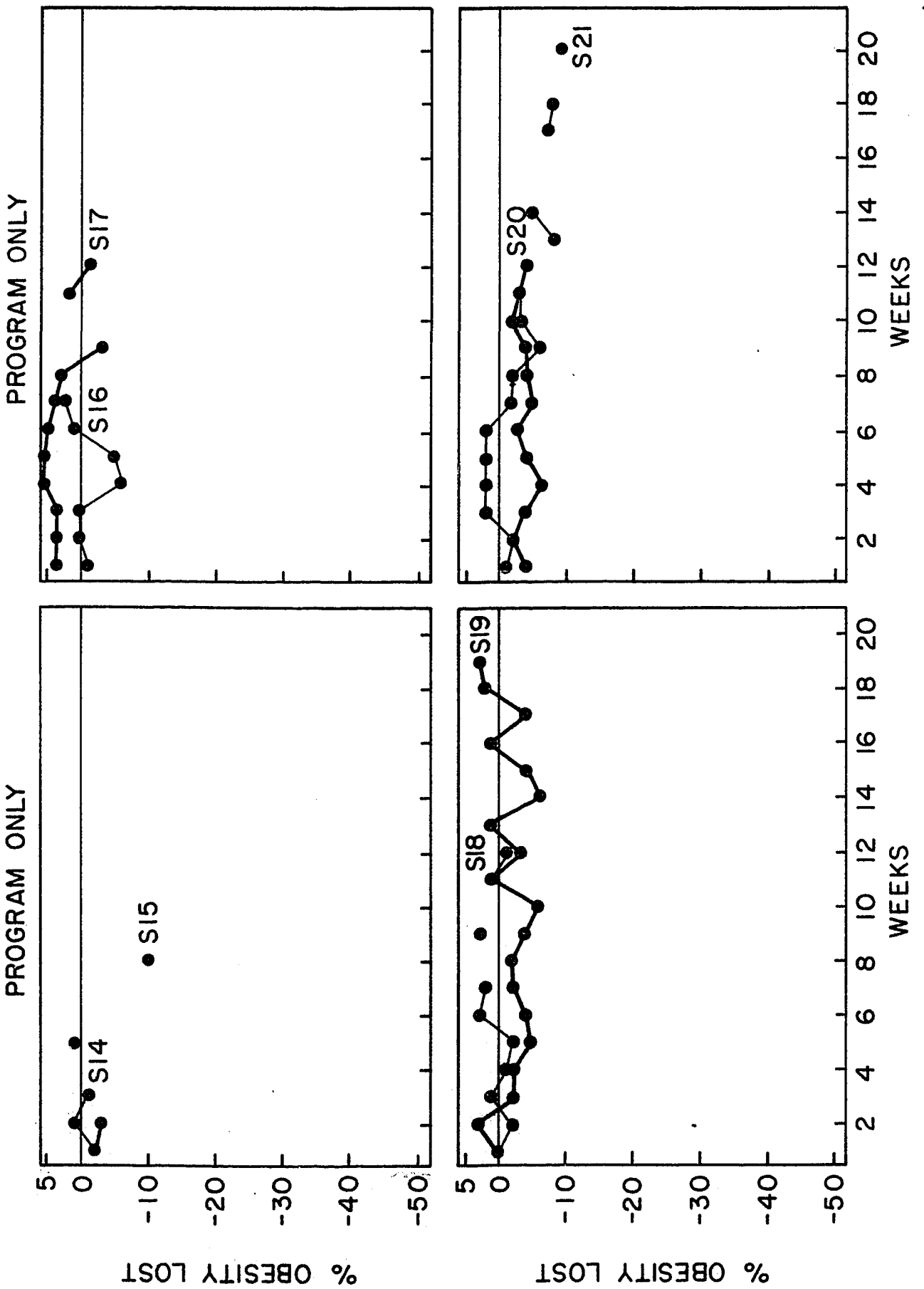
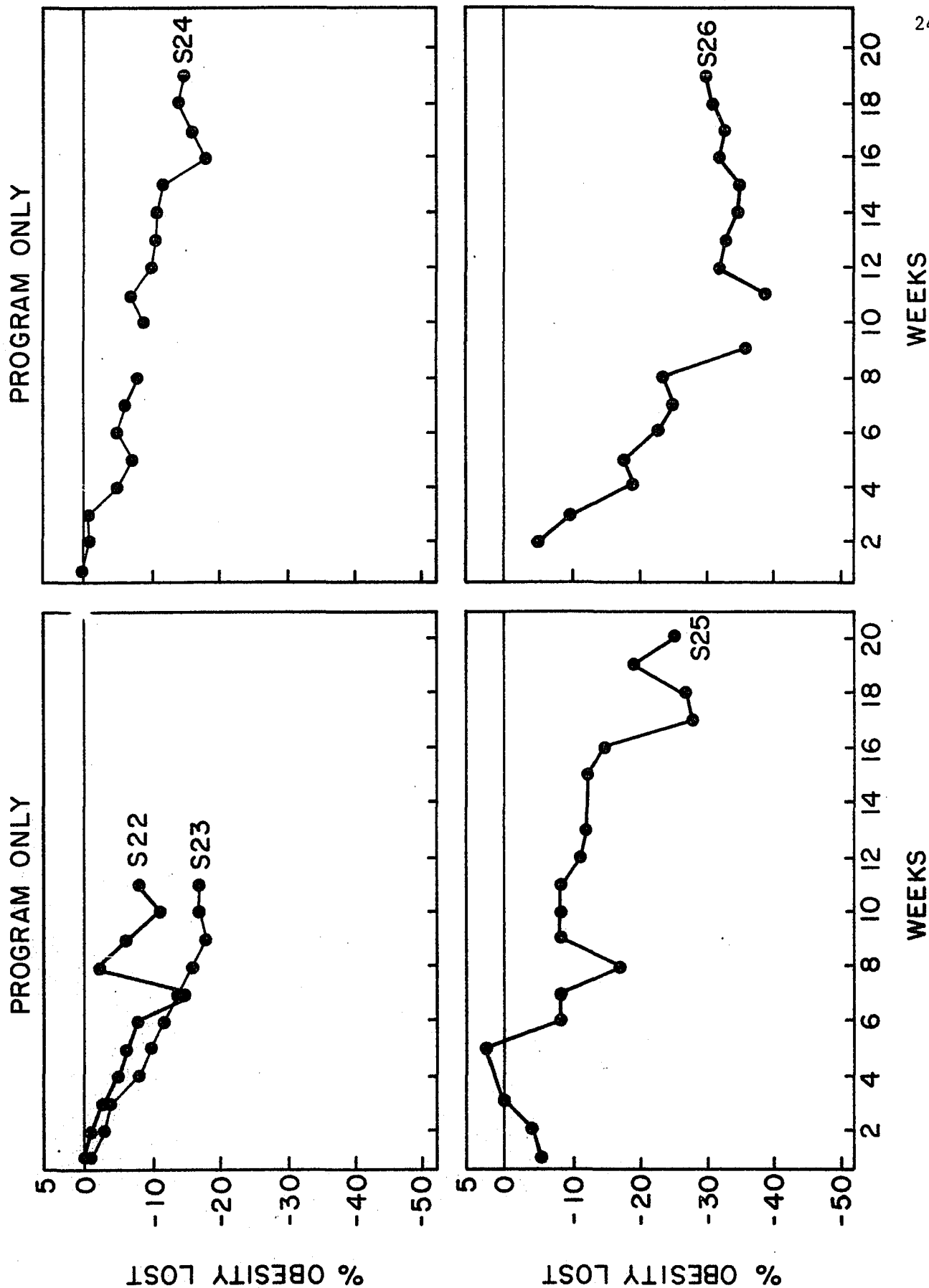


Figure 4. The percent obesity lost as a function of successive weeks under the program only condition.



defined by weight loss at the end of the program of less than 10% obesity lost. Two subjects lost 10-20% obesity, two lost 20-30%, one lost 30-40%, two lost 70-80%, and one lost 80-90%, as Figures 4 and 5 show.

Ten weeks after the program was over, each person participating in the program was called and asked to evaluate it. They were asked what they felt was the best and the worst feature of the program, why they had quit the program (if applicable), and whether they would recommend the program to a friend. The results of this evaluation appear in Table 1. Subjects reported that the feature they liked best was that they were required to attend and be weighed-in twice per week. The feature rated worst was that there was not enough counseling and suggestions for help with individual problems. Over 66% of the subjects reported that they would recommend the program to a friend. Seven of the 15 subjects who gave a reason for quitting said that it was due to either their lack of weight loss and/or that they were going to join Weight Watchers.

Figure 5. The percent obesity lost as a function of successive weeks under the program only condition.

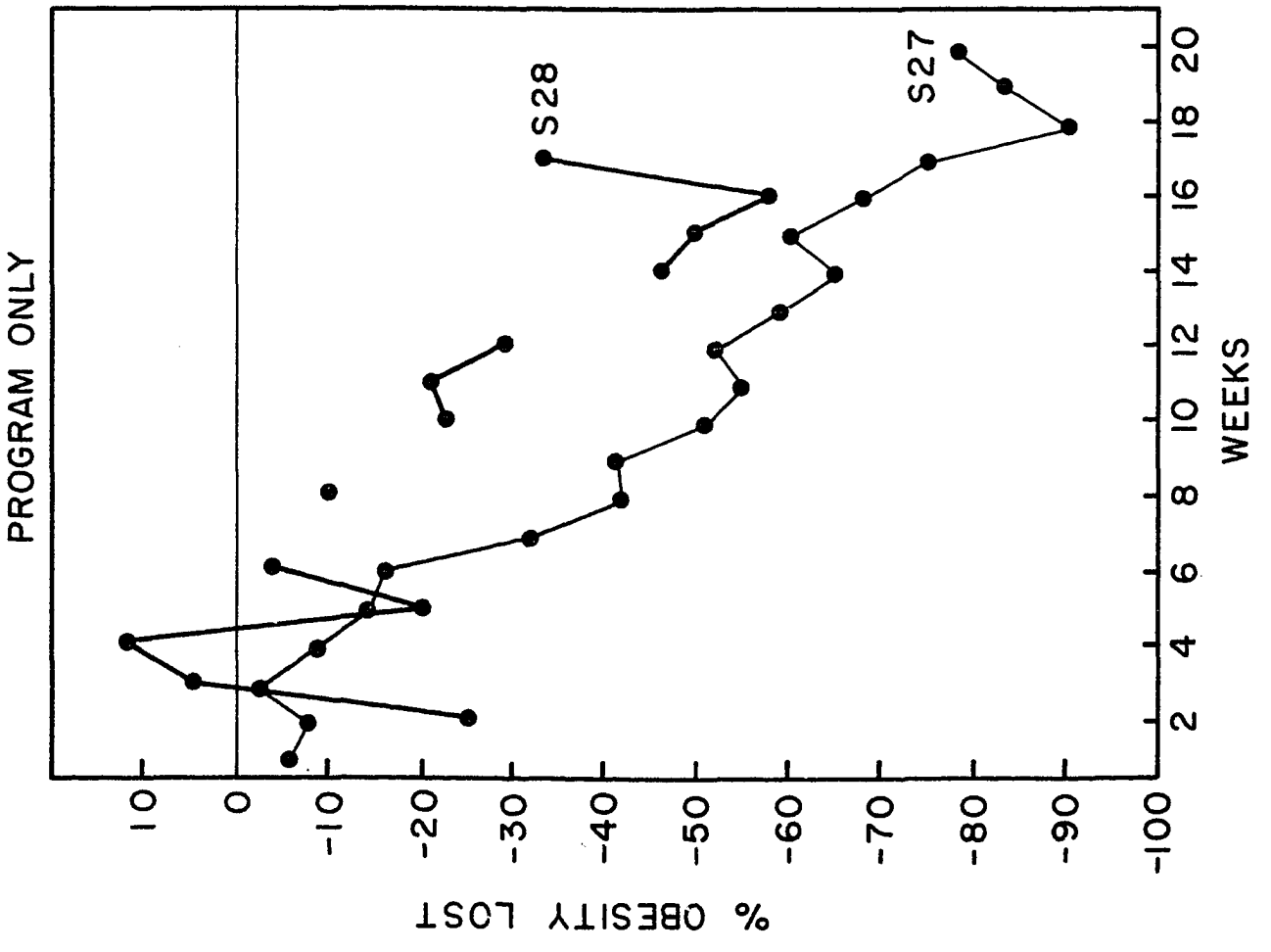
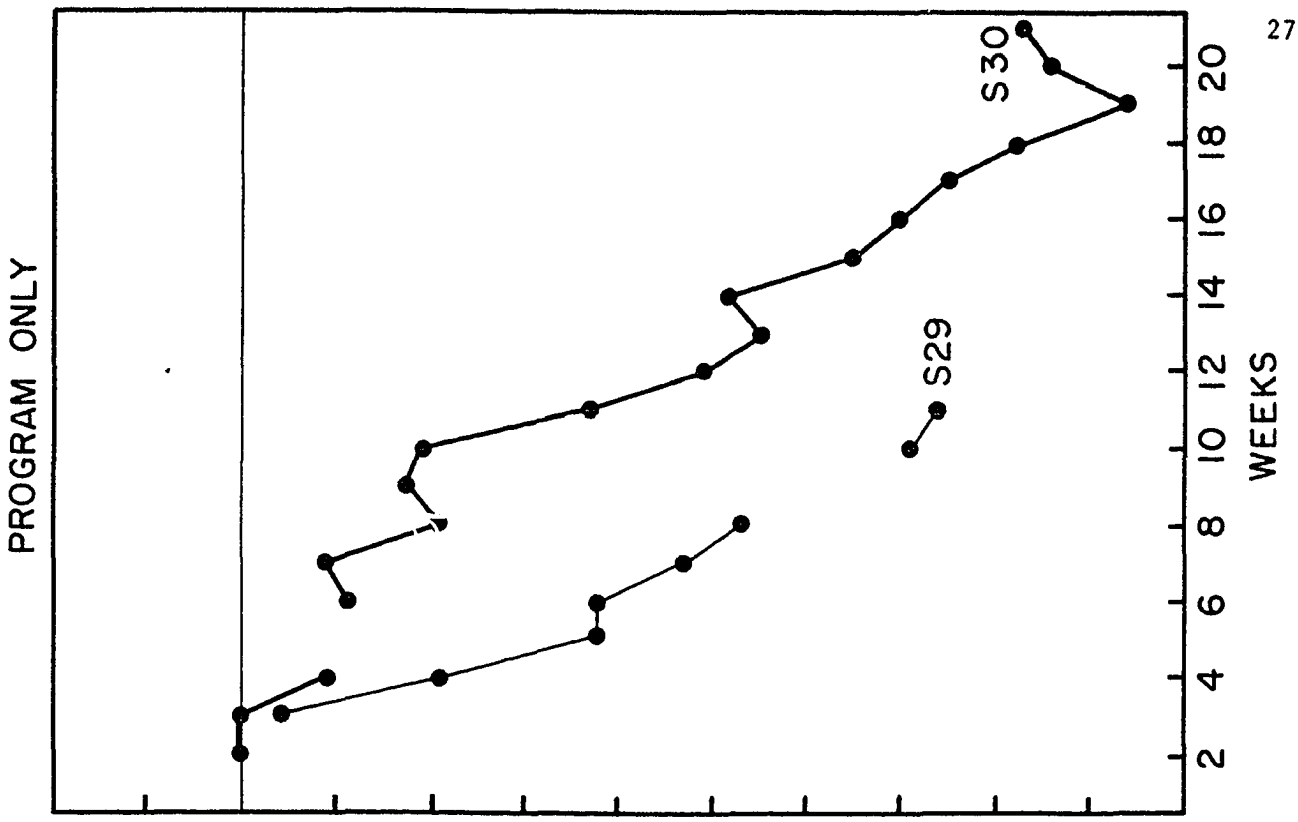


TABLE 1

Results of Subject Evaluation

<u>Best Feature</u>	<u>n</u>	<u>Worst Feature</u>	<u>n</u>
having to attend	13	not enough counseling	9
food intake sheets	4	inconvenient to attend	5
the contractor	3	not enough support	3
exercise sheets	2	weight-loss contract	3
book	1	self-monitor forms	3
<hr/>			
<u>Recommend the Program to a Friend</u>	<u>n</u>	<u>Reason for Quitting</u>	<u>n</u>
yes	18	not doing well	7
no	8	out of subject's control	5
maybe	1	weight-loss contract	2
		upset with absence fine	1

DISCUSSION

The subjects were not told that a weight-loss contract would be available since it was felt that this would result in a possible confounding of the results. For this reason the contract was optional and less than one-half of the subjects agreed to sign it. This could have been avoided had the contract been signed as a condition of acceptance into the study, even though it would not be implemented until the program had been in effect for at least a month. However, it worked out well this way, for it made possible an examination of the generality of acceptance by individuals of such a contract. By screening those persons from the program who would not sign such a contract, this information would not have been available. Mann (1972) demonstrated the effectiveness of a severe contract for weight-loss, but he used only six subjects, and it is not clear how many individuals would enter into such a contract. A procedure which is very effective but is not acceptable by the client population is of only limited use. In addition to the information on generality, the optional contract also allowed for evaluation of the program alone for those individuals who did not sign the contract. This limited signing will have no effect on the internal validity of the experiment, but rather will limit the external validity of the findings to those individuals who agree to sign such a contract, which evidently is a reasonable percentage of those interested in this type of weight control program.

The results of the contract implementation do not support the notion of the general efficacy of a weight-loss contract as part of a weight control program (Harris & Bruner, 1971; Mann, 1972). Although 13 subjects signed the contract, it was beneficial to only four of them. When all 13 subjects who had signed the contract are considered, and when the evaluations are noted, it does not seem that the benefits of the contract outweigh the disadvantages. However, some adjustments could be made which might make the contract worthwhile. First, a less aversive contract could be written. This would entail the subject depositing the goods with the service, and then earning them back as weight was lost. This would probably be less aversive than a system of fines as was used in the present study. Another alternative would be using input from the subject concerning the specifications of the contract. Farris and Walton (1975), and DeRisi and Butz (1974) stress the necessity of subject input and negotiation. In this study the contracts were already written in terms of the weight to be lost, the amount of the fine, and how often the criterion was to be met. A smaller fine or allowing leeway when the criterion was to be met may prove more acceptable. Another alternative is to use weight-loss contracts only after all other program components have failed.

The program without the contract generated similar results. Only four subjects of the 17 who did not sign the contract lost more than 30% of their obesity. For three of these, there was an immediate weight-loss which continued throughout most of the program. It is not clear which component of the program was controlling their behavior.

There was much variability in the weight of the fourth subject, S28. This was due to her being only 9.4% obese even when the 25th percentile was used, and a weight change of a few pounds resulted in a large percentage difference.

Several problems occurred as a result of poor program development. The first was that there was some confusion as to how to specify the weight-loss criterion for each session because of the way the contingency was specified in the contract. One way was to specify a target line at the first session and then fine the individual each time he went above that line. The other way was to determine the criterion on a week-to-week basis. If the subject lost more than was required for that session, the criterion for the following session was readjusted to be one-half pound below that weight. The benefits were that the subject was continually motivated and could not accumulate pounds lost, and that cumulative failure was avoided. If on any given session the subject did not meet criterion, the criterion for the next session was readjusted so that he did not need to make up the weight gain during that week. This ambiguity of the contract was not foreseen and contractors began setting criteria differently.

The second problem was that certain critical data were not kept. Data were not collected as to when fines were levied for not meeting criterion. This is related to the first problem in that it was assumed that it would be evident from the graphs when fines were levied. The data presented would have more meaning if one had this information. Also, no data were kept on the extent of subject self-monitoring. Subjects were requested to bring their self-monitoring forms with them

to each session. However, since this was not specified as part of the attendance contract, many subjects did not bring them. It was a mistake not having this as part of the attendance contract, and for not collect these data.

Another major problem resulted from no specific contingencies to maintain the contractors. There was no differential pay-off for the subjects' weight-loss, and as a result the contractors often made the response of least effort in dealing with them. This led to a decrease in the reinforcement value of their behavior on the subjects and several subjects mentioned during the evaluation that there was not sufficient support from the contractors. The contracting service and this weight control program specifically were designed to use paraprofessionals as the on-line personnel (Hall & Trainor, 1975). However, more control over their behavior must be established before this can become a generally effective service.

The design of the weight control program was primarily responsible for the poor results. In addition to the insufficient reinforcement and counseling, there was not enough feedback to the subjects concerning their weight loss. Although they recorded their weight daily, there was never any clear specification of what their target weight was, nor to what extent they were approaching their goal. The rationale was that they were to lose as much weight as possible, but this was not effective. There also should have been a more extensive exercise program. Although exercise sheets were distributed, not all subjects used them. Even with them, most subjects did not exercise sufficiently. This should be a major compo-

nent of a weight control program. Also, subject input should have been used, and more options available with the attendance contract, as was recommended for the weight-loss contract.

The dependent variable, percent obesity lost, seemed to be a good measure in terms of sensitivity and in providing a reasonable way to evaluate relative weight change between individuals. However, there is no way to assess the absolute change. It would be better to include on the graph the number of pounds lost at the end of the program, and the percent obesity at the time the program was begun. This would give one all the information needed to evaluate absolute and relative change.

The weight control program used in the present study generated significant weight-loss in only a limited number of subjects. The implementation of a weight-loss contract also had a limited effect. The conclusion to be drawn is that, to be effective, a program must involve more effective components than were used, and that a weight-loss contract with a generally inadequate program is not sufficient to generate weight-loss.

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