

THE BEHAVIOR-THERAPEUTIC USE OF CONTINGENCY  
CONTRACTING TO CONTROL AN ADULT BEHAVIOR PROBLEM:  
WEIGHT CONTROL<sup>1</sup>

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Items considered valuable by the subject and originally his property were surrendered to the researcher and incorporated into a contractual system of prearranged contingencies. Each subject signed a legal contract that prescribed the manner in which he could earn back or permanently lose his valuables. Specifically, a portion of each subject's valuables were returned to him contingent upon both specified weight losses and losing weight at an agreed-upon rate. Furthermore, each subject permanently lost a portion of his valuables contingent upon both specified weight gains and losing weight at a rate below the agreed-upon rate. Single-subject reversal designs were employed to determine the effectiveness of the treatment contingencies. This study demonstrated that items considered valuable by the subject and originally his property, could be used successfully to modify the subject's weight when these items were used procedurally both as reinforcing and as punishing consequences. In addition, a systematic analysis of the contingencies indicated that punishing or aversive consequences presumably were a necessary component of the treatment procedure.

Comparatively few therapeutic techniques displaying generality in natural settings have been developed to deal with the behavior problems of normal non-institutionalized adults. Two major reasons for this are suggested. First, it is difficult for a therapist to discover and/or gain systematic control over relevant consequences of an adult's behavior in its natural settings. Second, even if a therapist did have such control, it would still be difficult to maintain reliable measurement of the behavior. Without reliable measurement, it would be difficult to deliver relevant consequences at appropriate times. Similarly, it would be difficult to assess any changes that might occur in the behavior. Thus, an applied demonstration of a therapeutic change in behavior could be made, but with difficulty.

A recently discussed procedure that may have potential as a technique to remediate adult behavior problems in their natural settings is that of contingency contracting (Homme, 1966; Homme, Csanyi, Gonzales, and Rechs, 1969; Tharp and Wetzel, 1969; Michael, 1970). Its applications as a therapeutic technique, however,

have been suggested mainly for use in school settings with children (Homme *et al.*, 1969; Cantrell, Cantrell, Huddleston, and Woolridge, 1969) and in home settings to remediate the behavior problems of pre-delinquent adolescents (Tharp and Wetzel, 1969; Stuart, 1970).

The term "contingency contracting", as it has most commonly been used has meant an explicit statement of contingencies (*i.e.*, a rule), usually agreed upon by two or more people. In other words, it has been a specification of a

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number of behaviors whose occurrence would produce specified consequences, presumably to be delivered by parents or teachers. It has been amply demonstrated that contingencies can, in fact, change behavior. Nevertheless, little evidence has been gathered to support the notion that the use of contingency contracts will facilitate the remediation of child or adult behavior problems.

The present study attempted to develop a therapeutic technique that would effectively remediate the behavior problems of normal non-institutionalized adults. The basic technique used was that of contingency contracting. The contingency contract used in this study was similar to others that have been discussed, in that it too was an explicit statement of contingencies. However, this contract incorporated a number of additional techniques that were considered necessary to accomplish effectively an applied behavior analysis, and which were relevant to the problems both of gaining systematic control of effective consequences and of maintaining reliable measurement.

In brief, this study attempted to test the applicability of contingency contracting with adult subjects, and to assess the effects of various treatment contingencies on weight reduction. Weight was used as the dependent variable for two reasons: (1) It is a convenient and reliably measurable "behavior", and (2) weight control is a socially important behavior problem.

## METHOD

### *Subjects*

Seven women and one man, 18 to 33 yr old, had responded to an advertisement for a "behavior therapy research program of weight reduction". Each subject was required to give to the researcher a signed physician's statement indicating that it would be medically safe for him or her to lose the specified weight agreed upon for this research over the agreed-upon time and at the agreed-upon rate. Furthermore, the physician's statement included an entry indicating

whether the subject's physician had prescribed a diet for him. It was made clear to every subject, both verbally and as a written clause included in each contract, that any diet or foods that the subject selected or his physician prescribed would be ultimately the subject's responsibility. With one exception, only those individuals agreeing to lose 25 pounds or more and who had their physician's approval were accepted as subjects. (The one exception was a subject who agreed to lose 16 pounds).

### *The Contingency Contract*

The Contingency Contract was a legal document that incorporated as separate clauses all of the procedures in the weight control program. First, the contract required each subject to surrender a large number of items considered to be valuable to himself. These items were retained by the researcher (a similar technique has been discussed by Tighe and Elliot, 1968). Secondly, the contract prescribed the manner in which the subject could earn back or permanently lose his valuables (*i.e.*, the statement of contingencies). Third, the contract required the subject to be weighed by the researcher at regular intervals. Fourth, the contract stipulated that the researcher, at his discretion, would change the procedures from baseline, to treatment, to reversal, and back to treatment conditions. Thus, the contingencies of the contract could be either continued or temporarily discontinued in order to assess experimentally the causal variables and the efficacy of the contract itself. The details of the experimental conditions were also specified in the contingency contract.

In brief, the contract was a guarantee to the subject that valuables supplied by him would be returned contingent upon meeting the specified requirements, or would be permanently lost if those requirements were not met. It was also a guarantee to the researcher that the subject would be available for measurements and the delivery of consequences at specified intervals.

All individuals interested in losing weight were shown a copy of a contingency contract

and given a detailed description of the procedures to be used. The procedures were explicitly characterized as being extremely rigid and severe. The researcher then answered any questions raised by the prospective subjects. Each subject was encouraged to take as much time as he needed to consider whether he should sign the contract. When an individual decided to be a subject in the program, he was asked to nominate a number of objects he considered valuable to himself, either in the form of money and/or personal items (*e.g.*, medals and trophies, clothes, jewelry, *etc.*). It was emphasized to all subjects that the items should be as valuable as possible. The contract was then tailored to each subject's personal specifications, with reference to intermediate and terminal requirements of the program: (1) the minimum number of pounds to be lost cumulatively by the end of each succeeding two-week period (*i.e.*, the minimum rate for losing weight), and (2) the terminal weight requirement. The number of valuables obtained from each subject to be used as consequences depended in part upon the amount of weight that the subject agreed to lose, and the minimum rate at which he agreed to lose it. Finally, the researcher, subject, and one witness signed two copies of the contract. The researcher and the subject retained one copy each.

Three sets of contingencies were specified in the contract: (1) Immediate Contingencies; (2) Two-week Contingencies; and (3) Terminal Contingencies.

The Immediate Contingencies were applied to each cumulative two-pound gain or loss of weight that occurred during the treatment conditions. Any time the subject cumulatively lost two pounds with reference to the final weight measurement of baseline, he received one valuable from the researcher. Each additional two-pound weight loss below the previous weight loss was rewarded with one more valuable, and so on. On the other hand, each cumulative two-pound weight gain (above the subject's lowest recorded weight) was punished by the loss of

one valuable. The weight of each subject was always recorded to the nearest half-pound.

The Two-Week Contingencies required the subject to lose a minimum number of pounds by the end of each successive two-week period during the treatment conditions. The two-week periods and their associated minimum weight losses were calculated from the last baseline weight measurement and date. Every two weeks, if this requirement was met, the researcher delivered a bonus valuable. If this requirement was not met, the subject lost that valuable as a punishing consequence. The Immediate and the Two-Week Contingencies were each a single valuable selected unsystematically by the researcher. Subjects never knew in advance which valuable would be used as a consequence.

The Terminal Contingency was a portion of the valuables (or money) delivered to the subject *only* if and when his terminal weight requirement was met. These particular valuables were itemized in the contract as specifically for this purpose, and consequently were never in jeopardy of being lost as penalties (*i.e.*, for weight gains or for not meeting a Two-Week Contingency) nor available to be regained before reaching terminal weight. In addition, the researcher agreed to deliver to the subject all of the other remaining valuables that had not been regained or lost as penalties, whenever the subject reached his terminal weight. However, if at any time the subject decided to terminate the program, then all remaining valuables in the possession of the researcher, including the Terminal Contingency, became the property of the researcher. Thus, the Terminal Contingency helped to ensure that the subject would remain in the program until his terminal weight requirement was met.<sup>2</sup> A clause in the contract stipulated that all items that became the property of the researcher would be disposed of in

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<sup>2</sup>Although the contingency contract did not specify the possibility, the researcher, in fact, would dissolve the contract with the mutual agreement of the subject for special circumstances, and return to the subject the remainder of his valuables.

a manner not personally profitable or beneficial to the researcher. These items were subsequently donated to various charities.

It should be stressed that the terminal contingencies were always in effect during every phase of the program (*i.e.*, during baseline, treatment, and reversal conditions). In other words, they were long-term consequences that presumably would operate against the usual outcome of a reversal.

### *Measurement and Reliability*

The contract stipulated that the subject be weighed at a specific time and place every Monday, Wednesday, and Friday of each successive week until his terminal weight was reached. The subjects were weighed on the same medical-type scale throughout the experiment. Both the subject and the researcher independently recorded the subject's weight to the nearest half pound. However, the consequences were delivered in accordance with the researcher's weight determinations.

Reliability determinations were made on each of the days that the subject was weighed by subtracting the subject's notation of his own weight from the researcher's notation. The range of differences of weight occurring throughout the program was the measure of reliability.

The differences between the subject's and the researcher's weight determinations ranged from plus or minus half a pound. Both the subject and the researcher were in agreement on 95% of the weight determinations.

### *Procedures*

The procedures followed a single-subject reversal design (*cf.*, Baer, Wolf, and Risley, 1968). The design included sequential baseline, treatment, reversal, and treatment conditions (*i.e.*, an ABAB design).

During the baseline condition, the subject's weight was regularly measured; there were no scheduled consequences for weight, except the Terminal Contingency. Baseline data were recorded for approximately two to five weeks,

depending upon the stability of the subject's weight. The criterion for stability was a two-week period in which either a subject gained weight, remained stable, or lost no more than one pound per week. The final two-week criterion period was considered baseline.<sup>3</sup> At a time unknown in advance to the subject, the researcher notified the subject that the treatment procedure was beginning. The weight of the subject and the date at the time of this notification were considered the final weight measurement and date of the baseline condition.

During the treatment condition, all three contingencies were in effect: The Immediate, Two-Week, and Terminal Contingencies. Both the Immediate and the Two-Week Contingencies were calculated from the final weight measurement and date of the baseline condition. The treatment condition was maintained at least for four weeks, and often longer, depending upon the stability of the subject's rate of losing weight. At a time unknown in advance to the subject, the researcher notified the subject that the reversal procedure was beginning and that until told otherwise, he could continue losing weight but he would neither receive back valuables for losing weight nor lose valuables for gaining. He was also told that whenever he reached terminal weight, the remaining valuables would be returned. The weight of the subject at the time of this notification was considered the final weight measurement of the treatment condition.

During the reversal condition, the subject continued to be weighed regularly, but there were no scheduled consequences, except the Terminal Contingency, regardless of whether the subject lost weight, gained weight, or remained stable. The reversal condition was maintained for approximately two to four weeks. At a time unknown in advance to the subject, the researcher notified the subject that the second treatment procedure was beginning. The weight

<sup>3</sup>Use of the last 14 days of baseline gives each subject a uniform baseline to facilitate comparisons to other subjects. Fourteen days was the shortest baseline of any subject.

of the subject and the date at the time of this notification were considered the final weight measurement and date of the reversal condition.

The second and first treatment procedures were identical. During the second treatment condition, however, both the Immediate and the Two-Week Contingencies were calculated from the final weight measurement and date of the reversal condition.

In summary, items considered valuable by the subject and originally his property were surrendered to the researcher and incorporated into a contractual system of prearranged contingencies. The contract prescribed the manner in which the subject could earn back or permanently lose these items. This complex of contingencies, presumably both of reinforcing and of punishing consequences, was in effect during the treatment conditions. Experiment I assessed the effects of the whole complex of treatment contingencies on weight reduction.

## RESULTS AND DISCUSSION

### *Experiment I*

Six of the eight subjects who were in the weight-reduction program participated in Experiment I. The data of one of these subjects have been selected to exemplify the procedures and are presented in Figures 1a and 1b. In these figures, each open circle (connected by the thin solid line) represents a two-week minimum weight loss requirement. Each of the solid dots (connected by the thick solid line) represents the subject's weight on each of the days that he was measured. Each triangle indicates the point at which the subject was penalized by a loss of valuables, either for gaining weight, or for not meeting a two-week minimum weight loss requirement. Only the data of the first four conditions (*i.e.*, baseline, treatment, reversal, and treatment) are considered as Experiment I (Figure 1a). A subsequent experimental manipulation was made with this subject (Figure 1b) and those data were considered as part of Experiment II. This is discussed later. As the data

of Figure 1a indicate, this subject gained weight (slightly) during baseline, lost weight during treatment conditions, and gained weight during reversal.

Although the data of this subject were selected as the most orderly to exemplify the procedures, it was representative to the extent that the data of the other subjects, similarly, suggested that the researcher's control of the treatment contingencies were responsible for all losses in weight. That is, most of the subjects gained weight or remained stable during baseline, lost weight during treatment conditions, and gained weight or remained stable during reversal.

A comparison of each subject's rate of losing or gaining weight during each of the first four conditions (*i.e.*, baseline, treatment, reversal, and treatment conditions) is presented in Table 1. These data were calculated for each specified condition (except baseline) by subtracting the final weight measurement of the preceding condition from the final weight measurement of the specified condition. The difference was then divided by the number of weeks that the specified condition was in effect. The baseline data were calculated by subtracting the first weight measurement from the final weight measurement of baseline. This difference was then divided by the two weeks considered as baseline. These calculations yielded an average estimate of the number of pounds lost or gained per week by each subject during each of the four conditions. Only the data from baseline and the first treatment condition are presented for Subjects 5 and 6. Subjects 5 and 6 each initially lost approximately 20 pounds during treatment. However, a continuation of scheduled consequences seemed to have no effect on decreasing their weight further. Therefore, both of these subjects were terminated from the program, by mutual agreement.

In all cases except one, the subjects either gained weight or remained stable during the baseline condition. The exception, Subject 3, lost weight during baseline. All of the subjects

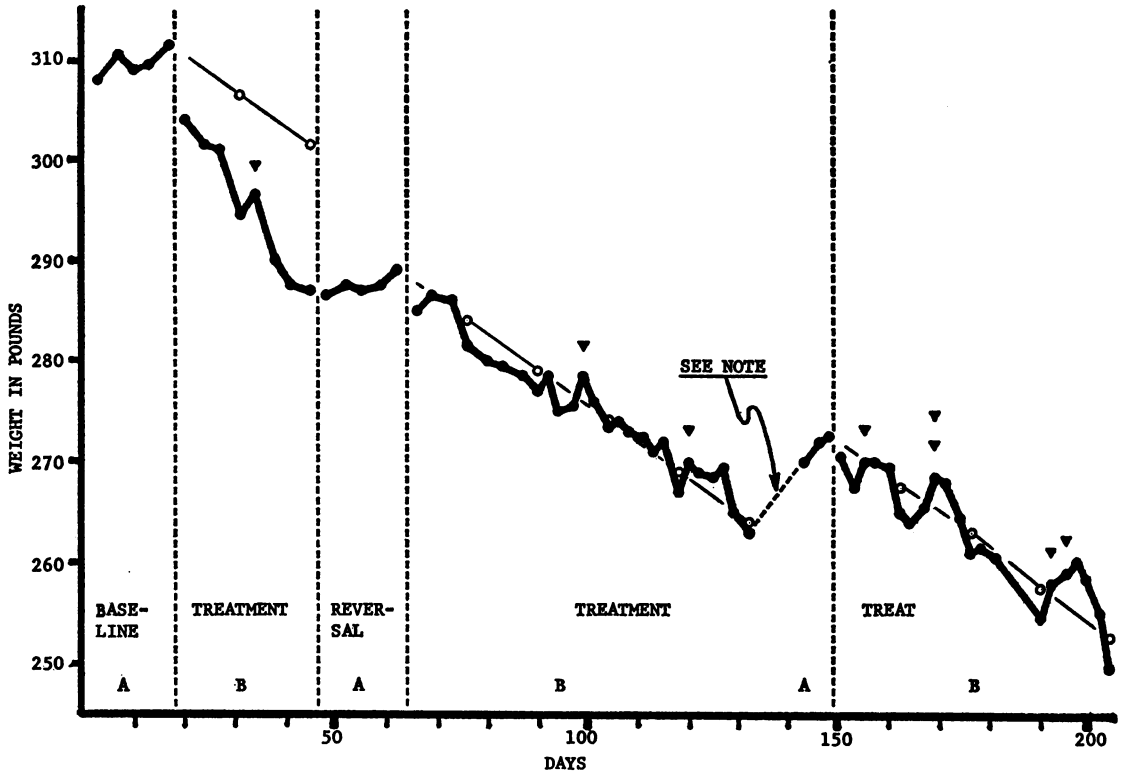


Fig. 1a. A record of the weight of Subject 1 during all conditions. The first four conditions (*i.e.*, Baseline, Treatment, Reversal, and Treatment) were considered as Experiment I. During the Baseline and Reversal conditions, the subject's weight was regularly measured; there were no scheduled consequences. During both Treatment conditions the contingencies of the contract, presumably both of reinforcing and of punishing consequences, were in effect. Each open circle (connected by the thin solid line) represents a two-week minimum weight loss requirement. Each of the solid dots (connected by the thick solid lines) represents the subject's weight on each of the days that he was measured. Each triangle indicates the point at which the subject was penalized by a loss of valuables, either for gaining weight or for not meeting a two-week minimum weight loss requirement. Experiment II begins with the third Treatment condition (continued in Figure 1b). NOTE: the subject was ordered by his physician to consume at least 2500 calories per day for 10 days, in preparation for medical tests.

gained weight during the reversal condition and lost weight during the treatment conditions. Subject 3 lost weight at a greater rate during each of the treatment conditions than during the baseline condition.

A summary assessment of the functions of each of the first four conditions of the program are presented in Figure 2. These data represent the mean weight change in pounds per week that were gained or lost during each of the four conditions. They were calculated by averaging the rates of each subject as listed in Table 1. The baseline and first treatment condition data of Subjects 7 and 8 (Experiment II subjects)

were included in these calculations because the baseline and first treatment condition procedures of these subjects were identical to those of Experiment I subjects. The reversal and second treatment condition data of Subjects 7 and 8 were not included, because the reversal condition of Experiment II differed from that of Experiment I. As Figure 2 shows graphically, the mean weight change during baseline and reversal conditions was +0.9 and +1.9 pounds per week, respectively. Figure 2 also shows the mean weight change during the two treatment conditions was -2.1 and -1.2 pounds per week, respectively.

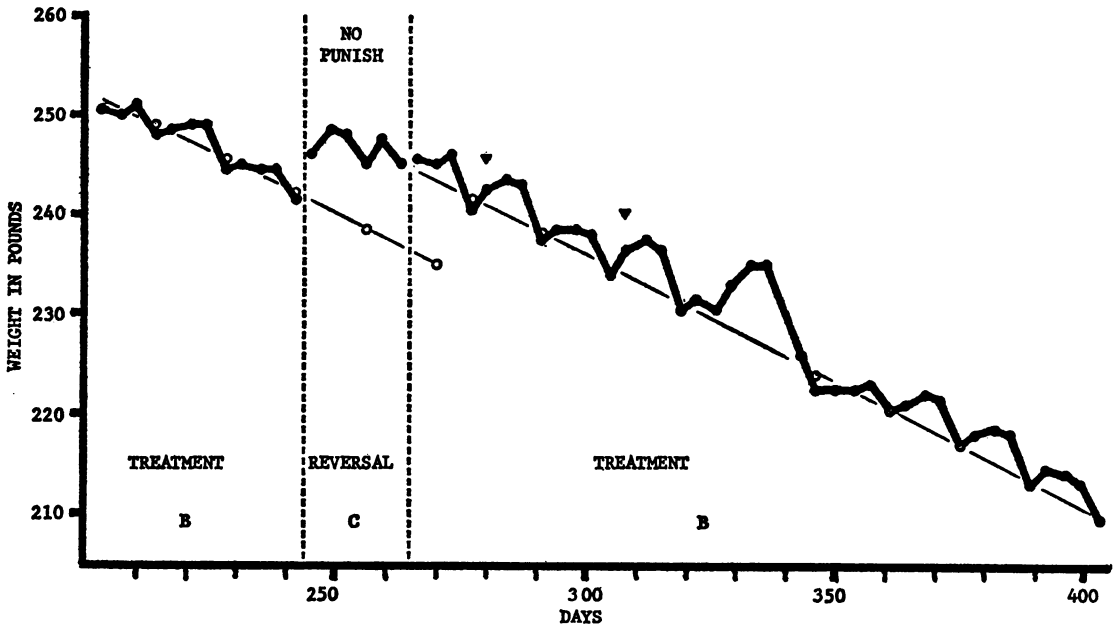


Fig. 1b. A record of the weight of Subject 1 (continued from Figure 1a). The last three conditions (*i.e.*, Treatment, No Punishment Reversal, and Treatment) were considered as Experiment II. The Treatment conditions of Experiment II were procedurally identical to those of Experiment I. The No Punishment Reversal condition was identical to the Treatment conditions with the following exception: the punishing consequences were removed; only the reinforcing consequences continued to remain in effect.

In summary, Experiment I investigated the applicability of contingency contracting with adult subjects, and assessed experimentally the effects of a complex of contingencies on weight reduction. A single-subject reversal design was used. Almost all of the subjects gained weight or remained stable during the baseline condition, lost weight during treatment conditions, and gained weight or remained stable during the reversal condition. The results suggest that items considered valuable by the subject and originally his property, can be used successfully to modify the subject's weight when these items are surrendered to the researcher and incorporated into

Table 1

The average number of pounds lost or gained per week by each subject during each condition of Experiment I (*i.e.*, Baseline, Treatment, Reversal, and Treatment), and Experiment II (*i.e.*, Treatment, No Punishment Reversal, and Treatment). \*Subjects 5 and 6 were terminated from the program before a Reversal and second Treatment condition.

EXPERIMENTAL CONDITION	EXPERIMENT I							EXPERIMENT II			
	S-1	S-2	S-3	S-4	S-5	S-6	$\bar{X}$	S-7	S-8	S-1	$\bar{X}$
BASELINE A	1.4	0.0	-1.0	0.0	1.0	3.2	0.9	1.5	1.2	---	---
TREATMENT B	-6.1	-1.7	-2.0	-1.6	-1.3	-1.1	-2.1	-1.5	-1.4	-2.2	-1.7
REVERSAL A-C	0.8	2.1	4.1	0.4	*	*	1.9	0.4	2.6	1.2	1.4
TREATMENT B	-2.6	-0.2	-0.5	-1.4	*	*	-1.2	-1.4	-1.5	-1.8	-1.6

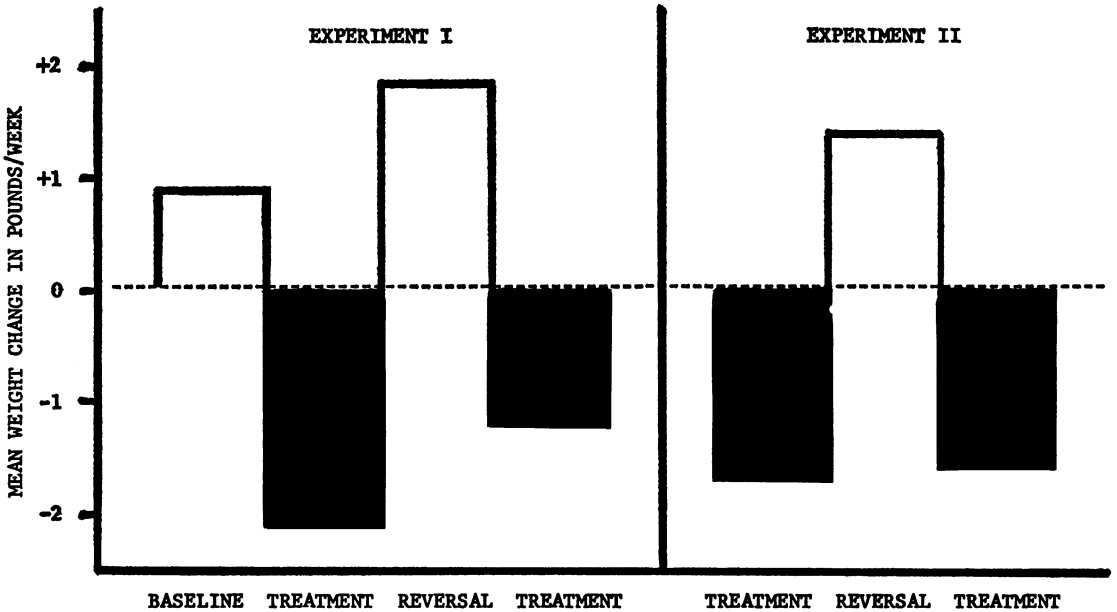


Fig. 2. Summary assessment of the functions of each condition of Experiment I and Experiment II for all subjects. These data represent the mean weight change in pounds per week gained (+) or lost (-) by all subjects during each of the conditions. They were calculated by taking the means of the average number of pounds lost or gained per week by each subject during each of the conditions of Experiments I and II.

a contractual system of prearranged contingencies. Both intra- and inter-subject replications support the generality of these findings. However, Experiment I did not analyze whether the reinforcing consequences, the punishing consequences, or both, were necessary components of the treatment procedure.

Experiment II was an attempt to ascertain whether the presumptive punishing consequences were, in fact, functional as a component of the treatment procedure.

## METHOD

### *Experiment II*

Subjects 1, 7, and 8 participated. The procedures were identical to those of Experiment I, with the following exception: during the reversal condition of Experiment II, the reinforcing components of the Immediate and the Two-Week Contingencies continued to remain in effect. The punishing components of the Immediate and the Two-Week Contingencies, however, were removed. In other words, during the

reversal condition of Experiment II, the researcher continued to deliver to the subject one valuable contingent upon each cumulative two-pound weight loss. However, if the subject gained weight, he did not lose any of his valuables as a punishing consequence. In addition, the subject continued to receive a bonus valuable contingent upon meeting each two-week minimum weight loss requirement. Nevertheless, no valuables were lost by the subject if he did not meet this requirement. At a time unknown in advance to the subject, the researcher notified the subject that the second treatment procedure was beginning. The weight of the subject and the date at the time of this notification were considered the final weight measurement and date of the reversal condition. During the second treatment condition, both the Immediate and the Two-Week Contingencies were calculated from the final weight measurement and date of the reversal condition.

It should be noted that Subject 1 was used in both Experiments I and II, and consequently was exposed to both types of reversals.



## RESULTS AND DISCUSSION

Only the treatment-reversal-treatment portions of the data were considered as Experiment II. The last reversal condition in which Subject 1 participated was procedurally identical to those of Subjects 7 and 8 (see Figures 1a and 1b). Therefore, the last treatment-reversal-treatment condition data of this subject were similarly included in the analysis of this experiment.

During the first and second treatment conditions, all of the subjects lost weight with reference to the final weight measurement of the preceding conditions (*i.e.*, baseline and reversal). During the reversal condition, all of the subjects gained weight with reference to the final weight measurement of the preceding condition.

A comparison of each subject's rate of losing or gaining weight during each of the three conditions (*i.e.*, treatment, reversal, treatment) is presented in Table 1. These data were calculated (in the same manner as for Experiment I) for each specified condition by subtracting the final weight measurement of the preceding condition from the final weight measurement of the specified condition. The difference was then divided by the number of weeks that the specified condition was in effect. These calculations yielded an average estimate of the number of pounds lost or gained per week by each subject during each of the three conditions. In all cases, the subjects lost weight during both treatment conditions and gained weight during the reversal condition.

A summary assessment of the functions of each condition are presented in Figure 2. These data represent the mean weight change in pounds per week gained or lost during each of the three conditions. They were calculated (in the same manner as for Experiment I) by averaging the rates of each subject (*i.e.*, Subjects 1, 7, and 8) as listed in Table 1. As Figure 2 shows graphically, the mean weight change during the reversal condition was +1.4 pounds per week. The mean weight change during each

treatment condition was -1.7 and -1.6 pounds per week, respectively. As can be seen in Figure 2, the functions of the reversals in Experiment I and in Experiment II were almost identical.

In summary, Experiment II attempted to ascertain whether the permanent loss of a subject's valuables contingent upon either specified weight gains or losing weight at a rate lower than an agreed-upon rate, was a punishing or aversive consequence. Subjects 1, 7, and 8 lost weight during the two treatment conditions and gained weight during the reversal condition. When the presumably punishing consequences were removed from the procedure (*i.e.*, during reversal), the subjects gained weight even though positive contingencies for losing weight remained in effect (Table 1). The data suggest that the permanent loss of the subject's valuables, when used as consequences are a necessary component of the treatment procedure.

## GENERAL DISCUSSION AND SUMMARY

The present research investigated the applicability of contingency contracting with adult subjects, and the effects of a complex of treatment contingencies on weight reduction.

The results suggest that properly designed contingency contracts may be an effective means to control some behavior problems of normal non-institutionalized adults. In this case, being overweight was treated as the behavior problem.

This study demonstrated that items considered valuable by the subject and originally his property, could be used successfully to modify the subject's weight when used as reinforcing and as punishing consequences. Furthermore, a systematic analysis of the contingencies indicated that punishing consequences were a necessary component of the treatment procedure for the three subjects of Experiment II.

The contingency contract used differed from those previously discussed by other investigators (Homme *et al.*, 1969; Cantrell *et al.*, 1969; Tharp and Wetzel, 1970). Those contracts were

essentially an explicit statement of contingencies, usually agreed upon by two or more people. The contingency contract used in this study was also an explicit statement of contingencies, but it incorporated a number of additional features considered salient to its effectiveness.

First, the contract required each subject to surrender a large number of his valuables to the researcher. The subject then could earn back portions of those valuables contingent upon meeting the specified behavioral requirements (*i.e.*, weight losses), or lose valuables if those requirements were not met.

Second, the subject signed the contract in front of witnesses, thus further legalizing the researcher's authority to control the delivery of those valuables as consequences. The researcher also signed the contract, thus obligating him to abide by the terms of the contract.

Third, the contract required the subject to be available for behavioral measurement and the delivery of consequences at specified intervals.

Fourth, the contract included a clause stipulating that the researcher could, at his discretion, experimentally manipulate the treatment variables. Thus, the contingencies of the contract could be continued or temporarily discontinued in order to assess experimentally the casual variables.

Last, the contract was designed as a "behavior trap". A behavior trap, as discussed by Baer and Wolf (1970, p. 321) and Baer, Rowbury, and Goetz (1971), is basically a situation in which, "only a relatively simple response is necessary to enter the trap, yet once entered, the trap cannot be resisted in creating general behavioral change".

In this study, the subject's surrendering of his valuables to the researcher and signing the contract can be conceptualized as the "relatively simple response" required of the subject to enter the behavior trap. Once these responses were made, the subject was in the program (*i.e.*, in the behavior trap), and was required to lose weight steadily (at the agreed-upon rate) or be penalized by the permanent loss of portions of

his valuables. Furthermore, the subject could terminate the program, before reaching his terminal weight, only if he forfeited all of his remaining valuables. Thus, the contingencies of this contract presumably acted as a behavior trap by facilitating the subject both to lose weight steadily and to remain in the program until his terminal weight was reached. Still, it should be emphasized that the behavior trap principle was functional only to the extent that the subject did, in fact, surrender items of value.

Although each subject verbally reported which items he considered valuable before surrendering them to the researcher, the definition of valuable in this procedure was still in terms of the effects those items had on the subject's weight. In other words, the items surrendered to the researcher by some of the subjects, could have been valuable (*i.e.*, reinforcing) with respect to affecting some behaviors, but not necessarily as effective with respect to losing weight. This may account, in part, for the variability in the effectiveness of this procedure.

Variability in the effectiveness of this type of procedure may have other sources as well. For example, as a subject steadily loses weight, presumably because of dieting, the probability of consuming larger quantities of food may increase. This increase in probability can then compete with the aversive effects of losing valuables. This type of effect may be facilitated further because the reinforcing effects of eating are immediate while the aversive effects of losing valuables are minimized by the delay in time imposed by this type of procedure.

Before concluding, it should be pointed out that this procedure had some problems, especially as it related to weight control. Unsolicited anecdotal reports from some of the subjects indicated that they had used extreme measures at various times to lose weight rapidly and temporarily in order to avoid aversive consequences. These measures, reportedly, included taking laxatives, diuretics, and doing vigorous exercises just before being weighed. This problem may have occurred because the contract

specified that the treatment contingencies be delivered contingent upon specified weight changes rather than the behaviors that can produce those changes. Weight, as a measure, is the result of various other behaviors. The contract neither specified, controlled, nor prescribed the manner in which the subject could arrive at changes in his weight. Therefore, any one of a number of behaviors could have resulted in a reduction of weight. These included appropriate dieting, an increase in exercise, or both, as well as extreme measures such as taking laxatives or diuretics which could avoid aversive consequences, at least on a temporary basis.

Consequently, contingency contracting and other techniques should be used with caution to the extent that these techniques place effective contingencies on the outcomes of various behaviors. It is difficult for a researcher or therapist to anticipate all of the behaviors that can produce a specified outcome or result. And some of the behaviors that can produce such an outcome may be socially undesirable or even dangerous in some cases.

In summary, properly designed contingency contracts may be an effective technique to facilitate remediation of some behavior problems of non-institutionalized adults. The probability of this is increased to the extent that such techniques can facilitate a therapist both in gaining systematic control of effective consequences and in maintaining reliable measurement of the behavior to be changed. The present study met these two criteria and thereby demonstrated the application of contingency contracting with adult subjects. The dependent variable of this study was both a convenient and reliably measurable "behavior". Other behavior problems do not lend themselves as readily to reliable measurement. Smoking, drinking, and stealing, are examples of behaviors that are much more difficult to measure reliably. Never-

theless, as better methods of surveillance and monitoring of these types of behaviors develop, so may an increase in the use of contingency contracting with adult subjects.

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