THE USE OF SENSORY DEPRIVATION IN A
PROGRAMME OF WEIGHT CONTROL

by

RODERICK ALLEN BORRIE
B.Sc., Denison University, 1969
M.A., Temple University, 1973

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Department of Psychology

The University of British Columbia
2075 Wesbrook Place
Vancouver, Canada
V6T 1W5

Date 21 March 1928
ABSTRACT

Sensory deprivation has been used in a number of clinical contexts either as a form of therapy by itself or in conjunction with other therapeutic techniques. The characteristics of increasing persuasibility and receptivity to therapeutic input make sensory deprivation an attractive tool for many varieties of behaviour change. In past research sensory deprivation has been used in the treatment of poor self image, autism, phobias, and smoking. This study was designed to extend previous research in which sensory deprivation was used to successfully moderate or eliminate health endangering behavior. In the research on smoking the technique was used in conjunction with appropriate messages to help psychologically addicted smokers to stop smoking (Suedfeld, 1973). The present project applied the sensory deprivation technique to the problem of obesity caused by overeating.

The design was a 2 x 2 factorial with the major variables being (1) sensory deprivation (SD) versus non-confinement (NC), and (2) therapeutic messages (M) versus no messages (NM). Subjects were 39 female volunteers between the ages of 20 and 56 who responded to announcements of an experimental weight loss programme. The subjects were assigned to one of the four experimental groups which were equated for weight, age, and marital status. Sensory deprivation consisted of lying in a dark, quiet chamber for 24 hours; the messages consisted of two sets of communications concerning weight loss. The first set of messages was concerned with body orientation, relaxation, and controlling urges; the second set dealt with specific behavioural self-control techniques. The group which received both sensory deprivation and messages heard the messages
during their stay in sensory deprivation. Following the experimental treatment, all subjects were given a standard diet manual and standardized instructions in its use. Subjects were seen periodically over the following six months.

The weight loss data at six months show a significant interaction between sensory deprivation and message. The combined treatment (SDM mean = 5.87 Kg) was superior to the other three groups (SDNM mean = 1.08 Kg, NCM mean = .67 Kg, NCNM mean = 2.36 Kg). There were no significant changes in skinfold measurements. The weight loss data at two months showed a significant message effect with those who heard the messages losing 3.14 Kg versus 1.23 Kg for those who did not. Weight loss over the final four months showed a condition effect with those who had sensory deprivation losing 1.58 Kg, while the nonconfined subjects gained .98 Kg. These results are discussed in terms of the motivating characteristics of sensory deprivation.

When various demographic and behavioural data were regressed on weight change, three significant predictors emerged. The facts were that the more difficulty the subject anticipated, the more weight she lost; the stronger her motive to please her spouse, the less weight she lost; and the more she was concerned with eating slowly, the more weight she lost. The results are discussed in terms of their implications for future treatments of obesity. The present study is also discussed in comparison with other sensory deprivation studies and other obesity treatment studies.
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For many years researchers have been interested in the psychological effects of reduced sensory stimulation. Over short periods of a few hours to several days, this procedure is most commonly known as sensory deprivation. Research on human adults exposed to temporary conditions of sensory deprivation has investigated its effect on such heterogeneous variables as biochemistry, persuasibility, EEG activity, and ego strength (see Zubek, 1969). This diversity of research pursuits is promoted by the nature of sensory deprivation, which, rather than being a research paradigm with the mandates of specific theories and concepts, is a technique or method whose applicability is limited only by the researcher's imagination.

The concern of this research report is the application of sensory deprivation in a therapeutic context. Specifically this report is an investigation of the use of sensory deprivation with therapeutic messages in a programme of weight loss. Sensory deprivation in this programme was used as a therapeutic facilitator in conjunction with more conventional techniques of behavioral self control for weight loss (Stuart and Davis, 1972). While sensory deprivation was the major experimental concern of this study, in terms of time it actually was a small portion of the programme; in fact, the length of time that each subject followed the programme was six months whereas the single session in sensory deprivation was only 24 hours.

The plan of this chapter is to begin with a review of the therapeutic uses of sensory deprivation and discuss the characteristics of the sensory deprivation experience which have provided the rationale for the different
research approaches. Following this, a brief background in the treatment
of obesity will be presented with a summary of the relevant theories of
overweight and a discussion of treatment problems. Next, the rationale
for applying sensory deprivation to the problem of weight loss will be
examined with a final comment on the problems inherent in obesity research
and the design of this study.

The Therapeutic Use of Sensory Deprivation

While there is a long-standing interest in the possible uses of sen­sory deprivation as a form of or aid to therapy, the number of empirical
investigations is quite small, especially in comparison to the enormous
body of sensory deprivation research in general. A type of sensory depriv­ation is reported to have been used as early as ancient Greece (Kouretas,
1967); however systematic research into its clinical use began only in the
mid-1950's shortly after the first sensory deprivation research of any
kind began.

Some of the initial studies looked at the beneficial effects of mere­ly spending a period of time in conditions of sensory deprivation (Azima
and Cramer-Azima, 1956; Harris, 1959; Cohen, Rosenbaum, Dobie and Gottlieb,
1959; Gibby, Adams, and Carrera, 1960; Cleveland Reitman and Bentinck,
1963; Reitman and Cleveland, 1964; Cooper, Adams, and Cohen, 1965). Other
studies have combined sensory deprivation with therapeutic communications
designed to treat a specific problem (Gibby and Adams, 1961; Robertson,
1965; Adams, Robertson, and Cooper, 1966; Suedfeld, Landon, Pargament and
Epstein, 1972; Suedfeld and Ikard, 1974; Barnes, 1976; Kammerman,
1977) or with some other therapy aids such as visual presentations.
In addition, some have used sensory deprivation to enhance the effectiveness of another separate therapy method (Schechter, Shurley, Sexauer and Tousseng, 1969; Maier, 1970; Martin, Roush, and Nicholson, 1967; Suedfeld and Best, 1977).

While we might categorize the clinical uses of sensory deprivation according to whether it is used alone, with therapeutic communications, or with other therapy methods, there is a great deal of overlap between studies in the use of these methods. For example, most of the studies that used therapeutic communications also included a control group that experienced sensory deprivation without the communications. In addition, communications have been included with sensory deprivation in studies using a combination of therapy techniques (Suedfeld and Best, 1977). Therefore, it will be more useful to discuss this body of research in relation to the effects of the sensory deprivation experience that they were attempting to utilize.

Some of the initial clinical studies that used sensory deprivation by itself attempted to examine the reactions of psychiatric patients to reduced sensory input. An early study (Azima and Cramer-Azima, 1956) placed 14 patients into four days of sensory deprivation and reported such beneficial effects as increased responsiveness to the therapist, enhanced self-assertiveness, and increased desire to socialize. Harris (1959) reported no behavioral improvements in 12 schizophrenics following a short session wearing translucent goggles and listening to white noise but they did seem more tolerant of the situation than normals. Cohen et al. (1959) compared the reactions of six psychiatric patients and four normal subjects who
experienced one hour with translucent goggles and white noise. Again, there were no reports of behavioral improvement.

Gibbey et al. (1960) reported symptom improvements in 30 psychiatric patients which lasted up to a week after a six-hour session lying in a quiet room with eyes covered and ears plugged. These patients also exhibited an increased desire for social contact and an increased awareness of the internal causes of personal problems. Another report from the same study (Cooper, Adams and Gibby, 1962) added that patients showed a significant increase in ego strength on the Rorschach. Although this study did not include a nonconfined control group, a study with such a group (Cleveland, Reitman and Bentinck, 1963) found no difference between the sensory deprivation group and nonconfined group on pathology ratings. They concluded that sensory deprivation offers "little promise" as a treatment of behavior disorders but in another paper from the same study (Reitman and Cleveland, 1964) they do report improvements in body image and increased tactile sensitivity.

These divergent results are most probably explained by differences in sensory deprivation techniques: the Gibbey et al. (1960) study used a reduction of absolute stimulation level by covering subjects' eyes with cotton and plugging their ears, whereas the Cleveland et al. (1963) experiment used a reduction of stimulus patterning without reducing stimulus intensity. Up to this point the term sensory deprivation has been used to describe both methods; however there is a distinction to be made between the two. The reduction of absolute level of stimulation is referred to as sensory deprivation while the reduction of stimulus patterning without reducing intensity is known as perceptual deprivation (Rossi, 1969). Unfortunately,
a careful investigation of the differential therapeutic effects of the
two procedures has never been carried out.

In a recent review of the clinical relevance of sensory deprivation,
Suedfeld (1975a) suggests that sensory deprivation "drastically magnifies
many factors which should maximize the patient's responsiveness to therapy:
sensitivity to one's own thoughts, memories, and emotions; dependence upon
the therapist, the desire for and reward value of social interaction; re-
ceptiveness to communications; a need for cognitive structure; increased
flow of primary process material. It also facilitates relaxation, mini-
mizes distraction, and eliminates cues that in normal environments elicit
undesired behavior" (p. 98). Some of these factors, such as the minimiza-
tion of distraction and the increase in receptiveness to communication
have led several researchers to study the possibility of enhancing the
effectiveness of therapeutic messages. Actually, the idea that sensory
depression might increase the effectiveness of persuasive or educational
materials was part of the original impetus behind sensory deprivation re-
search (Scott et al., 1959). If sensory deprivation would increase the
attentiveness of the individual, it would increase the impact of the ma-
terial presented. Part of this increased impact was postulated to result
from a heightened need for stimulation caused by the severe reduction in
stimulus level.

Notwithstanding some disagreement concerning the precise definition
of this need for stimulus or information, there is general agreement that
sensory deprivation does lead to stimulus-seeking behavior. Since the
evidence in support of this has been thoroughly reviewed by both Schultz
(1965) and Jones (1969), a brief sampling of this evidence will suffice
here. The doctoral dissertation of Bexton (Bexton, Heron, and Scott, 1954) provided the first indication that sensory deprivation created an "eagerness for stimulation". Bexton's subjects, when allowed to listen to rather boring material as much as they wished, chose to listen far more frequently in the latter half of their stay in sensory deprivation. Comparing subjects in sensory deprivation with control subjects, Scott, Bexton, Heron, and Doane (1959) found that the former chose to listen to recorded talks more often than the latter.

In a seven-day long session, subjects confined in sensory deprivation chose to listen to rather dull stock market reports significantly more often than did nonsensorally deprived subjects (Smith, Myers and Johnson, 1967). In addition, as the duration of the session increased so did the difference between groups; those in sensory deprivation chose to listen increasingly more the longer they stayed. When subjects were asked why they chose to listen, the most frequent response was a desire to "hear a voice or other meaningful sound" (Smith, et al., 1967). These researchers suggested that their findings support the concept of a drive for sensory variation which increases with length of deprivation.

In general, the findings from other research in this area also indicate that severely reduced external stimulation results in an increased desire for stimulation with a preference for high information (see Jones, 1969), and that this desire will vary among individuals depending on recent stimulation levels (Zuckerman, 1969; Haggard, Ås, and Borgen, 1970). The typical experience of the subject who is placed in sensory deprivation is initially pleasant or at least an interesting respite from the usual stimulus confusion in normal conditions. When the initial relaxing novelty
wears off, the subject begins to wish that something would happen. The nature of the stimulation comes to matter less so that material which normally might be avoided becomes sought after or at least more acceptable. As Scott et al. (1959) put it, "the subject becomes so bored that any form of stimulation is better than nothing at all" (p. 208).

This stimulus need may contribute to the patient's receptiveness to therapeutic messages that are heard in conditions of sensory deprivation. A number of studies have obtained beneficial effects using this combination for a variety of problems, one of the earliest being a study by Gibby and Adams (1961). They combined four hours of sensory deprivation with a 14 minute tape recording designed to improve the patient's self concept. This study was a 2 x 2 factor design which included sensory deprivation with a message, sensory deprivation only, message only, and test-retest control groups. Measuring changes in patients' self-evaluations, Gibby and Adams (1961) found that combined sensory deprivation and tape produced a far greater improvement in self evaluations than any of the control conditions. Combining three hours of sensory deprivation with individually prepared tapes oriented to the unique problems of each patient, Adams, Robertson and Cooper (1966) found the combination superior to sensory deprivation alone or no treatment in producing behavioral improvements. The improvements reported included increases in dominance, ego strength, self-acceptance, and sense of personal adequacy. A study with less positive results (Robertson, 1965) reported that sensory deprivation with a taped message was no better in increasing patient self-acceptance than either sensory deprivation or the message by itself. A reason for the lack of difference between conditions in this study may have been the delay of a week be-
tween treatment and post-treatment testing.

In a recent study that involved lying partially submerged in a warm saline solution, Kammerman (1977) found that the combination of sensory deprivation and a standardized tape recording produced changes in MMPI scores that did not occur in sensory deprivation only or no treatment groups. Kammerman feels that this method of sensory deprivation "provides for maximum contact with the unconscious." (Early, 1975). While the sensory deprivation only group evidenced increased ego strength and defensiveness, the group that heard the message in sensory deprivation demonstrated significantly increased insight, decreased impulsivity, and more emotional stability in their MMPI profiles.

A group of studies of this type that emerged more from work on increased suggestibility induced by sensory deprivation (Suedfeld, 1965; Suedfeld and Vernon, 1966) than from interest in its clinical uses are those by Suedfeld and his colleagues. Based on the sizeable body of evidence that sensory deprivation increases susceptibility to persuasion attempts (for review see Suedfeld, 1969), an experiment was designed aimed at going beyond merely changing subjective reports of attitude to change actual behavior patterns on an issue of personal importance, inducing the individual to stop smoking (Suedfeld, Landon, Pargament, and Epstein, 1972). Sensory deprivation had been used previously in an attempt to change smoking behavior in a study by Patrick (1965). However his treatment of one hour of perceptual deprivation followed by an anti-smoking film was not significantly better than the film alone in reducing smoking behavior over a three hour follow-up period. For the Suedfeld et al. (1972) study subjects were recruited without reference to any attempt to quitting smoking and relevant
individual smoking data were obtained from an initial recruiting interview; all subjects were heavy smokers. The study was a factorial design investigating sensory deprivation versus no sensory deprivation and a brief antismoking message vs. no message. Sensory deprivation consisted of lying in a completely dark, sound-attenuated chamber for a period of 24 hours, and the antismoking message discussed the health hazards of smoking and lasted less than three minutes. Three months following the session control subjects with neither sensory deprivation nor the message under normal conditions were smoking slightly less. Subjects who underwent sensory deprivation, either with or without the message, had decreased their rate of smoking by 38%. This is particularly fascinating since subjects in the sensory deprivation only group had received no mention of cigarettes.

Pursuing these intriguing results, Suedfeld and Ikard (1974) tested the hypothesis that the lack of effect of the anti-smoking message was due to its brevity. They therefore expanded the message to a dozen antismoking communications and spaced them at different intervals throughout sensory deprivation. The additional factor of initial motivation was used by recruiting subjects specifically for an experimental method to quit smoking. The 36 subjects, all heavy smokers classified as "psychologically addicted" on the Tomkins-Ikard Smoking Questionnaire, were assigned to one of four groups set up as in the previous study (Suedfeld et al., 1972). At the three month follow-up, the sensory deprivation—message group had reduced their smoking rate by 70% and the sensory deprivation only group was smoking about 50% less. The message only group had cut down their smoking about 40% while the no treatment controls were basically unchanged, smoking
at their original rate. After a full year, the combined sensory deprivation groups were smoking 48% less with a much smaller difference between groups; the combined non-sensory deprivation subjects were smoking only 16% less than their original rate. Follow-up after two years showed these results to be quite stable. Of the sensory deprivation subjects, 25% were completely abstinent and many others were smoking considerably below their pretreatment level (Suedfeld, 1976).

These studies do demonstrate the powerful influence of sensory deprivation in changing behavior. However, they do not necessarily support the hypothesis that sensory deprivation increases suggestibility to outside influence. In one study (Suedfeld et al., 1972) both sensory deprivation groups evidenced equal amounts of smoking reduction regardless of whether the message was heard. In the other study (Suedfeld and Ikard, 1974) there was an initial difference in smoking reduction between the sensory deprivation groups with and without anti-smoking messages, but the difference at three months was small and lessened considerably over the course of the next year. Sensory deprivation alone was sufficient in both studies to reduce smoking behavior significantly. This result is not interpretable solely in terms of information need, enhanced information value, and increased suggestibility.

A partial explanation may be found in some of the earlier studies on the effects of mere exposure to sensory deprivation. Even without messages, sensory deprivation was reported to make patients more self-understanding, self-accepting, and also more aware that their own problems were the result of inner conflict (Gibby et al., 1960). By removing distracting external stimuli, sensory deprivation forces one to focus attention on
internal stimuli, such as memories, desires and fantasies. At the time of the smoking studies by Suedfeld and his colleagues, the public was being inundated with antismoking propaganda which may have created a general low level desire in many smokers to quit. When this is combined with the personal experience of spending 24 hours without cigarettes and in most cases not missing them (Suedfeld & Ikard, 1974) a very therapeutic experience may result.

Recently the effectiveness of the sensory deprivation technique (Suedfeld and Ikard, 1974) has been compared to that of the Five Day Plan to quit smoking (McFarland and Folkenbery, 1964) in a comparative study by Barnes (1976). Except for slightly modified sensory deprivation facilities, the Sensory Deprivation condition was identical to the 24 hour procedure of Suedfeld & Ikard (1975). Subjects in the Five Day Plan condition participated in five 2-1/2 hour lecture sessions on five consecutive evenings. Six months following treatment 53% of the Five Day Plan group reported abstinence as compared to 58% of the Sensory Deprivation group. Although this difference between treatments is not statistically significant, the success rate of both smoking treatment programmes is quite impressive.

In several other studies Suedfeld and his colleagues (Suedfeld and Smith, 1973; Suedfeld and Buchanan, 1974; Suedfeld and Hare, 1977) attempted to utilize a combination of several effects of sensory deprivation to alleviate the irrational fear felt by snake phobics. It was reasoned that if phobics were given an opportunity after a period of sensory deprivation to look at slides of the object of their fear, in this case snakes, the increased stimulus need would cause them to request to see the slides and
have a more positive evaluation of them. In addition the slides would be viewed in a state of relaxation induced by sensory deprivation which would create a form of desensitization to the slides. Using self report, behavioral, and physiological measures of fear the most recent study (Suedfeld and Hare, 1977) compared a group of phobics who chose to view snake slides after five hours of sensory deprivation, with two control groups of similar phobics. On the written and behavioral approach tests, the experimental subjects showed significantly less fear. However, this was not evidenced on the physiological tests. Not only do these studies support the use of sensory deprivation in the reduction of phobias but they also represent an ingenious attempt to utilize some of the unique therapeutic possibilities of sensory deprivation.

It is surprising that a technique with such clinical potential has not been incorporated into more areas of therapy as an adjunct to other techniques. Unfortunately, the use of sensory deprivation as a facilitator of other therapeutic techniques has not been examined very fully. As Suedfeld (1975a) suggests, the poor exchange of research findings between specialized areas may be the reason behind this lack of research. Another possibility for its neglect is the negative aura which has typically surrounded sensory deprivation in the popular literature. However, it appears that there is a renewal of interest in this area evidenced in the scientific (Suedfeld, 1975a, b; 1976; Kammerman, 1977) and popular presses (Smith, 1976; Early, 1975). Part of this interest is due to the development of a more positive attitude toward sensory deprivation (Suedfeld, 1975a, b) and to the dispelling of some of the negative ideas which have been associated with the technique (e.g., Heron, 1957).
One of the earlier uses of sensory deprivation as a therapeutic facilitator was in the treatment of esophoria, a disorder in which the eyes tend to deviate inward. Martin, Roush, and Nicholson (1967) used a form of visual training following a brief exposure to sensory deprivation. Subjects who received this treatment showed significantly more improvement than the control groups who had other combinations of treatment. Another use has been the incorporation of a reduced stimulus environment into the treatment of autistic children (Schéchter, Shirley, Sexauer, and Toussing, 1969; Maier, 1970). In these studies the patient lived in a low stimulus level environment and was visited daily by a therapist. It was felt that living in a room with a minimum amount of light, constant low sound level, a minimum of inanimate objects, and minimum personal contact exclusive of the therapist would make the autistic child less defensive and much more receptive to human contact. One child, treated with this technique for 76 days, showed remarkable improvement in his condition (Maier, 1970).

In an extension of the earlier research on smoking (Suedfeld, 1973), Suedfeld and Best (1977) have combined the techniques of self-monitoring and satiation smoking with sensory deprivation and antismoking messages. This combination has not only had a remarkable success rate but has also produced some interesting side effects, such as initiating a weight loss programme and being better able to cope with very stressful situations. The advantages of the combination of techniques are several. Monitoring of smoking behavior and satiation smoking bring the patient to the sensory deprivation session with both an increased understanding of his own smoking behavior and a very negative feeling about smoking more. After a day
of satiation smoking the desire to smoke has been temporarily reduced
to almost nothing. The sensory deprivation provides not only a 24 hour
time out from smoking but also a chance to engage in some introspection
particularly regarding smoking and one's desire to quit. The antismoking
messages serve to direct the patient's thoughts to this problem and to
provide useful information about the reasons for and problems of quitting
smoking. In addition to bolstering the patient's motivation about quitting,
the sensory deprivation session also becomes a distinct starting point for the individual. The 24 hours of sensory deprivation is analogous to a rite of passage after which the person emerges into his new role as nonsmoker.

After an extremely auspicious pilot study using this technique
(Suedfeld and Best, 1977) a larger scale investigation currently in progress is producing even more promising results (Suedfeld and Best, in press). Using 15 subjects per condition this study is a comparison of the sensory deprivation smoking treatment, satiation smoking, and a combination of the two techniques. At the time of this writing, follow-up at 6 months shows 73% abstinence for the group with combined sensory deprivation and satiation treatments. This is far superior to either technique separately: 25% abstinence for satiation only and 27% for sensory deprivation. Preliminary data from a 12 month follow-up of this study show the combined sensory deprivation and satiation condition to be holding at 75% abstinence. The effectiveness of these two treatments appears to be additive when the techniques are used together.

It is the success of this research which led to the present study.
It was reasoned that if sensory deprivation can contribute to the success-
ful treatment of smoking it might also enhance the effectiveness of treatment of another difficult personal problem—obesity.

**Treatment of the Overweight**

The situation facing the overweight individual seeking to lose weight is a complex and confusing one. Having made the initial decision to lose weight, the choice of a suitable technique must be made from an enormous supply of available methods. The simple decision to go on a diet to lose weight is complicated by the extreme overabundance of special diets each making special claims to weight reduction; a recent guide lists over 60 different available weight loss diets (Berland, 1974). If one chooses to put the burden of decision on his physician the number of alternatives multiplies. Even going the route of the diet pill is not simple. A recent review of medical treatments (Samuel and Burland, 1974) describes ten different amphetamines and numerous other varieties of drugs used in weight reduction. There also exist a number of more extreme and more questionable alternatives, such as the use of levodopa to induce vomiting, stereotactic electrocoagulation of the lateral hypothalamic area, and the increase of caloric output by means of cholestyramine. While none of these medical techniques has proven to be effective in producing long-lasting results, the more drastic intestinal bypass has become a viable alternative notwithstanding the considerable risk involved (Quaade, 1974).

In spite of this tremendous diversity of techniques, the prognosis for successful weight loss and maintenance of that loss in the treatment of obesity has traditionally been extremely poor (Stunkard and McLaren-
Hume, 1959). Stunkard (1974, p. 196) recently summarized the situation prior to the emergence of behavioural techniques with five propositions:

1. Most obese people do not enter treatment for obesity.
2. Of those who do enter treatment, most will not remain....
3. Of those who remain, most will not lose much weight....
4. Of those who lose weight, most will regain it....
5. Many will pay a high price for trying.

Since the introduction of behaviour modification, reports of successful treatment for overweight individuals have significantly increased (Stunkard, 1974).

The promising success of behavioural techniques for weight loss has created a sizeable amassment of research literature, and fortunately, the last few years have seen a number of excellent reviews of the area (Stuart, 1973; Abramson, 1973; Hall and Hall, 1974; Stunkard, 1974; Leon, 1976). In addition most recent collections of readings in the field of behaviour modification contain at least a few papers on the treatment of obesity (Patterson et al., 1974; Yates, 1975; Leitenberg, 1975). As one researcher in the area has put it, the body of literature on the treatment of obesity has become obese itself (Richard B. Stuart, personal communication). For this reason the review presented here will be somewhat selective, extracting the representative highlights.

The initial successful use of behavioral self-control methods in the treatment of obesity was a study by Ferster, Nurnberger and Levitt (1962) who reported a weight loss of 15 pounds in 15 weeks of treatment. They reasoned that lengthening the chain of responses required of the individual before engaging in eating, the "desire to eat would be weakened."
The first long-term success in the field is a study by Stuart (1967) which Stunkard (1974) refers to as a "landmark in the treatment of obesity". Stuart's treatment was a 12-week comprehensive self-control package with follow-up at one year. His eight subjects lost from 26 to 47 pounds with an average loss of 38 pounds over the 12 months. Stuart (1971) replicated these results with an equally successful study that included a delayed treatment control group, which did not lose weight over the treatment period. These studies provided the basis for Stuart's later behavioral self-control programme (Stuart & Davis, 1972). This programme contains specific behavioral recommendations designed to help the individual establish control over food intake and energy expenditure.

In addition to concentrating on the eating response itself, as in the Ferster et al. (1962) study, the Stuart (1971) plan also focused on controlling the antecedents and consequences of eating. An example of controlling the antecedents of eating is the restriction of the setting in which eating is permitted. The individual is allowed to eat only in one particular room, in one seat at the table, and using a specific placemat. An example of a step for controlling the consequences of eating is the maintenance of daily records of calories consumed and weight change. This technique was also extended to the control of energy consumption by having the individual keep a daily record of calories expended on exercise. The entire programme includes 18 such behavioral steps which can be individually tailored to achieve control of eating and exercise.

Since the initial successful study of Stuart (1967), a number of other studies have shown behavior modification to produce more weight loss than a no treatment control condition (Harris, 1969); a social pressure
technique and a non-specific therapy (Wollersheim, 1970); will power (Jeffrey and Christensen, 1972); and more traditional group therapy (Penick, Filion, Fox and Stunkard, 1971). These studies used treatment periods ranging from 9 to 12 weeks; the standard procedure being a visit with the therapist at least once a week. Hagen (1974) suggested that this frequent contact with the therapist was unnecessary and that the actual therapeutic content of the behavioral techniques was powerful enough. He tested the idea that the written presentation of the behavioral steps in a manual form could be as effective without visits with a therapist, by comparing three treatment conditions—contact only, manual only, and manual plus contact—with a no treatment control group. After a 10-week treatment period and four-week followup all three treatment groups had significantly more weight loss than the no treatment control group and there were no significant differences among treatment groups. The manual only technique or "bibliotherapy" had proven as effective as treatments with therapist contact.

Although Hagen's bibliotherapy did not involve actual visits with the therapist over the course of treatment, it did include weekly correspondence and homework assignments which constituted a form of therapist contact. In a thesis by Fernan (1973, cited in Stunkard, 1974) Hagen's study was replicated with an additional group without even these forms of therapist contact. This group received the manual but had no further contact of any kind except for post-treatment and followup weigh-ins. While the Hagen style bibliotherapy group did as well as the same group in Hagen's (1974) study, the manual/no contact group lost less weight than the control group with no treatment. The minimal written contact appears to be a necessary
factor in the success of the bibliotherapy technique. There seems to be some aspect of therapist contact, perhaps motivational, that is needed in addition to the content of the behavioural self-control programme.

Since the initial success (Stuart, 1967) and subsequent affirmation of the effectiveness of behavioural techniques in the treatment of overeating (Harris, 1969; Wollershein, 1970; Stuart, 1971; Penick, Filion, Fox and Stunkard, 1971; Abrahms and Allen, 1974), researchers have turned their attention to specific elements of the programme content other than therapist contact. The keeping of records on one's own calorie intake and weight, or self-monitoring, has proven to be an important part of the approach (Romanczyk, 1974). Its most effective when self-monitoring occurs prior to rather than following actual food intake (Bellack, Rozensky, and Schwartz, 1974). Mahoney and his associates (Mahoney, Moura, and Wade, 1973; Mahoney, 1974) have investigated the effects of self-reward in conjunction with a behavioural weight loss programme. Self-reward proved to be more effective in producing weight loss than self-monitoring or self-punishment (Mahoney et al., 1973) and it was better when self-reward was for habit change rather than weight loss (Mahoney, 1974).

Other forms of behaviour modification that have been used in the treatment of the overweight are aversive conditioning (Kennedy and Foreyt, 1968; Foreyt and Kennedy, 1971), covert sensitization (Cautela, 1967; Meynen, 1970; Janda and Rimm, 1972), and experimenter-controlled reinforcement (Ayllon, 1963; Harmatz and Lapuc, 1968; Hall, 1972). These techniques have been found to be effective at least during the course of treatment but have not produced as consistent long-term maintenance of weight loss as
situation management techniques where the individual controls his own eating setting and behavior (Abramson, 1973; Leon, 1976). In addition to being less effective in the long run, each of these other techniques has more specific problems. Both aversive conditioning, which is the pairing of desired food cues with noxious stimuli, and covert sensitization, a technique where the individual is negatively sensitized to some target food, have the disadvantage of being directed toward a few specific problem foods and not to a broad range of eating. Reinforcement by the experimenter likewise does not typically modify general eating behaviour but rewards losses in weight achieved by any means. As Mahoney (1974) has shown in his study of self-reward, reinforcement of changed eating habits is much more effective in maintaining continued weight loss than is reinforcement of weight loss itself.

Concepts of Obesity

The superiority of treatment techniques for overweight that rely on situational management can be better understood by examining some of the current conceptualizations of obesity and its causes. Human obesity has been divided into several etiological categories: hypothalamic, endocrine, physical inactivity, dietary, genetic, and drug-induced (Bray, 1974). Of these factors, physical inactivity and dietary patterns are responsible for the majority of overweight problems; the other etiological forms are comparatively rare (Bray, 1974). These major factors can be translated into insufficient energy expenditure and excessive intake of calories, two problems which require behavioural rather than medical solutions.

The problem of physical inactivity is firmly embedded in the lifestyle and attitudes of our culture. The majority of the population does
not generally engage in physical activity to earn a living, and has a large portion of leisure time. Combine this with a high value on labour saving, step-reducing conveniences and a preponderance of sedentary leisure activities, and the result is a society of very inactive people. In fact, if an individual wants to lead a more active life it is necessary to go out of his way to get it. In our society physical activity may require the availability of special facilities or the ability to afford proper equipment, or if nothing else, a good deal of personal motivation. In addition to improved attitudes and motivation toward physical activity, treatment of this problem requires that the individual's environment be manipulated to facilitate and encourage increased energy expenditure (Stuart and Davis, 1972; Jeffrey, in press). On an individual level this can include such steps as daily graphing of one's energy expenditure (Stuart and Davis, 1972) or personal progress on a particular exercise programme (e.g., Cooper, 1975) and avoiding such energy-saving devices as elevators and escalators. A more global prescription would include the establishment of national standards for recreational facilities, employer sponsored fitness programmes, and taxation policies that encourage physical activity (Jeffrey, 1976).

The problem receiving the greatest attention has been that of dietary habits, specifically overeating. Once researchers were able to look beyond the rather circular explanation that the obese were simply gluttonous, they began to search for differences in individual characteristics other than eating habits. The theoretical question of whether personality factors exist which precipitate obesity is often simplified to why some people overeat and others do not. One reason for the popular notion that obese
persons were merely very hedonistic was the common belief that people should eat when they are hungry and that everyone should be hungry only when his stomach is empty. It was Cannon (Cannon and Washburn, 1912) who claimed that the perception of stomach contractions was the experience of hunger. However, since studies such as one in which a man with his stomach removed still felt hunger (MacDonald, Inglefinger, and Belding, 1947), the relationship between stomach contractions and hunger is thought to be less absolute. Further investigations of gastric motility and hunger in relation to the obese have demonstrated that while stomach contractions have only a weak influence on hunger, obese persons have a poorer correlation between contractions and hunger than nonobese (Coddington and Bruch, 1970; Stunkard and Fox, 1971). These differences, however, are not enough to account for the differences in food intake between obese and nonobese persons (Stunkard and Fox, 1971).

Bruch (1973) has incorporated the concept of poor hunger awareness into her psychoanalytic explanation of obesity. Poor perception of bodily states, Bruch suggests, leads to the misinterpretation of various emotional states as hunger. Essentially a developmental psychoanalytic interpretation, Bruch's theory suggests that by constantly and authoritatively contradicting the child's own feelings, overbearing parents cause the child to mistrust his own sensations and never learn to label them appropriately. Since the child is not allowed to feel "unhappy," the alternative is that he "must" be feeling hungry. Most of the supporting evidence that Bruch (1973) offers is in the form of individual case studies, but it is interesting to note the contrasts between her concept of mislabelling and the cognitive-arousal theory of Schachter (1971).
Schachter's theory is basically a modification of William James' earlier theory of emotion (1890) which states that a feeling or emotion is produced by a combination of a state of physical arousal and knowledge of the situation. The state of arousal makes one aware of the feeling as a personal experience, but the actual labeling of the specific emotion is the result of the cognitive assessment of the situation (Schachter, 1964). Obese individuals, according to Schachter, are relatively unaffected by internal cues like hunger and emotions, but are overly influenced by external food-related cues. Slochower (1976) has posited that while the positions of Schachter and Bruch appear to be conflicting points of view, they are actually related.

Since the internally generated visceral responses of different emotions are relatively similar, it would be quite possible to "mislabel" a feeling by misjudging the situation. It might be possible, for instance, to mistake the feeling of "anxiety" for the feeling of "hunger." For the obese then it might be that "hunger" is the label inappropriately applied to any number of emotional responses. The problem with this argument is that the visceral responses for different emotions, while being similar in many instances, do have different patterns (Lacey, 1967), particularly for feelings as grossly different as "anxiety" and "hunger." In fact, fear is reported to suppress gastric contractions (Cannon, 1929).

Schachter's solution to this problem is a hypothesized difference between obese and normal-weight persons on the dimension of internal-external orientation (Schachter, 1971). He suggests that obese individuals are more externally and less internally oriented than their nonobese counterparts. This particular orientation of the obese predisposes them to be
less aware or less discerning of internal hunger cues and more readily aware of external cues in their immediate environment. Instead of eating when the feeling of hunger dictates, the externally oriented person eats when the appropriate cues for eating are present—e.g., the presence of food or others eating, the time of day, etc. This external orientation combined with the over-abundance of food cues in our society would readily explain the current prevalence of obesity.

Schachter and his associates (e.g., Schachter, 1971; Schachter and Rodin, 1974) have amassed considerable experimental evidence in support of the hypothesis that obese persons are more externally oriented than nonobese persons. As a demonstration of the poor hunger discrimination of the obese, Schachter, Goldman, and Gordon (1968) found that the obese eat just as much when their stomachs are full as when they are empty, and that fear does not affect their intake. Normal-weight control subjects ate less when they were full and when they were frightened.

Evidence for the obese being more dependent on external cues than nonobese comes from a study by Schachter and Gross (1968). Utilizing a trick clock that either slowed down or speeded up in relation to actual time, they found that obese persons ate more when time was speeded up and less when time was slowed down than did nonobese in the same situation. When other pleasant food cues such as mealtime socializing and pleasing taste are eliminated from the eating situation, the obese eat far less than do normal weight persons (Hashim and VanItalie, 1965). Another study (Nesbitt, 1968) also provided evidence that the obese are more affected by the taste of food. The heavier subjects were, the more they ate when
the food was good tasting. When the food had quinine added there was no
difference in consumption among overweight, normal weight, and underweight
groups.

A very interesting demonstration of the effect of the presence of
food on the eating patterns of the overweight is another study by Nesbitt
(1968). He presented overweight, underweight, and normal weight subjects
with a lunch which consisted of either one or three sandwiches with "doz-
ens more" available in a nearby refrigerator to which subjects were invi-
ted to help themselves. The underweight and normal weight subjects ate
about the same number of sandwiches in both the one sandwich and the three
sandwich conditions. The overweight subjects, on the other hand, were
affected considerably by the manipulation. In the one sandwich condition,
they ate less than either of the other groups (M = 1.48 sandwiches versus
M's of 1.5 and 1.96 for underweight and normal-weight subjects, respec-
tively); and in the three sandwich condition they ate considerably more than
the other two groups (M = 2.32 versus M's of 1.62 and 1.88).

A number of studies investigating the externality hypothesis have
been performed comparing overweight and normal weight subjects on general
tasks other than eating behaviour (see Schachter and Rodin, 1974). Pliner
(1973) found obese subjects to be more responsive than normals in time
estimation to salient external cues, but less responsive when cues were
of low salience. Obese subjects have also been found to be more distractable
than normals when performing a proofreading task, particularly when the
distraction was of an emotional nature (Rodin, 1974). In a number of tests
requiring external orientation, obese subjects did better than normal
weight subjects (Rodin, Herman, and Schachter, 1974): they had faster reaction times on a discrimination task; they had more complete recall of slides after a brief presentation; and they had faster recognition of tachistoscopically presented words.

In a more recent study, Rodin and Slochower (1976) used some of these measures of internal-external orientation to predict changes in weight and eating behaviour. At a summer camp, they tested normal-weight children for externality and then measured their weights bi-weekly over a two month period. Since meals were served in such a way that the children had free access to food that was plentiful and visible, it was predicted that the more externally oriented would gain more weight. This hypothesis was generally supported since the more externally responsive children gained more weight than children lower on externality.

Not all of the results, however, have been supportive of Schachter's hypothesis. Using Rotter's (1966) test to measure internal versus external locus of control (I-E), Gormanous and Lowe (1975) found no differences in the locus of control scores of normal weight and obese subjects. In his brief note concerning false assumptions about the obese, Mahoney (1975) states that the evidence for the externality is equivocal and cites a review of Wooley and Wooley (1975) to support this. Slochower (1976) has suggested that the externality is by no means a general characteristic of the obese and she provides evidence that overeating is strongly influenced by factors other than external food cues. In her study, she found support for the "mislabelled emotion" hypothesis. Her obese subjects ate much more when they could not identify the cause of their own high arousal (manipulated by means of false biofeedback) than when they were given a reason
for its occurrence. Slochower also found that obese subjects reported significantly more arousal reduction following eating than did normal weight subjects. These findings suggest that the obese either misinterpret arousal as being hunger or they eat as a means to reduce arousal. It is also possible that both of these mechanisms are working to some extent simultaneously.

The conflicting evidence on the issue of internal versus external orientation does not negate the importance of the theory; on the contrary, it emphasizes the complexity of the externality concept. The idea of externality is not a new one; it has been used for many years under such terms as field dependence-independence (Witkin et al., 1954), locus of control (Rotter, 1966), and introversion-extroversion (Eysenck, 1960; Jung, 1933). Each of these conceptions of personal orientation has various measurement techniques associated with it. The fact that there are so many different constructs and measuring devices of the internal-external dimension suggests that it is a many faceted concept containing more than one dimension or sub-dimension. Even within the single concept of perceived locus of control (Rotter, 1966), a number of dimensions have been found to exist. Reid and Ware (1974), for example, have factor analyzed three separate subscales from the Locus of Control Scale, self control, social systems control, and fatalism. A tentative solution to be drawn from this situation is that a multi-method approach is necessary in any attempt to measure internal-external orientation.
Methodological Considerations

Regardless of the theoretical background of any treatment for the obese, the issue of primary importance is the success of the treatment. The problem of measuring the success of a programme or the relative success of one type of treatment over another has been the focus of several recent papers in the area (Stuart, 1973; Hall and Hall, 1974; Jeffrey, 1975; Franzini and Grimes, 1976). These papers have cited a number of specific problem areas that vary across studies. Some of these areas require standardization for valid comparison of different treatment methods, while other areas merely require more detailed reporting of results.

A number of the problems are concerned with the subjects themselves. Methods of subject selection have created a literature on the treatment of obesity which is based largely on slightly overweight college students (Stuart, 1973; Franzini and Grimes, 1976). There is a need to recruit subjects from wider ranges of social status and age to insure greater generalizability of results. In line with this it has been suggested (Stuart, 1973; Hall and Hall, 1974; Franzini and Grimes, 1976) that more individual data be reported than the usual minimal inclusion of age and weight. Also more attention should be paid to the relationship between treatment success and demographic variables rather than merely personality variables (Hall and Hall, 1974). Another often cited problem is the reporting of data from subjects who terminate before completing the programme (Stuart, 1973; Jeffrey 1975; Baekelund and Lundwall, 1975). It is important that the procedures used to handle drop-outs be described
in research reports, and attempts should be made to minimize subject attrition (Stuart, 1973; Jeffrey, 1975). One method for reducing the drop-out rate is to require the subject to put down a monetary deposit whose return is based on good attendance (Franzini and Grimes, 1976).

A second major problem area in the treatment of obesity lies in the reporting of data. As mentioned above, more detailed reporting of individual data other than age and weight has been suggested; a frequent shortcoming cited is the use of weight and height as the sole measures of obesity. It has been argued that using weight and weight change as the sole measures of obesity and of treatment success does not necessarily provide complete and reliable results since weight is not always a good measure of body fat (Stuart, 1973; Hall and Hall, 1974; Jeffrey, 1975). To provide a more complete indication of obesity, it has been proposed that skinfold measurements be taken in addition to weight measurements (Stuart, 1973; Franzini and Grimes, 1976b).

In addition, the manner of collecting data has been listed as a common problem (Stuart, 1973; Franzini and Grimes, 1976). Since it has been found that data regarding eating patterns and weight which is provided by the overweight subjects themselves is very unreliable (Stuart and Davis, 1972; Leon and Chamberlain, 1973), it is recommended that experimenter collected data be used rather than those collected by the subject.

Further, in regard to data collection, Stuart (1973) has also stressed the importance of evaluating subject response to the procedure itself. This is in addition to the weight and skinfold changes used to judge treatment success. The subjects' evaluation of the programme and suggestions for improvements can give the researcher needed insights into
reasons for the success or failure of a treatment. Also Stuart (1973) suggests that other effects of the treatment on the subject need to be evaluated. Possible problems may occur due to the induced behaviour or weight changes. For this reason measurements of variables, such as subject mood and attitude need to be included.

The third and final source of problems in the comparison of treatment programmes lies in the design of the treatments themselves. There has been no set format regarding the length of treatment or of follow-up after treatment. Irregularity of follow up has been named consistently as a problem in treatment comparison (Stuart, 1973; Hall and Hall, 1974; Jeffrey, 1975). Behavioural treatments of obesity have ranged from periods of four weeks to four and one half months with the mode being 10 to 15 weeks; follow-ups after treatment for these same studies have ranged from none at all to one year (Leon, 1976). Calling for longer follow-ups Hall and Hall (1974) recommended that subjects be followed for at least six months.

Another criticism raised has been the use of different diet programmes when the type of diet plan is not the actual focus of the research attention. Stuart (1973) has encouraged the use of standardized treatment plans (e.g., Stuart and Davis, 1972) when investigating variables other than the diet program itself. Of even greater importance is the standardization of the delivery of service across treatment conditions within a given study. It is important that subjects receive the same attention in all aspects other than the experimental variable. Services such as interviews, weigh-ins, and diets, should all be carefully
standardized for all subjects across conditions (Stuart, 1973). Similarly, the use of different therapists should be balanced across groups (Stuart, 1973) and therapist expectancies should be equated (Paul, 1969). Much of the problem of different therapists and therapist expectancy can be alleviated by careful standardization of interview procedures across conditions (Stuart, personal communication).

One additional suggestion for improved evaluation of various treatment techniques is the inclusion of an index of cost effectiveness (Jeffrey, 1975). This index might be a ratio of the mean treatment time or cost per subject over the mean weight reduction. This is an excellent suggestion but can easily be distorted depending on how it is applied. For example Barnes (1976) assessed cost effectiveness in her comparison of sensory deprivation treatment and the Five Day Plan for smoking. Dividing the total cost of treatment by an index of smoking reduction per subject she found the Five Day Plan to be more effective relative to its cost than was sensory deprivation. This comparison was unfair and distorted since the cost of her sensory deprivation treatment included the four sensory deprivation rooms. This cost was spread over her very small number of subjects. In the short run sensory deprivation treatment was more costly than the Five Day Plan; however, since the cost of such equipment is a one time expense, the cost effectiveness index for sensory deprivation treatment would decrease with the number of subjects treated while that of the Five Day Plan remains constant. Also, the costs of the Five Day Plan were greatly reduced since materials and personnel were donated for the purposes of her study.
Rationale for the treatment used in this study

The design of the weight control programme that comprises this study is based on considerations of the characteristics both of sensory deprivation and of the obese as externally oriented individuals. As was mentioned in the earlier discussion of the clinical application of sensory deprivation, sensory deprivation appears to make individuals more responsive to therapy (Suedfeld, 1975a). It may do this by increasing dependency on the therapist and receptiveness to communication, and at the same time making one's own cognitions more salient. Individuals have been found to be both more persuasible and better able to recall material heard during sensory deprivation (Suedfeld, 1969). These are valuable features for the treatment of any problem. It was decided to investigate this role of sensory deprivation as an educator to facilitate the learning of material geared toward changing eating habits. The specific habits to be learned were those behavioural self-control techniques described by Stuart and Davis (1972).

By increasing simultaneously receptivity to external input and the salience of internally generated thoughts, sensory deprivation creates a situation of forced introspection with more attention being paid to therapist-generated advice in this endeavour. For the externally oriented obese person, this increased focus on internal stimuli may be very therapeutic. With proper guidance the obese individual may be able to become better attuned to the internal cues of hunger. This assumes that if the individual becomes more internally oriented, there will be less dependence on the external cues for eating.
Sensory deprivation has also been found to facilitate relaxation (Suedfeld, 1975a). This quality should be very useful in dealing with obese persons. As Bruch (1973) has suggested, much of the obese person's overeating is instigated by anxieties. If given an alternative to eating for the reduction of anxiety, the obese person may be better able to avoid overeating in emotional situations. For these reasons it was decided to pair the relaxing qualities of sensory deprivation with a progressive relaxation exercise. The initial success of achieving deep relaxation in the sensory deprivation session should encourage the individual to practice the exercise again under normal circumstances.

Another quality of sensory deprivation is that it "eliminates cues that in the normal environment elicit undesired behavior" (Suedfeld, 1975a, p. 98). This is particularly appropriate because it should provide the obese person with an impressive demonstration that his hunger is externally generated. In the absence of food cues the externally oriented obese person should experience very little hunger during the sensory deprivation session. As in the studies with smokers, where going 24 hours without having or wanting a cigarette was an impressive experience (Suedfeld et al., 1972; Suedfeld and Ikard, 1974), the experience of 24 hours with little or no hunger should be a dramatic one.

As mentioned previously, this study planned to use behavioral self-control techniques along with the session of sensory deprivation. Judging from the superior success rate of the combined techniques of Suedfeld and Best (in prep., 1977) over either technique singly, it was felt that by pairing a weight control method already proven to be effective (such as that of Stuart and Davis, 1972), with sensory deprivation, the overall
effectiveness should be greatly increased. Not specifically designed to test the effectiveness of self-control techniques, this study is a test of the added effectiveness of the components of sensory deprivation treatment. The separate components—the sensory deprivation session and the therapeutic communications—were examined both separately and in combination. Though this investigation is not a direct test of behavioural self-control methods of weight reduction, control of the many problems inherent in research of the behavioural treatment of obesity is important.

As these problems have already been listed it is not necessary to detail them here. However some of the features of this study designed to handle these problems are as follows: using subjects sampled from a broad range of social status and age; using skinfold as well as weight measurements; using experimenter collected data; following up subjects for a six-month period; standardizing interview procedures; reporting handling of and data on drop-outs; evaluating subject responses to and feelings about the programme; and reporting more thoroughly on individual subjects.
DESIGN OF THE STUDY

The study incorporated two independent variables in a 2 x 2 factorial design: 1) sensory deprivation (SD) versus nonconfinement (NC) prior to individual instruction in the diet and exercise programmes, and 2) presentation (M) versus non presentation (NM) of therapeutic communications during the 24 hour period prior to personal instruction in the programme. The four treatment groups in this design are 1) sensory deprivation with messages (SD-M), 2) sensory deprivation with no messages (SD-NM), 3) nonconfined with messages (NC-M), and 4) nonconfined without messages (NC-NM). Subjects in all four groups were given the same programme instructions and follow-up interviews over a six month period.

Data were analyzed as follows: (1) a multivariate analysis of variance on initial demographic and personality data for the four treatment groups and for the experimental groups plus a group of drop-outs; (2) a 2 x 2 analysis of variance of weight and skinfold changes in the four treatment groups; (3) a 2 x 2 x 7 repeated-measures analysis of variance on weight over the six month period; and (4) regression analyses of weight changes on demographic and behavioral measurements. In addition a large amount of individual data is reported in individual case studies. (See Appendix A).

METHOD

Subjects

Responding to two articles published in major local newspapers and a live broadcast radio interview, a large number of women volunteered to
participate in an experimental weight loss programme. The newspaper articles requested women between the ages of 20 and 55 years who were at least 25% overweight to participate in a six month programme that could include a 24-hour session of sensory deprivation. (See Appendix B.)

With information gathered in the initial telephone interview, subjects were matched for age, marital status, and percentage overweight. The upper end of the recommended weight range for medium framed women was used to calculate percentage overweight for all subjects (Metropolitan Life Tables, 1958). Subjects who indicated that they were diabetic or hypoglycemic were excluded. From these matched groups, subjects were assigned randomly to the four treatment groups. Subjects' ages ranged from 21 to 57 years with a mean age of approximately 41. The percentages of excess weight ranged from 25% to 130%.

The initial design called for 12 subjects in each of the four groups. An attempt was made in the early stages of the study to keep the numbers balanced among the groups; therefore, early drop-outs were replaced from the list of volunteers. No attempt was made to replace subjects who terminated during the later stages of the study. Subjects were seen individually throughout the programme.

Procedure

Subjects selected from the list of volunteers were telephoned to arrange for a preliminary interview. Scheduling of specific times for interviews was at the subject's convenience throughout the study. At the first interview the subject was briefed about the procedure for the entire six month study and demographic and personality data were collected.
At this time the subject was also requested to leave a deposit in the form of a $25.00 check made payable to the Canadian Heart Fund. Each subject signed an agreement stating that she would forfeit her deposit if she failed to attend all scheduled sessions. In actual fact, the deposit was returned to all those who completed the final six month follow-up regardless of other attendance.

In addition to giving information regarding personal history, weight, and height, subjects also completed a Motive Checklist designed for this study, the Locus of Control questionnaire (Reid and Ware, 1974), a portable version of the Rod and Frame Test (Witkin et al., 1954), and Self-Monitoring Scale (Snyder, 1974), the Autonomic Perception Scale (Mandler, Mandler, and Uviller, 1958), the Barber Suggestibility Scale (Barber, 1965), and the Personal Causality Questionnaire (Peevers, Blascovich, and Secord, 1974). Subjects were given a form on which they were to procure their physician's approval for their participation in the programme. Further, where appropriate, a description of the programme was sent home to the subjects' spouse or roommate along with a form soliciting support for this weight loss attempt. An attempt was also made to involve this other person by asking for some descriptive information about the subject's eating habits.

During the first interview subjects were instructed to record details of their eating behavior until the next session without altering their eating pattern in any significant manner. Each subject was given a self-monitoring booklet with spaces marked for specific information concerning each eating situation. In addition to recording foods and quantities, subjects were to note the date, place, time, other people
present, whether others were eating, whether food was present before eating, and prior activity for each eating situation. A time was scheduled for the next interview to be held one week later. Each subject was briefed as to the procedure for the next sessions appropriate for the group to which she had been assigned. The entire procedure for the first session took between one and one-half to two and one-half hours depending on the individual subject's speed.

The second session comprised the experimental manipulation. The procedure for all sessions except this one was identical for subjects in all groups. At the beginning of the second session the subject's weight was measured and the self-monitoring material and physician approval forms were collected. A female research assistant took measurements of infrascapular and tricep skinfolds using a Lange Skinfold Caliper. The treatment procedures were as follows:

**Group One - Sensory deprivation with messages (SD-M)**

Subjects reported to the laboratory at 12 noon, were briefed again about the procedure and were given a form to sign stating that they understood the procedure and were willing to participate (see Appendix D). After an orientation to the sensory deprivation chamber and its food and toilet facilities, subjects were given a few minutes alone in the chamber to change into comfortable clothing. Subjects were requested to leave watches and any other distracting objects outside the chamber. When the subject signalled that she was comfortable the light was turned off and sensory deprivation began.

Sensory deprivation consisted of lying on a firm bed in a dark, quiet room (Industrial Acoustics Model 404-A). Liquid food (vanilla
Metrecal) and water were in thermos bottles next to the bed and were available ad lib through plastic tubes pinned near the head of the bed. A chemical toilet was located in the chamber at the foot of the bed. Instructions were given requesting the subject not to move around or make unnecessary noise. She was also informed that a monitor would be on duty in an adjacent room for the entire 24 hours and that the subject could leave the chamber at any time should she become too uncomfortable. This, she was told, would end her part in the experiment. After one hour and 45 minutes each sensory deprivation subject was asked to estimate the amount of time that had passed and her response was recorded.

At three hours (approximately 3:00 p.m.) the subject was wakened and informed that she would be hearing a tape recorded message. The first set of messages was played at this time. At 20 hours (approximately 9:00 a.m.) the subject was awakened again and the second set of messages was played. At 24 hours the subject was reawakened and informed that she had completed the full 24 hour session and that the light would be turned on.

The two sets of messages were one hour long and 45 minutes long, respectively. The first set contained a discussion of the problems of controlling urges and caring for one's body, a relaxation exercise, a body orientation exercise, and an exercise on dealing with emotional situations without eating. The second set contained nutritional information, facts about dieting, suggestions for controlling eating behaviours, and suggestions for increasing energy expenditure (See Appendix C for the complete transcripts of the recorded messages).
Immediately following the sensory deprivation session the subject was interviewed about her reactions to the experience she had just completed (See Appendix A for specific reactions). Next the subject was provided with a copy of the diet manual (Stuart and Davis, 1972) and the specifics of this plan were reviewed with her. Special attention was paid to the mechanics of the diet; recording and graphing calorie intake and output, and the behavioral steps spelled out in the Stuart and Davis (1972) manual. This part of the procedure was identical for all subjects in all four groups. Subjects were then scheduled for another session to be held one week later.

**Group Two - Sensory deprivation with no messages (SD-NM)**

The procedure for subjects in this group was identical to that used with Group One except no mention was made of the messages and the tapes were not played. The subject was told, as were all sensory deprivation subjects, that she should use the session to concentrate on herself and her problem of losing weight. Except for the absence of the messages and being awakened at those times, the procedure before, during and after sensory deprivation was the same as for Group One.

**Group Three - Nonconfined with messages (NC-M)**

The subjects who received only the message portion of the treatment reported to the laboratory on two consecutive days. In order to control for the timing and spacing of the message presentation, these subjects were scheduled to hear the first set at 3:00 p.m. on one day and 9:00 a.m. on the following morning. On reporting to the laboratory on the first day, the subject's forms and other data were collected and she was led to a room where she would hear the first set of messages. The subject lay
comfortably on a bed for this presentation and the lights were dimmed but not turned off completely. On completion of the first set of messages, the subject was reminded of the next day's appointment and excused to return home.

On the following day the subject heard the second set of messages under the same circumstances as on the previous day. At the completion of the tape, the subject was given personal instruction in the plan and presented with the diet manual as mentioned above. A third appointment was made for one week later.

**Group Four - Nonconfined without messages (NC-NM)***

This group of subjects received neither message presentation nor exposure to sensory deprivation. After weighing in and handing in the required materials, these subjects were given personal instruction in the diet and exercise programme, and given the diet manual, as outlined above. Another session was arranged for the following week.

**Follow-up sessions**

The five follow-up sessions were arranged to be one week, one month, two months, four months, and six months after the second session, which was the treatment session. In general, this timetable was followed with some individual variations due to personal scheduling problems and conflicts. At each follow-up session, the subject's weight was measured and recorded. The subject's own personal records of calorie intake, output, and weight were discussed but not collected. Each session lasted between one half and one hour in length.

The one week, one month, and four month follow-up sessions were basically reviews of the material covered in the first instruction session.
Subjects were asked about their own implementation of and reactions to the eleven behavioral steps outlined in the Stuart and Davis (1972) programme. Suggestions were made for individual improvements in carrying out these steps with special focus on problems brought up by the subject. Other than reviewing these behavioral steps and noting individual progress, there were no other standardized procedures for these sessions.

The two month and six month follow-up sessions proceeded in basically the same manner but were more standardized. These interviews followed a specific set of information gathering questions. The two month follow-up questions were designed to measure the extent to which the subject was carrying out each step of the programme and the reactions of the subject to the programme and her progress up to that point. The six month interview was designed to tap reactions to the entire programme and to gather suggestions on the strong and weak points of the procedure. Skinfold measurements were taken again by the same female research assistant at this final session. Also at this follow-up session the subject's data deposit check was returned.

Measures

**Weight, height, and skinfold.** Weight and height were measured on a Health-O-Meter balance scale with metric readings. Therefore, weight is reported in kilograms (1 Kilogram = 2.2 lbs.) and height in centimeters. Weight measurements were taken with the subject dressed but without shoes. An attempt was made to schedule the subject at the same time of day for each session to control for fluctuation in weight over the course of the day. However, this was not always possible due to individual scheduling problems.
Skinfold measurements were made with a Lange Skinfold Caliper at the infrascapular and tricep sites. An average of three measurements taken at each site was used to account for slight variations in measurement. These particular skinfold sites have been recommended as good indicators of overall body fat and as being clearly measureable in all but severely obese cases (Tanner & Whitehouse, 1975). These measurements were made by a female research assistant.

Demographic data. In addition to name, age, and marital status, the subject was asked about education level, number of children, and occupation. Information relevant specifically to weight was desired weight, age at onset of overweight, perceived cause of overweight, previous diet attempts and amounts lost as a result of those attempts. The subject’s activity level was inquired into by asking the kinds and frequencies of sports, hobbies, and exercise she engaged in. Estimates of smoking and alcohol consumption were made through self reports. Finally the subject was asked her motives for enrolling in the programme and the amount of difficulty she anticipated in carrying out the programme. For the latter measure the subject estimated difficulty on a scale of zero (minimum) to 100 (maximum difficulty).

Motivational data. A Motive Checklist was designed for this study to measure the importance to the subject, of each of a number of motives for losing weight. The list included improving appearance, improving health, demonstrating self control, involving social opportunities, improving employment opportunities, preparing for an upcoming event, and pleasing one’s spouse or friends. According to Stuart (personal communication) these are the most commonly cited motives for joining weight
reduction programmes. After each motive the subject circled a number from one (not at all important) to five (very important).

**Personality measures.** The various personality tests used in this study were selected for their relevance to internal-external orientation. As was mentioned earlier, this characteristic seems to be multidimensional and it was hoped that a more complete understanding would be gained by using several different approaches. The rationale for attempting to measure this orientation is based on the theory of Schachter (1971). The intention was to analyze the relationship between these personality measures and success at losing weight at the conclusion of the programme.

Field dependence-independence (Witkin et al., 1954) was measured with a portable Rod-and-Frame Test. The score from this test was the total absolute judgment error summed over eight trials.

The construct of internal versus external control (Rotter, 1966) was another relevant measure. The Reid and Ware (1974) version of this scale was used since it has been divided into three separate dimensions: fate, social systems control, and self-control. The fate dimension measures the extent to which people believe that luck, fate, or fortune govern personal achievements or outcomes. The social systems control dimension reflects the amount of control people feel they have over social and political forces and events. The self control dimension is identified by the perceived amount of control over one's own desires, impulses and emotions (Reid and Ware, 1974). This scale consists of 45 forced choice items.

Another scale related to the Locus of Control scale is the Personal Causality Scale (Peevers, Blascovich, and Secord, 1974). This question-
naire is designed to categorize the individual as personal or external regarding the locus of causality. The major difference between this idea and the Locus of Control is that the Personal Causality Scale measures perceived causality in interpersonal relationships. The scale consists of "35 questions about everyday interpersonal situations to which participants respond in their own words" (Peever et al., 1974, p. 1). In addition to categorizing individuals on locus of causality, this test also yields a score that indicates the degree of perceived intentionality that others have in their actions toward the individual.

One suggestion from the hypothesis that the obese are more externally oriented is that the obese are unable to discriminate internal cues. To tap this aspect of internal-external orientation the Autonomic Perception Scale (Mandler, Mandler, and Uviller, 1958) was administered. This scale was designed to measure the extent an individual is aware of autonomic activity.

It has also been suggested that the scale is actually measuring the degree to which individuals tend to be concerned about autonomic activity (McFarland, 1975). This interpretation of the test would also be very pertinent to the problem of obesity, particularly if this score is predictive of weight loss.

Another variable that is related to internal-external orientation is suggestibility. The extent to which individuals are receptive to external suggestions varies considerably and might be an added dimension to the concept of internality-externality. The Barber Suggestibility Scale was used to measure this variable. Although it is usually considered to be a measure of hypnotic suggestibility, the test is standardized and requires no hypnotic induction (Barber, 1965). The test was
administered in tape recorded form to insure a standard procedure. The only prior instructions were as follows: "I am now going to play a tape recording. I would like you to close your eyes, relax and listen to the instructions on the tape." The text and scoring procedure followed directly from Barber (1965). The test yields two separate scores: an objective suggestibility score which is the amount of actual compliance with the instructions; and a subjective suggestibility score which reflects the extent to which the subject felt the suggested effect as opposed to merely going along with the instructions to please the experimenter.

Since the importance of the self in controlling weight loss has been demonstrated to be greater than the importance of some external control (e.g., Jeffrey, 1974) the ability to observe and control one's own behavior may be a contributing factor in successful weight loss. The Self-Monitoring Scale was designed to measure self-observation and self-control of expressive behavior and self presentation (Snyder, 1974). The generalization from how aware one is of expressing his own attitudes or emotions to how aware he is of his own eating behavior is not a large or unreasonable one.

Spouse Involvement. The social nature of the problem of any diet and exercise plan makes social support extremely necessary, particularly support from one's family and spouse. Although this study did not deal directly with the families of the participating subjects, an attempt was made to solicit spouse support by sending some material home for perusal and completion. This technique has been suggested by Stuart (personal communication). The material provided a brief description of the plan and suggested that the spouse read the diet manual. In addition the
spouse was asked to complete a questionnaire concerning the subject's eating habits (See Appendix D). It was felt that this would at least serve as a public statement by the subject that she was attempting to lose weight. Most, but not all, of the subjects had a spouse or other with whom they were living.

**Self Monitoring.** Recent research on the effects of self-monitoring has shown it to be effective in increasing the individual's awareness of his own eating patterns (Stuart and Davis, 1972) and in actually contributing to weight loss (Mahoney, 1974). This latter role of self monitoring has been found to be less long lasting and is limited to monitoring that precedes the eating behaviour (Romanczyk, 1974). Since in the present study this measure was intended to increase awareness and provide the experimenter with information about the subjects' normal eating habits, post monitoring, or self monitoring after having eaten, was used to reduce reactivity to the monitoring procedure.

Each subject was given a small self monitoring booklet and instructed to fill out one page for each incident of eating whether it was a full meal or a very small snack. The subject was instructed to use the self monitoring booklet for one week starting immediately after the initial interview until the next session. It was also made clear that the subject was not to change her eating habits since the purpose of self monitoring was to gain insight about her present pattern.

**Two month interview.** The third follow-up session occurred after eight weeks had passed since the instruction session. A standardized interview was used to assess the subjects' progress up to that point (see Appendix D). Subjects were asked to estimate the percentage of days
they had been on and off their diet and on and off their exercise plan. Since graphs were not examined as a regular part of the follow-ups, they were asked whether they were actually graphing as instructed.

To assess the extent to which subjects were following the specific behavioral steps, they were asked to estimate percentage of possible time they engaged in those steps. The habits measured in this way were: eating in one place (when home); not doing anything else when eating; keeping problem foods out of sight and reach; working on specific problem times; getting help from others; using a smaller plate; measuring portions; keeping low calorie foods available; eating slowly; and using a payoff plan.

The subject was asked if her attitude toward eating had changed, if she felt better about herself, and if she felt healthier. These questions were answered on a five point scale. Using the same scale of 0 to 100 as in the initial interview, subjects estimated the amount of difficulty they had had to that point and how much difficulty they anticipated over the next four months. Inquiry was also made into the subject's opinion of the manual and the number of times she had read it. Finally subjects were asked about their reactions to the specific features of the programmes which differed between groups, i.e., sensory deprivation and messages. Subjects were only asked about the features they had received.

Six month interview. (See Appendix D). This interview was designed to assess subjects' final reactions and to get ideas and suggestions from subjects on the strong and weak points of the programme. Subjects responded on five point scales to the questions of how successful or unsuccessful they felt the programme had been, how much their attitude
toward eating had changed, how much their attitude toward their health had changed, whether they felt better about themselves, and whether they felt healthier. Subjects also responded orally to several open ended questions about the programme's most important aspects, worst aspects and how the programme could be improved. Subjects also described their greatest problems and what they had learned about themselves. Questions concerning intentions to continue using the diet and exercise programmes and the probability of achieving goal weight were also included. Finally, the subject was allowed any general comments and asked if she would be willing to return again in the future for a further follow-up.
RESULTS

Intergroup differences. In addition to the initial effort to equate groups for weight, age, and marital status, a check was made to evaluate the equivalence of the groups on the personality measures and other demographic variables. One-way multivariate analyses of variance (MANOVAs) were performed on these dependent variables using blocks of six or eight variables at a time. Since the smallest number of subjects in any of the treatment groups was nine, no more than nine variables could be analyzed at one time. Variables were analyzed on groupings which logically seemed to belong together.

There were no significant differences among the groups on any of the data from the initial session. The MANOVA on the variables age, height, initial weight, number of years overweight, triceps skinfold, infraspinatus skinfold, number of children, and years of education produced a likelihood ratio criterion with associated $F(24$ and $82 \text{ df})$ of $0.495 = 0.675$, $p > .50$. Likewise, the MANOVA including as dependent variables the Rod and Frame Test, the Self Monitoring Scale, the total Locus of Control score, Autonomic perception, the subjective and objective Barber Suggestibility Scale scores, and the locus and initiation scores from the Personal Causality Questionnaire showed no significant differences $F(24,82) = 0.543$, $p > .50$. Neither were there significant differences between amounts of drinking or smoking, anticipated difficulty, or on the three separate scales of the Locus of Control scale $F(21,82) = 0.945$, $p > .50$. The MANOVA for the items on the motive checklist (appearance, health, self control, social opportunity, employment opportunity,
preparing for an event, or pleasing spouse) did however, yield a significant group difference $F(21,84) = 1.835, p < .05]$; however, with the greatest characteristic root (gcr), no significant differences were found ($gcr = .4048, S = 3, M = 1.5, N = 13.5, p > .05$). In summary, the four experimental groups were equivalent on the demographic and personality data.

Relationships between measures. All of the physical, demographic and personality data were tested for intercorrelations on the 39 subjects who completed the study. Since the number of correlations involved is quite large, the .01 significance level was used, (see Table 1). Age, as might be expected, was positively related to years overweight ($r = .55$) and negatively related to the importance of improving social opportunities ($r = -.48$). Age was also negatively correlated with the objective score on Barber's Suggestibility Scale ($r = -.44$). Older subjects were less suggestible.

Height and initial weight were significantly correlated but at a surprisingly low $r = .40$. Initial weight was also positively correlated with the two skinfold measures: weight and tricep skinfold with an $r$ of .62, and weight and infrascapular skinfold with an $r$ of .63. The two skinfold measures were more highly correlated with each other than with initial weight ($r = .85$). Weight and skinfolds were significantly correlated with very few other variables. There was a significant though low correlation between weight and total Locus of Control score ($r = .41$), demonstrating a tendency for the heavier subjects to be more externally oriented. However a correlation of .41 is not particularly conclusive.
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TABLE 1
Summary of Correlations

52
Weight was also negatively related to years of education ($r = -.47$) more highly educated subjects tended to be lighter. The score on the Autonomic Perception scale was positively correlated with initial weight ($r = .47$) reflecting a tendency for heavier subjects to report more awareness or concern for autonomic activity. There was also one other correlation of skinfold with a personality variable. Infrascapular skinfold was positively related to the Subjective scale on Barber's Suggestibility Scale ($r = .41$). Subjects with more fat tended to be more suggestible.

There were a number of significant correlations between subscales of the different questionnaires and between the different scales themselves. Several of the motives for joining the programme on the motive checklist were related. The motive to improve social opportunity was positively related to the motive to improve employment opportunity ($r = .46$), and the motive to prepare for some upcoming event was correlated ($r = .51$) with the importance of pleasing one's spouse. On the Locus of Control questionnaire the subscales Fate and Self Control were positively correlated ($r = .47$). The Objective and Subjective subscales of the Barber Suggestibility Scale were fairly strongly correlated ($r = .63$). There were also two intercorrelations between different scales. The Personal Causality score was significantly correlated with the amount the subject claimed to smoke ($r = .41$). This reflects a tendency for those who are more externally oriented on this measure to smoke to a greater degree. Externality on this measure is the amount one perceives others (as opposed to self) as being responsible for interpersonal events. Finally, the Autonomic Perception score was positively related to the Social Systems Control subscale of the Locus of Control scale ($r = .43$);
the more aware the subject was of her own physiological activity the more she felt social systems to be out of her control.

**Group Size and Analysis of Drop Outs.** The initial design called for 12 subjects in each of the four groups. However, since subjects were seen completely on an individual basis they did not all begin the programme at the same time. A number of subjects terminated the programme at various points in the progress of the study. In the initial stages an attempt was made to replace these subjects with others from the list of volunteers. However, no replacements were made after three months from the beginning of the first subject. Subjects who terminated after that point were not replaced. As a result the desired cell sizes were not achieved, neither were the final number of subjects in each group equal. The SD-M group had 11 subjects, the SD-NM group had 9 subjects, the NC-M group had 9 subjects, and the NC-NM group had 10 subjects. To avoid distortions in the results caused by analysis of unequal cell designs, two subjects from the SD-M group and one subject from the NC-NM group were randomly dropped for the multivariate and univariate analyses of variance and the repeated measures analysis. Their data are included in all other analyses.

There was a total of 15 subjects who terminated before the programme's conclusion. Of these, six terminated after the initial interview and therefore were not presented with any of the treatments. Three subjects left the sensory deprivation session early. Two of these, one in the SD-M group and one in the SD-NM group, terminated the session after five hours of sensory deprivation. The third subject, who had been
assigned to the SD-M group, left after 45 minutes of sensory deprivation. In accordance with a previous understanding these subjects terminated the programme at this time. One, however, was allowed to continue unofficially and she is discussed in the next chapter. The remaining dropouts from the study were as follows: two subjects (one NC-M, one NC-NM) terminated after the instruction session; two subjects (one SD-NM, one NC-NM) terminated after the one week follow up; one subject (NC-M) terminated after the one month follow up; and two subjects (one NC-M, one NC-NM) terminated after the two month follow up. Several other subjects expressed a desire to quit when they were discouraged by poor progress. These subjects were encouraged to continue and responded to this encouragement by remaining in the programme.

In order to test for systematic differences in demographic and personality variables which distinguished the drop-outs from the other groups of subjects, a further series of multivariate analyses of variance was performed. These analyses include the subjects who dropped out as a separate group compared to the experimental groups. The overall test of the multivariate null hypothesis by the likelihood ratio criterion revealed no significant differences for the variables age, height, years overweight, anticipated difficulty, initial weight, years of education, or number of children ($\Lambda = .658$, $F_{28,160} = .704$, $p >.50$); nor for scores on the Rod and Frame test, Locus of Control test, Autonomic Perception, the Objective and Subjective scales of the Barber Suggestibility Scale, and the locus and initiation scales of the Personal Causality Scale ($\Lambda = .647$, $F_{28,160} = .733$, $p >.50$). The variables drinking, smoking,
Self Monitoring Scale, and the Fate, SSC, and Self Control subscales of the Locus of Control were also not significant ($\overline{A} = .652$, $F_{24,158} = .860$, $p > .50$). As in the analysis of the four experimental groups, the likelihood ratio criterion was significant for the motive variables; appearance, health, self control, social opportunity, employment opportunity, upcoming event, and please spouse ($\overline{A} = .399$, $F_{28,160} = 1.66$, $p < .05$). However, using the greatest characteristic root approach this test was not significant ($gcr = .301$, $S = 4$, $M = 1$, $N = 21$, $p > .05$).

The overall finding of these analyses is that the dropouts were not systematically different on the personality and demographic measures taken from those who did not drop out. This result is discouraging in that no good predictor of early terminators emerged.

Weight Change. The dependent variable of most interest is the total weight change over the entire six month period. An analysis of variance (ANOVA) of weight change at the end of the programme showed no significant main effects ($SD F_{1,32} = 2.72$, $p > .10$; Message $F_{1,32} = 1.70$, $p > .20$). However there was a significant interaction ($F_{1,32} = 7.43$, $p < .01$) between environment type and message. The largest weight change occurred in the SD-M group (Mean loss = 5.87 kg) and the second most significant change occurred in the NC-NM group which had a mean loss of 2.36 kg. Multiple comparisons using the Neuman-Keuls procedure showed the mean weight loss of SD-M group to be significantly ($p < .05$) greater than the mean loss of each of the other three groups (Table 2).

In addition to overall weight loss for the six month period, the pattern of weight change over time was also examined. This was done in two different ways. The first was to analyze weight loss over different
<table>
<thead>
<tr>
<th></th>
<th>Sensory Deprivation</th>
<th>Non-confined</th>
<th>Message Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Messages</td>
<td>5.87 Kg*</td>
<td>.67 Kg*</td>
<td>3.27 Kg</td>
</tr>
<tr>
<td>No Messages</td>
<td>1.08 Kg*</td>
<td>2.36 Kg*</td>
<td>1.72 Kg</td>
</tr>
</tbody>
</table>

*Significant interaction at p < .01
# TABLE 3

Weight Loss Means Over First Two Months

<table>
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<tr>
<th>Sensory Deprivation</th>
<th>Non-Confined Means</th>
<th>Message Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Messages</td>
<td>3.67 Kg</td>
<td>2.61 Kg</td>
</tr>
<tr>
<td>No Messages</td>
<td>.11 Kg</td>
<td>2.35 Kg</td>
</tr>
</tbody>
</table>

Condition Means
Mean: 1.89 Kg 2.48 Kg

*Significant main effect at p < .05
periods. ANOVA of weight change over the first two months period showed no significant environment effect ($F < 1$) but a significant message effect ($F_{1,32} = 4.00, p = .05$). Those who had heard the messages lost an average of 3.13 kg versus 1.23 kg. for those who had not heard the messages. The environment by message interaction was marginally significant at two months ($F_{1,32} = 3.00, p < .10$). Means for 2 month weight loss are presented in Table 3. Weight change during the last four month period was also analyzed. Here ANOVA revealed the message effect ($F < 1$) to be nonsignificant and the interaction ($F_{1,32} = 2.88, p < .10$) to be marginally significant. There was a significant environment main effect ($F_{1,32} = 7.60, p < .01$) for change during this period. The mean change in the last four months for those who had spent 24 hours in sensory deprivation was a loss of 1.58 kg versus a gain of .98 kg for those who were nonconfined. Table 4 contains mean weight losses for the last four month period.

To examine the pattern of weight change further a repeated measures ANOVA was performed on all of the weight measurements over the six month period. If a subject had missed a session and consequently had a missing data cell, the average of the two adjacent sessions for that subject was used. This analysis yielded a significant trial x environment interaction effect ($F_{6,192} = 2.27, p < .05$) and also a significant trial x environment x message interaction ($F_{6,192} = 4.21, p < .001$). The trial by message effect was of borderline significance ($F_{6,192} = 2.06, p = .06$). For the actual trends of this data see Figure 1. These findings reflect the earlier findings from the ANOVA on the different time periods, the groups with messages losing most in the first 2 months and the sensory deprivation groups losing most weight over the last four months. This combination
**TABLE 4**

Weight Loss Means Over the Last Four Months  
(negative numbers = weight gain)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Sensory Deprivation</th>
<th>Non-Confined</th>
<th>Message Means</th>
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<tr>
<td>Messages</td>
<td>2.20 Kg</td>
<td>-1.93 Kg</td>
<td>.13 Kg</td>
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<tr>
<td>No Messages</td>
<td>.97 Kg</td>
<td>-.02 Kg</td>
<td>.48 Kg</td>
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<tr>
<td>Condition</td>
<td>1.58 Kg*</td>
<td>-.98 Kg*</td>
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</tr>
</tbody>
</table>

*Significant main effect at p < .01


**TABLE 5**

*Mean Skinfold Changes Over Six Months*  
*(positive number = loss)*

<table>
<thead>
<tr>
<th>Condition</th>
<th>Sensory Deprivation</th>
<th>Non-Confined</th>
<th>Message Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message</td>
<td>1.93 mm</td>
<td>2.71 mm</td>
<td>2.32 mm</td>
</tr>
<tr>
<td>No Message</td>
<td>2.04 mm</td>
<td>.64 mm</td>
<td>1.34 mm</td>
</tr>
</tbody>
</table>

| Condition Means    | 1.99 mm             | 1.68 mm       |

<table>
<thead>
<tr>
<th>Condition</th>
<th>Sensory Deprivation</th>
<th>Non-Confined</th>
<th>Message Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message</td>
<td>2.36 mm</td>
<td>2.61 mm</td>
<td>2.48 mm</td>
</tr>
<tr>
<td>No Message</td>
<td>3.82 mm</td>
<td>1.21 mm</td>
<td>2.52 mm</td>
</tr>
</tbody>
</table>

| Condition Means    | 3.09 mm             | 1.91 mm       |
produces the interaction effect with the SD-M group losing most weight over the entire six months.

**Skinfold Measurement Change.** Infrascapular and tricep skinfold measurements were taken at the beginning of the programme and again at the final six month session. ANOVA of change in each of these dependent variables yielded no significant differences. All F ratios were less than one with the exception of the environment x message interaction for the infrascapular measure ($F_{1,32} = 1.38, p < .10$). A repeated measures ANOVA also yielded no significant difference between groups on these variables (see Table 5). This complete lack of significant findings with the skinfold measures is particularly interesting in view of the relation between weight change and skinfold change. Six month weight change was significantly correlated with infrascapular skinfold change ($r = .50, p < .002$, and to tricep skinfold change ($r = .40, p < .01$). The correlation between change in the two skinfold measures was .67 ($p < .0001$).

**Analyses of other dependent variables.** ANOVA's were carried out on the other data which were collected at the two and six month sessions. Significant differences between sensory deprivation versus nonconfined subjects were found on the number of calories of exercise they claimed to average daily ($F_{1,32} = 4.54, p < .05$; SD mean = 271 vs. NC mean = 149). These two groups also differed in the percentage of time they reported they were trying to slow down their eating ($F_{1,32} = 8.13, p < .01$; SD mean = 69% vs. NC mean = 40%). These were the only significant results from the data collected at two months.

At six months, there was a surprising finding that those who had the messages reported significantly less attitude change toward eating ($M$ mean = 3.11) than those who did not have the messages ($M$ mean = 3.72) ($F_{1,32} = $
4.61, \( p < .05 \)). In addition there was a significant environment \( x \) message interaction on the amount the subjects reported feeling better about themselves (\( F_{1,32} = 6.93, p = < .01 \)). The extent to which the subject felt better about herself seemed to correspond with the amount of weight lost (SD-M mean = 3.56, SD-NM mean = 2.33, NC-M mean = 2.22, NC-NM mean = 3.22). These were the only statistically significant six month data aside from the weight data.

**Regressions involving weight change.** To further explore the factors which contribute to successful weight loss aside from the manipulated experimental variables, multiple regressions were performed with the initial demographic data and with the two month behavioural data as predictors of weight change. In the demographic regression, the predictor variables were age, years overweight, drinking pattern, anticipated difficulty, motive to please spouse, Rod and Frame Test, Self-Monitoring score, Autonomic Perception, initial weight, and number of children. Most of these predictor variables were selected because of their higher correlations with weight change at six months. A stepwise multiple regression of six month weight change on these variables produced only two significant predictor variables. These were the amount of anticipated difficulty with a standardized regression coefficient (beta coefficient) of .38 (\( p < .01 \), bivariate \( r \) between six month weight change and this predictor = .40) and motive to please spouse with a standardized regression coefficient of -.38 (\( p < .01 \), bivariate \( r = -.40 \)). Anticipated difficulty was a positive predictor, i.e., the more difficulty the subject expected in carrying out the diet the more weight she lost. Motive to please spouse was a negative predictor, i.e., the more important losing weight in order to
please her spouse was, the less weight the subject lost. This will be discussed more thoroughly in the Discussion section.

A second regression was done using the behaviour report data from the two month interview as predictors for six month weight change. The predictor variables were calorie plan being used, percentage of the sticking to diet, average daily calories of exercise, percentage of time the subject ate in one place, percentage of time she avoided other activities while eating, amount of reported help from others, percentage of time she used a smaller plate, and the percentage of time she tried to eat more slowly. Stepwise multiple regressions of (a) two month weight change and (b) six month weight change on these variables yielded almost identical results. The one significant predictor variable was the percentage of time the subject reported to be attempting to eat slowly. For the six month weight change the standardized regression coefficient was .46 \((p < .005, \text{bivariate } r = .46)\) and for the two month weight change it was .42 \((p < .01, \text{bivariate } r = .42)\). This result indicates that the more the subject reported being concerned with eating slowly the more weight she lost.

Unanalyzed data. Two other measures did not provide enough information to be adequately analyzed statistically. These were the estimate of time during sensory deprivation and the pre-treatment self monitoring of eating. The time estimate was included because of its possible value in predicting drop-outs from SD in a population which had been hypothesized to have a high level of stress in a low stimulus environment. While the early termination rate from sensory deprivation of 13% (3/23) is higher than the normal rate of 5% reported by Suedfeld (1976), the small number
of drop-outs make it difficult to analyze the differences in time estimation between those who left early and those who didn't. The available data are reduced even further since one drop-out left sensory deprivation after 45 minutes, before time estimation was measured. The mean error in estimation of those subjects who successfully completed the sensory deprivation session was .61 hour off the 1.75 hours of actual time. The errors in estimate for drop-outs were .75 and 1.75 hours (mean = 1.25 hours).

The data from self monitoring were both incomplete and poorly reported. While most subjects did hand in their forms after the first week, few handed in their monitoring forms for the final week. In the initial monitoring many subjects had not monitored for a complete week and some kept track for as little as one day. The most consistently reported data were the amount and type of food consumed, although the amount was often recorded quite vaguely. With these data an attempt was made to estimate the pre-diet daily calorie consumption. Even though this estimate was sometimes little more than a rough guess from the available information, it did demonstrate the unreliability of subject reported data. The mean reported calorie consumption was 1047 calories per day before the beginning of the diet. This was lower than the lowest calorie plan which was suggested for the subjects, i.e., a 1200 calorie diet. Due to the general inconsistencies in these data, no further analyses were performed.

Some of the other data from the six month interview were not analyzed due to their non-quantitative nature. These data were chiefly concerned with the subjects' final impressions of the programme and suggestions for its improvement. These data are reported and discussed in the next section.
DISCUSSION

The findings supported the prediction that 24 hours of sensory deprivation combined with therapeutic messages would enhance the effectiveness of a standard behavioral weight loss programme. The six month weight change results show the group receiving this treatment to have been clearly more successful than the other three groups. The average weight loss of this group was twice that of the next most successful group. Since each individual received identical treatment aside from this initial manipulation, it may be concluded that sensory deprivation combined with therapeutic messages can be a therapeutic facilitator in a programme of weight control.

These findings are actually more complex when the pattern of weight change among the other groups is considered. The six month follow-up showed neither an environmental nor a message effect on weight loss. Instead it was the interaction between these two variables that was significant. An understanding of this configuration can be gained by examining the pattern of loss over time. At two months those who had heard the therapeutic messages had lost more weight than those who had not heard them, regardless of environmental condition. This result attests to the effectiveness of the messages used which included health information, relaxation exercises and discussions of motivation, in addition to diet and exercise information. Many of the subjects who heard the messages commented favourably on the material and several requested transcripts of the tape. (For standardization purposes these requests were politely refused.) These positive reactions came from both groups who had heard the messages,
but more frequently from those in the nonconfined group. In fact several sensory deprivation subjects reported that they did not really remember the specific messages. The useful content of the messages combined with the favourable reactions toward them might account for a large part of the two month message effect.

The message effect, however, was no longer present at six months. This reduced effectiveness was probably due to the loss of impact as a result of gradually forgetting the message content. Most of the requests to hear the tape again and for copies of the tape were later in the programme; some subjects stated they needed a boost by hearing the tapes again.

An important factor in the poorer progress later in the study was infrequent contact with the experimenter. In fact, in the final interview, the most common suggestion for improving the programme was to have more frequent visits. In the latter portion of the study, follow-up sessions were one or two months apart and apparently this was not frequent enough. Having to report to be weighed provided a strong motivational factor for the majority of subjects regardless of treatment group, since most subjects lost more weight in the first two months than over the last four months. The weight change curve for the combined groups shows a leveling of the loss curve that resembles the usual retention curve in learning. However, there was an interesting between-group difference for weight change during this period. The significant main effect for environment at this time was due to continued weight loss at a slow rate among those who had sensory deprivation with or without messages, while the nonconfined
group either gained weight or remained the same. The sensory deprivation with message group continued to lose at the same rate up until the last two months when there was some slowing of the loss rate. The sensory deprivation group without messages did not really begin losing weight until after the two month follow up (See Figure 1).

The combination of messages which were more effective over the first two months with sensory deprivation which was more effective over the last four months makes the final six month results more understandable. The combined early effectiveness of the messages with the later effectiveness of sensory deprivation explains why the sensory deprivation with messages was the most effective treatment.

**Motivational Effects**

The finding that those who had sensory deprivation lost more weight during the last four months suggests that sensory deprivation may provide some sort of motivational boost or increase in resolve. In the group which had sensory deprivation without messages this was something of a "sleeper effect" in that they had lost very little weight during the first two months. Another finding which supports the idea of a motivational boost is the differential dropout rate between the groups. After the beginning of the actual diet programme, i.e., after the session containing instructions in the diet and exercise plan, there was only one dropout from the combined sensory deprivation groups and that one was in the no message treatment. The nonconfined groups had a total of six dropouts, three in each group. Not only did the sensory deprivation groups lose more weight in the last four months, but they had far fewer dropouts.
during the entire programme. This is strong evidence for a motivational effect of sensory deprivation.

There were also three subjects who terminated the sensory deprivation session early and were therefore forced to drop out of the programme. However, the reasons for dropping out of sensory deprivation are quite different from those for dropping out of an ongoing diet regimen. Subjects terminate the sensory deprivation session because they find it too boring or too upsetting to continue; subjects drop out of a diet programme chiefly because they are not losing weight and are discouraged. Nevertheless, even with these different motives, it is conceivable that the sensory deprivation experience served to screen out those who were poorly motivated and hence to reduce the later dropout rate.

The case of one subject speaks against this possible interpretation. The subject who terminated sensory deprivation after 45 minutes was extremely upset at the time and also anxious not to be excluded from the rest of the programme. In order to comfort her at the time, she was told she would not be excluded. She was, in fact, put through the rest of the six months receiving the same treatment as all other subjects. She completed the entire six months even though her weight loss was not large. While her data were not included in any group, she does provide evidence that the motives for remaining in sensory deprivation and for remaining in the diet programme may be quite different.

The fact that subjects dropped out of the programme because they were disappointed with their own progress has other implications for the results. The data of dropouts were excluded from all analyses except the initial analyses of demographic variables. Had it been possible to
include their weights at six months, the overall results would most probably have been quite different. The fact that dropouts lost less weight and the differential distribution of dropouts among the groups suggest that the results as they stand are on the conservative side. If the dropouts with their negligible weight loss could have been included in the final analyses, the other groups, especially the nonconfined groups, would have had significantly less weight losses than the sensory deprivation with message group which had no dropouts. This may account at least in part for the relative success of the nonconfined - no message group which had three subjects who dropped out of the study.

Comparison with other SD Studies

It is interesting to compare the procedure in this study with those used in the sensory deprivation smoking studies. In the Suedfeld and Ikard experiment (1974) the sensory deprivation and message variables were manipulated in the same way as in the present study. As mentioned previously, sensory deprivation treatments with and without messages were of comparable effectiveness. In the present study the sensory deprivation group without messages did very poorly relative to the group with messages. The most likely explanation for this difference lies in the different natures of the problems being dealt with. Smoking is an all or none type of problem while overeating is not. Obesity is a problem that is tied much more closely with the person's self image and perhaps requires more external influence to modify behavior than does smoking. For these reasons the messages may have been more influential in this study than in the smoking study. In the smoking study (Suedfeld and
Ikard, 1974), however, sensory deprivation was not working as an adjunct to some other treatment; it and the messages represented the entire treatment.

A more recent study by Suedfeld and Best (in preparation) examined sensory deprivation's role as a therapeutic facilitator in the treatment of the smoking problem. The combination of a sensory deprivation plus messages treatment with a self-monitoring plus satiation smoking treatment was much more effective than either treatment alone. In fact, the effectiveness of the two techniques appeared to be additive. This smoking study involving a combination of techniques, has more in common with the present study, which combined sensory deprivation with a weight plan (Stuart and Davis, 1972).

Comparison With Other Weight Reduction Studies

Another important comparison for this study is with other investigations of weight programmes. Unfortunately such a comparison is not without its problems. This study was designed to test whether sensory deprivation and messages aided an already tested weight plan. The treatment period consisted chiefly of one 24-hour sensory deprivation session with a one-hour instruction period afterwards. The five follow-up sessions over the next 24 weeks cannot, however, be said to be totally free of therapeutic effect. Not only was there some reiteration of points in the plan, but the contact itself and the necessity of weighing oneself have been shown to have therapeutic effects (Hagen, 1974). One problem therefore lies in distinguishing the actual length of treatment from the length of follow-up in the present study. While it is probably incorrect to say that treatment consisted only of the sensory deprivation and in-
struction, it is also wrong to say that treatment lasted for six months. Another method of assessing treatment length is the amount of contact with the experimenter. Measured in this way, treatment in this study consisted of six therapist sessions each of which was one hour long. The 24-hour sensory deprivation session involved no therapist contact.

In other obesity studies that used more than one or two subjects, the length of treatment varied between four weeks and eighteen weeks with follow-ups ranging from none at all to one year. Typically, contact with the experimenter was on a weekly basis throughout the treatment period. Generally treatment sessions were in groups rather than individually. For comparison purposes a summary of the results of other studies which used behaviour management techniques is presented in Table 6. This table is adapted from Leon (1976) and includes only studies with more than two subjects. The results of the present study have been translated into pounds for more direct comparison. For this table, treatment in the present study is considered the first two-month period and the follow-up is the six month data. This is a rather arbitrary distinction but, as mentioned above the definition of treatment length is difficult in this study. The sensory deprivation session and enough of the experimenter contact did occur during the first two months to warrant this delineation in the table.

An overall comparison of the results of the current study with the results of the other studies in Table 6 show the present procedure to be on a par with most of the others. The results at 2 months for the sensory deprivation with message treatment is comparable to eleven weeks of
<table>
<thead>
<tr>
<th>Study</th>
<th>No. of S's</th>
<th>Treatment Period (wks)</th>
<th>Weight Loss (lbs)</th>
<th>Follow-up Weight loss pretreatment-follow-up</th>
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<td></td>
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<td>Pre-treatment</td>
<td>End of treatment</td>
<td>Period</td>
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<td>Present Study</td>
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<td>8</td>
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<td>NC-M</td>
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<td>Stuart (1967)</td>
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<td>Stuart (1971)</td>
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<td>15</td>
<td>treatment: 15.0</td>
<td>3-6 mos.</td>
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<td>delayed treat: +5.0</td>
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<td>Harris (1969)</td>
<td>21</td>
<td>9-11</td>
<td>Aversive cond: 8.1</td>
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<td></td>
<td></td>
<td>Control</td>
<td>6.9</td>
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</tr>
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<tr>
<td>Wollersheim (1970)</td>
<td>79</td>
<td>12</td>
<td>Social Pressure: 5.4</td>
<td>2 mo.</td>
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<td>Nonspecific: 6.9</td>
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<td>Learning: 10.33</td>
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<td>Control: +2.39</td>
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<tr>
<td>Hagen (1974)</td>
<td>89</td>
<td>10</td>
<td>Contact: 11.94</td>
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<td>Manual &amp; Contact: 15.00</td>
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<td></td>
<td></td>
<td>Manual: 12.00</td>
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<td>Control: 1.80</td>
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<tr>
<td>Penick, Filion, Fox &amp; Stunkard (1971)</td>
<td>32</td>
<td>12</td>
<td>Behav. Mod: 53% &gt; 20 lb.</td>
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<td></td>
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<td>33% &gt; 30 lb.</td>
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<td>13% &gt; 40 lb.</td>
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Table 6 (cont'd)

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aversive conditioning (Harris, 1969), nine weeks of social reinforcement (Abrahms and Allen, 1974), six weeks of behaviour modification (Harmatz and Lapuc, 1968), or 12 weeks of a self-control treatment (Harris and Bruner, 1971), to name a few. The present study compares favorably with the others in the period between treatment and final follow-up. The majority of other treatments showed either maintenance of the weight lost or actual weight gain during the follow-up period. By contrast, both of our sensory deprivation groups lost weight during the follow-up period.

Overall, the present procedure appears no less effective than other techniques and considering the amount of therapist time involved is generally more cost-efficient. The next step for further investigations is to combine sensory deprivation and therapeutic messages with a regular weekly contact schedule. This treatment procedure is currently being studied with extremely encouraging initial results (Borrie, in progress).

Treatment of Methodological Problems

Additional comparative evaluation of the present study can be made regarding the handling of methodological problems common in obesity research. These problems were spelled out in detail in the first chapter. Direct comparison with specific studies will not be made here; instead an examination will be made of the manner in which the present study accounted for these problems and how successful this effort was.

One step taken to meet the objections raised about subject populations was the recruitment of subjects from a more general population than university students. This assured a wider age range and broader social background in the experimental sample. The age range was between 21 and
57 years. While no direct measure of social status was taken, the level of education ranged from grade 9 to postgraduate degrees. Other evidence in favour of this sample being very generalizable to the population of obese women is that a large proportion of the sample had previously tried such commercial weight programmes as Weight Watchers and TOPS. Also the degree of weight problems covered a broad range.

Complaints have been made against the poor reporting of individual data in the literature. The present study recorded a large amount of personal data, both demographic and personality, and these data were analyzed both in checking for group differences and to attempt to discover predictors of success. Not only were the experimental groups equivalent on these demographic and personality variables, but there were no differences between the subjects who remained in the programme and those who terminated early. More detailed reporting of the various individual data can be found in Appendix A.

Toward solving the problem of dropouts, steps were taken to lower attrition rates by requiring a 25 dollar deposit that would be returned at the completion of the programme. While this may have reduced the dropout rate somewhat, the fact that the deposit was to go to a worthy charity, the Canadian Heart Fund, made forfeiture less unpleasant. In fact several subjects preferred to donate their deposit even after successfully completing the programme.

Predictors of Weight Loss

The search for demographic and personality predictors of success yielded only three significant predictors - one motivational, one expecta-
tional, and one behavioural. The motivational predictor was the importance of pleasing one's spouse. The stronger this motive was, the less successful the subject was in the programme. The implication here is that when one is trying to lose weight for someone else, even a very close other, there is a poorer chance of succeeding. In order for the person to have the greatest likelihood of success in losing weight that person must want to do it for herself. This finding is paralleled by one case in the Suedfeld & Ikard (1973) smoking study in which one unsuccessful subject admitted that she really only joined the study in order to placate her family who wanted her to quit smoking.

The expectation variable that predicted weight loss was the amount of difficulty that the subject anticipated she would have in sticking to the programme. Those who felt it would be more difficult lost more weight than those who thought it would be easier. This finding implies that a realistic view of the hardship involved in losing weight is an important factor. Losing weight is hard work and at times disappointing, and an early realization of this fact helps one to deal with it. On the other hand, unreal expectations of an easy or "magical" solution lead to poor progress.

The final predictor was the behavioural self-report of how much effort the subject was making to slow down her eating. Those who reported eating slowly a greater percentage of the time lost greater amounts of weight than those who reported eating slowly less of the time. This was the only behavioural factor that did predict weight loss. This is also the behaviour step that is linked most closely with the actual ingestion of food. It is quite probable that more concern with this step is an
expression of increased awareness of the eating process. Since overeating is the major cause of overweight, increased attention to the actual performance of the act of eating is one very direct behavioral solution.

The fact that these particular variables were the only significant predictors of weight loss has some fortunate implications for the treatment of obesity. While these three predictors are quite different from one another, they do have the common feature of being changeable and trainable variables rather than permanent subject variables. One way to explain the advantage of these predictors for treatment is to consider possible alternative predictors. If, for instance, a demographic variable like number of children or a personality variable like field dependence had been the best predictor of success, then those not possessing the "right quality" on these factors would have a poor prognosis since there is little hope of changing that quality. But as it is, each of the variables found to be a good predictor is manipulable. This is because in each case the variable is related to attitudes that can be changed. Treatment of obesity can easily incorporate increased emphasis on the importance of expecting difficulty, of losing weight for yourself and not for others, and of eating slowly at all times. Considering this, it is probable that the emphasis on attitude change in the condition with sensory deprivation and messages contributed to its greater success. However, there were no significant intergroup differences on these three variables to support this hypothesis.

Data Collection

As mentioned earlier a larger amount and variety of individual data
were collected and reported. Moreover, crucial data such as weight were collected by the experimenter rather than relying on subject report. A great deal has been said against using absolute weight change as the sole criterion of success. For this reason, measurements of skinfolds were included in the present study. While there was some correlation between initial weight and skinfold measurements, as well as between weight change and skinfold change, there were no significant treatment effects on the skinfold variable. This result might be viewed as a statement against the effectiveness of the treatment; however, it is more probably a demonstration of the unreliability of skinfold measures. Even for a well trained and practiced individual, it is difficult to get the exact same readings with repeated measurements (Mayer, 1968; Grimes & Franzini, 1976). For this reason an average of three separate measurements at each site was used in this study.

A more critical problem is the fact that the correlations between weight change and skinfold changes were actually quite small. The highest, between weight change and infrascapular skinfold, was only .50 which leaves much room for variation. Actually many subjects showed weight change in one direction and skinfold change in the other, or weight change and no skinfold change, or vice versa. Many of the subjects showed differential change for the different skinfold sites. It seems then, that skinfold measurements may be much more influenced by such factors as type and quantity of exercise (Grimes & Franzini, 1976), and therefore are not especially reliable criteria for overall fat loss. It is probable that in the case of larger weight losses skinfold measures might be a more valuable criterion variable. It is also possible that by including a larger number
of skinfold sites reliability might have been increased. However, in this study the two sites reported to be most indicative of overall body fat were used (Tannen & Whitehouse, 1975).

**Subject reaction to the programme**

Another feature included in this study was a suggestion by Stuart (1973) to record subjects' responses to the programme itself. Each subject was asked whether she felt the programme had been successful, whether she felt better in general about herself, whether she felt healthier and what she felt the good and bad points of the programme were. Opinions of programme success, feeling better about oneself, and feeling healthier were all intercorrelated but more importantly they were each related to weight change. This was most pronounced with the feeling of the programme's success. Logically, the more weight the subject lost the more successful she felt the programme was.

The most frequent responses to the question concerning the programme's best aspects were: the book (28% of the subjects mentioned this), the diet itself (28%), and the exercise (33%). Although exercise was mentioned the most frequently many subjects also commented that it would have been good if they had been able to stick to it. It is also interesting to note that nine of the 11 who listed the book as the best feature had not heard the tape recorded messages. However only two subjects said the tape was one of the best aspects of the programme. Other often mentioned "best" features were regular checks (18%), becoming aware of eating habits (15%), and eating in one place (18%). The sensory deprivation session was mentioned as a "best" aspect by only three (15%) of the 20 subjects who
experienced it but another 15% reported that they did not know whether it had been beneficial or not.

On the other hand 20% of the sensory deprivation subjects listed sensory deprivation as the programme's worst aspect. The most frequently mentioned "worst" features were the infrequency of follow-up visits (28%) having to keep records (18%), and the inconvenient location of the programme (13%). With suggestions for improvement of the programme there was much more consensus. Twenty-six (66%) subjects suggested that more contact would be helpful and 11 (28%) thought that meeting in groups would be an improvement. The only other improvement mentioned by more than three subjects was to hear the taped messages again (15%). All six of these subjects were in the message only group. Three of the sensory deprivation subjects said they would have liked another session of sensory deprivation.

Several other improvement suggestions were made by only one or two subjects but seem worth mentioning because of their potential usefulness to other programmes. It was suggested that the book did not provide enough specific exercise material and that more direction should be given in exercise with the possible inclusion of group exercise sessions. One subject suggested that it would be of benefit both to the individual and to the programme if participants had the option to volunteer time to work for the programme. Assistance provided in this way might be a good way to meet some of the other suggestions, such as: more literature available, more contact with families to gain their support, and a longer programme in general.
Treatment Format

The third major area of methodological objections is that of the actual treatment format. The steps taken in this study to meet these problems were to use a standard diet form, to use standardized interview and follow-up procedures, and to follow subjects for at least six months. The standard diet and exercise plan used was that in the booklet *Slim Chance in a Fat World* (Stuart and Davis, 1972) which had the advantage of being a tested, commercially available product. Standardized handling of subjects was achieved by using prepared data collection forms which required specific interview questions. Differences in experimenter-subject contact occurred only when subjects asked questions about specific personal problems. Response to these questions was made as standard as possible by using the text and the taped message content as guidelines. Nevertheless it cannot be said that each subject received precisely the same treatment word for word. It is doubtful though that such minor discrepancies in subject handling would have had any noticeable effect on the overall results. This is so especially since there is no reason to suspect any systematic between-group differences in treatment.

Relevant to this last point is an issue which remained a problem in this study as well. Throughout the study subjects were seen by only one experimenter who knew the relevant hypotheses and predictions of the study. During the running of the study, however, the experimenter was concerned only with the welfare and progress of each subject as an individual and tried as much as possible to ignore treatment group distinctions. This was made easier by the fact that there was no group pattern to the sche-
duling of interviews and follow-ups. In most respects, then, the methodological problems seem to have been handled satisfactorily in this study.

Relevance to theories of obesity

One important consideration yet to be discussed is how the present findings reflect on relevant theories of obesity. While not designed specifically to test any particular theory of obesity, the study did include data relevant to Schachter's suggestions of internal-external orientation differences in the obese and nonobese. All subjects were tested on a battery of measures related to this difference in orientation. Most of these measures were not related to the subjects' initial weight, though there were exceptions. Heavier subjects did exhibit higher externality scores on the Locus of Control test. This was true only for the total Locus of Control score and not for the individual subscales, which suggests that perhaps externality in overweight individuals is a very general factor. If this is so, it may be that the other measures of externality were too specific in content to tap the internal-external dimension adequately. On the other hand, the correlation between Locus of Control and initial weight, although statistically significant, was only large enough to describe a slight tendency. It is also interesting that this particular measure has failed to discriminate weight groups in other studies (Gormanous and Lowe, 1975).

Another measure related to initial weight was the Autonomic Perception score. More awareness of autonomic activity was reported by heavier subjects. This is exactly the opposite to what Schachter's hypothesis would predict, which is that the heavier subject should exhibit less
awareness of internal cues. This particular measure, being a subjective self-report scale, may actually be measuring concern about body function rather than awareness of internal activity. McFarland (1975) found this measure to be a poor predictor of a subject's ability to perceive his own actual heart activity. Interpreted as a measure of internal concern, the present finding provides some support for the mislabeled emotion hypothesis. Overweight persons are more focused on internal functions but are not able to clearly perceive and differentiate those functions.

One of the major reasons for including the various measures of externality was to test the possibility that some aspect of internal-external differences could predict individual success in a programme based largely on manipulating external cues. The key to the Stuart and Davis (1972) plan is to control one's environment in order to encourage desirable behaviors and discourage undesirable ones. There was wide variation on subjects' scores for all of the measures; however, none of the measures proved to be at all related to success. As mentioned earlier, the absence of a personality variable that predicts success in losing weight is expedient for the treatment of obesity, but could be deleterious to an obesity theory based on personality differences.

Even if consistent differences exist between obese and normal weight persons in orientation measures (a hypothesis not tested in this study), the usefulness of such differences is lessened if they cannot be used to predict success in weight loss attempts. It is true that Rodin and Slochower (1976) used externality measures successfully to predict weight gain in children who were living in a novel environment. However, these
researchers also found that those who lost weight in the same situation scored higher externality than those whose weight remained constant. Although Rodin and Slochower (1976) used externality measures which differed from those used in the present study, the difference between their successful prediction and the present lack of success at prediction is probably better explained by the change of environment. Their subjects were in a situation entirely different from the home setting, while the subjects in this study (and in most other treatment studies) carried out the programme in their normal everyday environment. The former situation had no habit patterns linked to eating cues in the setting except food itself, whereas the latter situation has a well established set of eating habits tied firmly to the stimulus patterns of a familiar environment.

It may be that externality does play a part in establishing habits in a novel situation, but it did not predict success in weight loss attempts in a familiar environment. At least this is true with the measures of externality used in this study. In a familiar situation an important factor would be the ease with which one can extinguish existing habits and learn new ones. Perhaps a measure of this would make a better predictor of success than measures of externality. Singh (1973) has suggested that overeating can be better understood as an inability to inhibit a well learned response than a difference in external orientation. While not specifically testing ease of extinction, Singh did find that obese subjects were less able than normal weight subjects to suppress response tendencies when situational demands were changed. This inability to suppress an ongoing response would seem to be related to ease of extinction and relearning.
A measure of this relearning would be easy to establish; the subject could overlearn some simple response and then go through extinction of that response with the simultaneous learning of an alternative response. The number of trials to extinction as well as trials to learning the new response might then provide valuable information on the subject's prognosis in this sort of programme.

**Individual Differences**

Recently Leon & Roth (1977) after a thorough review of the theoretical issues in obesity has concluded that the "search for a unitary explanation of obesity does not, at present, appear to be a fruitful avenue of exploration, and the evidence strongly suggests that obesity is not a unitary syndrome" (1977, p. 138). The search for individual differences that can explain obesity and predict success of treatment has largely been disappointing. Leon & Roth (1977) concluded that few personality characteristics common to obese persons can be considered causative factors. Even a variable such as initial weight which consistently has been found to be positively correlated with weight loss (Murray, 1975), was not a significant factor in the present study. For a measure to be a good predictor of treatment success it should be specific as to the manner of the treatment for which it is predictive (Jeffrey, 1972; Leon, 1976). Since the most successful behavioural methods of dealing with obesity are those that require a relearning of eating habits (Leon, 1976), a measure of the ability to unlearn and relearn a response would be relevant information. However, it would not be by any means complete. Eating habits are not solitary isolated behaviours; they are interwoven into every aspect of the person's life. For the obese in particular, food habits may have a
uniquely central importance in life. The specific pattern of eating
habits and their interrelatedness to other habits and cues in the per-
son's life should be the main concern of the behavioural programme.
This constellation of interrelated habits is where the important indivi-
dual differences lie. It is also where the key to successful treatment
of weight problems lies.

This study, while paying attention to a large quantity of personal
data that were analyzed or reported in Appendix A, did not incorporate
these data into the treatment programme for the individual subject. A
truly success-oriented treatment would have to do this; however, the re-
strictions imposed by research considerations make this a rare inclusion
in weight studies. Keeping this in mind, the present study was not in-
tended to be a "best" treatment method. It was rather a test of sensory
deprivation as a therapeutic facilitator in a minimal-contact weight pro-
gramme. The findings offer strong evidence that sensory deprivation with
messages increases programme effectiveness. Even without messages, sen-
sory deprivation appeared to provide some long-term effects to the sub-
jects' motivation.

It is important to keep in mind the relation of sensory deprivation
to the rest of the procedure. The actual exposure to sensory deprivation
was a single 24-hour period prior to being instructed in the actual diet
programme to be used. The following six months of follow-up were basical-
ly data collecting times, although if the subject brought up specific
problems they were discussed. Hence, the follow-up sessions did include
some further instruction which consisted of reiterating points contained
in the programme already outlined. However contact over six months was minimal and, as mentioned earlier, seen as inadequate by most subjects. Thus the role of sensory deprivation was designed to be an adjunct to a complete weight control programme.

Part of the explanation for the increased effectiveness of the sensory deprivation treatment may lie in the way individual differences, so troublesome in a standardized programme, affect the sensory deprivation experience. It has been well documented (e.g., Jones, 1969) that in a situation where external stimulation has been removed, the individual seeks to raise his level of input. With no ready means to increase external stimulation, the individual in sensory deprivation turns to internal stimulation—his own thoughts, fantasies, reveries, dreams, etc.—to achieve a more desirable input level. This experience of increased attention to internal stimuli will be a completely unique individual one, different from that of any other person (see Suedfeld and Borrie, in press). Thus, sensory deprivation, by forcing the individual to focus attention on himself and to closely examine his thoughts and feelings, provides a flexible treatment that accommodates individual differences not only in personality but also in habit patterns and interrelationships.

Since individual reactions to sensory deprivation have been listed in Appendix A, a detailed accounting will not be made here. However, the therapeutic power of this experience is exemplified by case #SDNM-9. This woman reported that during sensory deprivation she felt extremely dependent upon the monitor who was outside the chamber. She did not like to feel this dependent, and the unpleasantness of the feeling helped her to realize that in most aspects of her life she was a very dependent
person who rarely relied solely on her own decision about anything. She also found she never did anything that was only for her own benefit. Other persons were always the motivating forces behind her actions. She reported that her experience in sensory deprivation had made her initially aware of this and she was gradually taking steps to resolve the problem and become master of her own life. Incidentally she felt this result was of greater personal significance than her progress in the weight programme. Similar positive side-effects of sensory deprivation have been reported by Suedfeld and Best (1977) in a recent smoking study.

Conclusion

In conclusion, this study has demonstrated that sensory deprivation can act as a therapeutic facilitator especially when combined with therapeutic communications. Subjects who received this combined 24-hour treatment were better able to carry out a standard behavioural programme of weight reduction than those who had only portions or none of this combination. In addition, this treatment seemed to provide a motivational boost as evidenced by continued weight loss and lower dropout rate. The reasons for the effectiveness of this combined treatment are less clear. The individual nature of the sensory deprivation experience allows for several simultaneous explanations. Among these explanations are that sensory deprivation promotes introspection, allows one to reflect on current problems, helps the individual increase his awareness of internal cues, serves as a specific starting point for the programme, and/or provides a preliminary test of the individual's motivation. With each individual any, all or none of these may be part of the sensory deprivation experience.
Further, the findings of this study support the hypothesis that therapeutic communication is made more effective when it is heard in sensory deprivation. It is important to note that this finding is different from the previous smoking studies where therapeutic messages had little effect on the final outcome of the treatment. This difference can be attributed to 1) the differences in the problems being treated and 2) the differences in message length and content.

Finally, the implications for future studies deriving from this study are twofold. In the area of the treatment of overweight individuals, the findings suggest that sensory deprivation can be a valuable adjunct to therapy, especially when combined with a more powerful individually oriented weight-loss programme. In the area of sensory deprivation research, this study suggests that sensory deprivation as a therapy technique needs to be explored further and applied to a wider variety of problems. Also, more attention should be paid to the variables of subjective experience that occur in sensory deprivation. Greater knowledge of this factor may suggest new areas to which the method might be applied.
To create groups of equal size for the MANOVA's and ANOVA's, subjects SDM-2, SDM-5, and SDNC-5 were randomly selected to be omitted from these analyses. Since subject SDNC-5 did very well in the programme, a second set of analyses was performed omitting a different subject from the SD-NC group. The results from these analyses differed very little from the first analyses and did not change which effects were statistically significant. The results reported are those of the first analyses with the original randomly selected subjects omitted.
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APPENDIX A
Subject SDM-1 was a 37 year old married woman with a 13 year old child, who worked managing the apartment building in which she also resided. Her starting weight was 92.4 Kg at 158 cm and her desired weight was 61 Kg. She began to gain weight after the birth of her child and attributed this gain to not enough activity and eating too much of the wrong foods. She had previously tried an all steak diet when she lost 9 pounds in 9 days and Weight Watchers when she lost 20 pounds in six weeks. Her reason for joining the study was that she felt she had tried everything else and now needed a real change in living style to conquer her weight problem.

After SD she had very few comments on the experience except that it was hot and stuffy. In the first week after SD she lost 1.3 Kg. At one month she said she felt very determined and volunteered that she "used to think that psychology was a lost of bunk" but because of the ease with which she was losing weight she no longer thought that. At two months when asked if SD had helped in her progress she said, "Yes, 100%". She had become so conscientious that she felt that things must have been said while she slept in SD. In fact she felt that it was so effective that she "must have been brainwashed". While she felt the messages had helped she felt that having heard them in SD made the biggest impression.

At six months she had lost 8.6 Kg and still was very determined. Her attitude toward eating had changed in that she was thinking about everything she ate. The most difficult obstacle to her progress was her husband who saw nothing wrong with the way she was and therefore never gave her assistance. Therefore she felt it was entirely up to her and this was rewarding when she made progress. She said at the end of the programme that she had learned to be patient with herself and not become disgusted with lapses because she intends to be on the diet for the rest of her life.
Subject SDM-2 was a 55 year old married woman who was employed part time as a clerk. She began the programme at 76.4 Kg at 152 cm. Her desired weight was 59 Kg. She began gaining weight after the birth of the last of her three children, aged 32, 31, and 25. However she did not feel that she overate and claimed to be quite active. She joined the study partly because she was curious about the "new experience". After eight hours in SD she spoke to the monitor over the intercom and expressed doubts about the usefulness of the experience. The monitor gave her reassurance and she completed the 24 hours although she complained of the chamber's stuffiness.

One week after SD she suggested that the SD experience had strengthened her resolve. She had lost 1.4 Kg, had quit drinking and was eating much slower. At two months although she had lost only another .4 Kg, she still felt SD had helped. The thought of that experience made her feel she could accomplish the things she set out to do. The 24 hours of SD had been quite an accomplishment. The message that had made the most impression on her was that she was responsible to herself.

At four months this subject wanted to quit the programme. She had gained .8 Kg and felt very discouraged and embarrassed. Rather than call, she sent a letter expressing her desire to quit. She was telephoned and told of the importance of her staying in the programme even if she gained weight. She remained in the programme and returned at the six month follow up when she had gained another 1.6 Kg.

She felt her largest problems were motivational. She spent alot of time alone and found this to be when she ate, and this was largely out of habit rather than boredom. At the end of the programme she still felt that SD had boosted her motivation but that it hadn't lasted and that perhaps a repeat session would help. While she claimed to normally be "quite a strong person" the inability to lose weight was bothersome. Still she realized that she alone was the only one who could do it.
Subject SDM-3 was a 24 year old first year university student. She was single and weighed 75.3 Kg at 168.5 cm. Her desired weight was 59 Kg. She had been overweight since the age of ten and could not really say what the cause of her overweight was although she did confess that she probably ate too much. She also consumed alcoholic beverages fairly regularly in social situations and smoked one pack of cigarettes a day. Her only stated motivation for joining the study was to lose weight. During SD she had several dreams about being in the chamber and things happening to her there. The following day outside the chamber she said she felt very disoriented and antisocial.

At one week she had lost 2.5 Kg but at the next one month session had gained back 2 of those Kg. This was due to much eating and drinking over the Christmas holidays. She returned to the plan with the usual New Year's resolve. At two months she claimed she was "gung ho" again and was down to 71.7 Kg as proof. She still vividly recalled the SD experience, particularly the dreams she had there. In one of these dreams the light went on and some lady was standing there telling her she couldn't go to the bathroom. In another dream the light was on again and she was looking at herself in a mirror. She felt that SD had made the messages hit harder.

At the end of the six months her weight was back up to 73.5 Kg and she attributed this to not following the plan. The programme had made her much more aware of her eating habits, of healthy foods and of the importance of exercise. She felt she had very little self control and needed someone standing over her "with a whip" to keep her in line. She did become aware of the fact that she eats most when she is depressed and that she looks for excuses to be able to drink or eat. She no longer felt it was possible to reach her initial goal weight and had lowered her expectations.
Subject SDM-4 was a 53 year old housewife with two children aged 32 and 27. Her initial weight was 113.75 Kg at 165.5 cm. Her goal weight was 68 Kg. Her weight gain began six months after getting married at age 19. She explained that she ate at this time because she was so happy. However several times she volunteered that she felt she may have gained weight in order to become less attractive to some of her husband's friends who were making advances. She joined the study because she wanted to lose weight in a healthy way but felt she needed some guidance and someone who cared about her problem. Although she felt SD was too stuffy she did do a lot of thinking. The darkness made her think about her blind father. She also composed many letters to her friends. In one of her dreams someone came and took her out of the chamber and led her to a banquet in her honour. She sat at the head of the table because she was doing so well on the programme. Even though everyone was eating a big meal and drinking wine she had only juice after which she returned to the chamber. On recalling the SD experience she complained about the disinfectant smell and also claimed she was getting quite confused in the last few hours.

At one week she had lost 2.6 Kg but complained that her husband was not being very cooperative. Following this she was ill for 2 weeks and her doctor took her off all protein. She did not lose weight during this period.

At two months she did not feel that SD had helped; in fact since SD she had not been able to sleep well and she blamed this on the SD experience. She did feel however that the messages had definitely helped her and they came back to her. At this point she was down to 107.0 Kg. At four months she had lost another 2 Kg and said that she had started a contest with a friend so that the first one to get to 160 lbs would get a ring worth $100.

At six months she had not lost further weight. This was attributed to the fact that she had been away to Israel and had gained 2 Kg which she had
since lost and that she had been in the hospital for two weeks where she couldn't stay on her diet. She felt that because she had been sick and in the hospital several times during the programme that she hadn't lost the weight that she wanted to. However she felt that the programme had prevented her from gaining during that time and had made her much more able to cope with problems without using food. She was still very determined at the end of the programme and was planning to continue its use.
Subject SDM-5 was 49 years old, single, and was not employed at any occupation. She weighed 86.7 kg at 161 cm. She had a grade 12 education and had been overweight since age 16. Her goal weight was 61 Kg. Her perceived cause of overweight was loneliness; she overate to fight boredom. She had previously been somewhat successful on Weight Watchers diet but had stopped six months earlier. She joined this study because her doctor had ordered her to get her weight down. She did not particularly like SD and was bothered by the heat which caused a headache. Also she was not able to get relaxed with the relaxation messages and complained she was too uncomfortable to take much in.

One week after SD her weight was down to 86.5 Kg. She was quite pleased with the Stuart and Davis plan and was able to stick with 1200 calories, though she did not get much exercise. By two months she had read through the book four times plus references to specific parts. By this time her weight was 84.7 Kg.

At six months she was quite pleased with her progress. Her weight was 81.5 Kg and her blood pressure had gone down. The book, she explained, provided her with a sense of communality of the problem; she wasn't the only one fighting it. Her major problems were fits of depression which led her to eat. The programme had made her more aware of her own feelings of inferiority but also of the fact that nobody could solve this problem but herself.
Subject SDM-6 was a 44 year old housewife with five children aged 21, 19, 18, 16, and 6. Her height was 172 cm. and her initial weight was 110.25 Kg. Her overweight began at age 30 and the only reason she could give for this was that she is constantly nibbling. She joined this study because she was "tired of being fat". Her goal was 77 Kg. She was very restless during SD and was pleased when the 24 hours was up. She complained about nightmares about the assassination of Gandhi. This is of interest in that Gandhi's hunger strikes were used as an example in one of the messages.

Throughout the entire six months her weight varied very little. She was interested in more social contact about her problem and joined a TOPS club and got some sort of contest going with them. At two months she recalled SD as a "terribly interesting" experience. She did not feel it had helped her weight but that it had helped her to understand herself.

At six months she weighed 111.3 and attributed her lack of success to her own laziness. Losing weight was just not important enough. She was very busy with her family and was not able to concentrate the extra energy to sticking to the diet. She saw the major problem of the programme as her own lack of self discipline. She felt that unless she got her head straight she would never get to her goal weight of 170 lbs.
Subject SDM-7 was a single 23 year old woman who worked with mentally retarded individuals. She began the programme at a weight of 102.85 Kg and height of 163 cm.; her goal weight was 57 Kg. She had been overweight since the age of 15 and saw the cause of her overweight as being insecure. When she began this programme she had already been working at losing weight with a regimen of diet and exercise. She lived in a house with a number of other people and it was actually one of her girlfriends who originally signed her up for the programme.

She did not like the SD session and claimed to become "terribly bored" after the first set of messages. At one point she woke up and felt extremely disoriented and seriously considered terminating the session. She had forgotten where she was. She was motivated right from the beginning and enthusiastically took to the diet plan; she was already carrying out a regular exercise plan. At the one week follow up her weight was down to 98.9 Kg. Evaluating the SD session after two months, she felt that the session had made her more aware of things but hadn't really reached her "subconscious". She was especially impressed by the message about protecting her body and would think about it when she felt like cheating. Although she had been down to 96.5 at one month, at two months her weight was back to 98.5. She was quite depressed by this since she had a wager with one of her housemates that she would lose 50 lb over a particular period.

At four months her weight was still at 98.5. She explained that she had been eating junk food as a result of depression. The underlying reason was that she was one month pregnant and was about to have the pregnancy terminated.
At the final six month session her weight was down to 92.8 Kg. She said she especially liked the logical, intellectual quality of the programme but felt that it had not really caught on with her until the last two months. She felt that she had gained control over her desire to eat while still realizing she great pleasure she derives from food. She liked the infrequency of the follow-ups especially because she hates to be told what to do. She planned to continue the plan and felt it was possible to reach her goal weight.
Subject SDM-8 was a 43-year-old housewife with three children the youngest being 10 years old. She also worked part-time as a stenographer. Overweight since the age of 12 she felt that the major cause of her overweight was that she was a compulsive eater. She began the programme at 77.7 Kg and gave her desired weight as 57 Kg. Her height was 152 cm. The foods which were the biggest problem were crackers, cheese, and wine rather than sweets. She had been on Weight Watchers diet one year previously and had lost 16 pounds. She joined this programme because she felt a need to have someone to report to.

She had no problems with the SD session, in fact she reported that it was pleasant and she enjoyed it as a very restful experience. At one week her weight was 75.7 and she seemed quite pleased with her progress on 1200 calories.

At 2 months she was down to 73.0 Kg. Her daughters had been quite supportive of her diet plan and she was getting daily light exercise. She was very pleased with the book and found it to provide a lot of motivation.

At the final six month session, she was again to 73.7 Kg even though she had been down to 71.9 Kg at 4 months. She attributed the loss at 4 months to having been away in Mexico and not being able to eat the food there. The gain in the last two months was due to not spending enough time on herself. She had been worried about problems with her family and this led her to eat. This failure at the end of the programme made her feel like a terrible procrastinator. She felt the programme was very sensible but that she had done poorly because she didn't take enough time for herself.
Subject SDM-9 was a 43 year old housewife with four children between 11 and 23 years old. She began the programme weighing 72.5 Kg at 164 cm tall. Her goal weight was 60 Kg. Her only expressed motive for joining the programme was to lose weight which had been a problem since her first child was born.

She found the first few hours of SD very frustrating and had difficulty concentrating on the content of the messages once they were over. Her comment on the messages was that they all seemed very sensible.

Her weight was down to 71.8 Kg after one week on 1200 calories. She reported that the night following SD everything from the messages she had heard kept returning to her all night long.

At one month she was quite disappointed with the small weight loss she had had. In spite of a vigorous exercise programme, averaging 400 calories a day her weight was 71.6 Kg.

At two months her weight was back up to 72.3 Kg. She had not been keeping regular track of her diet and had slowed down in her exercise because she had begun taking accounting courses.

After this she cut her diet down between 800 and 900 calories and concentrated on vegetables and meats in essentially a low carbohydrate diet. At four months she was down to 68.5 Kg. Her final weight at six months was 67.4 Kg. She felt the most important part of the programme had been the exercise although she knew she should have done more. Her time in SD did not impress her and she didn't think it helped. She also felt that learning about proper habits was very important.
Subject SDM-10 was a 42 year old mother of four children between the ages of 10 and 22 years. She was separated from her husband and currently enrolled as a full time university student. She joined the programme weighing 73.5 Kg at 154 cm tall and her goal was 55 Kg. Her overweight problem began after her second child around the age of 25. She enjoys eating but feels she uses it as a comfort.

She claimed to have spent most of her 24 hours of SD sleeping. In line with this she fell asleep during the relaxation message. After one week her weight had changed little (73.9 Kg) however at one month it was down to 69.3 Kg. She had not really started the programme when she was supposed to but had delayed a couple of weeks.

At two months she was back up to 71.0 and attributed this gain to a 2 week splurge at Christmas during which time she ate quite a bit and stopped exercising. Ice cream was a particular problem with her. At this time when asked to recall the SD experience she said that it must have helped because it had been easier for her to diet this time than it ever had before. This was the longest she had ever been on a diet. She could no longer recall the messages. After Christmas she had no trouble getting back on the diet.

At four months she was down to 66.0 Kg and was quite pleased with her progress. She felt better and had more energy and a more positive outlook. At six months she weighed 67.4 Kg but was not particularly discouraged by the gain which she attributed to some personal problems and to having final examinations. Her biggest problems with the plan had been that she runs a very unstructured household and therefore had difficulty planning her schedule. She found the intellectual and personal aspects of the programme appealing and still could not say for sure that SD had helped her motivation.
Subject SDM-11 was a 54 year old married woman with five children between 18 and 32 years old. She was working three days a week as a secretary. Overweight became a problem at the age of 35 when the stress of raising children led her to eat. At that time she would overeat when she felt tired. Overeating however was not a problem at this time. She began the programme weighing 82.75 Kg at 169 cm tall with a goal weight of 64 Kg.

At the beginning of the SD session she got panicky and tried yoga breathing techniques. This evidently worked for during the relaxation message she fell asleep. Overall, she said she enjoyed the experience but wouldn't want to repeat it.

At one week she had lost one kilogram and was quite pleased with the programme. She remained consistently on 1500 calories with a minimum of exercise. At two months her weight was 77 Kg. She explained that every time she was about to waiver from the diet she would recall the SD session and think "what was the sense of going through that if I'm going to eat this". She felt that she was adopting a healthier attitude toward food.

At four months she weighed 73.5 Kg and at six months was down to 73 Kg. She was still very determined and now convinced that it was something that she must do for herself since others can't be depended upon to help. Her attitude toward food and health had changed so that now if she went "overboard" it was more likely to be on bananas than on chocolate. The reason for her poorer progress in the last two months was that she felt she had been sabotaged by her husband who on one occasion brought home four huge chocolate bars for her. Her daughter, who had been quite supportive, thought that her husband did not really want her to lose weight. All of this emphasized the fact that she must do it on her own. When asked if she thought reaching her goal weight was possible she said "I think so - I'm going to".
Subject SDNM-1 was a 41 year old housewife with four children between 21 and 10 years old. She weighed 87.6 Kg at 159 cm and had a goal weight of 61 Kg. She first began to gain weight at the age of 21 around the time of her first two children's births and gained again after the birth of her last child. She ate when she was nervous or upset and was getting desperate about getting the weight off. She smoked a little more than a package a day and was a social drinker.

Sensory deprivation was fairly uneventful for her. She commented that once she had a craving for a cigarette and also that she had had a dream about being on a diet. During the first month she did quite well dropping down to 84.6 Kg. Shortly after this however, came the Christmas holidays when she "dropped everything". At two months her weight was back up to 87.1 Kg. She did comment however that everytime she ate she thought of the dark room.

Over the next two months her whole family went on a diet which added a lot of support. At four months her weight was back down to 84.4 Kg. At the final six month follow-up her weight was 86.0 Kg. She felt she had learned how to eat but not really what to eat and thought that a more rigid diet would be better for her. Her biggest problem on the programme was "keeping her mouth shut". She felt very positively about SD and expressed a desire to repeat it.
Subject SDNM-2 was a 39 year old married woman who worked in the office of a family run business. She had three children between 19 and 12 years old. Her weight was 118.5 Kg at a height of 161 cm. Her goal weight was 70 Kg.

She had been overweight since the age of 16 and felt that the reason for this onset was that she became somewhat hypoglycemic at that age. Her most immediate concern for getting her weight off was with problems in her ankles caused by having to support such excess weight.

She went through SD without a problem except for an overriding concern for her purse which had been left outside the chamber. She also thought about why she couldn't lose weight and about her 12 year old child at home. At the one week follow up her weight was down to 117.7 Kg.

In general sessions with this subject were longer than usual as she would talk about her many problems with her family and particularly with her oldest son who would get into numerous financial problems. She seemed to find some pleasure in going on about how miserable her life was. At one month her weight was up to 119.25 Kg. She explained that she was "retaining fluids" and had been sticking perfectly to the diet. She was planning to go to California for an extensive testing of hypoglycemia.

The next time she was seen was at three months when her weight was 123.5 Kg. She reported having been faithfully on 1200 calories but that something was haywire in her body. Her tests for hypoglycemia had been positive and she had been given a special list of foods that she should eat.

At four months her weight was up to 126.3 Kg. She reported that she was still on the diet and that she was using the urine test for ketosis. Her tests showed that she was in ketosis and should thus be burning fat.
At the final six month session she related that she had been given pills to release fluid. Her weight at this time was back down to 121.4 Kg. She felt that this was good but that she should have been losing all along. However she was not worried about it since she knew that there was something physically wrong that was causing her to retain fluid. She nevertheless felt she had learned about good eating habits and had been fairly successful. She expressed some frustration that the doctors could not seem to discover what her problem was. She felt the SD session was of no benefit to her and that all she did was worry about her purse.
Subject SDNM-3 was a 48 year old housewife with four children between the ages 23 and 7. Her weight was 98.5 Kg and height was 162 cm. She had been overweight since the age of eight and saw the cause of her overweight as two much food. She felt she did not overeat but that she needed very little food. Her goal weight was 61 Kg.

She found SD very tedious and was not able to relax completely. At 23-1/2 hours she wanted to leave but was persuaded to stay because of the short time left. Most of her time in SD was spent listening to her bodily processes and playing "games with the light in my mind". For several days after SD she was disturbed with problems getting to sleep and with poor digestion.

At one week her weight was down to 97 Kg and she was quite pleased with the diet regimen. After that she quit smoking and did not stay on the diet as well. Her one month weight was 96.7 Kg.

Her weight at three months was 92.7 Kg, a loss that she attributed to having been away in Mexico for several weeks around Christmas. She had difficulty eating Mexican food and was sometimes ill with "Montezuma's revenge". Her reflections on the SD experience were that it served as a focal point; it was a break to cleanse the system and break old habits. Also when she thought of the ordeal she felt "if you can do that you can do anything".

At four months her weight was up to 94.3 Kg but she felt that "in spite of everything the programme is working". She was upset with family problems and thought that normally she would have gained much more. At the final six month follow up her weight was much the same at 94.9 Kg but she felt the programme had been successful since she normally gains 5 pounds a year. At
this point she felt that SD had been pretty devastating. Having to take a long hard look at herself had made her depressed. She claimed that since SD she had felt entombed and attributed this to the isolation of SD, feeling buried for that time. She also was concerned that medical and psychiatric factors could have been stressed more. She felt that in order to reach her goal weight she would need medical help.
Subject SDNM-4 was a married woman, 43 years old, with six children between the ages of 8 and 21 years. She was employed as an Industrial Relations Officer. Her starting weight was 83.5 Kg at 161.6 cm. She had gained weight after her first child but said she didn't really know why. Her major motive for losing weight was to appear slimmer. She was very determined and thought she would have no difficulty in reaching her goal of 68 Kg.

Sensory deprivation was uneventful except for some interesting dreams. In one she had left the chamber and kept trying unsuccessfully to get back in. A more alarming dream was that the programme was being run by someone who hated fat women and was gassing them in the chamber.

At one week her weight was down to 82 Kg, but at one month it was back up to 84 Kg. She had gone on an eating binge that lasted a week. At two months she had gained again and was now 85.2 Kg. She had recently found that she was hypoglycemic and was going on a special diet plan for that.

A month after that she wrote to say that she was discontinuing the programme and going back to Weight Watchers where she had experienced prior success. She stated that she needed the weekly weigh-in and the constant reminder to keep on the track. On the phone it was explained to her that the programme was research and that her data were important.

At the final six month meeting her weight was 84.2 Kg. She felt the programme was not successful but that it might have been had she followed it. She found the details of the diet regimen bothersome and too time consuming. She was puzzled as to why she couldn't get serious about losing weight. Her final comment was that she wondered what the 24 hours of SD was for.
Subject SDNM-5 was a 51 year old housewife with one child 29 years old. Her weight was 79.3 Kg at 166 cm tall and her goal weight was 64 Kg. She felt that her overweight which began at age 30 was due to excessive eating and drinking, particularly between meal eating. Her drinking consisted of one or two cocktails regularly before dinner. Two weeks prior to joining the programme she had begun a diet of her own cutting down on sugars and starches and had lost six pounds. She was also walking every other day. Her major motive for joining the programme was to avoid becoming a "middle aged frump".

She found the bed in SD too hard and therefore described her experience as uncomfortable and she reported having unusual dreams such as one about a hurricane. The week following SD her weight was down to 78.4 Kg and at one month she was down to 77.1 Kg when she reported that she was trying to get into habits that would last her the rest of her life.

At the two month follow up after Christmas she had gained slightly (77.5 Kg) but reported that she was stepping up her exercise programme by going to exercise classes. Her husband had recently joined her on the plan and this was good for her motivation. This seemed to help her since at the four month session she was down to 75.0 Kg.

The final six month follow up was quite surprising in that her weight was back up to 79.5 Kg. She reported that she had been constantly picking at food and had difficulty leaving liquor alone. She felt she needed more regular check ups in order to keep on the plan. Otherwise she was pleased with the programme but quite disgusted with herself.
Subject SDNM-6 was a 33 year old married woman with four children between the ages six and 13. She was employed as a keypunch operator. She weighed 69.4 Kg at 156 cm and had a goal weight of 54 Kg. She had been overweight for 10 years seeing the cause as "babies and surgeries". Three months prior to joining the programme she had lost 34 pounds on Weight Watchers and had kept that weight off. She had been referred to this programme by the Smoking Clinic at UBC.

She did not find SD unpleasant even though she was a bit shaky at first and was occasionally very warm. She spent her time thinking about dieting and about getting things done for Christmas. After a while her "mind began flitting" but she relaxed and enjoyed it. One week following SD her weight was 70.6 Kg which was down from the 71.3 she had been at the time of SD.

At one month she was up to 71.9 Kg although she reported having been down to 68 Kg before becoming ill around Christmas. While she was sick she didn't eat much but was retaining a lot of fluid. Her physician had told her that her kidneys were not functioning properly. At two months her weight was up to 73.8 Kg. She felt that she had approached the programme with too much of an attitude that it would be very easy. She was then starting to plan meals in advance.

At the four month follow up she weighed 74.8 Kg and reported getting worse. She was now sneaking food and felt that she needed group support to keep her motivated. At six months she was down some to 72.7 Kg. This loss she attributed to the fact that she had started smoking again at the same level as before going to the Smoking Clinic. She felt if she had followed the programme properly it would have worked. She attributed her lack of will power to having hunger urges which she had never really experienced before because she had always been smoking. The urges began when she quit
smoking. At the same time she said her eating problem came mainly from social pressure. This she thought would have been assisted by more frequent follow up visits.
Subject SDNM-7 was a 52 year old married woman who worked as a Registered Nurse at a major hospital. She had three children between 23 and 28 years old. Her initial weight was 83.8 Kg at 162 cm. and her desired weight was 61 Kg. She had been overweight for the past 10 years and attributed her gain at that time to have been the result of overeating triggered by emotional upset. She was joining this programme as a "last ditch effort" since nothing else had worked; on Stillman's quick weight loss diet she had lost .75 pounds and on a completely liquid diet had lost 1.5 pounds.

At the time of SD her weight was up to 84.5 Kg. She reported no difficulties with SD; it was neither unpleasant nor uncomfortable but she didn't want to repeat it. One week following SD her weight was down to 82.6 Kg and at the one month follow up was 82.5 Kg. This slow progress was discouraging and she reported that she was planning on fasting 2 days a week.

At two months she was 84.1 Kg and was considering fasting 3 days a week. She reported following the diet carefully and fasting 2 days a week, however she still had some problem with snacking in the evening. At four months she reported that she had ceased fasting because she was becoming dizzy. Her weight was down to 81.6 Kg.

At the final six month session her weight was 82.0 Kg. She found it difficult to keep the programme going with such slow weight loss. She was particularly frustrated by this. She did not feel that she could even reach her goal weight but was planning to stick with the programme to avoid gaining any more.
Subject SDNM-8 was a 25 year old woman who worked as a Registered Nurse. Her initial weight was 75.3 Kg at 164 cm and her goal weight was 51 Kg. She had been overweight since 18 and saw the cause as being away from home which resulted in overeating, eating starchy foods, and drinking beer. She joined this programme because she was not feeling very good about herself and her weight.

She reported that SD was much better than she had anticipated; she had been worried about the lack of communication but actually found it quite relaxing. One week following SD her weight was 73.5 Kg. After one month she reported that SD had been a starting point for her good progress, although she reported that being sick around Christmas time contributed to her current weight of 71.0 Kg.

At two months she reported averaging 500 calories of exercise a day and that she was on her 1500 calorie diet about 60% of the time. Her weight however, had changed very little (70.9 Kg) at that time. She showed little progress at four months with a weight of 70.6 Kg. She reported having had a number of family worries that led her to eat and that she had stopped keeping records of what she was eating. On the other hand she said that the idea of not eating pie and other such favorite foods had stuck with her.

At the final session her weight was back to 70.9 Kg and she felt she needed to be pushed more to keep up the plan. Nevertheless she felt she had gained a healthier attitude about the kinds of foods to eat and was eating less sweets. She was impressed with the whole plan but attributed her poor progress to her own laziness.
Subject SDNM-9 was a 40 year old housewife with two children aged 4 and 6. She occasionally worked as a social worker. Her weight was 71.3 Kg at 155 cm with a goal weight of 55 Kg. She had been overweight since the age of 12 and attributed her weight problem to her binge eating. Occasionally she would go on binges and eat high carbohydrate foods.

While she did not find SD to be stressful she did not particularly enjoy it. She expressed a desire to get up and do and see things. Toward the end of her session she reported "visual experiences with shapes and lights". She did not particularly think about food or dieting but she did get hungry. Finishing the allotment of Metrecal she repeatedly requested and received more. She consumed a total of 10 cans of Metrecal and asked for more just prior to being let out at the end of 24 hours.

Over the first two months she showed virtually no change in weight; her weight at one week, one month and 2 months were 71.6 Kg, 71.4 Kg., and 71.0 Kg respectively. She reported her most difficult time being when she felt pleased with herself and her progress. At two months she related an interesting personal experience that stemmed from the SD session.

While in SD she felt tense and was unable to relax however was made aware that this tension was the result of feeling extremely dependent on other people. This made her aware of the extent to which she looked to others for leadership. Even having to ask for more food in SD made her aware of this dependence and made her resentful of it. She also realized the emotional role that food plays in her life; her stomach had been tense in SD and she interpreted this as hunger pangs and wanted to stretch out her stomach.

At four months her weight was down to 68.5 Kg. She reported she had been working on making decisions for herself and trying to do things for herself. At the final six month session she was down to 65.9 Kg but said
that she hadn't lost any weight during the last month. Because she had been sticking carefully to the programme she was discouraged and had tried to withdraw from the programme. She felt she had finally been able to focus on the problem which really centered on her own motivation and that she had a much healthier attitude about food.

She felt she had gained a great deal of insight into the emotional reasons for her eating and that she was now able to be more independent, look out for herself and rely less on the opinions of others. A lot of this progress she attributed to her one session of SD.
Subject NCM-1 was a 33 year old articled student of law. Her initial weight was 85.1 Kg at 167 cm. tall and her desired weight was 59 Kg. She had been overweight since around ten years old and saw the cause of the problem as her mother's use of food as a sign of affection. This problem was a continuing one in that she still lived with her mother who continued to use food in this way. Pies and pastry were constantly present and her mother always made sure that she was eating "enough". Another possible influence on her weight was that she took birth control pills constantly to avoid the unpleasantness of menstruation.

Because of a hectic schedule and a number of problems at home she was not able to return until one month after hearing the messages, at which time her weight was 85.7 Kg. Her boyfriend's mother was seriously ill and this stress had prevented her from getting started on the diet. At two months she was down to 82.5 Kg. She was sticking to a diet of 1350 calories and getting regular moderate exercise. She was receiving no support from her mother which presented quite a problem since her mother prepared her food. She expressed a desire to become more independent from her mother but complained that this was impossible because of her mother's manipulativeness. Even the possibility of marrying and moving out was met with threats of suicide or loss of inheritance.

This subject was not seen again until the final six month session when her weight was up to 90.0 Kg. Her complete lack of family support was seen as the reason for her failure. Her mother was constantly trying to sabotage her efforts and her boyfriend would say "all you have to do is eat less". She still used food as a reward and comfort whenever any stress or discomfort arose. Food, she had found, was the only uncomplicated pleasure she had. One thing she felt she had gained was a more thorough understanding of
the complexity of her problem. She was not "just a fat slob" but in many ways was a victim of her environment.
Subject NCM-2 was a 57 year old housewife who had had two children however, one had recently been killed. Throughout the six months she was in mourning and occasionally became quite emotional. Her initial weight was 93.8 Kg at 166 cm and her goal was to weight 68 Kg. Her weight had been gained at three different ages: 14, 24 and 51. The reason for her problem was her use of food as a comfort in time of stress.

One week following the messages her weight was 92.8 Kg and at one month was down to 90.2 Kg. She reported that she liked the fact that neither the book nor I was ever negative and since there were no forbidden fruit it was easier to not eat things. She had been using the relaxation exercise to curb her eating urges.

At two months her weight was 89.7 Kg and she had been off the diet over the Christmas holidays. Her husband had been very supportive of the plan she was following. At four months her weight was 88.0 Kg and she reported having been off the programme again for about a month. Her doctor suggested that she was suppressing her grief too much. She was still using the relaxation exercise and found it very useful in dealing with her grief. This pleased her as she didn't want to take drugs for it.

At the final six month session her weight was 87.1 Kg. She was not as concerned about losing weight but was still very concerned with her health. She was pleased with the effects her exercise had had in making her feel better. The major problem had been her grief which had also depressed her and led her to eat for comfort. She felt that while she was very lazy about losing weight that she could do it.
Subject NCM-3 was a 41 year old married woman who ran a florist shop. She had four children between the ages of 5 and 19. Her initial weight was 108.3 Kg at 170 cm and her goal weight was 70 Kg. She had become overweight with her last pregnancy. She speculated that since she had been remarried perhaps she was more content, however, she also overate when she was upset. Her weight at this point was causing her problems with her back and her doctor had ordered her to reduce.

After the session with the messages this subject had great difficulty in making any of the scheduled appointments. The major conflict was the fact that she was chiefly responsible for her store. The first follow up for her was after two months when her weight was 107.5 Kg. She felt she was having difficulty because she needed someone to report to. Also she had gone off the diet at Christmas time.

Because she went away for a holiday she was not seen again until the final six month session when her weight was 106.9 Kg. She felt that she was more conscious of taking care of herself but that running her store was a drain on her and made her nervous. This made her want to eat. She was not thinking of selling her store and thought that this action would help her lose weight. She felt that now she was able to follow a diet without becoming depressed about depriving herself.
Subject NCM-4 was a 44 year old housewife with six children between 11 and 23 years old. Her initial weight was 82.1 Kg at 167 cm and her goal weight was 68 Kg. Her weight problem which she had had since the age of 15 was due mainly to poor eating habits. She was a fussy eater showing a preference for sweets and generally avoiding many vegetables. Her motivation for joining the programme was that her problem had been aggravated by having recently given up smoking.

One week following the presentation of messages her weight was 81.6 Kg and after one month was down to 78.2. After this she became quite involved in an election campaign, during which she didn't follow the diet at all. For this reason her weight went up to 79.1 Kg at two months.

After the election was over she returned to the diet only briefly due to a rather upsetting home situation. Problems between her husband and her which resulted in their separation produced stress that prevented her from sticking conscientiously to the plan. At four months her weight was 79.0 Kg.

At the final six month session her weight was 76.9 Kg. She saw the major difficulty as her inability to organize herself. Her initial commitment had first been interrupted by the election and then by harassment from her husband. After seeking family counseling she and her husband were back together and getting along much better. She felt she had learned a lot about her eating habits but still didn't understand her craving for sweets. She now realized the importance of exercise and was planning to start over on the programme.
Subject NCM-5 was a 44 year old woman who worked as a child welfare social worker. She had three children between 15 and 19 from an earlier marriage but was currently living in a Common Law situation. Her weight was 76.5 Kg at 155 cm and her desired weight was 57 Kg. She had been overweight since the age of 13 and saw the cause of the problem being that eating was her response to stress and she was a very emotional person with a lot of stress. Her motive for joining the programme was that recently her overweight was causing her to become fatigued easily.

At one week following the messages her weight was 76.8 Kg. Because of her busy schedule she found very little time to follow the diet or do any exercise. At one month her weight was 78.0 Kg and she was wondering if she really did want to be thin anyway. At two months she was the same weight at 78 Kg and she reported averaging about 2000 calories a day. Her Common Law spouse seemed to be sabotaging her diet by bribing her with food because, she claimed, he liked her to be fat. She also said that up to that point she had made no real commitment to the programme but intended to do so at the beginning of the year.

At four months she weighed 79.5 Kg and complained of being very depressed. She had been off anti depressants for a year but was now back on them. Her spouse was providing no emotional support for her programme and she found herself having to become more independent.

At the final six month session she weighed 77.7 Kg and attributed this loss to having joined TOPS programme in the previous two weeks. She enjoyed the other women in the programme and was on a high protein diet. She felt the philosophy behind this programme had been good but was not right for her, as she had great difficulty following the structure. She
didn't like being told what to do or being tied to a chart. She felt that she now had a better orientation about why she should lose weight but didn't feel this attitude change was the result of the programme.
Subject NCM-6 was a 45 year old housewife with four children between 17 and 23. She also worked in a delicatessen as a sales person. Her initial weight was 95.25 Kg at 163 cm and her goal weight was 70 Kg. Having been overweight since the age of 16 she saw overeating and lack of exercise as the chief causes. During her week of self monitoring she discovered that she did much snacking while working the food counter at her job.

A week following the message she weighed 94.5 Kg but after one month was back up to 95.1. Her snacking at work was still a problem and she found it difficult to find the time for exercise. At two months her weight was 93.7 Kg. To fight her snacking at work she was bringing raw vegetables to her job and eating them instead. She felt she had become much more aware of eating.

At four months her weight was 94.7 Kg and by six months was back up to 95.6 Kg. The major problems were seen as never having time to do the exercise that she knew was necessary and eating at work. The constant temptation of being surrounded by delicatessen goodies was too much for her even though between meal eating was never a problem at home. She felt that she was weak willed and easily bored with any programme. She had learned to slow down when she ate but continued to eat the wrong foods.
Subject NCM-7 was a 43 year old housewife with five children between 9 and 19 years old. Her initial weight was 91.2 Kg at 156 cm and her goal weight was 64 Kg. She had been overweight since after the birth of her first child when she had become much less active and began to overeat to cope with boredom.

One week after the messages her weight was 89.7 Kg and she showed very slow progress after that with one and two month weights of 89.4 Kg and 88.4 Kg. She had been taking inderol for high blood pressure and felt that this had slowed down her metabolism because she was sticking to her 1350 calorie diet.

At four months her weight was up to 90.4 Kg and at six months was up further to 92.9 Kg. She felt she had been unable to break her old habits and learn new ones and she was confused about her motivation. She wanted to lose weight but wasn't working at it. She had stayed on the diet for two months but quit because her progress was so slow. She also expressed resistance against the behavioural aspects of the programme. She voiced having qualms about behaviour theory since it was outside rather than internal influence. She saw the taped messages as an attempt at manipulation. On the other hand she saw herself as being wishy washy with no will power. She was beginning to hate housework and this made her eat a lot around the house. In addition she was developing bursitis which she felt was a psychosomatic symptom of this hatred. She concluded that the programme itself was successful but she was not.
Subject NCM-8 was a 30 year old housewife with two children aged six and eight. Her initial weight was 111 Kg at 167.5 cm and her goal weight was 64 Kg. She had been heavy since the age of eight but had become extremely heavy after her second child. Overeating had become her response to depression and disappointment with herself. She had previously lost weight on TOPS and Weight Watcher programmes but had always gained the weight back.

One week after hearing the messages her weight was down to 108.2 Kg. She was quite pleased with the 1700 calorie and the programme in general. By one month she weighed 104.5 Kg and was still very enthusiastic about her steady progress. Her exercise consisted of 5 minutes each morning and evening.

At two months her weight was 102.2 Kg and although still pleased with the diet she reported that she had been depressed for one week and had neglected parts of the plan like writing things down. She was able to stay on the diet plan throughout the Christmas holidays but "fell apart" afterwards. She stopped keeping track and even took down her graphs. At four months her weight was 106.4 Kg. After that she was never able to get back on the plan. She would start for a few days and then quit. She claimed she still wanted to do it but couldn't follow through. Her six month weight was 107.9 Kg.

While she was able to keep exercising regularly she felt very stupid about the way she was eating. When people started noticing her weight loss she became overconfident and then started to slide. This in turn would give her the feeling she was letting everyone down which would depress her. Then she would go back to food for consolation. She felt particularly
frustrated knowing she could do it but wasn't. She was much more aware of her weight. To succeed she felt it would be necessary to isolate herself from others, to shut out the comments of others.
Subject NCM-9 was a 44 year old housewife with five children between the ages of 7 and 20. Her initial weight was 94.5 Kg at 166.5 cm and her desired weight was 66 Kg. She could not remember any particular age when her weight problem began; she had always had it. Her overeating was an emotional response; eating when she was upset, tense, or bored. She felt this programme might help her with this aspect.

This subject was never able to follow the diet very carefully and subsequently did not show much weight change over the six months. At one week her weight was 94.4 Kg. At one month she refused to come in for her appointment saying that she had been very depressed and had probably gained 5 pounds. She wanted to quit the programme at this time. After some persuasion she agreed to continue and came in at the two month period when her weight was 93.2 Kg. Although she had not been on the diet she had been very busy and eating was never a problem when she was "mentally busy". She found that having to concentrate on the mechanics of the diet only made her hungrier. She was desperately looking for some incentive that would motivate her to do it.

At four months her weight was back to 94.5 Kg and by six months was up to 96.6 Kg. She felt the programme should work for others but was not right for her; it hadn't dealt enough with her emotional problems. A recent resident of Vancouver she had no friends and felt very alienated and isolated. In addition her husband travelled frequently. She felt a group situation or a centre where she might volunteer time and feel useful would have been much better for her.
Subject NCNM-1 was a 21 year old woman who worked as a secretary. She had been overweight since leaving high school when she began eating to soothe emotional problems. Also at that time she became much less active. Her initial weight was 78 Kg at 161 cm and her goal weight was 55 Kg.

One week after beginning the diet she weighed 76.7 Kg and was extremely enthusiastic about the plan. At that point in any other programme she said she would have quit. She was not able to come in again until the two month session when her weight was 74.0 Kg. Her problem eating time had been after work in the early evening. To combat this she had taken a second job. She was sticking to a 1350 calorie diet and getting about 150 calories of exercise every day. She was still pleased with the plan and found the manual very useful.

At four months her weight was 71.7 Kg. She claimed that where she used to think of food constantly, centering a large part of her life around it, now she did not think of it often. At six months she weighed 71.1 Kg and was still enthused about the plan. She was pleased with the continuous weight loss and also with feeling healthier and in better physical shape. Her biggest problems had been going out to dinner with others and snacking. However she now felt she was not as lazy as she thought she was and that losing weight was not so hard if you go about it in the proper way.
Subject NCNM-2 was a 32 year old housewife with one child aged 5. She also worked as a Registered Nurse. Her initial weight was 77.2 Kg at 153.2 cm and her goal weight was 50 Kg. She became overweight shortly after she was married at age 23. She thought that because she felt happy and secure she began to overeat and to eat the wrong foods. She joined this programme because it was research, it lasted six months, and someone would be very interested in her progress. She was also currently attending Weight Watchers and had lost 13 pounds thus far on it.

One week following the instruction session she weighed 77.1 Kg and at one month was down a bit to 76.3 Kg. She was constantly shifting back and forth between her 1350 calorie plan with this programme and Weight Watchers programme. At two months when her weight was 78.4 she decided that she would stick to the Weight Watcher diet and the exercise part of this programme.

At four months her weight was 77.2 Kg and she felt that she had gained some insight into herself. She discovered that she felt great security in having lots of food around the house and always kept it overstocked. She also claimed that she no longer cared about losing weight anymore because she was just too lazy. However she was pleased with the book and had told several people about it and they had been doing well on it.

At the final six month session she was quite disappointed with the programme. Her weight was 75.0 Kg but she had intended that this would be the "diet to end diets". On one hand she felt more contact and literature would have benefitted her attempt but on the other hand she resented being told what to do and knew it must be self instigated. She felt she had learned the importance of the proper attitude but felt she didn't have it. She was disappointed that the programme hadn't done more for her.
Subject NCNM-3 was a 36 year old housewife with three children between 5 and 12. Her initial weight was 80 Kg at 168 cm with a goal weight of 59 Kg. She had been overweight since the birth of her last child and saw the cause as overeating in response to boredom.

One week after beginning the diet her weight was 78.9 and after one month was 77.3 Kg. She had not been following the programme exactly because she wasn't keeping track of calories and wasn't exercising. Instead she was just being careful of what she ate and following some of the behavioural steps. At two months she weighed 75.5 Kg and reported that she was concentrating on the learning of new eating habits.

At the four month session she reported that she had not been on a diet at all. Her weight was 76.0 Kg. She suggested that she would do better if she had some one else on the programme that she could call when she was losing her motivation. At six months she weighed 75.4 Kg. Her main problem was lacking the proper incentive. Not being accountable to anyone in the latter part of the plan had made it easy to forget about it. She was quite disappointed with herself and felt the programme was good in the guidelines it set down. She knew that if she wanted to lose weight badly enough it would now be possible.
Subject NCNM-4 was a 48 year old housewife with five children between 16 and 28. Her initial weight was 82.8 Kg at 163 cm and her goal weight was 61 Kg. She had started to gain weight with the birth of her first child but at the age of 40 had had a tubal ligation and gained a lot more.

Her weight was 82.5 after one week and 80.9 after one month. She was quite disappointed with this slow progress since she was staying fairly consistently with 1200 calories. After this she was found to be diabetic and was put on an exchange plan diabetic diet. She remarked on the similarities between the diabetic diet and this programme diet.

At two months her weight was 80.8 Kg. Suppertime was her biggest problem time. To combat this she was eating ahead of the rest of the family so she could then serve everyone else. Her weight at 4 months was 81.8 Kg. She had been put on a 1121 calorie diabetic exchange plan but felt that it was too much so she was planning on reducing it to 900 calories.

At the final six month session she weighed 80.2 Kg. She had been on the 900 calorie diet and sometimes even ate less. Also for the latest three weeks she had been going to TOPS meetings. One of her major problems had been the lack of support from her family. They would make fun of her effort saying "You'll never do it". She felt that she had learned to control her eating habits much better and had discovered that she needed very little food.
Subject NCNM-5 was a 26 year old married woman who was studying as an art student. Her initial weight was 74.6 Kg at 158 cm and her goal weight was 53 Kg. She had been overweight since the age of six and she saw eating as an outlet for frustration. She derived a great deal of comfort from food.

After one week she was quite pleased with the mechanics of the plan and her weight was 71.9 Kg. She was following a 1200 calorie diet with a small amount of regular exercise. At one month she weighed 70.5 Kg.

Her weight at two months was down to 68.3 Kg and she was very pleased with the sensibility of the diet plan and emphasis on good eating habits. She was also attending TOPS meetings but had been disappointed because their emphasis was solely on losing as much weight as possible.

At this point her weight loss was beginning to be physically visible and many of her friends would compliment her. This fact plus the ease with which she had lost weight made her feel a bit cocky and she started to nibble. However, this got a bit out of hand so she got back onto the programme strictly. At four months her weight was 64.6 Kg.

At the final six month session she weighed 62.0 Kg but did not feel she had been entirely successful because she still had bad habits which she occasionally would slip back into. This plus dealing with going out to eat had been her biggest problem. Otherwise she was feeling healthier than she ever had before and was planning to start studying dance. She was more confident in her self and pleased with the idea of situational control that was used in this programme. She still felt very committed and was going to continue using the plan. Her one objection to the programme was having to pay for the diet manual. She initially didn't think she should have to pay for it but later thought that owning it herself may have been helpful.
Subject NCNM-6 was a 43 year old married woman with 4 children between 11 and 16 and who worked as an orthodontic technician. Her initial weight was 89.2 Kg at 167.5 cm and her desired weight was 68 Kg. She had been overweight since the age of 16 and her only perceived cause was that she just liked to eat.

One week after starting her 1350 calorie diet her weight was 87.8 Kg. She also was getting fairly regular exercise with walking, jogging, and gardening. Her weight at one month was 87.0 Kg.

At two months she weighed 85.6 Kg and felt very good about the diet. She felt that she was eating more now than before the diet but that now she was eating the right foods. Furthermore she was not hungry and no longer craved sweets or candy. Her weight at four months was 83.5 and she claimed it had been very difficult. During that period she had been ill and ate to feel better. She also had been getting no exercise.

At the final six month session her weight was 86.6 Kg. She didn't know why she was doing it but she had been "eating everything in sight". Also she had gone away twice and both times had put on weight. Also she hadn't been exercising. She found that managing to get regular exercise was her biggest problem. She felt she was no longer as strong willed as she thought she had been. Recently her neighbor had died and it made her think, "Why am I suffering; I'd rather die happy - eating". On the other hand she felt she was eating better foods and was less hungry than on other diets.
Subject NCNM-7 was a 43 year old housewife with three children between 17 and 21. Her initial weight was 93.1 Kg at 168 cm and her goal weight was 77 Kg. She had been overweight since the age of 18 and had gained 30 pounds in the first year of her marriage. While she attributed this gain to being very happy and loving to cook she said that her most recent weight gain was due to loneliness and depression.

One week after beginning a 1350 calorie plan her weight was 90.7 Kg. She was extremely enthusiastic about the diet, in fact at one month she claimed that she "lives the diet". She liked the exchange plan because of its flexibility. She had problems with her arms which prevented much motion and this made some exercising impossible.

At two months she weighed 87.5 Kg and reported that she was never over 1350 calories and was getting daily exercise. She was pleased with the manual and had been discussing it with many of her friends. At four months her weight was down to 86.3.

At the final six month session she weighed 86.7 Kg and although she felt she hadn't lost much she was very happy with how much better and healthier she was feeling. Her biggest problem had been disappointment with slow weight loss especially in the last portion of the programme. She praised the book and programme as the best she had seen. She also commented on the positive attitude of the experimenter as an important factor. She was disappointed however at not having been able to go through SD.
Subject NCNM-8 was a 33 year old housewife with three children between 5 and 15. Her initial weight was 133.7 Kg at 165 cm and her desired weight was 64 Kg. She became overweight with her first pregnancy at age 17 and gave as a reason overeating and no exercise. She also ate enormous quantities of food in the middle of the night.

After one week on a 1200 calorie diet her weight was 132.4 Kg. She had difficulty with her midnight eating and was given some technique to combat it. At one month her weight was 131.3 Kg.

She missed the two month session but came in at four months. Her weight was up to 137.0 Kg at that time. She reported that her typical pattern was to start out "all gung ho" in the morning and by evening have given up. Her midnight eating was still a problem and she had given up working on that.

At the final six month session she weighed 138.2 Kg and in spite of this gain felt the programme was fairly successful because of the things she had learned. When asked if she had learned anything about herself however she said, "What's to learn, I'm fat, that's it". She was getting a great deal of pressure from her doctors to lose weight but she still was unable to develop enough motivation. She felt she might be able to do better if she were more closely supervised.
Subject NCNM-9 was a 46 year old woman with three children 11 to 21. She was separated from her husband and was studying some at University. Her initial weight was 74.8 Kg at 164.5 cm and her goal weight was 59 Kg. She had been overweight for the last four years and attributed the problem to emotional problems. Her response to worry and tension was to eat. She also drank frequently and usually it was beer.

One week following the beginning of her 1500 calorie diet her weight was 73.25 Kg. She was sticking to the diet and getting occasional exercise. At one month she weighed 73.0 Kg. Since her lifestyle involved going out frequently, she had difficulty with dining out and drinking.

At two months her weight was 72.3 Kg. She reported that she belonged to a diet club that would give her support when she lost weight. She was walking or swimming about three times a week. After this she became quite depressed and couldn't get herself to do anything. Consequently her weight at four months was up to 73.7 Kg.

At the final six month session she weighed 73.1 Kg and said that the programme had made her feel worse than before. Usually able to do the things she set out to do, she found the failure at this diet attempt very frustrating. She commented that because she was eating less frequently she was enjoying food more. However, she felt that the plan left too much organizing and responsibility to her. She felt both her eating and drinking were due to the emotional upset that was caused by her being separated from her husband, a state she could not get used to. She felt that she had no will power. When she would eat the wrong things she would say to herself "Oh you don't look too bad". This failure had been hard on her self esteem but she thought that if she had attempted it in a happier, more stable period of her life she would have been more successful.
Subject NCNM-10 was a 46 year old housewife with five children between 9 and 25. Her initial weight was 87.5 Kg at 163 cm. and her goal weight was 59 Kg. She began to gain weight with her first pregnancy and gained with each subsequent one. She also overate in response to stress and anxiety.

One week following the diet instruction her weight was 87.7 Kg. After one month she weighed 87.9 Kg and reported that preparing food for her large family presented a major snacking problem. Also she still used food as a reward for working hard around the house.

At two months she weighed 86.9 Kg and reported being on a 1500 calorie diet about half the time. She was not, however, graphing or keeping careful track of what she ate. Following this she learned that her husband was to be transferred and she must sell their house and move. This upset in lifestyle threw the diet routine "out the window". At four months her weight was 90.8 Kg.

By the six month session she was already settled into her new house. Her weight was 87.7 Kg. She felt the programme had failed for her because of unusual pressures on her during the programme period. She thought the plan of diet and exercise was excellent but that more emphasis should have been placed on the reasons for overeating. She had learned how much she rewarded herself with food for everything she did and was determined that food would no longer be her "best friend". She was planning on joining a group called Overeaters Anonymous and using this diet in conjunction with their programme. She felt that sticking with the programme in the face of failure had forced her to examine her many motives for overeating and that she was now better equipped to deal with them.
APPENDIX B

Newspaper Articles Used to Recruit Subjects
Relax...and lose some of that weight

A University of B.C. grad student needs 48 overweight women for a research project on obesity.

Rod Borrie said several candidates will lie alone in a dark, padded, room for 24 hours and drink Metrecal while relaxation instructions are piped through loudspeakers.

"What we're looking at here," he said Tuesday, "is sensory deprivation as a technique to improve relaxation training and as a booster in self-control."

Those given instruction in the padded room, and a control group taught the relaxation techniques in a more normal setting, will be watched for six months.

The idea of using "relaxation techniques" to lose weight may seem strange to those accustomed to the idea that vigorous exercise is necessary to burn off excess calories.

Borrie wants to see whether sensory deprivation aids in relaxation training by forcing concentration and providing an appropriate setting.

"The program is based on a complete change in lifestyle and regular eating and exercising," he said. "It's not a crash diet program. It's a long term thing."

Applicants must be women between 20 and 55 who are at least 25 per cent overweight.

They also must be willing to submit to a medical checkup, introductory and follow-up interviews, and rigorous self-control for six months.

New diet based on persuasion

Weight reduction is usually fraught with anxiety and suffering, real or imagined, but a University of B.C. graduate student is experimenting with a more relaxed method of dieting.

Rod Borrie, a doctoral candidate in psychology, said in an interview Wednesday that gentle persuasion rather than harsh prohibition is the key to his method.

Overweight subjects will lie alone in a quiet, dark room and drink Metrecal while relaxation instructions are piped from tape recorders.

He said subjects who are isolated from distractions should be able to concentrate on the problem at hand -- cutting excess pounds.

"To test his theory, Borrie said he needs 48 women aged 20 to 55 who are at least 25 per cent overweight. They must agree to a medical checkup, follow-up interviews, and rigorous self-control for six months.

Borrie said his subjects, for the sake of consistency, have to be of the same sex. Women were chosen because they usually are more available than men, he said.

Only half of the volunteers will be exposed to his "sensory deprivation" technique. Others will be taught relaxation techniques in a more normal setting.

Borrie said the program is based on a change of attitude and better eating and exercising habits, rather than a crash diet. Instead of attempting to cut 20 pounds in a month, subjects should be able to reduce their weight by one pound a week, he said.
APPENDIX C

Message Transcripts
SET I

1. One of the most frequent mistakes that people make when they try to lose weight is to put the emphasis on not eating. For example, they say to themselves, "I must not eat. I should not eat. I won't eat." This kind of thinking is dead wrong. It makes about as much sense as concentrating on not having an itching sensation on your nose. What happens if you concentrate on not having an itch? Right: you have it! The same thing happens with losing weight. If you concentrate on not eating, you end up more preoccupied than ever with eating. Free people resent being told what not to do on a permanent basis, even if you tell it to yourself, but a free person is able to change on the basis of something he is for. So, if you look at this as a promise to protect your body, this can result in not overeating, but you experience it as "yes" rather than "don't!". By concentrating on this new sense of protection for your body, the urge to eat more than you should is ignored and eventually it disappears.

We know this much about urges. If you repeatedly deny satisfaction to an urge, whether biological or psychological by ignoring it, the urge eventually withers away. This is true even with something as strong as hunger. When Ghandi went on his hunger strike, he did not concentrate on not eating. He concentrated on arousing public opinion for his cause. Not eating was an incidental aspect of his strategy. As a result, days later, even though weak from starvation, he observed that his appetite was gone. His urge to eat disappeared. Similarly, by concentrating on this new sense of protection for your body, the urge to eat when you shouldn't is ignored and eventually it disappears.

2. You are your body's keeper. Your body is your physical plant. When you put too much food into your body, it can do nothing but accept it and make the best of it. When you realize that you are the one putting the extra weight there, you have some questions to ask yourself. Are you for your body or are you not? Are you for living or are you not? If the answer is no, then keep on overeating. But, if the answer is yes, you have a built-in obligation to give your body the respect and protection it deserves. You see how different that is from saying, "I will not eat"? In essence, this is an art form, the art of controlling an urge. If you mean to control an urge, don't fight it, the more you fight it, the stronger it will become. Instead, learn to ignore it. Here is a way to do it. When an urge to eat occurs, admit it, but at the same time acknowledge that you have this commitment to respect your body. Thus, you have two urges at the same time; the urge to eat and the urge to respect your body. Lock them together. By emphasizing respect for your body, you will be able to keep your intake at a sensible level. If you lock together two contradictory urges and focus on one, you must, at the same time, ignore the other.

I would like to teach you an exercise which you may find helpful whenever you feel the urge to eat or when you are sitting down to a meal.
The exercise is as follows: You sit or lie down, close your eyes, relax your body, and take three slow deep breaths. When you do this you are in effect entering into a brief period of meditation or increased concentration. In this state you concentrate on three critical points:

first: for your body, overeating is a poison
second; you cannot live without your body
third: If you want to live, you owe your body respect and protection

Repeating these three points is your way of acknowledging the fragile, precious nature of your body, and, at the same time, your way of seeing yourself as your body's keeper. You are in truth your body's keeper. When you make this commitment to respect your body, you have within your power to gradually lose all those extra pounds. Notice how this strategy puts the emphasis on what you are for, rather than what you are against. It is true that overeating is a poison and you are against it, but the emphasis is upon the positive commitment to respect your body. As a consequence of your commitment, it becomes natural for you to protect your body against the poison of further overeating.

Now, I would like you to do the exercise I have just described. Let your body relax, close your eyes and take three deep breaths. Now repeat after me.

1. For my body, overeating is a poison (pause)
2. I need my body to live (pause)
3. I owe my body respect and protection

You may want to try this exercise again, from time to time, while you are here.

3. States of Deprivation

When you are trying to lose weight you are depriving yourself of some of the food you would normally be eating. But actually there are three types of deprivation which are linked to losing weight. The first is food deprivation. When you skip a meal you are in a state of deprivation which automatically increases the positive value of food. This also makes you feel indebted to yourself for additional eating and you are more likely to overeat at your next meal or snack. This can be avoided by simply planning meals for regular hours and making sure you eat every planned meal.

The second type of deprivation is energy deprivation. It has been found that overeaters often associate great amounts of overeating with times when they are fatigued, generally due to lack of sleep. Whether the energy store is somehow depleted by sleep deprivation or whether fatigue merely becomes a signal to eat, it is very important that the overeater take pains to avoid fatigue due to lack of sleep. Careful monitoring of sleep patterns is essential in the control of overeating, second in importance only to attention to food intake and exercise.

The third type of deprivation encountered by the overweight person trying to diet is the stimulus deprivation experienced as boredom. Many overeaters eat because they are bored and have nothing else to do, however there is good clinical evidence which supports the idea that eating
is not the preferred pastime for overweight persons. Eating, therefore, can be displaced by any number of other activities which will keep your attention and provide gratification. Since it appears to be important that boredom be avoided if at all possible, it is a good idea for you to keep a number of nonfood activities available at all times. Perhaps you might keep your sewing machine up all the time, or keep interesting books, records, or magazines in clear view, or tools for gardening or other hobbies kept available. However, even if you should find yourself with nothing to do your experience here in this room has shown you that you can deal with such a situation without overeating.

4. Introduction to Relaxation Training

A great number of people today, especially in our Canadian society, do not pay much attention to their bodies. By this I don't mean the way we dress or how clean we are or anything about the way we look. The body that most of us ignore is our internal body which constantly sends us signals concerning its functioning. Of course we are aware of the larger and louder signals, such as, fatigue, toilet needs, extreme nervousness and hunger. However we are not really finely tuned to the quieter signals such as muscle tone, heart beat, mild tension, and blood pressure. Often even hunger is not a very clear signal especially with overweight persons: Frequently overweight people ignore or just don't recognize the body signals for hunger and instead they eat or overeat because of the signals they see around them such as the clock saying its time to eat or the mere presence of food. You can control these external signals by doing things like keeping food out of sight and never getting out more than you should eat. But it is also a good idea to try to get to know your body a lot better and learn the physical signals that it is sending.

Right now I'm going to take you through an exercise designed to teach you to relax and become better tuned to your body.

First, lie with your hand at your side and be comfortable and just relax. Now I want you to direct your attention to the large toe on your left foot. I want you to feel that toe; feel the muscle wrapped around the bone underneath it. Concentrate on relaxing that toe. As you relax that toe, feel the muscle sagging off the bone. Feel the muscle loosening. The toe becomes more and more relaxed. Let that relaxed feeling spread to the next toe, to the next near your big toe. Again, feel the bone with the muscle wrapped around it. Concentrate on that toe. Concentrate on letting the muscle on that toe relax. Feel it get looser; feel gravity pull the muscle. No more tension. And let that relaxed feeling spread again to the next toe. Same procedure: concentrate on the toe, feel the bone wrapped around with muscle, and relax that toe. Feel the muscle unwrapping from the bone underneath it. Now move to your next toe. Again, feel the muscle tightly wrapped around the bone underneath. Feel that muscle loosen, getting looser and looser, sort of drooping off the bone. Four of your toes are now relaxed. Let that relaxed feeling move on to the next toe, the small toe on your left foot. Feel the small bone in that toe and the muscle wrapped around that bone. Let that muscle
loosen and relax, becoming looser, sagging off that toe, gravity pulling it down. Now all five toes on that foot are relaxed. Let that relaxed feeling spread from the toes into the ball of the foot. There's a lot more bones there. Feel the muscle around and between those bones loosening, relaxing. Part of your foot is getting heavier, pulling down, relaxing, loosening. Now that loose, relaxed feeling is spreading through the arch of your foot. Muscles loosening. No tension there. Feels very nice. This relaxed feeling continues on to the heel of your foot. Concentrate on the muscle wrapped around the bones there. Feel it loosen. Feel it pull into the bed. Your whole foot now is very relaxed. Feels loose and heavy. Now move your concentration up to your ankle. There's a lot of bone, a lot of tendon there. Concentrate on the joint there, to your knee cap. Feel all the tendons that meet here. Concentrate on relaxing your knee. Feel it getting heavy. Feels very relaxed. Then move up. Feel the long bone on your thigh. A lot of muscles here, all wrapped tightly around that bone. Let them loosen, let them unwrap. Feel them getting heavy and sagging into the bed. Concentrate on relaxing that thigh. Now your whole leg, your whole left leg is relaxed now. Now I want you to think about how your left leg feels compared to your right leg. Does it feel heavier? Perhaps it tingles a bit. Does it feel more relaxed? Enjoy this feeling of relaxation in your left leg. While you are going through your body like this, concentrating on each part and letting it relax, occasionally you find an area which is difficult to relax. Very often this occurs when you have suffered some injury in that part. There is a lot of extra tension in areas that have been injured at one time or another. Spend extra concentration on those areas and get them to relax just as much as the rest of your body.

Now we are going to move back down this time to your right foot, starting again with the big toe, leaving your left leg all completely relaxed. Concentrate now on the big toe of your right foot. Again, feel the muscle and the bone underneath that muscle. Let the muscle relax. Let the muscle loosen. Feel the tension leaving. Now feel that relaxation spread to the next toe as the muscle there starts to loosen, and to the next toe. It should be easier now: you've got the knack of it. Feel that third toe relaxing, the muscle loosening, getting heavy, and move over to the next toe. Feel the bone, feel the muscle; concentrate on it, and concentrate on it loosening, pulling down. And now move to your small toe, starting to tingle, loosening, getting heavy. You can feel gravity pulling down the muscle to sort of sagging off the bone. Now let that singly relaxed feeling move to the ball of your foot. Feel it loosen, feel it get heavy. There's a lot of muscle in between those bones too. Concentrate on that, and let it relax. The relaxed feeling is now moving to the arch of your foot. Has to go a bit deeper here. There's a lot of bone, a lot of muscle, a lot of tendon. Feel it all unwinding. Feels very good. Starting to relax. Getting heavy, loosening, and now spreading down to your heel. Concentrate on your heel. Feel the bone there
and the muscle, and feel them relaxing, sinking into the bed, getting heavy. Your whole foot now starting to tingle, feeling good. It's very relaxed, and all those muscles which are attached to your ankle. Spread the relaxation up to your ankle. Concentrate now on your ankle. A lot of bones join together at your ankle. A lot of tendons all connected to muscles. Feel them all relaxed, loosening; the whole joint unwinding, getting heavy. Feels good. That relaxed feeling is spreading up to your lower leg. Feel that big muscle of your calf, the tight muscle, and you feel it relaxing, unwinding. Feel it as it sags off the bone there. Becomes heavy, becomes very relaxed. Spread that relaxation up to your knee. Often knees are problem areas. We frequently injure our knees. Feel the joint there. Feel how the bones join together with all the tendons holding it tight in your knee cap. Feel it all relax. Maybe it's the first time you've ever relaxed your knee in this way. Enjoy the feeling, until it gets heavier. Feel that tingly, relaxed feeling spread up from your lower leg, and let that looseness continue up to your thigh. A large bone here, and a lot of muscles wrapped around it. Feel that muscle loosen. It's a long muscle, and it just sags off the bone; getting very heavy, gravity pulling those muscles away from the bone. Feeling relaxed. Feels good. Both of your legs are now very relaxed. Feel that relaxation spreading up to your buttocks. These are the two largest muscles of your body. Feel them relax, getting heavy, sinking into the bed, getting very loose. Now I want you to concentrate on your genital area. This is often a point of much tension. Spend some time and relax. Feel the tension going away. I want you to continue up to your stomach. Feel the muscles that cover your stomach. Feel them relax, getting looser, all the tension leaving. And you can feel the organs underneath those muscles; your stomach, your intestines. Feel them all relaxed. All the tension there subsiding. Feels very comfortable. Now go all the way through and feel the muscles of your back. Feel your backbone, each vertebra with muscles attached to it. These muscles are often extremely tight. I want you to go up feeling each vertebra and the muscle on either side of it, and relax it slowly, feeling that muscle loosen. Feels good. There's a feeling of relaxation spreading from your lower back and travelling up towards your head. At each vertebra, the muscle near it loosens, feels heavy, begins to tingle, spreading up your back towards your head. This wonderful sensation of being very relaxed. Now concentrate on your chest. Feel your ribs. Between each of your ribs is muscle. Take a deep breath. Feel those ribs spread apart. The muscle between them is stretching. Feel that muscle get loose. Feel it relaxed. Gets heavy. Your whole chest is relaxing. Still moving as you breathe, but it is very relaxed. All the organs inside your chest. Concentrate on them. Feel them relax. This can be an extremely exhilarating experience. Relaxation here in your chest starts shooting up your neck. That tingly looseness - you can feel it in your neck. Big muscles in your neck - they're unwinding. Getting heavy, sagging into the bed. Those muscles that attach to the back of your head - they're getting loose, getting heavy. That relaxed feeling is spreading right over the top of your head. You can feel your scalp relaxing, loosening, sagging right off your skull. Feels very good. A relaxation comes over the top of your head and down to your forehead. Your forehead is often the seat of a great deal of tension. Whenever you are concerned about something, worried about something, distressed, tension resides in your forehead. Feel your forehead relax, and as it does this is a very wonderful feeling; one of complete relaxation. Feel the muscles of your
whole face now relaxing; the muscles around your mouth, the muscles in
your cheeks, the muscles around your eyes. Your eyes are relaxing.
Feel the muscles of your eyebrows relax. It's a very nice feeling.
Enjoy it. Your whole body is now relaxed.

This relaxation procedure is one you can practice on your own. For
best results daily practice is desirable.

Now while you are in this deeply relaxed state I want to listen to
some of the quiet signals from your body. First, try to feel your heart
beat. Direct your attention to the center of your chest and feel the
constant, quiet throbbing of your own heart. (pause) If you have diffi­
culty feeling your beating heart take a few rapid deep breaths, then re­
lax again and listen (pause) Each pulsation of your heart is pushing
your blood further through the body. If you are relaxed enough you might
be able to feel this pulsing in different parts of your body. Your hands
and especially your finger tips are often very sensitive to this. If
you want to actually listen to your heart beat cup your hands over your
ears, relax, and listen. (pause). If you don't hear it cup your hands
slightly tighter. (pause)

Put your hands at your side once more and this time I want you to
direct your attention to your stomach. I want you to take three deep
breaths but before you do I'm going to explain exactly how to do it.
Wait until I say breath. Instead of expanding your chest to take those
depth breaths, I want you to expend your stomach By pulling your diaphragm
down you will be extending your stomach while you pull air into your
lungs. With each breath take in as much air as possible and push your
stomach out as far as it will go. When you have all the air you can
manage the slowly exhale by pulling your stomach back in. Try to push
out all of the air in your lungs as you suck in your stomach as far as
it will go. Then repeat the whole procedure. Do not breath rapidly.
Breath in and out slowly and you will find your self becoming more and
more relaxed with each breath. As you relax direct your attention to in­
side your stomach and try to feel it as you expand and contract. O.K.
now I want you to take three deep breaths as I have just described them.
Ready. Breathe. (pause)

Becoming more relaxed with each breath.....Feeling your stomach...

This exercise is one that you should use often. It is a means to
quick relaxation and to awareness of your stomach. It is an exercise
which can be done anywhere; you don't have to be lying down. In fact
it is a good idea to do this three-deep-breath exercises each time you
sit down at the table before you have anything to eat. While you are
taking your three deep breaths and relaxing you can remind yourself of
your new commitment to protect your body and your health.

I want you to do the following exercise using your imagination. I
am going to read off a series of emotions. I would like you to think
back to the last time you experienced the emotion and relive it in your
mind the whole experience as best you can. When I tell you that time is
up, you will cease thinking about the emotion and go on to the next one
which I will give you. The first one is, think about the last time you were very happy.

Ready, start --- 3 minutes

(MONITOR: DO NOT STOP TAPE RECORDER BETWEEN ITEMS)

0.K. next: I want you to think about the last time you were very disappointed.

1-1/2 minutes

0.K. next: I want you to think about the last time you felt very guilty.

1-1/2 minutes

0.K. next: I want you to think about the last time you felt you were a failure.

1-1/2 minutes

0.K. next: I want you to think about the last time you were very anxious.

1-1/2 minutes

0.K. next: I want you to think about the last time you were very disgusted with yourself.

1-1/2 minutes

This concludes the exercise. The purpose of the exercise was to show you that you could experience negative emotions, even very negative ones and not have to eat. Think about this and remember it when you leave here. It is a myth that you cannot cope with emotions unless you have something to eat.

5. From time to time most of us feel negative emotions such as fear, tension, anger or sadness. For many people eating becomes a way to cope with these negative emotions. In fact, some overweight people come to believe that eating is the only way they can cope with these unpleasant feelings. However, this is a false belief. A good substitute which many people find works just as well or even better than eating is to take three deep breaths and relax just as you were taught in the last message.
This weight program has been designed specifically to aid you in your efforts to regulate your weight. Since you are the one who wants to lose and keep off those extra pounds, this program emphasized identifying your eating problems and changing your eating habits. We will provide you with information and suggestions for losing weight but we cannot control your weight for you, only you can do that. Though many would like it, there is no magic pill which will solve your overweight problem for you. The solution must come from within you. Thus, the primary focus of this program is you; your willingness now to totally commit yourself to controlling your weight, your willingness to take responsibility for the causes and cures of your overweight, your willingness to work hard at changing those aspects of your environment and those aspects of your life which affect adversely your eating habits, your motivation to see the program through to the end, even when the going might be a little rough.

As was mentioned before, to effectively control your weight you must take the initiative to systematically change your eating habits. No special diet is required because the intention is to produce long-lasting changes in eating patterns. Most people could lose weight by eating nothing for a month or going on a special grapefruit diet or some other crash diet. However, few would be willing to remain on such a diet for the rest of their lives. Thus, after weight is lost on a special diet, people usually resume their old eating habits—the very behaviors which caused the weight problem in the first place! For effective weight control, the individual must alter his eating patterns in such a way that he can live with them comfortably for the rest of his life and still maintain a desirable weight! "Crash" starvation diets have no lasting value. Rather, an attempt should be made to find a reasonable balance between fattening and unfattening foods—a balance that can be maintained for life. You must learn to break the old habit patterns of eating snacks while preparing meals, eating while watching television, eating everything that is placed before you in a restaurant, and so on.

A cardinal rule in weight control is make haste slowly. That is, don't try to lose weight too rapidly. You are probably anxious to see the pounds drop off (and rightfully so), but your strategy of weight control is aimed at modifying longstanding eating patterns. Those habits have been "in power" for many years and may take a little time to dethrone. Also, if you set your sights for dramatic and rapid weight loss you may become prematurely discouraged with gradual but significant reductions. Take it one pound at a time. A one or two pound weight loss per week is recommended as a healthy weight loss goal. In ten short weeks this adds

*Large portions of these messages were adopted from Mahoney, M.J., & Jeffrey, D.B. A manual of self-control procedures for the overweight. Abstracted in the JSAS Catalog of Selected Documents in Psychology, 1974, 4, 129.
up to a 10-20 pound weight loss.

In addition to having a proper attitude and commitment to losing weight, it is also very important to have specific information about weight management and to know how to implement this information in your daily weight control program. We will be talking later about methods to help you become aware of your daily weight fluctuations and problematic eating situations. We will also be providing you with information about dieting so you will be able to plan your own eating program which will include a balanced diet but which will also cut out those extra calories so you can lose weight. Finally, we will discuss specific techniques to change those nasty, gluttonous eating habits.
A basic understanding of the human body and the food which nourishes it can be very helpful to you in your weight loss attempt. Our body uses food in two ways: (1) as a source of fuel to provide the energy to keep it running, and (2) as a source of nutrients for the continual repair and maintenance of all tissues. All foods can serve as fuel for energy but no one food provides all the essential nutrients. We therefore need a balanced diet of different foods. Most foods are a mixture of protein, carbohydrate, and fat (along with varying amounts of vitamins and minerals).

Proteins occur in all living matter and are essential for the upkeep of every tissue of our bodies. Because protein is not stored in the body it must be supplied by our daily diet. Good basic sources of protein are in the milk group and the meat group of foods, and certain of the vegetable group. Because some of these foods do not provide all the protein that we need, our diet should contain a variety of these sources of protein.

Carbohydrates are second to fats as the main fuel source supplied in the diet. The chief function of carbohydrate is to supply sugar as fuel for the brain and nervous tissue. By limiting our intake of carbohydrate, we draw upon stored fat for our fuel requirement. But some carbohydrate is required in a balanced diet. Otherwise, the body has to convert protein into sugar needed by the brain. Food sources of carbohydrate are not difficult to find. Cereals and vegetables are preferable to pastries and sweets as a source of carbohydrates. Any excess carbohydrate in our daily diet is converted to fat and stored as such in the body. This is also true of excess protein and excess fat.

Fats are built into the structure of all tissues as are proteins. But fats are the most concentrated form of energy and serve primarily as a fuel storage material. Overweight occurs when there is an excess amount of fat storage caused by more food input than energy output. Food sources of fat, like carbohydrates, are not hard to find. The problem is to control the amount of fat-rich foods we eat such as fatty meats and whip cream desserts.

As we mature, we begin to need less and less food than we needed during our active growing years. With every year past 25 our food needs drop by about 1% but most of us continue eating as much as we did during our youth. Extra weight then begins to creep up. To maintain a constant level of bodyweight the food energy in a diet must balance the daily energy requirements of the body. In order to lose weight, you must take in fewer calories than you need. The most practical way to do this is by altering longstanding eating patterns which have caused the weight gain. Since overweight does not happen suddenly, you should not expect reducing to be an overnight affair. It will take some time to remedy the imbalance between food input and bodily requirements. Also, do not expect your weight loss to be uniform and consistent. Individuals lose weight at different rates. The average weight loss curve is one which contains many brief "plateaus" and a few brief 1 or 2 pound weight gains.
A Few Pointers to Remember About Dieting

1. Your daily diet should be a well-balanced one, high in protein and low in carbohydrates and fats. However, do not eliminate all carbohydrates and fats. Avoid crash starvation diets.

2. Substitute lower calorie foods and dietetic forms of food preparation for your present ones. Familiarize yourself in a general way with the "calorie cost" of different food categories.

3. Make room for an occasional snack or sweet by cutting down elsewhere in your food intake. Do not forbid yourself certain food categories--this only makes them more tempting and increases the chances that you will simply give up once you have "blown your diet" by eating a forbidden fruit.

4. Don't skip meals--it is easier to avoid overeating if you are not overhungry.

5. If you find that you are too hungry at mealtime, control your appetite with a small dose of carbohydrate half an hour before mealtime. (e.g., 1 or 2 soda crackers or a small glass of vegetable juice).

6. If you overeat at lunch, or midmorning snacking is a problem, make an effort to eat a high-protein breakfast.
Some Misconceptions About Food and Dieting

There are a surprisingly large number of people who have many misconceptions about food and dieting. These misconceptions may mean the difference between success and failure in losing weight, or may make weight reduction more of a chore and less of a pleasure. The following are some of the more popular misconceptions.

1. Brown eggs have a higher food value than white eggs. False.
2. Toasting reduces the calories in bread. False.
3. Protein is the most important nutritional need of the body. False.
4. One can eat and drink whatever he pleases if a vitamin and mineral capsule is taken each day to assure a supply of essential nutrients. False.
5. It's natural to get fatter as you get older. False.
6. One can never eat too much protein. False.
7. If a person has been overweight for a long time (e.g., since childhood), his problem is probably "medical" or hereditary. False.
8. Food eaten before you go to bed is more likely to cause weight gain than if the same food were eaten for breakfast. False.
9. Pork liver has more nutritive value than calf liver. False.
10. A person can never drink too much milk. False.
11. Overweight people are generally happy, healthy people. False.
12. Because meat is a high protein food, it does not cause weight gain. False.
13. Beer is a good source of nutrients. False.
14. It makes no difference whether a person eats fast or slow. False.
15. It is better to lose weight as rapidly as possible rather than one pound at a time. False.
16. All fat and carbohydrates should be eliminated in a reducing diet. False.
17. Exercise increases the appetite. False.
18. One should drink less water, while dieting. False.
21. One should expect to feel weak and fatigued during weight reducing. False.
SPECIFIC WEIGHT CONTROL TECHNIQUES

Specific eating habits are somewhat individualized. To cope with this variety, we have compiled a list of weight control techniques which vary in their appropriateness for different eating styles. The techniques are divided into three types: Quantity Control, Quality Control and Situation Control. We recommend that you choose the easiest technique to begin with and use it until it becomes a new eating habit which is beneficial to you (a minimum of one to two weeks). Then choose the next easiest technique and see it until it becomes part of your good eating habits. Continue employing eating control techniques in this manner as long as it takes you to eliminate your bad eating habits and develop new positive eating habits.

Quantity Control Techniques

1. Reduce the amount of food you serve yourself. It is much more important for you to work on eating smaller portions of food than to worry about overcoming your lifelong peaches for strawberry shortcake. Start now to cut down the total quantity of food you eat. This can be accomplished by buying, fixing and serving smaller quantities of food. For example, rather than serving yourself two extra large portions of potatoes, only serve yourself one moderate size portion of potatoes. One useful method to cut down servings is to simply use a small sized plate. This may a smaller portion doesn't appear quite so small. You may have an occasional event or other fattening food as long as you keep the quantities small and also reduce quantities of less liked foods. This technique is particularly helpful if you feel hemmed in by strict diets. There is no "forbidden fruit" in our weight control program; you simply have to cut down the total quantities of food eaten.

2. Leave food on your plate. Start getting in the habit of leaving a little bit of everything on your plate when you finish. Many people feel compelled to finish everything even though they are stuffed. Childhood training and the desire not to waste money may lie at the root of this habit. Think for a second about the money "wasted" on obesity (heart operations, useless clothing, etc.). Don't finish a child's food for him or force yourself to polish off the remnants of a ham. Throw them out, feed them to the dog, or whatever and plan a smaller portion next time. This technique is especially appropriate for restaurant eating. Do not eat everything put before you simply because you have paid for it. You'll be paying a much steeper price if you do.

3. Eat Slowly. It takes quite a while for your food intake to register with the brain, so if you eat fast you may overshoot your body's needs. Begin by requiring yourself to swallow one bite before putting the next of the fork. Actually, put your fork down between bites. Toward the end of the meal, interrupt your eating for 2 to 5 minutes so that you can get in the habit of starting or stopping your eating at will. It is important that you initially try this when you are moderately full and then gradually work toward situations where you stop eating despite moderate hunger. Require yourself to delay second helpings by at least 10 minutes.
Quality Control Techniques

1. Keep a supply of dietetic or unfattening foods on hand. Again, the temptation to snack or overeat is great when you have an unlimited supply of sweets on hand. You will be less tempted if your late night temptation requires a brisk walk to the store rather than to the refrigerator. Make it easier to snack dietetically than fatteningly. That is, do not keep sweets around the house. If the children need them for lunches, buy only enough for them. Keep a supply of dietetic foods in bright and shiny containers (e.g., always have cold diet pop on hand and a container of celery sticks in the refrigerator). Do not keep cold beer in the refrigerator (if beer is your downfall). Also, rearranged your cupboards so that fattening snacks are in strange, hard-to-reach places but dietetic ones are right up front.

2. Avoid high calorie snacks. If your cupboards are filled with ready-to-eat goodies, you are much more likely to give in to that late night snack temptation. Quick preparation foods are also unadvisable. If you have to have a snack, try to make it a less preferred one or something with nutritional value (e.g., a bowl of cereal). Substitute popcorn for potato chips; the former takes time to prepare and has fewer calories.

3. Do not adorn fattening foods. Avoid seasoning which makes some fattening food taste better. If you have to have a soda or beer, either have it only moderately cold (preferably warm) or have a less preferred brand. Do not use real butter, non-dietetic jam, etc.

Situation Control Techniques

1. Enlist the help of your family and friends. Your family and friends can be very helpful in your efforts to lose weight. Now is the time to actively enlist their assistance. Start by making public your commitment to lose weight. Research has indicated that this is important in helping you to see your weight loss program through to a successful completion. In addition ask your family and friends to do the following: (a) not to criticize your fatness but rather to praise you for your weight management progress; (b) to prepare and serve you small quantities of low calorie foods; (3) not to offer you additional food at regular meals or at parties; (d) to engage in nonfood activities such as taking a walk around the block rather than having an evening snack.

2. Eat only if you are hungry. This may sound foolish, but many people eat at 8, 12, and 6—not because they are hungry at the times—but because they are generally considered the "right" times to eat. Let your stomach guide your eating; not the clock or the stomachs of your friends or family. Don't feel compelled to eat because of social pressures. You can sit at the family dinner table and converse without eating. If possible eat several balanced small meals each day rather than just one large meal and much munching.
3. **Delay your gratification.** When tempted to nibble, try to wait for progressively longer periods of time (5 min, 8 min., etc.) before indulging (if the latter can't be avoided). Set a timer for your delay period and do not set until it buzzes. By progressively lengthening the delay, you will learn to control on-the-spot urges.

4. **Restrict yourself before you eat.** If you are eating by yourself, prepare the meal, fix your plate, and then put everything away before you sit down to eat. This will insure that you don't continue adding things to your plate. If the entire loaf of bread is lying right there in front of you, you are much more likely to reach for a few extra pieces. Get in the habit of setting limits before you begin eating.

5. **Buy and prepare food on a full stomach.** Never go shopping when you are hungry. You are much more likely to buy indiscriminately (both in quantity and in type) when you are hungry. Also, if eating while preparing a meal is a problem, prepare the evening meal immediately after you have finished lunch. It won't hurt it to sit for a few hours. This will reduce your temptation to nibble.

6. **Separate eating from all other activities.** When you eat, devote your entire attention to eating. Many weight problems result from the type of eating that becomes almost unconscious; that is, you may be munching on peanuts while watching the news without realizing what you are doing. If you spend a lot of time in the kitchen, you may find yourself habitually consuming left-overs and sweets. Make sure that when you eat you do nothing else—that is, no television, no reading, no phone calls, etc.
Exercise to Weight Reduction

The role of physical exercise in weight reduction has often been belittled. It has been stated, for example, that one must climb the stairs to the top of the Empire State Building and down again repeatedly for four hours in order to lose one pound of body fat. Such statistics would dampen the enthusiasm of the most ardent devotee of exercise. However, it is also true that if that same individual climbed the stairs to his fourth floor office and back down again four times a day, he would lose that pound of fat in thirty days or six working weeks. This would result in a yearly loss of approximately nine pounds. It is not necessary for exercise to be prolonged and exhausting for it to be effective. Short but regular periods of exercise will make the same contribution and can be a useful and enjoyable part of your weight reduction program.

It has been clearly demonstrated that when diet and exercise are combined, regular exercise increases the rate of weight loss. Furthermore, it is well known that the overweight individual will burn more calories per minute than his lean counterpart when carrying out the same task. It has been found that, in addition to increased weight loss, exercise helps dieters to retain needed body fluids and maintain a better, more positive attitude. Interestingly exercise is most beneficial when restriction of calorie intake is not excessive. When a diet is too severe, the body's rate of metabolism changes and reduces the effectiveness of exercise.

Exercise has yet another benefit to the dieter: by increasing energy expenditure it is not necessary to restrict calorie intake severely in order to yield encouraging results. The deprivation and hunger that often accompany dieting probably contribute more to an inability to adhere to a weight loss program than any other factor. By moderately decreasing intake and increasing expenditure, such discomforts can be avoided. By increasing exercise, a more relaxed and more satisfying dietary program can be enjoyed.

In addition, however, it is necessary to weave increased energy expenditure into the natural fabric of daily living. Although not measurable, such increases will undoubtedly influence energy expenditure and have some effect on body weight. One should be as conscious of how she uses her body as she is of what she puts into it and how fashionably it is bedecked, but in a labor serving society like ours this would call for a kind of diurnal heresy. For example, while the telephone company extols the virtues of adding extension telephones to save 70 miles of walking per year, this should be seen by the weight conscious person as an expensive leisure costing as much as 15 excess pounds of body fat in 10 years. In the same vein, department stores which provide convenient elevators and escalators but poorly lit stairwells cater to the convenience but not the health of their customers, as do the purveyors of golf carts, power (and even riding) lawn mowers, mechanical snow shovels, electric garage doors, carving knives, ice crushers, can openers, tooth brushes, and even parking lots which virtually eliminate walking from
shopping tours. To surmount these many forces which would lead to inactivity, one must make a deliberate decision to think before she saves even a single calorie of energy and then act to expend that calorie. This is done by walking upstairs every time it is appropriate instead of waiting for things to accumulate on the bottom step or sending an otherwise quite sufficiently, active child up, by sitting instead of lying down, standing instead of sitting, and walking instead of standing verytime it is practicable to choose the more energetic option.

Finally while these changes are often more readily arranged in the home, it is also possible to make a number of adjustments in work situations. For example, just using the coat rack and the coffee pot on another floor, using the toilet at the far end of the hall, or parking at the extreme end of the lot can appreciably increase the amount of energy expended over the course of a year. But none of these adjustments will be automatic; some will be the subject of ridicule, and all will require more exertion. To be successful in the face of these odds requires a firm commitment to strongly embracing exertion as a basic thread in the fabric of daily living.
APPENDIX D

Forms used in the Study
CONSENT FORM

As a volunteer for this weight control study, we want you to know what this part of the experiment is going to be like. You will spend up to 24 hours lying on a bed in a dark, somewhat sound-reducing room, and you are instructed to remain reasonably quiet while in the room. That is to say, you are not permitted to sing, whistle, talk to yourself, etc.; also, you are asked to refrain from moving around the room, sitting upon the bed, etc., except as detailed below.

Water and food (liquid diet food) will be available at your bedside through plastic straws, and you are free to take them at will. From time to time, messages will be presented to you over an intercommunication system, and also you may be asked questions about how you are feeling, and so on. At all times while you are in the room, there will be a monitor in the room next door to you who will listen periodically through the intercom set to make sure that you are all right, and that you are obeying the instructions to lie still without moving around the room, talking to yourself, or the like.

Several hundred subjects have participated in experiments involving essentially the same kind of situation, and very few of them have found it stressful or unpleasant. However, if you should find that your reaction to the situation is negative, you may end the experiment simply by getting off the bed and walking out of the room. If you decide to do this, you should not feel that it reflects upon you in any way; some people just find such a situation unpleasant, and there is no particular reason why they should force themselves to continue in it. You should feel assured that among these several hundred subjects, none has ever experienced any extremely undesirable or lasting side effects.

I have read the above information, and agree to participate in the project as described.

DATE________________________________ SIGNATURE________________________________

PRINTED NAME: __________________________ AGE:_____ ADDRESS ________________________

_________________________________________________________ TELEPHONE NO.______________

SOCIAL INSURANCE NO.______________________________
MOTIVE CHECKLIST

Below is a list of different reasons that people have for wanting to lose weight. Under each reason is a scale ranging from very important (5), to not at all important (1).

Circle the number which represents how important each of these reasons is for you in your decision to join this program. For example, is improving your appearance very important to you? Circle the 5 under that particular reason.

1. Improve my appearance

   1  2  3  4  5
   not at all  not very  somewhat  fairly  very
   important  important  important  important  important

2. Improve my health

   1  2  3  4  5

3. Demonstrate self-control

   1  2  3  3  4  5

4. Improve social opportunities

   1  2  3  4  5

5. Improve employment opportunities.

   1  2  3  4  5

6. Prepare for some upcoming event

   1  2  3  4  5

7. Please my spouse or friends

   1  2  3  4  5

If you have other reasons for joining the program please list them here and put a number from 1 to 5 representing how important that reason is to you.
Spouse Involvement Form

has decided to participate in a program designed to help her control over-eating and lose excess weight. A program of this kind is a big job and at times will be very difficult. It is for this reason that your support and assistance are crucial to the success of the program.

Essentially the program is a method of self control. Various techniques have been developed to aid the individual in learning good eating habits and good exercising habits. For example, in order to avoid eating all the time wherever one might be, it is important to arrange for her to eat in only one room, such as the dining room, and not do anything else while eating. Your role in this aspect would be to encourage your wife/friend to eat in one place and offer positive comments when she is fulfilling this particular step.

The techniques are many and instead of listing them all here, I would like to request that you acquaint yourself with the program by reading the short booklet that we will be supplying your wife/friend. I would like to add that for the program to be effective and long lasting, it must be taken completely seriously and for an indefinite period of time. This is not a crash diet with a piece of chocolate cake at the end. It is a change in living style with more emphasis on nutritional habits and exercise habits. I cannot emphasize enough the importance of your support to the success of this attempt to lose and maintain a new low weight.
You can be of assistance to the program by providing us with some information about the current eating habits of your wife/friend. She has already given us information and will continue to do this, however, in an experimental program like this, it is very important that we collect as much information as possible about each participant.

Please answer as best as you can the following questions about your wife/friend's eating habits:

1. How many meals does she eat a day?
   Average number ________.

2. How well balanced are the meals she eats?
   check one:   ____ very poorly balanced - not very nutritious
                ____ not very balanced - some nutritious foods but mostly junk foods
                ____ about average - some nutritious foods - some junk foods
                ____ fairly balanced - mostly nutritious foods
                ____ very well balanced - very nutritious

3. How appropriate for someone on a diet is the food she eats?
   check one:   ____ very appropriate - very few fattening foods
                ____ somewhat appropriate
                ____ about average
                ____ somewhat inappropriate
                ____ not at all appropriate - mostly fattening foods

4. How well do you think she has snacking under control?
   check one:   ____ never snacks
                ____ rarely snacks
                ____ sometimes snacks
                ____ frequent snacking
                ____ always snacking

5. Does she often turn down fattening foods when they are offered?
   check one:   ____ always turns down fattening foods
                ____ frequently turns down fattening foods
                ____ sometimes turns down fattening foods
                ____ rarely turns down fattening foods
                ____ never turns down fattening foods
Two Month Interview

NAME ______________________ DATE ______________________

I. Calorie plan?
% of days on ______________________
% of days over ______________________
% of days under ______________________

Graphing _______ yes ______ no __________

II. Exercise
average calories/da. ______________________
pattern: regular ______________________ how often
sporadic ______________________ how often

Graphing _______ yes ______ no __________

III. Habits
 % of time

Eating in one place (when home) ______________________
Not doing anything else ______________________
Keeping problem foods out of sight and reach ______________________
Working on specific problem times ______________________
Getting help from others ______________________
Use smaller plate ______________________
Measure portions ______________________
Keeping safe foods available ______________________
Eating slowly ______________________
Payoff plan ______________________

1. Do you feel your attitude toward eating has changed?

<table>
<thead>
<tr>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completely</td>
<td>A great deal</td>
<td>Somewhat</td>
<td>A little bit</td>
<td>Not at all</td>
</tr>
</tbody>
</table>

2. Do you feel better about yourself?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>A little bit</td>
<td>Somewhat</td>
<td>A great deal</td>
<td>Very much</td>
</tr>
</tbody>
</table>

3. Do you feel healthier and more physically fit?

<table>
<thead>
<tr>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2=</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremely</td>
<td>A great deal</td>
<td>Somewhat</td>
<td>A little bit</td>
<td>Not at all</td>
</tr>
</tbody>
</table>

cont'd....
4. How much difficulty have you had thus far (0-100) ____________

5. How much difficulty do you foresee having for the next four months (0-100) ____________

6. How many times have you read the book? ____________

7. What is your opinion of the book?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Worthless</td>
<td>Of little Value</td>
<td>Somewhat useful</td>
<td>Very useful</td>
<td>Extremely Useful</td>
</tr>
</tbody>
</table>

S.D. Experience

Has it helped?

Have you thought of that experience much?

What was it like? (Pleasant-Unpleasant)

Message:

Have they helped?

Have you tried relaxation since then?

Have you thought of them?
Six Month Interview

**NAME** ___________________________ **DATE** ___________________________

1. Do you feel that for you the progress has been successful or unsuccessful?

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<th>5</th>
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<tbody>
<tr>
<td>completely</td>
<td>fairly</td>
<td>neither</td>
<td>fairly</td>
<td>completely</td>
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<tr>
<td>unsuccessful</td>
<td>unsuccessful</td>
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<td>successful</td>
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<tr>
<td>nor unsuccessful</td>
<td></td>
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Comments:

2. Do you feel that your attitude toward eating has changed since the beginning of the program?

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<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>changed</td>
<td>changed a great deal</td>
<td>changed</td>
<td>changed</td>
<td>not at all</td>
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3. Have your attitudes toward your health in general changed?

<table>
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5. Do you feel healthier and more physically fit?

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<td>a great deal</td>
<td>extremely</td>
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</table>

6. What do you think are the most important aspects of the program?

7. What are the worst aspects of the program?

8. How could the program be improved?

cont'd....
Six Month Interview (cont'd)

9. What is the greatest problem you had while on the program?
10. What have you learned about yourself during the program?
11. Do you think you will use this program in the future?
12. Do you feel it is possible for you to reach your goal weight?
13. General Comments