THE URGE TO OVEREAT—THE INITIAL LINK

ROBERT YOUDIN and NANCY S. HEMMES
SUNY-Downstate Medical Center and Queens College of the City University of New York

Summary—Five overweight adult females were exposed to a weight reduction program based on the principle of response chaining. Under this program overeating was viewed as the terminal link in a chain of stimuli and maladaptive responses. Treatment was directed at the initial behavioral link of the chain—the urge to overeat (deviate from a prescribed diet). Following each urge the subjects wrote a series of sentences describing the desired food and questioning their motivation for overeating. For all subjects the urge to overeat was almost entirely eliminated during treatment and generally did not recur during long term follow-up periods (six months and one year). Subjects lost a mean of 26.6 lb during treatment, which represented 34.6% of their total excess of weight. At a follow-up one year later the mean weight loss had gone up to 40.2 lb.

In many treatment programs for excessive consummatory behaviors, the target behavior is viewed as the terminal link of a chain of stimuli and maladaptive responses. The basis of these programs derives from Skinner’s (1938) Law of Chaining according to which responses are capable of producing eliciting or discriminative stimuli for subsequent responses. All responses in the chain are maintained by the reinforcement derived by the terminal consummatory response. Thus, early responses which are temporally isolated from reinforcement should be weaker than later responses. Based on this analysis, maladaptive consummatory responses can be eliminated by disruption of the chain at some earlier point. Ideally the therapeutic intervention should be aimed at the initial response in the chain since this response will have the lowest strength.

With few exceptions, treatment programs for obesity have failed to consider this simple principle of chaining. A large number of behavioral studies have treated scale readings as the target problem, applying contingencies to weight change rather than to behavioral change (Harmatz and Lapuc, 1968; Mann, 1972; Bellack, Schwartz and Rozensky, 1974; Hall, Hall, DeBoer and O’Kulitch, 1977). While such procedures generally lead to more rapid weight loss than procedures involving no explicit external reinforce-

Requests for reprints should be addressed to Robert Youdin, 9-15 166 Street, Beechhurst, New York 11357.
antecedent stimuli (Ferster, Nurnberger and Levitt, 1962; Stuart, 1967). Under this procedure
subjects are instructed to restrict their consumption of food to a very small set of stimulus con-
ditions. In addition, food is to be kept out of sight except when eating is scheduled to occur.
In this way subjects would rarely be exposed to stimuli which elicit the eating chain. While this
technique is not generally used in isolation, it has frequently been included in successful treat-
ment programs (Abramson, 1973).

The present report describes a procedure based on the Law of Chaining for the treatment of
obesity. As with stimulus narrowing, the present procedure is designed to interrupt the eating
chain at its earliest link. However, rather than relying on the subject never coming into contact
with elicitors of the chain, our procedure treats the subject’s initial response to a forbidden
food—the urge to eat it. If the subject’s urge to eat a forbidden food can be eliminated, he can
reduce and maintain his weight loss in an environment which replete with potential elicitors of
eating.

Our program also included cognitive exercises designed to focus the subjects’ attention on their
eating problems and their solution. Unlike covariant programs (Homme, 1965), no contigu-
gencies were arranged for specific thoughts; nor were subjects asked to pair thoughts of eating
with aversive scenes. The cognitive exercises were included merely as potential sources of
motivation for the subjects (Sachs and Ingram, 1972).

METHOD

Subjects
Five adult female subjects were chosen from a group of

Table 1. Individual subject data

<table>
<thead>
<tr>
<th>Subject</th>
<th>Age</th>
<th>Duration of weight problem (yr)</th>
<th>Weight (lb)</th>
<th>Overweight (%)</th>
<th>lb Lost in 8-week treatment period</th>
<th>% Overweight lost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>44</td>
<td>35</td>
<td>215</td>
<td>49</td>
<td>30</td>
<td>28</td>
</tr>
<tr>
<td>2</td>
<td>30</td>
<td>20</td>
<td>164</td>
<td>30</td>
<td>22</td>
<td>45</td>
</tr>
<tr>
<td>3</td>
<td>47</td>
<td>20</td>
<td>125</td>
<td>20</td>
<td>10</td>
<td>40</td>
</tr>
<tr>
<td>4</td>
<td>47</td>
<td>20</td>
<td>192</td>
<td>38</td>
<td>26</td>
<td>35</td>
</tr>
<tr>
<td>5</td>
<td>45</td>
<td>35</td>
<td>304</td>
<td>61</td>
<td>45</td>
<td>25</td>
</tr>
<tr>
<td>X</td>
<td>42.6</td>
<td>26</td>
<td>200</td>
<td>39.6</td>
<td>26.6</td>
<td>34.6</td>
</tr>
</tbody>
</table>
THE URGE TO OVEREAT—THE INITIAL LINK

229

of their daily rates of overeating urges (urges per minute). The data were plotted on semi-log paper (3 cycles × 150 divisions) in order to magnify small deviations from zero urges. In the later stages of treatment a single urge produced a large increment on the graph which looked to the subject like an alarming return to previous overeating behavior.

In addition to recording urges to overeat, each subject was instructed to keep a daily written diary containing any material she felt was relevant to the treatment as well as any feelings she had as a result of the treatment. Diaries were collected at the weekly meetings but the experimenter did not discuss their contents with the subjects. Subjects recorded urges and wrote diaries during the 10 days of baseline and all subsequent stages of treatment.

**Intervention A.** Following the baseline period the subjects were instructed in stimulus control strategies for altering eating habits and were presented with the following rules:

1. I must always eat in the same place when at home.
2. I must eat small pieces of food, chewing very thoroughly.
3. If I feel the need for a snack, I will drink a glass of water.
4. I will never eat while engaging in another activity such as talking on the telephone or driving a car.

No consequences were established for adherence to these rules which remained in effect throughout the duration of the study.

The subjects were also encouraged to devote a period of time each day to thinking about overeating, its role in their lives and its effects on their bodies. Specifically, each subject was asked to remove her clothing (while alone in her bedroom) and to look in a full-length mirror and become familiar with her body. While doing this she was to imagine herself overeating for one minute, concentrating on the feelings which accompany this behavior. No contingencies were established for this exercise, but the subjects were asked to complete it daily during this and the subsequent intervention period.

**Fig. 1.** Rate of urges to overeat (responses per min) for each subject as a function of stage in treatment. Data are plotted on semi-log coordinates. Missing data points are indicated by dotted lines.
Treatment for the urge to overeat was also initiated during this intervention period. Now, each time the subject experienced an urge, she was instructed immediately to write the following questions on one of the $3 \times 5$ index cards which she carried with her at all times.

(1) Why do I want to eat this food when I entered this program to stop overeating?
(2) Who am I fooling by eating this food?
(3) Do I want to be overweight?

After writing these questions the subject clicked her wrist counter and consumed the food if she chose. This intervention was followed regardless of whether the food was eaten. **Intervention A** lasted 11 days.

**Intervention B.** During the second intervention, treatment for urges was modified by instructing the subject to write a full description (on $3 \times 5$ index cards) of the food she was having an urge to eat including: taste, smell, consistency and number of calories. Following this she was to write out the three questions listed above. Finally, the wrist counter was clicked. Again the subjects were instructed to carry out the full intervention regardless of whether the food was eaten. Intervention B was continued for 15 days.

**Removal of interventions.** After 26 days of treatment for urges to overeat, the subjects were instructed to discontinue all interventions as well as the daily exercise. They were, however, told to continue to follow the rules for good eating habits and to record and report eating urges. They also continued to keep their diaries. The weekly meetings were conducted as usual during this 20-day period.

**RESULTS**

**Urges to overeat**

Rate of urges to overeat (urges per min) is plotted in Fig. 1 on semi-log coordinates as the subject saw it. The same data are plotted on linear coordinates in Fig. 2. Days when subjects failed to call in their data are indicated by dotted lines on the graphs. As can be seen in both figures...
no consistent trends developed during the baseline period. This finding is at variance with the majority of reports on the treatment of overeating in which subjects typically show a decrease in caloric intake and/or weight during self-monitoring baselines (cf. Mahoney, 1974). Weight, however, was not recorded during baseline in the present study, so subjects may have shown some weight loss during this period even though their urges to overeat did not decrease. This speculation is made more probable by the fact that all subjects completely stopped overeating by the end of the first intervention period even though overeating urges had not been completely eliminated. As shown in Fig. 2, rate of urges to overeat decreased strongly in all subjects during the first intervention and continued to near zero during the second intervention period. When all interventions were removed, overeating urges remained at zero or one per day. All subjects reported themselves free of urges to overeat in the one month and six months follow-up contacts, but one subject reported a return of urges in her one year follow-up report. This subject treated herself for this problem by resuming the first intervention procedure. She wore the wrist counter for three days and followed each overeating urge with writing the intervention. After the first day, urges ceased to occur, but she wore the counter for two more days.

**Weight loss**

Since weight loss was not the primary focus of treatment, subjects were not encouraged to weigh themselves. As a result weight loss cannot be shown as a function of stage of treatment. Recall, however, that all subjects reported that they had stopped overeating by the end of Intervention A. Furthermore there were significant changes in weight by the end of the eight-week treatment period. As indicated in Table 1 subjects had lost an average of 26.6 lb by this time. This weight change is more meaningfully expressed by a “reduction quotient” for each subject based on the pounds lost divided by the number of pounds overweight. This quotient multiplied by 100 expresses the percentage of overweight pounds lost. Subjects in this study lost an average of 35% of their overweight during the eight-week treatment period, a figure which compares favorably with other treatment programs using this metric (Mahoney, 1974). When a subject attained her desired weight, she was instructed not to change the definition of an urge to overeat but to conform with a maintenance rather than a reducing diet, to be prescribed by her physician. At a follow-up one year later the mean loss of weight had gone up to 40.2 lb (Table 2).

<table>
<thead>
<tr>
<th>Subject</th>
<th>Weight (lb)</th>
<th>Total weight lost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>173</td>
<td>42</td>
</tr>
<tr>
<td>2</td>
<td>131</td>
<td>33</td>
</tr>
<tr>
<td>3</td>
<td>114</td>
<td>11</td>
</tr>
<tr>
<td>4</td>
<td>154</td>
<td>38</td>
</tr>
<tr>
<td>5</td>
<td>227</td>
<td>77</td>
</tr>
</tbody>
</table>

Mean loss = 40.2 lb.

**Introspective data**

Although no attempt was made to modify the subjects’ feelings about themselves and about dieting, analysis of the diaries and follow-up interviews revealed some interesting changes. During the baseline period all subjects expressed feelings of ugliness, disgust with body and mind, feelings of having a bad character and a sense of hopelessness about losing weight. During the first intervention period the group again showed some homogeneous experiences with respect to the program and themselves. These included: feelings of possible self-control; inability at times to see a connection between their heads and bodies when gazing in the mirror; difficulty in visualizing themselves not overeating even though all subjects expressed more positive feelings when viewing their bodies. During the second intervention period subjects uniformly found: “a new sense of control”, feelings that they might be successful in learning self-control”, and a very noticeable positive change in their figures. When the interventions were removed
all subjects felt a firm and secure sense of control over their minds and bodies. No anxiety was evidenced when interventions were removed and during this period all subjects found it difficult to imagine themselves overeating. After the six-month and one-year follow-up all subjects reported experiencing complete control over their eating behavior and feelings of new vigor.

DISCUSSION

All subjects in this study showed significant and enduring weight loss accompanied by complete elimination of urges to overeat. In addition, all subjects reported strong positive changes in their self-concept and self-control. These changes resulted from a treatment program which combined behavioral and cognitive interventions. While the effects of the two types of intervention could not be separately analyzed, it seems unlikely that the cognitive exercises alone contributed in any specific way to the results since, unlike covert sensitization, they did not involve reinforcement or punishment for any particular thoughts. Furthermore, as Abramson (1973) has pointed out, cognitive conditioning has shown little promise as a means of altering specific eating behaviors. Rather, its function in the present study seems to be one of motivation. By devoting a period of each day to focusing on their eating problem, the subjects may have simply increased their awareness of their eating behavior (Sachs and Ingram, 1972).

The dependent variable in this study, the urge to overeat, responded strongly to response-contingent intervention consisting of the subjects immediately writing a description of the tempting food and three questions pertaining to overeating. The subjects also recorded each instance of the target behavior. This technique interrupts the normal eating chain which is initiated by the urge to eat and terminates with eating. According to Skinner’s (1938) analysis of chaining all component behaviors of a chain are maintained through the reinforcement accruing by the terminal link (the consummatory response). Behaviors prior to the terminal link are maintained by secondary reinforcers: discriminative stimuli in the presence of which the next behavior in the chain is reinforced. The farther a behavior is removed from primary reinforcement, the weaker its response strength. In the present study the target behavior (the urge to overeat) was made more distant from the terminal behavior by insertion of the intervention behaviors (writing and recording). In this way the response strength of the urge should be decreased. The urge to overeat may have also been weakened by the punishing properties of the intervention. That is, writing and recording may have been aversive to the subjects. Thus, their presentation contingent upon an urge to overeat may have punished the urge. Of course these two potential sources of control cannot be separately evaluated.

The subjects in this study were remarkable for their enthusiasm for the treatment program. This may have resulted from the program’s unique feature of treating one of the most troublesome problems of dieting—urges to cheat and the necessity of defying one’s strong desires to eat forbidden foods. While stimulus narrowing procedures help eliminate this problem by reducing temptation, it is unrealistic to expect to eliminate temptation entirely or for a long period of time. If instead subjects can learn to control their urges in the face of temptation, dieting becomes a relatively painless procedure. This feature of the present program makes it potentially valuable for individuals for whom the need to eliminate certain foods from their diet (e.g. sugar, cholesterol, sodium) is chronic and mortal. It also suggests the program for other obsessive behaviors which are initiated by urges, such as nail biting or obsessive rituals. The program has, in fact, been applied successfully to a case of nail biting and a case of obsessive fanticizing. It has also been used in the successful treatment of several additional overeaters by the present author (Youdin) and by four other practicing psychologists and psychiatrists.

REFERENCES

Abramson E. E. (1973) A review of behavioral approaches...
to weight control, *Behav. Res. & Therapy* 11, 547-556.