Satiation and Sensory Deprivation Combined in Smoking Therapy: Some Case Studies and Unexpected Side-Effects

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Abstract

Two promising techniques for smoking reduction, sensory deprivation and stimulus satiation, were applied in combination to five smokers. All were successful initially in achieving abstinence and four ultimately in maintaining abstinence.

The issue of possible side-effects is worth considering. Quitting per se and both satiation and sensory deprivation may be stressful and as a result may potentially produce negative side-
effects. The observation of positive side-effects in these cases balances this possibility to some extent.

Recent reviews suggest that attempts to help people stop smoking have had mediocre results. For example, it has been said of a public education approach that "its only merit has been the enthusiasm exhibited by the campaign organizers" (Bradshaw, 1973, p. 361). While some clinical treatments have had immediate positive effects, there is a relatively high relapse rate. Bradshaw (1973) estimates a relapse rate of 47%, as opposed to a rate of about 37% (Hammond and Garfinkel, 1964) for individuals who stopped smoking spontaneously. Similarly, Hunt and Bespalec (1974), having reviewed some 89 published studies using a variety of techniques, report that the relapse rate between 9 and 18 months after the end of treatment is around 50%.

Several reviewers (e.g., Bernstein, 1969; Bradshaw, 1973; Hunt and Bespalec, 1974) have complained that clinical programs are difficult to evaluate because of such procedures as preselection of subjects, selective

<table>
<thead>
<tr>
<th>Study</th>
<th>Sample Size</th>
<th>Subject Population</th>
<th>Techniques</th>
</tr>
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<tbody>
<tr>
<td>Best (1975)</td>
<td>89</td>
<td>General population</td>
<td>Rapid smoking, satiation, counter attitudinal role playing</td>
</tr>
<tr>
<td>Flaxman (1974)</td>
<td>64</td>
<td>General population</td>
<td>Rapid smoking, stimulus hierarchy, self-management training</td>
</tr>
<tr>
<td>Lichtenstein et al. (1973)</td>
<td>30</td>
<td>Recruited with signs on campus and in community</td>
<td>Rapid smoking, warm smoky air</td>
</tr>
<tr>
<td>Sipich et al. (1974)</td>
<td>30</td>
<td>Not reported</td>
<td>Covert sensitization, self-control, suggestion, attention-placebo</td>
</tr>
<tr>
<td>Suedfeld and Ikard (1974)</td>
<td>37</td>
<td>General population</td>
<td>Sensory deprivation, antismoking messages</td>
</tr>
</tbody>
</table>

*Comparison excludes control subjects whose performance was significantly inferior to experimental subjects.
dropping of subjects during treatment, use of different dependent variables
(some investigators report only abstention, while others report percentage
reductions in smoking rate), and unavailability of long-term follow-ups.
Recent studies which were reported in sufficient detail are compared in
Table 1.

While many investigators have reported positive results from their own
particular techniques, there appears to be a lack of demonstrable difference
among various methods (Johnston and Donoghue, 1971; Bernstein, 1969;
Hunt and Matarazzo, 1973). However, methodological flaws make it
impossible to perform critical tests; thus the inability to discriminate is
based on a lack of adequate data rather than on any explicit demonstration
of no differences.

Two recently developed techniques, satiation smoking and sensory
depprivation, have obtained promising results with a relatively small invest-
ment of time and effort on the part of clients and therapists. In the first
method, the smoker's baseline smoking rate is established. He is then
required to smoke for some days at a rate much higher than baseline.

<table>
<thead>
<tr>
<th>Sessions</th>
<th>Termination</th>
<th>Six month</th>
<th>% baseline</th>
<th>Termination</th>
<th>Six month</th>
<th>% abstinence</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\bar{x} = 10.3$</td>
<td>7</td>
<td>61</td>
<td>69</td>
<td>32</td>
<td>Treatment effectiveness a function of personality factors</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 6 | 18 | 67 | 52 | 31 | Treatment effectiveness interacts with subject sex; gradual reduce-
| $\bar{x} = 8.4$ | 0 | 26 | 100 | 60 | Possibly limited population, abstinence required for treatment
| 6 | 16$^b$ | 45$^b$ | Not reported | Weekly (10 week) phone follow-up |
| 1 | 24$^c$ | 48 | 73$^c$ | 32 | Unusually large number (19%) with reduced (less than 50%) smoking on follow-up |

$^b$ Percentages calculated from a graph included in the report.
$^c$ Calculated 1 week after termination.
Under these conditions, cigarette smoke becomes an aversive reinforcer, causing dizziness, nausea, headaches, and sore throat (Best, 1975; Best and Steffy, 1975; Claiborn et al., 1972; Lando, 1972; Marrone et al., 1970; Morrow et al., 1973; Resnick, 1968a, 1968b; Sushinsky, 1972). Subjects report that for several days after the experience they have an aversion to cigarettes and feel no desire to smoke. Table 2 summarizes representative results for satiation procedures.

With the sensory deprivation technique, the subject is placed in a dark, silent room and remains in bed for up to 24 hours. In some conditions, subjects periodically heard messages concerning the dangers of cigarette smoking, methods of controlling the urge for a cigarette, and the like; other subjects have been left undisturbed for the duration of the experimental session. Several studies have demonstrated that this technique enables even highly addicted cigarette smokers to stop or reduce smoking (Suedfeld et al., 1972; Suedfeld and Ikard, 1973, 1974).

From a theoretical point of view, the combination of these two approaches seemed likely to be useful. Sensory deprivation removes the subject from the cues which normally initiate his smoking and enables him to focus his attention on residual stimuli such as the messages and his own thoughts and emotions. Among other things, he might recall vividly the aversiveness of smoking after the satiation procedure. The two effects should thus strengthen each other. With this in mind, we have now run five subjects through this combined procedure since February 1974.

Another issue is the possibility of unpredicted side-effects of smoking treatments; so far, published comments have raised some negative possi-

<table>
<thead>
<tr>
<th>Study</th>
<th>Sample size</th>
<th>Subject population</th>
<th>Satiation techniques</th>
</tr>
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<tbody>
<tr>
<td>Best and Steffy (1975)</td>
<td>24</td>
<td>General</td>
<td>Instruction to double for 1 week</td>
</tr>
<tr>
<td>Marrone et al. (1970)</td>
<td>21</td>
<td>General</td>
<td>Instruction to smoke constantly during 10 or 20 hour session</td>
</tr>
<tr>
<td>Resnick (1968b)</td>
<td>40</td>
<td>Undergraduates</td>
<td>Instruction to double or triple for 1 week</td>
</tr>
<tr>
<td>Sushinsky (1972)</td>
<td>12</td>
<td>Students</td>
<td>Instruction to triple for 1 week</td>
</tr>
</tbody>
</table>

* Figure is for report 2 weeks after the clinic.
bilities. There may be danger in attempting to stop smoking. For example, borderline psychotic individuals may be "thrown over the border" when smoking is abruptly stopped (Tamerin and Neumann, 1973, p. 35), and various neurotic symptoms may be exacerbated when smoking ceases. Some people may feel pressured into pretending that they have quit smoking, thus entering into a humiliating and uncomfortable life-style. More specifically, the satiation technique leads to considerable physical discomfort and may be physically dangerous for some individuals (Hauser, 1974). Sensory deprivation, while a generally innocuous technique (Suedfeld, 1975; Suedfeld and Borrie, in preparation), can also be stressful if the subject is not properly prepared for the experience. However, even with our few subjects we found some serendipitous positive side-effects, which should be noted along with the problems mentioned above. The experiences of our subjects as recorded through a number of interviews with each are reported in Section I below; Section II briefly describes some unexpected side benefits reported as a consequence of the procedure.

**METHOD**

**Subjects**

All of the subjects had become aware of one or both of the smoking cessation programs being conducted by the two authors and had spontaneously approached us to express an interest in cessation.

**Stimulus Satiation Procedures**

<table>
<thead>
<tr>
<th>Sessions</th>
<th>Termination</th>
<th>Follow-up</th>
<th>Limitations</th>
</tr>
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<tbody>
<tr>
<td>6</td>
<td>42</td>
<td>25 (4 month)</td>
<td>Subjects did not achieve goal of double rate</td>
</tr>
<tr>
<td>1</td>
<td>48*</td>
<td>38 (4 month)</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>58*</td>
<td>63 (4 month)</td>
<td>Limited population</td>
</tr>
<tr>
<td>2</td>
<td>42</td>
<td>29 (4 month)</td>
<td>Limited population, excessive subject dropout</td>
</tr>
</tbody>
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Procedure

Four procedures were used in the treatment of each subject:

(a) Tallying. Subjects were asked to keep a detailed record of their smoking for 1 week before the other phases began. The tally system called for the recording of time of day, situation, activity, and perceived reason for smoking each cigarette. This was done for two reasons: to heighten the awareness of smoking behavior and to make it possible to analyze systematically the functional utility of smoking for the subject.

(b) Satiation. One to 3 days before scheduled sensory deprivation, the subject was required to double his normal rate of smoking.

(c) Sensory Deprivation. The day after satiation, the subject was placed in a completely dark, sound-reducing room (Industrial Acoustics Model 404A). He was required to lie on a bed, without moving more than necessary to remain comfortable, and to remain silent except when instructed to make a report. Liquid diet food and water were available ad lib through plastic tubes leading to the pillow; a chemical toilet was placed near the bed. During the 24-hour session the subject was given messages concerning the negative physical effects of smoking and he also went through a brief desensitization procedure in which he was taught to use a simple relaxation exercise instead of smoking (see Suedfeld and Ikard, 1974). At the end of each message, some questions were asked to make sure that the subject had been listening and had understood the contents. Some of the messages were as follows:

Informational/Persuasive Messages (n = 10)

1. One of the most frequent mistakes that people make when they try to stop smoking is to put the emphasis on not smoking. For example, they say to themselves, “I must not smoke. I should not smoke. I won’t smoke.” 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 smoking. If you concentrate on not smoking, you end up more preoccupied than ever with smoking. 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 smoking, but you experience it as “yes” rather than “don’t.” By concentrating on this new sense of protection for your body, the urge to smoke 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 Gandhi went on his hunger strikes, 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 smoke is ignored and eventually it disappears.

5 second pause

Here are the three questions:

a) Concentrating on not doing something is a very effective way of making sure you do not do it.

b) One should not concentrate on something he does not want to do, but instead should concentrate on the reason why he should not do it.

c) One should not concentrate on something he does not want to do, but instead he should push it out of his mind altogether.

2. You are your body’s keeper. Your body is your physical plant. When you put poison 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 poison 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 smoking. 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 smoke?" 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 smoke 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 smoke and the urge to respect your body. Lock them together. By emphasizing respect for your body, you simultaneously ignore the urge to smoke. 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 smoke. 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, smoking 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 have smoked your last cigarette. Notice how this strategy puts the emphasis on what you are for, rather than what you are against. It is true that smoking 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 smoking.

Now, instead of answering questions, 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, smoking 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. From time to time most of us feel negative emotions such as fear, tension, anger, or sadness. For many people, smoking becomes a way to cope with these negative emotions. In fact, some smokers come to believe that smoking 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 smoking is to take three deep breaths and relax just as you were taught in the last message.

5 second pause

Here are the questions:

a) The belief that only smoking can calm a person down when upset is a myth.

b) Smokers feel negative emotions more often than nonsmokers.

c) When one feels negative emotions, there isn’t much one can do about them.

5. The most recent edition of the Surgeon General’s Report on smoking and health concerned itself with the potentially harmful effects one’s smoking can have on nonsmokers who happen to be in rooms or cars with smokers. Apparently, the carbon monoxide levels in the air significantly increase in these places as a result of one smoke. Therefore, remember when you stop smoking you are not only respecting and protecting your body, but the bodies of those around you, especially people who are around you a lot—the people you care about.

5 second pause

Here are the questions:
a) Smoking has not been shown to harm anyone.
b) Smoking harms only people who smoke.
c) Smoking harms not only the smoker, but also anyone who happens to be near him.

8. The problem of gaining weight is frequently voiced as a reason why people are afraid to quit smoking. From the studies on ex-smokers we know that there is an initial weight gain for many people; however, it seems that this is not a permanent condition. On the other hand, it is not necessary to gain weight. This can be avoided if you watch what you eat, at least for the first few months after giving up smoking. If you feel the urge to eat something other than your regular meals, try to eat food that is low in calories. Remember your new commitment to respecting and protecting your body includes your attitudes toward eating. Also, contrary to popular belief, a smoker does not have to substitute eating when one has an urge to smoke. Thinking about the protection of your body is the super substitute.

5 second pause

Here are the questions:

a) The fear of gaining weight is not that much of an issue, therefore it should not deter any smoker from giving up smoking.
b) Watching what you eat and exercising may insure that a person does not initially gain weight when he quits smoking but he will probably gain weight several months after he quits.
c) Smokers need not gain weight when they quit smoking as long as they conscientiously watch what they eat for the first few months after quitting.

10. It is estimated that there are presently 30 million people in the United States alone who have quit smoking cigarettes. This is an impressive number. However, more than twice that many tried and failed. Many of these people failed to quit because they kidded themselves into believing that they could smoke either just one more cigarette or only a few cigarettes in the days after their desire for cigarettes had
been greatly reduced. In fact, people have failed and gone back to cigarettes after spending 24 hours, as you are doing, because they thought they were cured and they could easily just smoke “one cigarette.” It is extremely important to keep in mind that the commitment to protect and respect your body means that you can never have one more cigarette—unless, of course, you make the choice that dying, or being disabled, is better than living.

5 second pause

Here are the questions:

a) There are approximately 30 million people in the United States who have failed to quit smoking because they have kidded themselves into believing that they could smoke “just one cigarette.”

b) More than twice as many smokers could have quit smoking had they not kidded themselves into believing they could smoke “just one cigarette.”

c) It is estimated that there are presently 30 million people who have quit smoking cigarettes in the United States alone. They could not have made it had they kidded themselves that they could have smoked “just one cigarette.”

Reinforcement Messages (n = 6)

You have now gone over 8 hours without a cigarette. Normally this would probably be a very long time for you to go without a cigarette. It is a step in the right direction.

(d) Functional Analysis. Cigarette smoking commonly serves functions such as coping with anxiety and tension, dealing with boredom, and as a source of reward for work completed. Tallies provided a base for analyzing the functional utility that smoking served for each subject. An effort was made to identify, teach, and systematically implement appropriate alternatives to smoking, tailored to the subject’s idiosyncratic pattern of reasons for smoking.

(e) Follow-ups. Each subject was interviewed several times during the week following sensory deprivation, and again two or three times during
the succeeding months. In some cases, friends and members of the family were also seen.

SECTION I: CASE STUDIES

Dr. A is a 28-year old psychologist who had been smoking for 9 years although she has smoked heavily only during the last few years. At the time of treatment she was smoking between 20 and 30 cigarettes a day. The prime motivators in her desire to quit were concern for her health (she had begun to develop respiratory symptoms) and the rising cost of her habit. Her husband had also been pressuring her to stop for several years. During the week prior to treatment, tallying made her aware of just how heavily she smoked. The actual number of cigarettes that she was smoking per day was quite surprising to her.

Treatment began with a day of satiation smoking. However, since she was not feeling well on that day, she did not reach the goal of double her usual number of cigarettes.

Although she was anxious about sensory deprivation, she had no problem staying for the entire 24-hour session and was very rested and relaxed at its conclusion. It did not bother her to go without a cigarette for that length of time; she said that she had not even thought of smoking a cigarette during the period. The only unusual experience that she had in the chamber was an olfactory hallucination of cigarette smoke during one of the messages. She found the messages themselves to be very useful and helpful. The teaching of the relaxation exercise as a substitute for smoking fit in well with the fact that she practices yoga; she later used the exercise a few times to subdue her desire for smoking during a somewhat stressful period 2 or 3 weeks after treatment. Great impact was made by the message to protect her body by not poisoning it with cigarettes. She kept rehearsing this message to herself for a long time after the treatment, and says that she has been aware of protecting her body continuously since the session. In general, she reports that sensory deprivation provided her with an opportunity to organize herself for giving up cigarettes. It removed her from the distractions of normal life and enabled her to assess her own situation and smoking behavior as well as to plan her course of action and bolster her determination to carry out the plans.

After treatment, Dr. A underwent a stressful period which included looking for a teaching position and getting a divorce. In spite of these anxiety-arousing events, which normally would have led her to smoke and on some occasions did increase her desire to do so, she has managed to
stay off cigarettes completely since the treatment (which was now approximately 8 months ago). She feels that sensory deprivation, the messages, and reinforcement were important components in the success. Reinforcement came both from a feeling of self-satisfaction as she counted the days and weeks that she had gone without cigarettes, as well as from the support of her friends and colleagues who kept asking her about her progress and congratulating her on her success.

Mr. B is a 35-year old newspaper reporter who not only wanted to stop smoking but also wanted to write a feature article on his experiences. He had been smoking regularly for 15 years and was consuming 30 to 40 cigarettes daily. While he recalled that he had originally smoked for the common adolescent reasons of wanting to appear grown-up and indifferent to regulations, the smoking habit seemed to take shape during a period of work in logging camps. The job was structured such that there were frequent, brief breaks during which all the men would smoke to fill the break and to relax. A week of pretreatment tallying confirmed Mr. B's impressions of his habitual reasons for smoking. The majority of cigarettes were smoked to relax. Many of these were smoked at work where they seemed to serve a second purpose. Mr. B typically would write a paragraph, then lean back to smoke a cigarette and think about what he had written. The cigarette seemed to not only relax him but to help his concentration. Smoking also was associated with interpersonal situations where it was seen as a sociable thing to do. Finally, Mr. B frequently read late at night and, quiet and relaxed, smoked quite a number of cigarettes "unconsciously."

The pretreatment tallying did not change Mr. B's impressions of his smoking but did serve to heighten his awareness of the smoking act. At first the tallying may have tended to produce a decrease in daily consumption, but it quickly became part of the routine and the rate returned to normal.

Treatment began with a 3-day period of satiation smoking. By doubling his normal intake for the 3 days, Mr. B developed a marked aversion to smoking. He reports that he "actively did not want to see a cigarette" and was very thankful he did not have to smoke when the satiation was finished. The satiation produced a headache and effects similar to alcoholic hangover. During satiation, Mr. B spontaneously decided to try to increase the aversive effect by smoking all cigarettes without taking them out of his mouth. The innovation proved effective, irritating his eyes and making it difficult to breathe. Despite its marked effects, the satiation procedure did
not seem to interfere unduly with work or other everyday activities. The strong aversion to smoking lasted for 3 or 4 days after satiation was discontinued and abstinence achieved.

Immediately following satiation, Mr. B underwent 24 hours of sensory deprivation. He was very interested in sensory deprivation and had been looking forward to the session. He was a little disappointed in that it was not dramatic. While in the chamber, he was not bored because of his interest in the experience; he underestimated the time spent in deprivation by 3 to 4 hours. He slept a good deal and was surprised when the 24 hours was up. No unusual occurrences were reported.

At first abstinence proved very easy. He had no desire for a cigarette and did not miss smoking. Other people's smoking had no effect on him. Mr. B commented that he has always been a fidgety person and that his restlessness increased after quitting. He discussed this problem in an interview 3 days after sensory deprivation. Deep muscle relaxation techniques (Jacobson, 1938) were demonstrated, stressing the utility of the techniques as an alternative means of coping with tension (Goldfried and Trier, 1974). Mr. B was encouraged to practice the relaxation exercises daily until he became able to achieve relaxation. He was instructed to contingently use his new relaxation skills in coping with the urge to smoke. Mr. B did not in fact practice relaxation or utilize the technique. Instead, when tense he tended to manipulate a pen or other small object with his hands.

Mr. B gained 10 pounds during the first month of abstinence but was relatively unconcerned about the gain as he is reasonably thin. He had lost 2 pounds at a 6-month follow-up.

Three months after treatment, Mr. B accepted an offered cigarette. Six months posttreatment, during a period of tension associated with personal problems, Mr. B resumed smoking. At first he smoked 2 or 3 a day, but over the period of a month increased his daily rate to 10. Mr. B's experiences parallel those commonly reported during relapse: each cigarette seemed to increase both the frequency and the intensity of cigarette urges. At a 6-month follow-up, additional treatment was offered. Mr. B declined, feeling that his earlier experiences with a smoking clinic had provided a sufficient base for him to cope on his own. He promptly, and with little reported difficulty, reaccomplished and has maintained abstinence.

Mrs. C is a teacher of library science who had been smoking for 28 years. She had stopped smoking twice after serious illnesses and had on those occasions remained abstinent for up to 8 months. Her previous
relapses occurred at parties. She smoked between 12 and 18 cigarettes a day.

The cigarette tallying proved an interesting and informative experience for Mrs. C. She found that most of her cigarettes were smoked in social situations, with coffee or a drink. She smoked far less when by herself, although before tallying she had believed her smoking rate to be quite consistent. Mrs. C also commented on the heightened awareness of smoking produced by tallying. She felt that this, as much as a better understanding of her reasons for smoking, facilitated quitting.

Mrs. C underwent satiation for 2 days preceding sensory deprivation. She did not achieve the double normal smoking criterion and in retrospect feels she did not try hard enough. As is not uncommon with satiation, Mrs. C found nonphysical consequences (e.g., irritation at the inconvenience and demeaning feeling which resulted) more aversive than the sore throat she suffered.

Mrs. C had, on one occasion in the past, experienced an intense claustrophobic reaction while in a cave. As a result, she was quite apprehensive about the forthcoming sensory deprivation period. Initially she felt panic and nausea, but after reminding herself that she had come into sensory deprivation and was remaining there completely voluntarily, and physically orienting herself to the chamber, these subsided. During this time she slept quite a bit. She found the experience boring and, although she found the messages simplistic, would have liked to hear more of them. Her thoughts wandered, and she tried to manipulate her experience of time, do puzzles, and the like. In general, she found some of these experiences "nothing much to do with smoking, but . . . fascinating."

Mrs. C had very little desire to smoke during the first week to 10 days after treatment. An interview 3 days after sensory deprivation focused on three approaches to maintaining abstinence. First, Mrs. C was encouraged to anticipate problematic social situations and to formulate and practice coping strategies in advance. Examples given were: deciding on reinforcing phrases to use in declining cigarettes, discussing the problem with dinner companions in advance, asking them not to offer cigarettes, etc.

Second, a covert self-instruction and reinforcement model, derived from the work of Meichenbaum (1975), Homme (1965, 1966) and Cautela (1970), was described to Mrs. C. The procedure involves four sequential events. The urge for a cigarette is contingently followed either by the covert imagining of aversive consequences of smoking (e.g., nicotine-stained fingers or emphysema) or by a covert self-instruction reiterating negative associations to smoking (e.g., "I feel controlled by the weed when
I smoke”). Next in the sequence is a covertly verbalized decision not to have the cigarette, followed by either self-praise or imagining positive consequences of not smoking. The procedure is presumed on theoretical grounds to decelerate or weaken the desire to smoke while simultaneously strengthening nonsmoking behaviors. Empirical support for the therapeutic utility of self-management training in general and covert techniques in particular is rapidly accumulating (Cautela, 1969; Mahoney and Thoreson, 1974; Meichenbaum, 1975).

Third, Mrs. C was encouraged to alter typical smoking situations which might elicit urges (e.g., drinking after-meal coffee in the living room rather than the more usual kitchen).

Weight gain is an ongoing concern for Mrs. C. She initially gained 2 pounds but reported during the 3-month follow-up interview that she had not only remained abstinent but had lost the 2 pounds and was continuing to lose weight, partly by utilizing the covert self-instruction model seen as helpful with the smoking. Mrs. C made an interesting observation during the interview. Although specific ways of coping with urges and maintaining abstinence had been discussed at length and with frequent examples during the session following sensory deprivation, and although she had read relevant sections in a guide to self-management (Watson and Tharp, 1972), she felt that still more attention could profitably have been devoted to concrete examples of coping techniques. This is a common problem with self-management programs: clients understand the principles but fail to generate detailed applications to their idiosyncratic problems. Mrs. C has now abstained from smoking for about 8 months.

Mr. D is a 39-year old lawyer who first began smoking at the age of 17. He has been quite active in athletics and has frequently quit smoking during athletic seasons. At the time of the clinic he was smoking 25 cigarettes per day.

Mr. D believes that originally most of his cigarettes were smoked for social reasons. Over the years they have been used more and more to cope with tension. Tallying served to confirm these two reasons and, as was the case with Mrs. C, to heighten the awareness of smoking. This later helped the subject to quit.

Mr. D satiated for 3 days preceding sensory deprivation. He did manage to achieve the goal of 50 cigarettes per day, but found the quota difficult and on occasion had to retire later than he normally would so as to get in the required cigarettes. Throughout satiation, Mr. D was aware of a very bad taste in his mouth. At times he gagged from the cigarettes...
and generally felt "lousy." The satiation seemed effective for Mr. D; at the end of 3 days he had developed a marked distaste for smoking.

Mr. D's experience in sensory deprivation was somewhat atypical. His reaction seemed associated with circumstances in his life at that time. He had remarried some 3 months earlier despite some misgivings about entering into marriage. During sensory deprivation, after an initial period of sleep he found himself thinking about a variety of things, including interpersonal problems with his wife. He had been actively trying to avoid dealing with these misgivings and was somewhat apprehensive that he would be unable to suppress them during the sensory deprivation period. In sensory deprivation, however, he decided that he would have to think his problems through sooner or later, and that a period free of distraction was a good opportunity to do so. He would have liked to hear more messages to divert himself during sensory deprivation, and was quite surprised at the simplicity of the technique. Mr. D reports that he was withdrawn and introspective for 2 or 3 days following sensory deprivation but that he was able once again to suppress his misgivings. The marriage did ultimately break up some 3 months later.

Mr. D came in for a follow-up session 2 days after sensory deprivation. He was having no difficulty remaining abstinent but was concerned about the relationship with his wife. Mr. D felt that abstinence would be most difficult when he was under stress. Accordingly, muscle relaxation techniques were demonstrated. Mr. D was encouraged to practice the techniques regularly and to use them to cope with tension. In a later interview he reported that he had not practiced nor used the techniques. As expected, stressful occasions were the most difficult. They usually occurred at the office, and on those occasions he would go for a walk up and down the hall. This seemed to serve as an effective alternative response. Mr. D reports that he had very little difficulty remaining abstinent for the first 3 months. At that point he and his wife separated. Two days after the separation, Mr. D returned to smoking.

In retrospect, Mr. D feels that he has a third major reason for smoking. He believes that he uses cigarettes at times of psychological stress. The cigarette may serve as a mild sedative and also provides an enjoyable moment at a time when little else is pleasurable.

Mr. D's case serves as a useful warning. While he attempted to give up cigarettes at a time of unusual stress and uncertainty in his life, he had no difficulty achieving abstinence, and initially had little difficulty in maintaining abstinence. His ultimate relapse came at a time of increased anxiety and moderate depression. It had been emphasized during the
follow-up session that Mr. D might encounter periods of relative difficulty and that if this happened he should reestablish contact with the clinic. This instruction, however, was not sufficient to cause him actually to ask for assistance.

Clients may be particularly likely to relapse during periods of difficulties in their lives, and the clinic’s efforts toward promoting maintenance must address this issue. It may be more efficacious to encourage the client to contact the clinic before problems with smoking actually arise, when a period of stress is just beginning. The emphasis is then on the clinic’s potential to help with stressful circumstances rather than with the smoking alone.

Dr. E is a 32-year-old psychologist who had been consistently smoking a package of cigarettes or 20 cigarettes a day since he was 17. His prime reason for quitting was a concern about the consequences his ill health would have for his family. He believed the quit effort was timely in that he was on a sabbatical leave, away from his normal environment, and experiencing little stress.

Treatment began with a week of tallying. The results were a surprise to Dr. E in that he had believed that he smoked cigarettes primarily for pleasure; instead, he seemed to smoke the majority of cigarettes in social situations in which they seemed to serve as a “social lubricant.” Tallying was followed by 3 days of satiation. With effort, Dr. E succeeded in achieving double his normal rate. Reactions included running eyes, a slight sore throat, and a marked psychological aversion expressed by the thought “Oh, my God, I’ve got to smoke another one.” Dr. E reported an interesting reaction that he experienced after 2 months of abstinence. On that occasion, he took a first puff on a cigarette since quitting. He experienced extreme nausea and the cigarette tasted very unpleasant; he attributes this reaction to the effects of satiation.

As the result of his knowledge of early sensory deprivation work, Dr. E had anticipated that sensory deprivation would be much more aversive than he actually found it to be. He slept initially but upon waking found the sensory deprivation increasingly aversive, both in terms of the sense of time disorientation and because he found the bed uncomfortable. He perceived the messages as being overly simplistic (although, as noted below, he did later make effective use of the suggestion regarding the deep breathing). Dr. E chose to leave sensory deprivation one-half hour early due to the discomfort he experienced lying on the bed. He reported no urge for cigarettes during sensory deprivation.
Dr. E found the first few days of abstinence relatively easy. He experienced an urge to smoke a maximum of 2 or 3 times a day, but had no difficulty in resisting. As he reported that the urges were strongest at those times when he would have taken a cigarette break from work in order to relax, relaxation training was demonstrated. Dr. E reports, however, that he found deep breathing, suggested by one of the messages during sensory deprivation, to be sufficient. He experienced a weight gain of 5 to 6 pounds, but this is not a major concern.

Rewards for not smoking included the contingent use of money saved to buy special foods or to go out for dinner. He received a good deal of social reinforcement from his 7-year old daughter for not smoking.

On a 2-month follow-up, Dr. E reported no smoking and only very rare urges since treatment. In evaluating the treatment, he assigned a major role to the tallying and the resultant awareness of his smoking. He believes the commitment to treatment and the efforts invested by himself and by clinic personnel served as deterrents to relapse. He is unsure about the role of sensory deprivation per se; however, he believes it was valuable in demonstrating to him that he could go for 24 hours without smoking.

SECTION II: POSITIVE SIDE-EFFECTS

One of the positive side-effects of the treatment was reported by Dr. A (see Section I). As was mentioned previously, she was very much impressed by the message to protect her body. This not only enabled her to maintain smoking cessation, but also turned out to lead her to a variety of beneficial activities which we had not foreseen. For example, she cut down considerably on her consumption of coffee, which before that had been very high. She also began a course of calisthenics, although she terminated it when she found that it did not make her feel better. Being concerned about gaining weight, and finding that her weight did begin to increase after she stopped smoking, she again recalled the "protecting the body" message as well as the message about the possibility of weight gain. She went on a strict diet, which she has maintained since, and which enabled her to lose most of the weight that she had gained.

In general, she feels that both her attention to her health and her health itself have improved greatly as a result of the treatment. She reports that she wakes up alert and refreshed in the morning, rather than feeling sluggish for an hour after getting up as she did formerly; and even when she caught the flu, she claims that it was much less severe than it would have been had she not gone through the treatment and quit smoking.
Thus there has been an improvement in her perception of the general state of her health, a feeling of accomplishment at having successfully quit smoking without experiencing great craving to resume, and a generally better set of health-related habits.

Dr. E (see Section I), who quit smoking successfully as a result of the treatment, has reported a beneficial side-effect which does not involve himself. He found after the treatment that, without either of them knowing it, the smoking behavior of his wife had been cued to his own; that is, she smoked whenever she saw him smoking. After he ceased, she was able to do so without any particular therapeutic intervention, and has remained abstinent since then.

Mr. F is a senior health science supervisor who went through the sensory deprivation treatment without previous tallying or satiation smoking. He is 53 years old, and had been smoking since adolescence. His recent history has shown many health problems, as well as family strains, particularly in relation to his adolescent children. While successful professionally, he was generally known by his colleagues as a soft-spoken, meek, and unassertive individual. He found it difficult to assert his authority as a father or as a supervisor on the job.

He underwent sensory deprivation in a chamber available at the institution where he worked. Incidentally, he is the first client upon whom we report who did not undergo the treatment within the university laboratory. The treatment consisted of 24 hours of sensory deprivation, plus the usual messages, and appears to have been completely successful. The treatment occurred approximately 8 months ago, and he has not smoked since.

Aside from this, however, a change in his personality has been reported by several of his colleagues. To quote from the report of the interviewer, who knows Mr. F well: “Following the completion of 24 hours of sensory deprivation the following changes were noted by his colleagues and his close relatives. . . . He started showing assertiveness. His supervisor was surprised when one day he spent one full hour in debating issues regarding his contribution at his institution. The supervisor thought that for the first time Mr. F was expressing some hostility. His colleagues also noted such a trend when he disciplined one of his subordinates quite firmly (he has been noted for his extreme tolerance and inability to control his staff).” He also began to assert himself at home, and apparently cleared up some difficulties in his relationship to his son.
DISCUSSION

Our results with these subjects indicate that the combined technique is a very useful one. Tallying, satiation smoking, sensory deprivation, alternative responses, and the messages delivered during deprivation were all mentioned by one or another of our subjects as having contributed significantly to their success in smoking cessation. All of our subjects stopped smoking completely after the treatment, and some were successful in maintaining abstinence even through very stressful life events. It is not possible from our data to infer whether the combined treatments are more effective than either satiation or sensory deprivation without the other; logically, the next step in our joint work on smoking cessation should be a large-scale test of this comparison.

The procedures used here have the advantage of requiring minimal staff training. The satiation treatment staff was trained with 10 hours of participant–observer involvement and discussion, followed by limited case supervision. Previous college degrees seem unnecessary. Training for the monitoring of sensory deprivation is straightforward and minimal, taking only approximately 1 hour. While the initial capital investment for a specially designed sensory deprivation chamber would be relatively high, it is quite likely that almost any windowless room can be soundproofed and equipped adequately with essential items of furniture and communications devices for less than $500. Beyond this, costs are limited primarily to staff time, food, and laundry services. Thus both techniques are quite economical in terms of financial requirements and professional therapist time.

The serendipitous finding of beneficial side-effects, both for the individual under treatment and in at least some cases for those connected with him, balances to some extent the warnings against unforeseen adverse side-effects which have been published previously.

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