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TREATMENT OF SMOKING BY COVERT SENSITIZATION

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Summary.—A detailed application of covert sensitization to smoking behavior is presented. Data are presented to indicate that the results of covert sensitization cannot be attributed to *S*'s expectancies. The available evidence indicates that the technique is effective in modifying smoking behavior.

Recently, increasing attempts have been made to modify smoking behavior. Keutzer (1968) and Bernstein (1969) have presented evaluative reviews of studies concerned with this topic. In general, they concluded that most attempts to modify smoking behavior have enjoyed little success. However, there is some evidence that under certain circumstances aversion therapies have successfully decreased smoking activity.

Franks, Fried, and Ashem (1966) devised an apparatus which emits puffs of smoke in the face of a smoking *S* and provides a relief stimulus (a candy mint or a puff of fresh air) when *S* stops smoking. Resnick (1968) attempted to make smoking aversive by satiation. He employed three groups of *S*s. One control group was asked to continue smoking at their normal rate. Another group was asked to double their consumption for a week, and a third group was asked to triple their cigarette smoking for 3 wk. A significant reduction was reported in the two satiated groups, but no change was reported in the control groups. Lublin (1969) also reports that satiation can produce an aversive response to cigarettes.

The imagining aversive conditioning technique of covert sensitization (Cautela, 1966, 1967) has also been used to modify smoking behavior. It is the purpose of this paper to describe the method of covert sensitization in the treatment of smoking behavior and present some studies in which covert sensitization has been utilized.

Description of Procedure

The general procedure of employing covert sensitization to treat maladaptive approach behaviors has been described in two previous papers (Cautela, 1966, 1967). In the covert sensitization procedure, the client is instructed to imagine he is about to engage in the maladaptive behavior. Then he is instructed to imagine that he is receiving a noxious stimulus (usually the feeling of nausea and vomiting). The procedure is labeled covert sensitization because both the behavior to be modified and the noxious stimulus are presented in imagination. The purpose of this procedure is to produce avoidance behavior. There is agreement among several investigators that imagery behavior is subject

to the same principles as overt behavior and that the manipulation of imagery can affect overt behavior (Bandura, 1969, pp. 584-585; Cautela, 1969b; Franks, 1967; Kimble, 1961, p. 462). Concerning aversive imagery, Weiner (1965) found that both imagining aversive consequences and being presented with actual aversive consequences reduced response rate more than a condition involving no consequences.

In addition to the usual assessment procedures (Cautela, 1968), the client is given a smoking questionnaire (unpublished) designed to elicit information concerning smoking behavior: frequency of smoking, kinds of cigarettes smoked, places and conditions under which smoking occurs.

The client is told that smoking is a habit which gives pleasure and reduces tension, that smoking has been associated with many situations which tend to instigate smoking behavior, and that if he is made to associate something unpleasant with smoking, his desire to smoke will be decreased or eliminated. He is told to sit back in his chair, close his eyes and try to relax. He is then instructed as follows:

"I am going to ask you to imagine some scenes as vividly as you can. I don't want you to imagine that you are seeing yourself in these situations. I want you to imagine that you're actually in the situations. Do not only try to visualize the scenes but also try to feel, for example, the cigarette in your hand, or the back of the chair in which you are sitting. Try to use all your senses as though you are actually there. The scenes that I pick will be concerned with situations in which you are about to smoke. It is very important that you visualize the scenes as clearly as possible and try to actually feel what I describe to you even though it is unpleasant."

The following is a typical scene:

You are sitting at your desk in the office preparing your lectures for class. There is a pack of cigarettes to your right. While you are writing, you put down your pencil and start to reach for a cigarette. As soon as you start reaching for the cigarette, you get a nauseous feeling in your stomach. You begin to feel sick to your stomach, like you are about to vomit. You touch the package and bitter spit comes into your mouth. When you take the cigarette out of the pack, some pieces of food come into your throat. Now you feel sick and have stomach cramps. As you are about to put the cigarette in your mouth, you puke all over the cigarette, all over your hand, and all over the package of cigarettes. The cigarette in your hand is very soggy and full of green vomit. There is a stink coming from the vomit. Snots are coming from your nose. Your hands feel all slimy and full of vomit. The whole desk is a mess. Your clothes are full of puke. You get up from your desk and turn away from the vomit and cigarettes. You immediately begin to feel better being away from the cigarettes. You go to the bathroom and wash up and feel great being away from the cigarettes.

After the scene is described to *S*, he is asked how clearly he visualized the scene and whether he felt some nausea and disgust. He is then asked to repeat the

scene himself, trying to see the cigarettes as clearly as possible and trying to see and smell the vomit.

Other scenes are given in a similar manner concerning other places in which he smokes, e.g., if he takes a cigarette after coffee in the morning, a scene is described in which he is about to smoke but gets sick and vomits all over the table and the cigarette.

Alternating with an aversive scene is an escape or self-control scene. A typical self-control scene is:

> You are at your desk working and you decide to smoke, and as soon as you decide to smoke you get this funny sick feeling at the pit of your stomach. You say to yourself, 'The hell with it; I'm not going to smoke!' As soon as you decide not to smoke you feel fine and proud that you resisted temptation.

The self-controlling response scenes make use of two procedures which have been found to increase response probability: (1) negative reinforcement (escape conditioning) (Mowrer, 1940) and (2) self-reinforcement (Kanfer & Marston, 1963).

At each therapy session, *S* is given 10 trials of vomiting alternating with 10 scenes of escape and self-control. At the end of each session, *S* is asked to practice the 20 scenes twice a day until the next session. Also he is instructed to say "Stop!" and imagine he is vomiting on a cigarette whenever he is tempted to smoke. At the beginning of each session, he is asked how many times he practiced and how many cigarettes he has smoked.

If it is evident (as usually is the case) that anxiety is antecedent to smoking or tension results from nonsmoking, the client could also be desensitized to those situations in which he usually smokes. In practice then the drive component and motor component are being manipulated. If *S* finds that the tension is too much in certain situations where he usually smokes, he is told to relax in these situations. Relaxation is normally taught in the first sessions as a self-control procedure (Cautela, 1969a).

Results

In clinical practice the procedure just outlined appears quite effective in the reduction and elimination of smoking behavior. The main problem in presenting anecdotal evidence for the efficacy of a clinical procedure is that the procedure is only one of a number of possible interacting variables that can influence outcome of treatment. In clinical practice, variables such as *S*'s expectancy and the combination of covert sensitization with other procedures make it difficult to assess the contribution of covert sensitization to treatment effects.

Regarding the use of covert sensitization and the *S*'s expectancy in outcome of treatment, Barlow, Leitenberg, and Agras have performed two studies. In one study (Barlow, Leitenberg, & Agras, 1969) they found that the degree of homosexual urges could be manipulated by introducing and withdrawing covert sen-

tization. No other procedure was explicitly utilized in combination with covert sensitization. In another study (Barlow, Agras, & Leitenberg, unpublished study[1]), they manipulated *S*'s expectancy by giving instructions to the effect that relaxing alone would reduce urges and covert sensitization would increase urges for homosexual behavior. The results were contrary to the expectancies given to *S*s. These results do not refute the possibility that expectancy or other factors are not important variables when combined with covert sensitization, but they do indicate the covert sensitization procedure itself can account for a large proportion of the outcome of treatment.

There have been some studies directly concerned with the effect of covert sensitization on smoking behavior. F. G. Mullen (personal communication, 1967) employed a control group, a group-treated covert sensitization group, and a group in which *S*s were treated individually with covert sensitization. At the end of six sessions (½ hr. for each session), the control group went from 16.3 cigarettes a day to 15.4 a day. The two covert-sensitization groups went from a mean of 15.3 cigarettes a day to 3.6 cigarettes. The group-treatment of covert sensitization had a mean of 5.0 a day and the individually treated covert-sensitization *S*s had a mean of 0.5 cigarettes a day. A 6-mo. follow-up showed that the control group had a mean of 17.1 cigarettes a day and the experimental groups had a mean of 10.1 a day. No member of the control group gave up smoking, but two members of experimental groups stopped smoking completely. Mullen reports that as early as the second session the majority of the experimental *S*s commented that they no longer enjoyed the cigarettes they smoked. In view of the small number of sessions, the follow-up results are not surprising. The experiment should have employed a placebo group.

Viernstein[2] compared covert sensitization with educational-supportive and control groups in the modification of smoking behavior. Seven sessions were used and two therapists alternated weekly administration of the procedures. *S*s subjected to covert sensitization smoked significantly ($p < .05$) fewer cigarettes at post-treatment and at a 5-wk. follow-up. She also reports that the covert sensitization *S*s said that when they did smoke, they didn't enjoy the cigarette. It would have been interesting to see reports of a 6-mo. follow-up.

Wagner (1969) compared systematic desensitization alone, covert sensitization alone, relaxation alone, and a group in which systematic desensitization and covert sensitization were combined. He reports that at the end of the 30- and 90-day follow-ups, only the group with combined systematic desensitization-covert sensitization was smoking significantly less than the base rate. As a

[1]Barlow, D. H., Agras, W. S., & Leitenberg, H. The effect of instruction on the use of covert sensitization. (Unpublished study)
[2]Viernstein, L. K. Evaluation of therapeutic techniques of covert sensitization of smoking behavior. (Unpublished data, Queens College, Charlottesville, North Carolina, 1968)

result of this study, Wagner and Bragg[3] developed a self-administering programmed recording of the systematic desensitization-covert sensitization procedure.

Implications

Evidence indicates that covert sensitization is effective in the modification of smoking behavior. When covert sensitization is combined with systematic desensitization and used as a self-control procedure, it appears more effective. Although the author has anecdotal evidence that the effects of covert sensitization can be long-lasting (i.e., at least a year), there is no experimental evidence which indicates the long-lasting effects of covert sensitization.

In empirical studies employing covert sensitization, it has been customary to employ a relatively small number of sessions. In clinical practice, the covert sensitization procedure is employed until the frequency of the maladaptive behavior such as smoking is reduced to zero. Then treatment is continued for a number of sessions. The continuation of the covert sensitization procedure after the response is eliminated is more apt to ensure less likelihood of reconditioning (Cautela, 1968; Pavlov, 1927, p. 57).

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