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An Experimental Examination of Cautela's Covert Sensitization as a Smoking Reduction Technique

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AN EXPERIMENTAL EXAMINATION OF CAUTELA'S COVERT SENSITIZATION AS A SMOKING REDUCTION TECHNIQUE

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This Dissertation submitted by Jerome Irwin Weiss in partial fulfillment of the requirements for the Degree of Doctor of Philosophy from the University of North Dakota is hereby approved by the Faculty Advisory Committee under whom the work has been done.

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ABSTRACT

Experimental studies investigating the aversive imagery technique of Covert Sensitization as a cigarette smoking deterrent have not clearly testified to its effectiveness. They have either deviated from Cautela's technique and/or confounded their results by adding other components to it.

The present study tested the hypothesis that the successful results of Covert Sensitization requires both therapist-administered treatment and instructions that Subjects (Ss) also self-administer treatment. The self-administered treatment (homework) consisted of Ss imagining Covert Sensitization scenes twice a day between meetings with the Experimenter (E).

Thirty-six habitual smokers were randomly assigned to one of three training groups; one group of twelve was taught only to imagine Covert Sensitization scenes when described by the E (CSN); a second group of twelve was additionally instructed to practice imagining them twice a day between meetings (CSH); a third group of twelve was taught to relax using Wolpe's relaxation technique and told to practice relaxing twice a day between meetings (RH). The three E's, who were randomly assigned one group from each condition,

trained each of the thirty-six Ss, and collected self-report data during six hourly sessions and four follow-up weeks.

Analysis of the data indicated that the groups smoked at different rates over time, and that the RH group smoked less than the CSN group over the follow-up periods. Although all the groups smoked fewer cigarettes once treatment began, the CSN group then increased its smoking rate throughout both treatment and follow-up weeks and the CSH group increased its smoking once treatment stopped. However, contrary to expectations, the RH group generally continued its decrease toward zero cigarettes smoked.

Speculation about these results and implications for future research were discussed, and it was suggested that the Covert Sensitization treatment was ineffective because of a low frequency of punishment or the possible use of weak aversive scenes by the Es.

The effectiveness of the RH treatment was interpreted as due to its dealing with tension, a possible underlying cause of smoking.

The reader was cautioned that these results may have been influenced by uncontrolled factors and ways to deal with these factors in future studies were discussed. Although the results of this study were inconclusive, this study has opened further areas for investigation.

CHAPTER I

INTRODUCTION

Aversion Therapy as a Technique of Behavioral Change

Aversion therapy refers to those techniques which use aversive stimuli with the intention of producing escape and/or avoidance behavior. These techniques are in contrast to others, such as implosive therapy, which uses aversive stimuli with an intention to produce approach behavior. The stimuli in aversive therapies are usually chemical, electrical current or imaginary aversive scenes. The problem behaviors usually dealt with by aversive therapy are those involving alcoholism, drug addiction, sex, obesity and smoking. Most aversive therapy studies have been poorly controlled. Therefore successful results, when occurring, do not present sufficient evidence for causal relationships. Therefore, the aim of the present study was to test an aversive imagery therapy known as Covert Sensitization, as a treatment for smoking without allowing supplementary conditions to confound the results.

Origin of Present Day Aversion Therapy

Aversion therapy is based primarily on a conditioning paradigm the basis of which is to be found in Pavlov's

report (1927) of a study by Podkopev, in which a dog appeared to develop a weak, conditioned nausea response to the sound of a tone.

The implication in Pavlov's report was that the latency of the conditioned reactions (nausea, sleep, etc.) decreased with the frequency of chemical injections given. This type of conditioned response is classified by Grant (1964) as 'Pavlovian Type B' and he suggests that a great deal of interoceptive and autonomic conditioning follows this paradigm.

One of the earliest Western accounts of aversion therapy was provided in 1935 by Max, who described the treatment of homosexual behavior by means of electric shocks. Eysenck and Beech (1971) report that during the thirties and forties, aversion therapy was used predominantly in the treatment of alcoholics and that the current resurgence of interest in aversion therapy may have occurred as a result of the increasing interest in behavior therapy. In current practice electrical stimuli are most often employed and the most frequent disorders treated are alcoholism and sexual disorders.

Aversive Stimuli

Three main kinds of aversive stimuli have been used in aversion therapies. One kind of aversive stimulus has been chemical. The chemical is usually something such as apomorphine, a drug which when taken internally produces nausea and vomiting (Rachman and Teasdale, 1969).

Over the years fewer studies have appeared in the literature using chemical agents. Perhaps this is because of the side-effects some of them have. For example, disulfiram (Antabuse) has been used as an aversive tool in the treatment of alcoholism. In combination with alcohol it has a toxic effect (Blum and Blum, 1967). The symptoms produced are a rise in blood pressure, flushed face, air hunger, accelerated heart rate, dizziness, nausea and vomiting. This is followed by a pallor, a rapid fall of blood pressure, unconsciousness, and with sufficiently high doses, death. Blum and Blum also indicate that side-effects from this drug may occur even when the drug is used appropriately. These side-effects include dermititis, abdominal cramps, nausea, peripheral neuritis, sedation, drowsiness, headache and possibly impotence and psychosis. These investigations note that although not all chemical agents which might be used in aversive therapies produce these side-effects, they do produce side-effects which should be of concern to the user.

The second main kind of aversive stimulus is electrical current. In contrast to chemical stimuli, electric current permits more precise control of the timing and intensity of the stimulus, and when not used with high intensity, has not resulted in detrimental side-effects. Thus it has achieved a relatively greater popularity than has chemical stimuli.

The third kind of aversive stimulus is that of imagery which produces nausea or an anxiety response. The patient is required to imagine the undesired activity or stimulus, and then imagine some extremely undesirable consequence such as nausea, shame or pain. The psychological literature usually terms these imagined aversive scenes aversive imagery (Rachman and Teasdale, 1969; Eysenck and Beech, 1971). Most work investigating aversive imagery has been under the heading of Covert Sensitization. Like other aversive therapies, Covert Sensitization has been used in the treatment of such problems as undesirable drinking, sexual or smoking behaviors.

And like many of the studies using tangible stimuli, those using Covert Sensitization have used supplementary techniques such as relaxation, counseling or systematic desensitization without analyzing the contribution of each. In addition many of the studies of Covert Sensitization have not followed its procedure. Since, as Rachman and Teasdale (1969) have speculated, the use of tangible aversive stimuli may be nothing more than a roundabout way of establishing symbolic connections between stimuli (e.g., alcohol and nausea), the use of such symbolic stimuli deserves some investigation. The present study is an attempt to test the Covert Sensitization procedure as a treatment for smoking without allowing supplementary treatments to confound the results.

CHAPTER II

REVIEW OF LITERATURE

Present day behavioral change techniques have developed historically from two main sources. These two sources are Freud and Breuer's clinical work and Pavlov and Thorndyke's laboratory work. The importance of man's inner world was stressed by those who followed the general direction indicated by Freud and Breuer (Rank, 1945; Moreno, 1964; Perls, 1969; Berne, 1964) while those who followed the direction of Pavlov and Thorndyke stressed the importance of observable events upon him (Watson and Rayner, 1920; Salter, 1949; Wolpe, 1958; Skinner, 1953). It was the work of the latter that eventually led to the present day learning and conditioning therapies.

One of the first important applications of learned principles to human behavior was Watson and Rayner's (1920) study of Little Albert (Eysenck and Beech, 1971). A white rat was offered to the child and a loud noise was made just at the moment that the child reached for the animal. Repeated presentations of the noise and rat eventually led to an emotional reaction to the animal alone. This, in Watson's view, paralleled the conditioning phenomena to be observed in Pavlov's laboratory.

Since Watson and Rayner's experiment with Little Albert, learning paradigms have contributed many techniques to deal with behavioral problems. Although offshoots from the traditional schools (e.g., Gestalt Therapy, Perls, 1945, psychodrama, Moreno, 1964) have made the use of imagined events for some time, it has been only comparatively recently that investigators whose work evolved from conditioning paradigms have begun to explore the possibility of utilizing imagery as well as in-vivo stimuli. For example, Systematic Desensitization, Implosive Therapy, Covert Sensitization are instances where imagined events are used. The techniques of Systematic Desensitization, Assertive Training, and Implosive Therapy deal with the elimination of anxiety and development of approach responses with such behavioral problems as phobias.(Wolpe, 1958). In contrast to these, another set of techniques is based on the learning paradigms of punishment, avoidance and classical conditioning. These are designed to develop anxiety or avoidance responses and are known as the Aversive Therapies. These also utilize either tangible stimuli such as chemical and electric current or symbolic stimuli such as imagined scenes.

These aversive therapies are presently used to treat problems such as alcoholism or smoking. In the following pages these aversive therapies will be discussed. The author will attempt to show how the rationale, purpose and results

of the aversive therapies have influenced the formation of the present study which examines the effectiveness of an aversive imagery technique called Covert Sensitization as an aversive technique used to reduce smoking behavior.

Present day aversive therapies have involved the almost exclusive use of emetic noxious stimulation produced by chemicals, imagined scenes, or electrical stimuli. This review will therefore present the rationale, use and results of chemicals, electrical current and imaginary events as stimuli.

The number of published studies concerning the use of aversive stimuli on humans are few in comparison to those reported in other areas such as Systematic Desensitization. This may be because of the difficult ethical problems one must consider and resolve when contemplating the use of potentially injurious stimuli upon humans. In addition to the ethical problem one must also consider the difficulty of getting volunteers willing to subject themselves to potentially harmful stimuli without any guarantee of successful or permanent behavior change.

Chemical Aversion Treatment

The main use of chemical aversion therapy has been to treat individuals for alcoholic or sexual problems. First the treatment of alcoholism will be considered.

Alcoholism

Chemical Aversion Therapy was first undertaken in connection with alcoholism. These studies are reported for the most part as anecdotal case studies (Lemere and Voegtlin, 1950; Voegtlin, Lemere, Broz, and O'Halleren, 1941; Thiman, 1949; Williams, 1947; Wallerstein, 1957; Beaubrun, 1967).

These investigators made no attempt to analyze their data and some of them seem to lack an understanding of the basic principles involved in Chemical Aversion Therapy. For example, Williams (1947) mixed an emetine in the patient's drink and then waited approximately twenty minutes for the nausea and vomiting to occur. In addition, Eysenck and Rachman (1965) have pointed out that some of the nausea inducing drugs used by the above have been central depressants which interfere with the acquisition of a conditioned response.

Lemere and Voegtlin (1950) have used a more adequate research methodology. They treated and followed up over 4000 patients at a Seattle Sanatarium devoted exclusively to the treatment of alcoholics. Surveying their results with patients treated between 1935 and 1948 they reported that twenty-three percent were still abstinent for ten to thirteen years after treatment. However their patients were atypical of the alcoholic population. They were wealthy private patients who were described as highly motivated,

were hospitalized, and in contact with a concerned medical staff.

Sexual Problems

The use of chemical aversive therapy was limited to the treatment of alcoholic patients until 1956. At this time Raymond (1956) reported his successful treatment of a fetishistic patient by apomorphine aversion conditioning. His patient, who was sexually attracted to handbags and baby buggies received injections of apromorphine, and just before nausea set in was shown a collection of handbags and baby buggies. He was given sixteen days of in-patient treatment and a booster treatment as an out-patient after six months. At a nineteen month follow-up the fetish objects were still aversive to him, he no longer had fetish fantasies, his sexual relations with his wife had improved, and he no longer had trouble with the police.

Other therapists (Glynn and Harper, 1961; Lavin, 1961; Morganstern, et al., 1965) used the same technique successfully in treating other types of undesired sexual behaviors such as homosexuality.

Freund's (1963) use of chemical aversion therapy was unsuccessful with his homosexual patients, but his study is noteworthy for two reasons: 1) the therapist attempted to develop alternative, acceptable behaviors by means of administering testosterone injections and then showing slides of women and 2) he developed a penile plethysmograph, which

enabled him to record the patient's involuntary sexual responses.

In summary, the use of chemical aversion therapy lacks experimental confirmation of success. Where reports of success have been made (e.g., Raymond) experimental control has been lacking.

Electrical Aversion Therapy

In a pair of articles, Eysenck (1960, 1964) discussed the potentially dangerous side-effects of chemicals and the problems one may have in timing their effects. He (Eysenck and Beech, 1971) gives these articles credit for the increased use of electrical therapy and decreased use of chemical therapy.

Electrical aversion therapy is primarily a form of punishment training in which the delivery of current is contingent on the occurrance of a response. For example, with alcoholics, the current is contingent on the sipping of liquor, and in sexual disorders, the current may be contingent on a penile reaction. The following subsections discuss the use of electrical aversion therapy to treat alcoholics and sexual problems.

Alcoholism

Very little research into the effects of electrical aversion therapy on alcoholism has been carried out. Studies (MacCullouch, Feldman, Orford and MacCullouch, 1966; McGuire

and Vallance, 1964; Hsu, 1965) in this area offer little quantitative data and only speculative causal relationships.

Eysenck (1960), in discussing the possible applications of aversive therapy, pointed out that in certain (unspecified) conditions it might be necessary to eliminate the drive, usually fear, that motivates the response respective as well as the behavior itself. Blake (1965) attempted to test this idea in an experiment by comparing the effect of a sequence of relaxation training, counseling and electric current with the effect of an electric current used by itself. A one year follow-up revealed at least fifty percent of each group either still abstinent or improved in an undefined manner.

Although this study had no treatment control group for comparison of results it was of importance because not only did Blake consider such factors as the appropriate reinforcement schedule and current intensity to use on each patient but also made a recording of the patient's GSR's during treatment and ascertained conditioning had actually taken place under the partial reinforcement schedule.

Sexual Problems

Apart from the treatment of alcoholism the greatest use of electric shock has been in the treatment of undesirable sexual behavior such as homosexuality, fetishism and transvestism (Raymond, 1956; James, 1962; Thorpe, et al.,

1964; Eysenck and Rachman, 1965; McGuire and Vallance, 1964; Glynn and Harper, 1961; Blakemore, 1963; Kushner and Sandler, 1966).

These reports generally tested the results of Max (1935) who claimed success (in spite of many uncontrolled variables) in treating a homosexual with the use of electric shock. Most of these studies have been single cases or small groups of cases undertaken to work out procedures and study patients' responding without concern for complete experimental control, analysis of data or follow-up investigation.

A comparatively recent study reported by Marks and Gelder (1967) utilized electric aversive therapy in the treatment of five in-patient fetishists and transvestites. The N was small and two of the patients relapsed during the one year follow-up period. However, their results and assessment methodology--which indicated some conditioning occurred--are of interest.

Initially, shock was delivered after the patient imagined himself masterbating or putting on women's clothes. In the second phase of treatment, the patient was shocked as he actually performed these behaviors. The effects of treatment were assessed by reported changes in patients' behavior obtained from their families, the use of penile plethysmograph recordings and application of a modified version of Osgood's semantic differential test given at various points in the treatment.

Over the course of treatments the time taken to obtain the required images increased. This occurred only when the image was followed by electric shock and not with simple repetition of the image. Thus the increase in latency can probably be attributed to the effects of the shock and not habituation. As treatment progressed penile erections were also delayed until in some cases, the stimulus failed to produce any erection. Each specific item involved in their deviant behavior had to be treated individually. That is, the patient's attitudinal and physiological changes toward panties would occur only after he had been subjected to electrical stimulation in the presence of this particular object. This specificity recalls the observations made by Azrin and Holz (1966) that punishment training is highly specific in its effects.

Although the N was small, no control groups were used, and other factors such as expectancy of success could have influenced their results, this study proves its importance by providing verification that some conditioning did occur.

Imaginary Stimuli

An alternative to the using of chemicals, electric current or other stimuli is that of presenting symbolic aversive stimuli such as imaginary scenes. The primary paradigm used is punishment. For example, instead of having a patient actually drink alcohol and then be shocked by an

electric current, the patient might be instructed to imagine he's drinking alcohol and that he becomes nauseous as a result. The fundamental hypothesis of using imagery is that it is sufficient to symbolically reproduce stimuli for conditioning to occur (Stampfl and Levis, 1967).

Rachman and Teasdale (1969) consider the possibility that aversive therapy using tangible stimuli may be a cumbersome and roundabout technique for establishing symbolic connection between a conditioned stimulus such as alcohol and an unconditioned stimulus such as nausea.

Some advantages which would appear to make aversive imagery a useful therapeutic tool in some situations are the following. The utilization of aversive imagery doesn't require special medical personnel as does drug administration, there are no known side-effects resulting from its use as may occur with the use of chemicals or electric shock, and, unlike the case of electric shock, special equipment is not necessary for its use.

The following discussion will first take note of representative studies using aversive imagery in investigation of alcoholism, sexual and other problems. Then this paper will concentrate on studies using Covert Sensitization, a specific aversive imagery technique used to treat problems such as obsessive compulsiveness, alcoholism, sexual deviancy, obesity and smoking. As with the other aversive therapies the results of these studies are often confounded by

various factors. For example, they may use a variety of techniques without being able to account for the effects of each in their analysis.

Sexual Problems

Rachman and Teasdale (1969) credit Gold and Neufeld (1965) for the initial development of aversive imagery. One of the treatment components in the Gold and Neufeld study was the training of a 16 year old homosexual client to associate male images with unpleasant stimuli, and later, female images with pleasant stimuli. After seventeen treatments over the period of a year, a follow-up indicated that the client consistently approached the heterosexual object both in fantasy and reality. It was impossible to assess the effect of the aversive imagery since the patient was also given suggestion, counseling and desensitization treatments. However, this case report may have suggested possibilities with the use of aversive imagery because more studies using the technique followed.

Another study of the treatment of an undesirable sexual behavior with aversive imagery was found in an investigation by Kolvin (1967). He treated a fourteen year old fetishist by the following means: he had the patient imagine himself becoming aroused with a fetish object and then introduced a vividly aversive scene. After eight sessions of aversive imagery coupled with reassurance and brief

psychotherapy the patient was discharged much improved. A seventeen month follow-up indicated that the patient had not experienced any recurrence of the fetishistic behavior.

Alcoholic Problems

Anant's (1967) result from the treatment of twenty-six alcoholic patients with his "verbal aversion" technique is the most successful this author has seen in the literature. Unfortunately Anant did not analyze the relative effects of all of the treatment factors involved (e.g., aversive imagery, counseling, relaxation), and so evidence is not available to establish causal relationships.

He first trained a patient in relaxation, then instructed him to imagine himself drinking, then getting nauseous and vomiting. The patient was also encouraged to imagine these scenes on his own. As treatment progressed, the patient was instructed to imagine that he felt sick at the smell of liquor, and then whenever he experienced a desire to drink. Finally he was taught to discriminate between liquor and soft drinks.

Twenty-five of the twenty-six patients were terminated as abstinent (one dropped out during treatment) and follow-up fifteen months later indicated no relapse whatever.

Anant's results certainly call for replication of his study. This replication should control for the effects of extraneous factors such as relaxation and counseling.

In addition to being applied to sexual problems, aversive imagery has also been used to treat other problems. For example, Davison (1969) reports a young client successfully reducing his misbehavior at home after being taught to associate his thoughts of misbehaving with images of an angry, vengeful father.

Covert Sensitization as an Aversive Imagery Therapy

Of particular interest to the present study is a particular kind of aversive imagery therapy called Covert Sensitization, developed by one of the leading exponents of Aversive Imagery, Joseph Cautela (1967).

He places Covert Sensitization under the framework of the punishment, escape and avoidance paradigms. The punishment aspect involves response-contingent aversive scenes. For example, in the treatment of alcoholism, the patient is instructed to imagine himself drinking and then becoming nauseous. The escape segment requires instructing the patient to turn away from the liquor, and upon doing to feel relief.

Cautela also presents as evidence for avoidance conditioning occurring his patients' "eventual" reports that their urge for alcohol has disappeared. However, according to various theorists (Beecroft, 1967; Rachman and Teasdale, 1969) avoidance training, unlike punishment, is a procedure geared to the learning of a new response, incompatible with the old, which prevents an aversive stimulus. However,

during the Covert Sensitization treatment, the patient is not allowed to prevent the occurrence of an aversive stimulus (nausea). Therefore, Cautela's technique consists of events based on punishment and escape paradigms, but not on an avoidance paradigm.

Cautela's technique essentially consists of presenting two sets of scenes, alternately. The first set, as described above, consists of the patient performing the undesired behavior, being punished and escaping the punishing stimulus. The second set has the patient respond to internal cues (e.g., urges or desires) of minor aversives with behavior that prevents stronger aversive stimuli from occurring. For example, an urge to smoke is followed by a minor feeling of nausea. Next a decision not to smoke is followed by relief. Thus in both sets of scenes the patient's undesired behaviors are initially punished, the punishment escaped from, and the escape rewarded. In the first set of scenes, imagined overt, motor behavior (e.g., drinking) is punished and in the second set it is imagined cognitive behavior (e.g., an urge to drink) that is punished. Although Cautela labels the first scene a punishment/escape scene and the second a "self-control" or relief scene there doesn't seem to be any actual difference.

The Covert Sensitization Procedure

The Covert Sensitization procedure goes essentially as follows: The client is told that the behavior he wishes to eliminate is a pleasurable habit associated with many situations which instigate it and that if he can be made to associate something unpleasant with this pleasurable habit his desire will be decreased or eliminated. A number of imaginary scenes are then constructed and the client is led through them by the therapist. In these scenes he is about to act out his habit, but is interrupted by therapist instructions to imagine himself getting sick and vomiting over himself and others. The client then is instructed to imagine that his rejection of the pleasurable object leads to relief from the aversive qualities of the scene.

These strongly aversive scenes are alternated with other mildly aversive scenes in which rejection of the habitual behavior also leads to relief. These latter scenes are labeled self-control scenes by Cautela, but they appear similar to the former ones.

The client is also told to practice ten to twenty repetitions of each type of scene daily as homework and to apply them at any time he is tempted by the habit. Cautela explains that the homework serves various functions. One is to increase the number of conditioning trials. He also explains that the homework is intended to reduce his patient anxiety because of its immediate availability, and to

increase their feelings of self mastery and sense of being able to control their lives. He notes that this assignment of homework is an important part of his technique and helps differentiate it from other aversive techniques.

Experimental Investigations Using Covert Sensitization

There have been relatively few experimental investigations of Covert Sensitization. When used, it has usually been combined with other techniques such as relaxation, motivational discussion, systematic desensitization, and thoughtstopping. Cautela, (1967, 1970) for example, notes instances in which he has used relaxation in conjunction with Covert Sensitization to reduce situation-specific anxiety or help a particular client develop clearer imagery.

The following discussion will be concerned with Covert Sensitization as a treatment for obsessive compulsive behavior, alcoholism, sexual problems, obesity and smoking.

Obsessive Compulsive Behavior

Wisocki's (1970) report is typical of the case studies involving Covert Sensitization. She indicated that she used Covert Sensitization among a number of other procedures (progressive relaxation, systematic desensitization, thoughtstopping and covert reinforcement) to treat the obsessive-compulsive problems of a 27 year old woman. After eight sessions the patient's obsessive-compulsive behavior was

eliminated, and had not reappeared at a twelve month follow-up. Wisocki attributes her successful results to the Covert Sensitization and Covert reinforcement treatments. However, a variety of procedures were used and no analysis was made of their effects, or of other factors such as expectancy. Any of these may have played a part in the outcome. Although the investigator attributed primary credit for the successful outcome to Covert Sensitization it was not proved that the technique was responsible for it.

Alcoholism

Ashem and Donner (1968) experimentally examined whether or not treatment which included Covert Sensitization would significantly reduce drinking of alcoholics. They treated hospitalized alcoholics for nine thirty to forty minute sessions over a period of six weeks. Their design included a forward conditioning group, a backward conditioning group, and a non-treatment minimal contact control group. At the beginning of each session the Es relaxed each S using abbreviated relaxation technique. Then they instructed Ss in the forward conditioning group to imagine themselves smelling and tasting alcohol. As soon as the Ss indicated that they were experiencing the odor and taste of alcohol they were instructed to imagine themselves becoming physically uncomfortable and vomiting. Finally, the Ss were instructed to stop imagining and just relax. As treatments

progressed, this final relaxation became contingent upon imagined alternative responses to alcohol (such as taking a non-alcoholic drink, or going to A.A. meetings).

The backward conditioning group were instructed to first imagine themselves becoming nauseated and then alcohol was brought into the scene. This group's behavior and self-report during treatment led the authors to speculate that an "automatic association" had been made between the imagined nausea and the alcohol. Therefore, both treatment groups were combined and compared as one to the control group. Their results indicated that the aversive imagery group was drinking less than the control group at the end of the treatment period. The results of a six month follow-up showed that all of the non-treated control Ss were drinking while only nine of the fifteen treated Ss were drinking.

Ashem and Donner attribute their successful results to the Covert Sensitization treatments. However, their study contained treatment components in addition to Covert Sensitization; they trained Ss to relax themselves, and this employment of relaxation was later made contingent upon a variety of imagined behavioral alternatives to drinking. Their positive results might also be due to a placebo effect alone because there was no control for attentions from a therapist or for S's expectations of success. In addition, the authors noted that while in this study all Ss also participated in group psychotherapy and other unspecified

therapeutic activities of a neuro-psychiatric treatment unit. These many confounding variables make it impossible for this author to attribute the successful results of this experiment to Covert Sensitization.

Sexual Problems

Barlow, Leitenberg and Agras (1969) designed two one-subject experiments in which Covert Sensitization and Relaxation procedures were used to treat a pedophile and homosexual over six and thirteen sessions respectively. In each instance they established base rate measures of sexual arousal, introduced Covert Sensitization and Relaxation treatments for a given period (acquisition), stopped treatments for a period (extinction), and finally reintroduced treatments for another period (re-acquisition).

Initial sessions consisted of teaching Ss to imagine pairing arousing stimuli with aversive stimuli. During the next group of sessions Ss were instructed to imagine only the sexually arousing stimuli, and not any nausea following it. Whereas the rate of sexual arousal had decreased during the aversive treatments, it now increased. They once again paired sexually arousing scenes with aversive stimuli in the last group of sessions, and by its end the number of inappropriate sexual urges had decreased to zero. However, whether or not this was a lasting effect is not known, since no follow-up was reported.

Agras (1972) reported another study of four homosexual Ss in which penile responses to slides were used as a measure of arousal. As a control for expectancy, in the first phase of their experiment, they presented visualization of deviant scenes in a relaxed state, giving patients the rationale that relaxation inhibits sexual arousal. In the second phase, noxious scenes were paired with deviant scenes and instructions given that (paradoxically) their sexual arousal might become higher. This was followed by another no-pairing phase, and then by pairing with positive instructions. There was no overall improvement during the placebo conditions but definite improvement during pairing with both positive and negative instructions. Although the N was small and improvement measures not given, these findings suggest that perhaps the pairing of noxious scenes with deviant scenes was responsible for the therapeutic effect, and that the altering of imaginal events may effect overt homosexual behavior.

Weight Reduction

Janda and Rimm (1972) used relaxation and Covert Sensitization techniques to treat a group of six overweight Ss. Another group of six Ss received six sessions of relaxation treatments and neutral discussion and a third group of six were only weighed once a week. Their results of the six week follow-up indicated that only the relaxation-Covert Sensitization group had lost a significant amount of weight.

However, factors such as relaxation or suggestion might have contributed to the success of this experiment. Therefore, it is not possible to conclude that Covert Sensitization was the most important variable.

Sachs and Ingram (1972) also used Covert Sensitization for the treatment of obesity. Five Ss were given forward-conditioning, then backward conditioning trials in three twenty-minute sessions over a three week period. Five other Ss were given the opposite sequence. Conditions were then reversed to allow each S to serve as his own control. Significant reductions were found for all Ss in the intake of selected foods, but no differential effect was found for the two conditioning procedures. Possibly the success of the backward conditioning group suggests that cognitive factors such as a therapist effect or expectancy of success may have accounted for the results.

Manno and Marston (1972) compared the use of Covert Sensitization, covert reinforcement and a minimal treatment control group in the group treatment of obesity. There were six one hour differential treatment sessions over a four week period. The Covert Sensitization treatment followed Cautela's general procedure while the Covert reinforcement treatment consisted of imagined scenes in which the Ss were told to imagine a desired food, reach for it, pick it up and bring it to their mouth. Just as they were about to eat

it, they were told to say, "I don't want it," and put it down and imagine that they and a friend are thrilled over the refusal.

Contrary to expectations all three groups lost a significant amount of weight by the end of a three month follow-up period. Confounding variables were that all Ss discussed problems related to weight reduction as part of the group activity, were asked to select and maintain a sensible diet, and were provided a nutritionist's standard diet at their request. These additional factors may have, at least in part, accounted for the weight loss by the three groups.

Smoking

Cautela (1970) briefly discussed an unpublished study which used Covert Sensitization to reduce the frequency of smoking behavior. The investigator, F. G. Mullen, treated smokers for six ninety minute sessions. His design assigned some Ss to be treated with Covert Sensitization on an individual basis, others to be treated on a group basis, and still others to a group described only as a "control group." In his brief discussion, Cautela noted that at the end of treatment the Covert Sensitization group had reduced their smoking from a combined base rate mean of 15.3 cigarettes smoked per day to a combined end of treatment mean of 3.6 cigarettes smoked per day. At the end of a six month follow-up these Covert Sensitization groups smoked a combined mean

of 10.1 cigarettes per day as opposed to the control group which had gone from a base rate mean of 16.4 to an end of treatment mean of 15.3 and an end of follow-up mean of 17.1 cigarettes smoked per day. Although Cautela presents this study as evidence that Covert Sensitization has been used to successfully reduce smoking behavior, the meagerness of detail really does not tell us what kind of control group was used, the size of his groups or whether other techniques were also used.

Wagner and Bragg (1970) compared various techniques that might be used to reduce cigarette smoking. They assigned Ss to a Covert Sensitization group, a Covert Sensitization plus Systematic Desensitization group (CS-SD), a Counseling group, a Systematic Desensitization only group, or a Relaxation group. All Ss (including those in the Covert Sensitization and Counseling groups) were initially taught to relax in three twenty minute sessions over the first ten days, and were given differential treatment in five twenty minute sessions over the next three weeks.

Their results indicated that there were no significant differences between the treatments, and all the groups extinguished significantly by the end of the follow-up period except the Covert Sensitization-Systematic Desensitization group. Wagner and Bragg note that after the first Covert Sensitization session they instructed Ss to extend the period of time between cigarettes for as long as possible. They

were to smoke imaginary "vomit cigarettes" instead. After the third Covert Sensitization session they instructed the Ss to stop smoking entirely and tell everyone that they had done so; the Ss were now to smoke only imaginary aversive cigarettes. They deviated from Cautela's technique by offering other treatments and by instructions to quit smoking and smoke only "vomit" cigarettes. Also, Wagner and Bragg met with Ss for about twenty minutes per session. It is improbable that this twenty minutes would allow him sufficient time to interview the S regarding his smoking problems over the past week, collect data, and practice aversion and relief scenes. Therefore, this study doesn't provide clear evidence pertaining to the effectiveness or ineffectiveness of Covert Sensitization.

Gerson and Lanyon (1972) have made additional criticisms of Covert Sensitization studies in general. They note that often Ss have had less than three hours of treatment, no follow-up data has been collected, and deviations have been made from Cautela's paradigm. For example, in regards to most of the studies discussed above the investigators have failed to indicate the assignment of homework as part of the treatment. As pointed out earlier, part of the Covert Sensitization technique is to instruct clients to practice imagining ten to twenty scenes twice daily between therapist-administered treatments. Thus the homework scenes provide a substantial number of additional conditioning trials.

Assuming Covert Sensitization to be an effective method of reducing cigarette smoking, Gerson and Lanyon (1972) designed a study in which they treated Ss as a group rather than individually. Their two groups received the following differential treatments: One group received two sessions of relaxation training followed by three sessions of Covert Sensitization training (including the assignment of homework) and then four sessions of group discussion of such topics as "health hazards of smoking." The second group was treated identically except that over the last four sessions these Ss were group-desensitized to scenes of themselves not smoking in various situations. Both conditions resulted in a significant decrease in smoking at the end of the treatment period. At the end of a thirteen week follow-up both groups were tending toward their pre-treatment rates, although Ss trained with Covert Sensitization and then Systematic Desensitization were still smoking significantly less than originally. Since the investigators did not isolate the contribution of Covert Sensitization to their results, the question of Covert Sensitization effectiveness was not answered.

Summary of Aversion Therapy

In summary, there have been a number of changes in aversion therapy since its inception. There has been a gradual shift from the use of chemical aversive stimuli to

the use of electrical and purely imagined stimuli. Similarly, there has been a shift in the type of conditioned stimulus employed from actual objects to imagined stimuli.

Although containing confounding variables, the studies discussed above suggest the possibility that Covert Sensitization may be an effective aversive therapy technique and worthy of additional investigation. Because some of the above studies also suggest that Covert Sensitization may have had an effect on smoking behavior, smoking was chosen as the target of behavioral change in the present study. Additional reasons are that the finding of a successful method to reduce smoking is important to many because of it's suspected relationship to lung cancer and heart disease (Surgeon General's Report, 1964) and the number of cigarettes smoked provides an easily measured dependent variable.

Smoking

In the United States the U.S. Government reports have indicated smoking as a possible causation of cancer since the early 1960's (Surgeon General's Report, 1964). However, even the anti-smoking advertising campaign of recent years has not reduced the overall percentage of smokers in this country. The 132.4 packs per capita use of cigarettes in 1971 was about the same as other recent years, while total cigarette sales increased 3.5% (Time, 1972).

Since smoking satisfies the World Health Organization's definition of psychological habituation rather than physical addiction, there should be no medical problems related to it's elimination. "The habitual use of tobacco," concludes the Surgeon General's Report (1964), "is related primarily to psychological and social drives." Withdrawal symptoms should not differ in any significant way from those occurring when one is deprived of any "desired object or habitual experience."

Historical Techniques of Dealing with Smoking

In various countries, at various times, smoking has been labeled a health, religious, or political problem. Therefore, there has been a great deal of literature reporting attempts to reduce or eliminate smoking behavior. Usually these attempts have centered about aversive means of smoking reduction.

For example, during Tsar Michael's reign in Russia two such aversive consequences were deportation to Siberia or nasal amputation. However, these methods though severe, did not achieve their goal of eliminating smoking by the Russian people (Eysenck, 1964). In 1630 a Chinese decree stated that all subjects caught smoking or trafficking in tobacco would be immediately beheaded. This did not bring about an elimination of smoking by the Chinese (Tooley and Pratt, 1967).

Taxation, admittedly aversive to all of us, is another variable which seems to have had no effect on smoking reduction. In Great Britain, tobacco taxes have been steadily increased since 1961, but the overall percentage of tobacco sold remained stable through 1963 (Brecher and Brecher, 1964).

Many kinds of treatments have been developed comparatively recently to reduce smoking behavior. Typically, they have included educational, counseling, drugs, electric current and as previously discussed, Covert Sensitization. A discussion of some of them follows.

Clinics Using Nonaversive Medication

The most popular smoking modification method in recent years has been the smoking withdrawal clinic. The American Cancer Society (1964) described such clinics as involving "an interpersonal, two-ended linkage between a counselor (usually, though not always, a physician) and the individual desirous of breaking his smoking habit." Originally developed by Dr. Borje Ejorp in Sweden in 1964, the concept soon spread to the United States.

The length of treatment usually consisted of ten days, during which the subject received educative information regarding his smoking behavior. This included a discussion of the problem with a physician, and an explanation of treatment techniques which usually included one or more drugs. The

drugs used most often are lobeline, meprobamate, nicotine, anticholinergics, amphetamines, and caffeine. Ejorp (1964) reported that the percentage of his subjects who stopped smoking entirely increased from forty-three percent in 1956 to eighty-eight percent in 1960. One wonders whether this increase is due to treatment effectiveness or the smoking-cancer link which began to receive publicity at that time. He also indicated that the quitting rate in all reported replications was 60.3%. However, he also notes that 50% of the patients who were successfully treated relapsed six months after treatment, and a one year follow-up indicated that in some instances 70% of the patients relapsed. The effect of factors such as drugs, attention, discussion and so forth were not analyzed.

5-Day Clinics Using No Medication

Reports by investigators (McFarland, 1964; McFarland et al., 1964; Guilford, 1966; Hoffstaedt, 1964) on five day clinics treating up to 400 Ss over five daily up-to-two hour sessions of lectures, films, demonstrations, discussions and so forth, indicate that such methods have been unsuccessful.

Hypnosis as a Treatment of Smoking Behavior

Hypnosis has been used with problem smokers for approximately thirty years (Johnston and Donoghue, 1971). Most

of the studies using hypnosis as a smoking reduction treatment are anecdotal, have no follow-ups, are poorly controlled and present no statistical analysis (Hershman, 1956; Arons, 1961; Kroger, 1963; Erickson, 1964; Kroger and Lobott, 1967; Sparks, 1968).

One of the few studies employing a systematic approach was by Graff, Hammett, Bash, Fackler, Yanovsky and Goldman (1966). They compared four smoking modification techniques; one of which involved hypnosis. The remaining three groups were made up of a group therapy procedure and two groups using drugs (lobeline and chlordizepoxide). The results indicated that all of the hypnotic Ss quit smoking at the end of treatment and eighty-eight percent were abstinent three months later. At the end of the three month period, forty-four percent of the group therapy Ss, none of the lobeline group and twenty-two percent of the chlordizepoxide group were abstinent. However comparison of the groups may not be valid because there was individual contact for only the hypnotic Ss, an overall attrition from an initial 135 Ss to twenty-four Ss, and the treatment setting varied for each group.

Chemical Treatment of Smoking Behavior

Plakun, Ambrus, Bross, Graham, Levin and Ross (1966) presented the results of a series of eight clinics consisting of 313 Ss. The last clinic in the series had no

pre-treatment indoctrination while the others had an indoctrination which included a medical lecture, a physical exam, and a medical, smoking, and psychological history-taking interview.

For treatment, Ss ingested two lobeline sulphate tablets a day and an ad lib amount of cinnamon flavored candy. Ss concerned about a potential weight gain were given one amphetamine tablet per day.

Ss were required to report on medication behavior, smoking behavior and their side effects throughout the entire treatment time. In contrast to the treatment group, the control group received only placebo medication.

Results were presented in terms of status after one week of treatment. At this point in time significantly more treated Ss than placebo Ss (sixty percent versus fifty percent) were not smoking. Of the 122 Ss available for the one to four month follow-up, forty-two percent of those who were not smoking after the first week of treatment were found to be still abstinent. It is interesting to note that first treatment day status of smoking versus nonsmoking was the best predictor of nonsmoking at the end of the first seven days, and that the clinic which had no indoctrination procedure was the least successful. Because so many factors were involved, it's impossible to establish any causative relationships.

Perhaps most typical of the drug research is an investigation by Bartlett and Whitehead (1957). They tested a compound made up of lobeline, (a commonly used nicotine substitute) and antacids. The compound is known as Bantron. They devised a double-blind experiment in which thirty-three Ss (who did not want to quit smoking) took Bantron, meprobamate, and a placebo for one week each in four different orders. The investigators separated treatment weeks by a no drug recovery week and a baseline recording week. The Ss were told that the medication would reduce their smoking rate but if they did have the urge to smoke they should. They were also instructed to take their medication three times daily. The results of the experiment indicated that neither Bantron nor meprobamate was more effective than the placebo in reducing smoking rate, for no significant changes in rate occurred under any of the conditions. In another experiment the same investigators treated sixteen Ss who wished to stop smoking. They were divided into two groups and given either meprobamate or a placebo to be taken ad lib up to eight times daily. The groups were told that the drug administered would reduce their urge to smoke. Three Ss in each group did stop smoking. However, there were no significant differences across groups.

Negative results of Lobeline research similarly achieved by other chemical smoking deterrants such as

benzedrine sulfate (Miller, 1941), methyphenidate, ritalin, diazepan, valium (Whitehead and Davies, 1964), and hydroxyzine (Trule, 1958).

Aversive Techniques Used to Treat Smoking Behavior

The various aversive stimuli used to treat smoking behavior include aversive imagery, cigarette smoke, hot air and electric shock. Since studies using aversive imagery to treat smoking have previously been discussed, only the other stimuli will be of concern here.

Hot Air and Cigarette Smoke.--Wilde (1964) used a ventilator to blow a mixture of hot air and cigarette smoke into the face of the smoker as he lit a cigarette. As soon as the cigarette was put out, cool mentholated air was delivered through the ventilator and S was encouraged to pick up and eat a mint. Between sessions, the S was told to recall the laboratory situation whenever he desired a cigarette, and to substitute a peppermint instead of smoking. Of the seven that initially began treatment, three stopped smoking, one cut down to two cigarettes a day, one switched to a pipe and two dropped treatment. A follow-up report (Wilde, 1965) noted that all five who completed treatment reverted to their original smoking rates.

Lichtenstein (1971) had individual Ss sit in front of a box and take a puff of a cigarette at six second intervals

while puffs of heated cigarette smoke were blown into their faces by a machine within the box. When S could no longer stand the smoke and put his cigarette out the smoke producing machine within the box stopped. After a brief rest and discussion, the S went through the procedure again. Although a smoking reduction occurred by the end of the treatment period, only one S was still not smoking two months later.

Electric Shock.--Powell and Azrin (1971) used a portable cigarette containing electric shock apparatus to treat a total of six male smokers. Ss wore the apparatus which shocked them each time a cigarette was withdrawn. Only three completed the treatment and these showed progressive reduction in smoking as shock intensity increased. However, when the smoking-shock contingency was removed, they returned to their pre-experimental smoking levels.

Azrin and Holz (1966) indicate that the most efficient method of eliminating behavior is to follow every instance of the behavior with strong punishment while providing the availability for a stimultaneous non-punished response. Based on this assumption, Chapman, Smith, and Layden (1971) combined punishment by electric shock and training, and self management skills in an attempt to eliminate smoking with two different groups of adults.

The aversive treatment was carried on in a manner similar to Blake's (1965) aversive treatment of alcoholism.

During treatment Ss were also told one "coffee break" per session was required. During the "coffee breaks" each S was instructed in self-management skills. During the "coffee breaks" the S was asked to make strongly emotional statements in favor of his stopping smoking whenever he desired a cigarette, instructed not to combine smoking with any other activity (e.g., drinking, watching T.V.), asked to smoke his least preferred brand of cigarettes, and asked to structure his time between scheduled events by the use of activities such as sketching and playing with a pencil instead of smoking.

Although there were only five days of treatment, at the end of a twelve month follow-up six of the eleven Ss in one group were not smoking compared to three of twelve Ss in the other group. The authors suggest that the first group was more successful because it also received therapist post-treatment phone checks for data whereas the latter did not. Since complete abstention was used as a criterion for success in this study, no information was presented regarding success in terms of a significant reduction of smoking. Of peripheral interest to the author was one S who increased her intake of tranquilizers and antidepressants as her efforts to reduce smoking increased. This would suggest the importance of also dealing with other variables such as tension in addition to the habit of smoking.

Electric Shock and Quinine.--Whitman (1969) compared the effects of smoking information dissemination through films, pamphlets, and discussion, aversive conditioning using shock and quinine, teaching use of operant principles and techniques, and non-contact control. All four groups, including the control group, had a significant reduction in smoking at a three month follow-up. In fact, the reduction showed by the control group was not significantly different from that shown by the treatment groups. The authors suggest that the successful result of the no contact control group might be due to the possibility that people who voluntarily participate in a smoking clinic may already be trying various techniques for ridding themselves of the habit. This may be an important hypothesis. With the exception of this author, none of the investigators reported asking Ss to refrain from using any other techniques during treatment and follow-up periods. Therefore, other successful results may have been due to this factor.

Self Reports of Smoking Behavior

The following study is of interest because it provides some evidence for the accuracy of smoker's self reports.

Ober (1967) assigned sixty volunteer Ss who smoked at least twenty cigarettes per day to either a self-controlled program, aversion therapy, transactional analysis therapy or

minimal contact. After a week of baseline recording, all Ss except controls were seen for ten fifty minute group sessions over a time period of four weeks. At each session Ss turned in daily records of their smoking behavior. Follow-up consisted of four weekly reports which were mailed to the experimenter. The accuracy of the reports was checked by means of at least one acquaintance of each S. (The correlation between the reports of Ss and those of their friends was +.94.) Although the treatment was not successful, an importance lies in the finding that self-reports may be accurate.

Practical Advantages of Covert Sensitization As A Smoking Reduction Technique

In contrast to the various techniques discussed, the advantages of Covert Sensitization are many. Since this is a technique in which both the aversive stimulus and the undesired behavior are presented only in imagination, the advantages of Covert Sensitization (Cautela, 1971) include:

1. Actual stimuli need not be used.
2. Images are applicable to a greater variety of stimulus situation aspects.
3. Patients aren't likely to drop out of therapy due to fear.
4. It has a wider range in time and space of self-control use than have chemical or electrical techniques.

The Present Study

The present study used number of cigarettes smoked as the dependent variable and compared three groups of Ss. One group received only therapist-administered Covert Sensitization treatments (CSN). A second group received the Cautela Covert Sensitization treatment of both therapist-administered treatments and assignment to imagine the scenes as homework (CSH). A third group was treated with therapist-administered relaxation treatment and assigned to practice relaxation exercises as homework (RH). The relaxation group was to have been a control for Experimenter-Subject interaction (Ss expectations of success). It was hypothesized that the CSH group would decrease their smoking more than the CSN group, and the CSN group would decrease their smoking more than the RH group.

CHAPTER III

METHOD AND PROCEDURE

Subjects

Ss were recruited from the community and university through radio, newspaper, and bulletin board notices. At the initial interview volunteers were told that a smoking reduction technique was being evaluated which had resulted in varying degrees of success elsewhere; this study was being done to gain first hand knowledge of the method's effectiveness.

Information to be used for subject selection was collected at this first meeting and volunteers filled out the following:

1. The Scene Test (Cautela, 1971) requires one to imagine thirteen uncomfortable situations and check on a five-point scale how much discomfort or fear each gives.

2. The Wolpe-Lang Fear Inventory (1964) which asks one to indicate with a check on a five-point scale how unpleasant are each of seventy-six experiences.

3. A Smoking Questionnaire adapted from Cautela (unpublished) which provided information such as one's smoking habits, his reason for wanting to quit, and the subjective probability he would quit within the next year.

The first two forms were to help the therapist design an individually unpleasant situation for his Ss if a standardized situation did not prove aversive. The purpose of the latter form was to provide such information as one's motivation and expectancies of quitting.

Volunteers were accepted as potential Ss if the following criteria were met:

1. They smoked more than half a pack of cigarettes per day.

2. They had been smoking for at least a year.

3. They would be available for treatment one hour per week for the six treatment weeks, and could be contacted during the follow-up.

4. They were willing to assure us of their continued attendance with a $5.00 returnable check.

Thirty-six volunteers were chosen as Ss and asked to come in for a second meeting. The Ss included twenty-three males and thirteen females, twenty-two students and fourteen non-students. The non-students were businessmen (4), nurses (3), housewives with a B.A. (4), housewives with a high school education (2), and a professor (1). At the second meeting the $5.00 guarantee was collected, receipts were given out, and each S was given a small, ruled notebook. Ss were told to begin an accurate daily record of their cigarette smoking. They were told that they and their therapist would judge the treatment effectiveness against

this tally as time went on. Ss were also told that they could be called by a therapist assigned to them, and he would make arrangements for future appointments. Each of the Ss was then randomly assigned to the CSN, CSH, or RH condition, and four Ss from each condition were randomly assigned to an E.

Experimenters

The three Experimenters (E) were a 4th year undergraduate Psychology major, a first year graduate student in Guidance and Counseling, and the author. Each E was randomly assigned four Ss from each of the three conditions, a total of twelve Ss each. The Es were informed that the study was designed to investigate the effectiveness of three different smoking reduction techniques. Each S was given procedural and treatment instructions and to reduce variation among therapist-administered treatments, they rehearsed and criticized each other's performances over four hourly meetings which preceded the experiment.

Treatments

Each E was responsible for training his Ss individually with the following techniques:

1. Covert Sensitization, Therapist-Administered only (CSN).--Instructions of what Es were to tell Ss during their meetings were adapted from Cautela (1970). At their first meeting with the Experimenter each S in this group was told,

in essence, that smoking is a pleasant learned habit, and if the S learned to associate smoking with something unpleasant, the habit could probably be broken; theoretically it would decrease, and possibly disappear. It was suggested that the general rationale could have been presented as follows:

You are one of a large group of people who have decided to quit smoking--probably because in some way it's had an adverse effect on your life. Smoking is essentially a strong, learned habit. It's a strong habit which we'll try to break with a technique which investigators claim to be very effective. The technique consists of teaching you to associate the now pleasurable habit of smoking with something very unpleasant. Once the habit is associated with unpleasantness rather than pleasure, it will lose it's strength, possibly even be eliminated. However, no matter how successful you'll eventually be at licking this habit, every treatment has it's ups and downs, so don't get discouraged. We'll be going over this technique today to give you an idea of it, then you're to use it twice a day until our next meeting.

The S was then told that he would be asked to imagine himself in various situations. He was told to try to use all of his senses as though he were really in the scene. The Ss were then given ten aversive scenes alternating with ten escape and self-control scenes.

The following is a sample escape scene followed by a sample self-control 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, 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.

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.

Other scenes can be seen in Appendix II.

As E described a scene to the S, he continuously asked for feedback regarding its aversive effect and adjust the scene accordingly. After an aversive scene was described to S, he was again asked how clearly he visualized it and whether he felt some nausea and disgust. Then he was asked to repeat the scene himself, and to try to see the cigarettes as clearly as possible, and to see and smell the vomit. Other scenes were then presented in a similar manner concerning other places in which he smoked (e.g., if he took a cigarette after coffee in the morning, a scene was described in which he was about to smoke but got sick and vomited all over the table, food, and cigarettes).

A scene labeled by Cautela as an escape or self-control scene was alternated with each aversive one. At the end of each session, the S was instructed that when he was tempted to smoke he was to imagine himself vomiting on a cigarette.

2. Covert Sensitization (CSH).--In this group treatments were both therapist-administered and assigned as homework. This group underwent the same procedure as did the CSN group, and in addition, was assigned the homework of imagining the twenty scenes twice a day between therapist-administered treatments.

3. Relaxation (RH).--In this group treatments were both therapist-administered and assigned as homework. Preceding their first treatment, this group was told that there was some scientific speculation that nervousness and tension caused smoking. This speculation had led to investigations indicating that if smokers were taught to reduce their general level of tension, their need for cigarettes might go down. After being given this rationale, the Ss were then trained in deep muscle relaxation using the instructions described by Wolpe and Lazarus (1966). The relaxation instructions may be seen in Appendix II. At the end of the session, Ss were instructed to self-administer the treatment twice daily, once every morning and once every evening. At this time, they were also told not to be discouraged if their progress fluctuated.

Instructions for all Ss

All of the Ss in the study were told to keep an up-to-date notebook record of every cigarette they smoked since the E would ask for this data at the beginning of every session. They were also told not to discuss their treatment with anyone since they might tend to do more talking than cutting down. This reason was a subterfuge designed to prevent the Ss from discovering from each other that there were different treatments and possibly requesting a change to a different treatment group. Ss were additionally asked not to confound evaluation by using "willpower" and not to use

any other smoking treatment or deterrent during the program for it might interfere with the present one.

All of the sessions were equated to last one hour. At the beginning of the hour, Ss were asked how the treatments were affecting them, and in what situations they had found themselves smoking during the previous week. In addition, the Es were instructed to collect cigarette smoking data for the previous week, and reinforce Ss for using their notebooks and for their progress. At the end of each session each S was reminded to continue his smoking record, and if in a homework group, to keep practicing between meetings.

At the last session those Ss in the homework groups were asked to continue self-administering treatment as usual during the follow-up, and all Ss were reminded that their $5.00 would be returned after the final four weekly data collections. After this last treatment session, every S filled out a post-treatment questionnaire designed to find out such things as his impression of the treatments, and whether he would want to continue them.

CHAPTER IV

RESULTS

Design of the Study

Each of the three Es gave differential training to a CSN group, a CSH group, and an RH group; there were four Ss in each group. Data collected at each session indicated how many cigarettes each S had smoked on each day of the week preceding collection. Weekly means for each S were used in the data analysis. Raw scores were used for computations since smoking has a potential of an absolute zero scale. In addition, raw scores clearly and simply showed where S began to reduce his smoking (Base rate) as well as how close he was to his zero smoking goal at any point in time.

Originally, it was hoped that the experimenter effects would be treated as a factor. However, because of subject attrition, this was not possible.

Treatment of the Data

The data from five of the twelve Ss assigned to the Counseling and Guidance student was not usable, the data from two of the twelve Ss assigned the psychology undergraduate was not usable and the data from one of the twelve Ss assigned the author was not usable. Thus, the data from

a total of eight Ss was not usable. No common characteristics which may have caused their attrition were found among the Ss whose data could not be used. Further details regarding Subject Attrition are given in Appendix IV.

It should be noted that during this study none of the Ss substituted the smoking of cigars or pipes for the smoking of cigarettes.

The design involved the use of the following tests (Winer, 1962):

1. Two-Factor Mixed Design with Repeated Measures on One Factor. These tests examined the CSN, CSH and RH effects across time. Thus they not only permitted comparison of overall group performance, but also an evaluation of the treatment effects in relation to the passage of time.
2. Tukey's Test of Multiple Comparisons (Winer, 1962). Once an overall test indicated significant effects were present, Tukey's Test of Multiple Comparisons was used to find the source of the effects.
3. Once the overall F test indicated a trend existed across time, a trend analysis was performed to indicate the nature of the trend for each group. Essentially the trend analysis describes the simplest equation that will fit the available data. The equation describing a linear trend is

in the form of $X = a + bx$ and indicates the data is linear in nature (e.g., continuously increasing or decreasing numerically). The equation describing a quadratic trend is $X = a + bx + cx^2$ and describes data having an arching deviation from a straight line). The equation describing a cubic trend is $X = a + bx + cx^2 + dx^3$ and describes data having two shifts, such as two parabolic arcs, each peaking in opposite directions.

4. A repeated measure analysis of variance which compared the overall group post-treatment follow-up performance, evaluated performance over the follow-up period and evaluated differential training effects in relation to the four follow-up weeks.

5. A one-way analysis of variance was performed at the last week of treatment and another at the last week of follow-up to ascertain whether a significant difference in smoking existed among the groups at each of these times.

At the beginning of the analysis there were usable data from nine Ss in the CSH group, nine Ss in the RH group, and ten Ss in the CSN group. The data of one S was randomly removed from the CSN group to make possible a repeated measures analysis with equal n's. That Ss data was replaced for the group's trend analysis.

Data Analysis

Table 1 contains the weekly means and standard deviations of number of cigarettes smoked under the CSN, CSH, and RH conditions at each time period the experiment.

TABLE 1

MEANS AND STANDARD DEVIATIONS OF THE DATA FROM THE CSN, CSH, AND RH GROUPS AT THE BASELINE, TREATMENT, AND FOLLOW-UP WEEKS
(Number of Cigarettes Smoked Per Day)

Condition		C S N		C S H		R H	
Week		X	S.D.	X	S.D.	X	S.D.
Baseline	1	24.55	6.578	28.00	7.297	26.00	6.224
	1	18.77	9.666	24.00	8.774	21.33	8.485
	2	18.22	8.941	22.44	5.150	18.22	8.333
	3	19.22	7.854	21.44	6.002	17.55	8.574
Treatment	4	19.44	7.601	21.00	6.284	17.33	8.986
	5	19.88	7.639	18.80	5.840	16.33	8.930
	6	20.33	7.382	18.00	6.324	13.88	8.737
	1	20.44	7.264	17.22	8.555	19.44	8.472
	2	19.66	6.782	17.66	6.224	15.66	9.924
Follow-up	3	21.11	7.801	19.44	6.444	14.44	9.166
	4	21.88	7.928	21.00	6.576	13.88	9.955

The means for the CSN, CSH, and RH groups are 24.5, 28.0, and 26.0 respectively for the baseline data.

A repeated measures analysis of variance was performed on the data to assess whether these groups reduced their smoking habit, whether they altered their habits to different degrees, and whether these differences varied over time.

A summary of the analysis of variance for the three treatments using baseline, last treatment, and last follow-up week scores is found in Table 2.

TABLE 2

ANALYSIS OF VARIANCE FOR TREATMENTS OVER TIME USING SCORES AT 3 POINTS IN TIME (Baseline week, Last Treatment week, and Last Follow-up week.)

Source of Variation	SS	df	MS	F
Between subjects	3268.2	26		
Treatments	343.9	2	171.95	1.41
Subjects within groups	2924.3	24	121.85	
Within subjects	2602.7	54		
(B) Time	1188.5	2	594.35	24.45[a]
Treatment x time	247.7	4	61.93	2.55
B x subj. within groups	1166.5	48	24.30	

[a] p. .01

An inspection of Table 2 shows a significant difference in the reduction of smoking as a function of time (F-24.45, p .01, df 2, 48). A closer investigation of the data by means of Tukey's test of multiple comparisons (Kirk, 1969) showed more cigarettes smoked during the baseline week than

during the last week of treatment or last follow-up week. The means were 26.2, 17.4, and 18.9 respectively. These differences were significant at the .01 level.

A summary of the analysis of variance of the three treatments over the eleven treatment and follow-up weeks is presented in Table 3.

TABLE 3

SUMMARY OF THE ANALYSIS OF VARIANCE USING SCORES FOR EACH OF THE 11 WEEKS OF THE DATA COLLECTION

Source of Variation	SS	df	MS	F
Between subjects	12395.1	26		
(A) Treatments	913.0	2	456.5	0.95
Subjects within groups	11482.1	24	478.4	
Within subjects	7305.2	270		
(B) Weeks	1858.5	10	185.9	9.62[a]
Treatments x Weeks	809.8	20	40.49	2.10[a]
B x sub. within groups	4636.9	240	19.32	

[a] p. .01

Table 3 indicates that, overall, the groups reduced their smoking during the eleven weeks of data collection ($F = 9.62$, p .01, df 10, 240). The treatment by time interaction indicated that the groups reduced their smoking at different rates over time ($F = 2.10$, p .01, df 20, 240).

The nature of this interaction can best be observed by inspecting Figure 1.

Figure 1 shows that the number of cigarettes smoked by each group was approximately the same at the baseline week, but thereafter varied with time. Examination of Figure 1 revealed that after an initial decrease, the CSN, and CSH groups appeared to smoke cigarettes more frequently with the passage of time, while the RH group continued to smoke less. To gain a clearer picture of each group's progress, a Trend analysis (Winer, 1962) was performed for each of these groups over time. This Trend analysis is summarized in Table 4.

The trend analyses summarized in Table 4 indicated that the data of the CSH and RH groups formed linear trends which are significant at the .01 level. In addition, the data of the CSH group also formed a quadratic trend which was significant at the .01 level.

The data presented in Figure 1 and Table 4 indicated that each group changed their smoking behavior at different rates over the eleven week period. Under all conditions, the sharpest drop in cigarette smoking occurred from the baseline week through the first week of treatment.

The CSN group decreased its smoking to the second treatment week, then their smoking increased throughout the rest of the treatment weeks. At the second post-treatment week this group once again decreased its cigarette smoking,

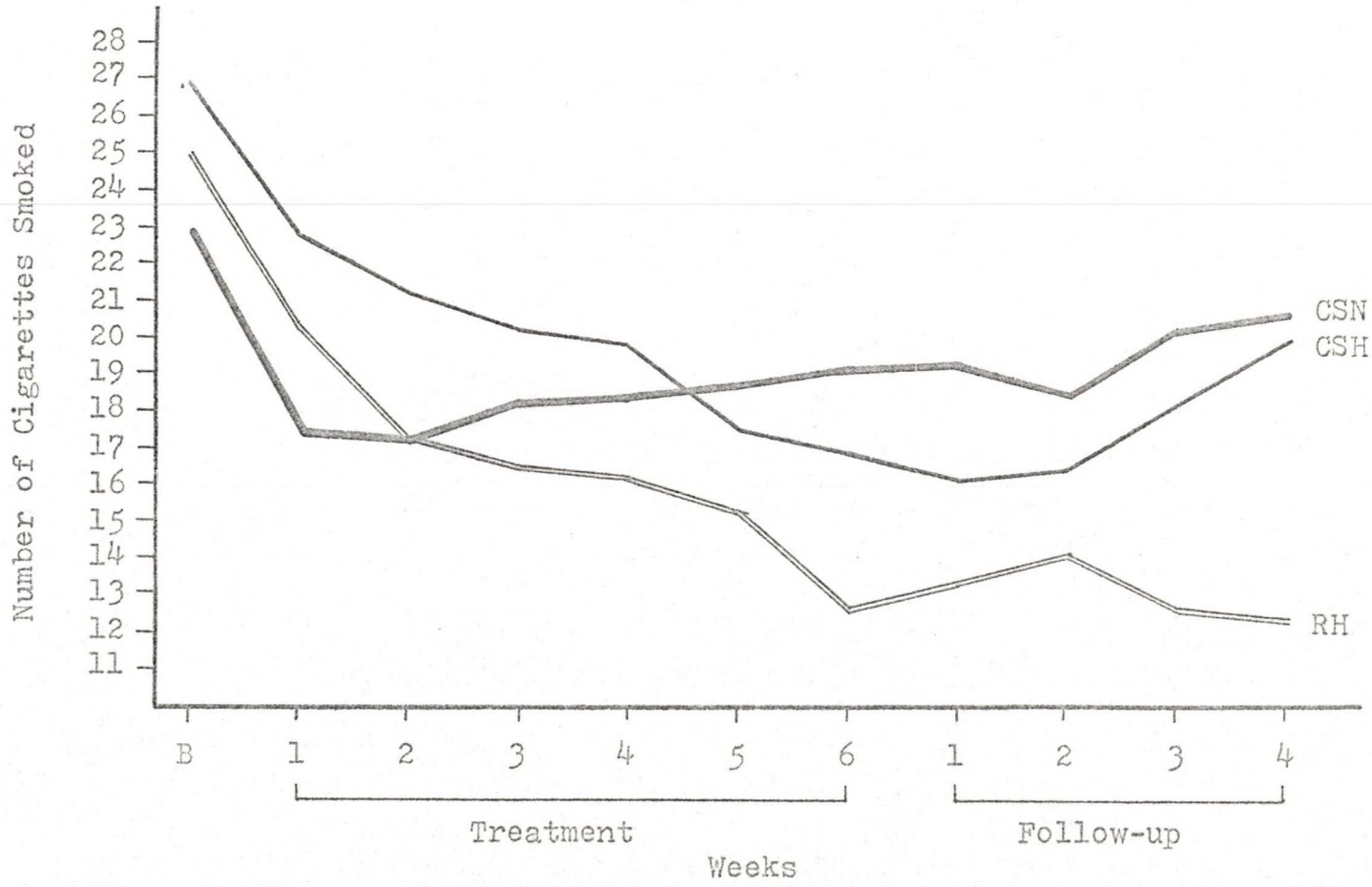

Fig. 1.--The mean cigarettes smoked during the 11 weeks Baseline, treatment, and followup weeks.

only to then increase it for the rest of the follow-up weeks. Thus the CSN data in Figure 1 and Table 4 indicated that this group did not maintain a reduction of cigarette smoking even during the weeks that treatment was therapist-administered.

TABLE 4

ANALYSIS OF VARIANCE TABLES SUMMARIZING TREND TESTS FOR CSN, CSH, AND RH GROUPS

Source of Variation	SS	df	MS	F
CSN:				
Between groups	222.03	10		
Linear	25.1	1	25.1	0.418
Quadratic	73.1	1	73.1	1.218
Cubic	51.1	1	51.1	0.652
Within groups	5935.9	99	59.6	
CSH:				
Between groups	911.1	10		
Linear	510.6	1	510.6	11.172[a]
Quadratic	353.9	1	353.9	7.743[a]
Cubic	7.9	1	7.9	0.172
Within groups	4025.1	88	45.7	
RH:				
Between groups	1223.3	10		
Linear	909.7	1	909.7	11.960[a]
Quadratic	213.8	1	213.8	2.787
Cubic	44.7	1	44.7	0.582
Within groups	6752.1	88	76.7	

[a] $p < .01$

The CSH group's smoking rate sharply dropped from the baseline to the first treatment week, then continued to drop at a slower place for the rest of the treatment and first

follow-up weeks. This group then smoked increasingly more cigarettes throughout the rest of the follow-up weeks. Thus, the data in Figure 1 and Table 4 indicate that the CSH group smoked a decreasing number of cigarettes when treatment included both the therapist-administered and homework components, but generally smoked an increasing number of cigarettes when only the homework component was in effect during the follow-up weeks.

The RH group continued its initial decrease of cigarette smoking throughout the treatment weeks. The group's number of cigarettes smoked temporarily increased from the first to the second follow-up week, then continued its decrease downward. Thus, the RH group generally decreased its smoking of cigarettes when treatment included both the therapist-administered and homework components as well as when only the homework component was in effect during the last follow-up weeks.

A one-way analysis of variance was performed on the data at the last week of treatment to assess whether the groups differed significantly in their smoking habit at this time. A summary of this analysis is presented in Table 5. Table 5 indicates that the three groups did not differ significantly in their smoking habit at the last week of treatment.

TABLE 5

SUMMARY OF THE ONE-WAY ANALYZING VARIANCE USING SCORES AT THE LAST TREATMENT WEEK

Source of Variation	SS	df	MS	F
Between Groups	192.5	2	96.2	1.76
Within Groups	1368.5	25	54.7	
Total	1561.0	27		

(F .95 2, 25 df = 3.39)

A repeated measures analysis of variance was performed on the group's data for the last four weeks of follow-up. A summary of this analysis of variance is found in Table 6.

TABLE 6

SUMMARY OF THE ANALYSIS OF VARIANCE USING SCORES OF THE LAST FOUR WEEKS OF FOLLOW-UP

Source of Variation	SS	df	MS	F
Between Ss	2994.4	26		
(A) Treatments	1163.6	2	581.8	7.63[a]
Ss within group	1830.8	24	76.3	
Within Ss	5733.0	81		
(B) Weeks	33.4	3	11.1	0.143
Treatment x Weeks	111.1	6	18.5	0.238
By Subjects Within Groups	5588.5	72	77.6	

[a] $p < .01$

Table 6 indicates that overall, the three groups differed in smoking during the four post-treatment weeks ($F = 7.63$, p .01, df 2, 24). A more detailed analysis of the data by means of Tukey's test of multiple comparisons (Kirk, 1969) showed that the relaxation group was smoking significantly fewer cigarettes than the CSN group during this time. The means were 14.5 and 20.7 respectively. This difference was significant at the .01 level.

A one way analysis of variance was performed on the data at the last week of follow-up to determine whether the groups differed significantly in their smoking habit at this time. A summary of this analysis is presented in Table 7.

TABLE 7

SUMMARY OF THE ONE-WAY ANALYSIS OF VARIANCE USING SCORES AT THE LAST FOLLOW-UP WEEK

Source of Variation	SS	df	MS	F
Between Groups	384.9	2	192.4	2.82
Within Groups	1635.0	24	68.1	
Total	2019.9			

(F .95 2, 24 = 3.40)

Table 7 indicates that the three groups did not differ significantly in their smoking habit at the last week of follow-up.

In summary, an analysis of the data indicated that, overall, the groups smoked fewer cigarettes during treatment and follow-up weeks than they did during the baseline week, and did so at varying rates. The CSN group reversed its rate upward toward its pre-treatment level after an initial drop even while receiving therapist-administered treatments. The CSH group reversed its rate toward pre-treatment level when no longer given therapist-administered treatments. The RH group, except for a temporary rise in number of cigarettes smoked, generally continued its initial decrease toward a zero smoking level even when only the homework component was in effect. Over the last four weeks of follow-up, the Ss of the RH group smoked significantly less cigarettes than the CSN group.

CHAPTER V

DISCUSSION

The following pages discuss the results that have been presented. In addition conclusions have been drawn from these results, evidence presented to support these conclusions and suggestions made for further study.

This study was based on the hypothesis that the CSH treatment would be an effective technique to reduce smoking, the CSN treatment would be less effective, and the RH treatment would be least effective. Examination of the data by analysis of variance showed that, contrary to expectations, Covert Sensitization was ineffective and relaxation effective as techniques used to reduce smoking.

The CSN treatment proved ineffective during both the acquisition and follow-up periods, the CSH treatment proved ineffective during the follow-up while the RH treatment proved effective during acquisition and follow-up periods.

The Failure of the Covert Sensitization Treatments

The Covert Sensitization treatments may have been ineffective because the aversiveness of the scenes was not strong enough and/or the homework sessions during follow-up

were uncontrolled. A third possibility, i.e., that Covert Sensitization is an inappropriate treatment for smoking, will be considered more thoroughly in connection with the relative success of the RH treatment.

Covert Sensitization may have been ineffective because the aversiveness of the scenes was not strong enough. Cautela (1967) assumes that his technique is based on a punishment paradigm. Both degree of suppression and maintainance of suppression is partially a function of punishment intensity (Azrin, 1960; Azrin, Hake, Holz and Hutchinson, 1965). In the present study the therapists began treatment with the administration of the standard scenes and the subjects reported them as quite aversive. In fact, they may not have been so, and the therapists may have inadvertently used suboptimal stimuli which were not strong enough to condition strong, lasting punishment responses. Instead of beginning with the administration of the standard scenes a better method would have been to administer a pre-test of those items listed as most aversive on the Scene Imagery and Fear questionnaires. The therapist and subject could then more knowledgably choose a "very" aversive scene.

A second reason why Covert Sensitization proved ineffective may have been due to the relatively low frequency of punishment. A study by Azrin, et al. (1965) indicates that the greater the frequency of punishment, the greater

will be the reduction of the punished behavior. The following comparison of the CSN and CSH treatment results may offer some support for the above speculation. The CSH Ss underwent punishment during the therapist meetings and were told to punish themselves twice a day at home for a maximum of 1480 trials during the acquisition period. Under the CSN condition Ss were punished only during therapist sessions, or for a total of 180 trials during the acquisition period. The CSH group, punished with greater frequency than the CSN group, also smoked less. This is what would have been predicted by a punishment paradigm, and this is what happened.

Almost all the CSH group reported difficulty doing their homework during acquisition (e.g., Often they would forget or not find time), and had to be encouraged to do so by the therapists. Although they were told to continue the homework over the follow-up period, therapists did not urge them to do so in their telephone contacts. The Ss were in a situation where the therapist not only no longer applied punishment, but also no longer urged them to punish themselves. One might assume that they therefore stopped doing the homework and their smoking increased. The resulting increase in smoking is what actually occurred.

The Success of the RH Treatment

Perhaps Covert Sensitization was an inappropriate method to use with the problem of smoking. Cautela (1971) assumes that punishing smoking behavior will eliminate it. However, if smoking is caused by tension, Covert Sensitization treatment may have been ineffective because it dealt only with a behavioral symptom rather than the underlying problem. Although the literature does not reveal a causal relationship between tension and smoking, Schneider and Houston (1970) note that smokers as a group scored significantly higher on the Taylor Manifest Anxiety Scale than did non-smokers. Over half of the Ss in the present study indicated in pre-treatment questionnaires that their smoking was either partially or completely due to tension. The CSH treatments may have made smoking temporarily aversive, thus reducing it, but possibly did not deal with the problem of tension. Thus the Covert Sensitization treatments may have been ineffective because they were treating the symptom and not the cause. If this relaxation-tension hypothesis is correct, the Ss who were given CSH treatments and reduced their smoking during acquisition should have been more tense than before treatment. This tension may have been expressed in some other way than through smoking. Pre-post treatment questioning about changes in other behaviors such as eating, drinking, and other expressions of tension might have presented some evidence in favor or against this hypothesis.

More information might have been available to evaluate this tension hypothesis in the present study if the Ss had also been asked to record their thoughts or feelings prior to smoking, a description of the events preceding smoking, the intensity of desire for a cigarette on a seven point scale, and the intensity of pleasure drived from the cigarette on a seven point scale. This information might have helped reveal the cues leading to smoking behavior and whether tension was one of them.

Based on this tension hypothesis, one might speculate that the relaxation treatment did not deal with smoking behavior directly, but with a possible cause of smoking, tension. This was the rationale given the Ss for the relaxation treatments. If tension was a cause of smoking and the relaxation treatments directly lessened it, the Ss, all cognitively intending to quit, no longer had a need to smoke and simply quit. It's interesting to note that over fifty percent of the RH Ss who completed the post-treatment questionnaire reported that the RH training had the beneficial side-effects of enabling them to relax with their families and sleep at night. In contrast, only two Ss treated with Covert Sensitization noted any side-effects that they could trace to their treatments. One noted that he had "a short temper since starting," and the other noted that he had become "more aware of people who do not smoke."

On the other hand, studies described earlier in this paper (Wagner and Bragg, 1970; Gerson and Lanyon, 1972) have found the use of relaxation in a smoking reduction program to be ineffective. However, these investigators did not require extensive relaxation homework as in the present study, or used relaxation in combination with treatments that may have counter-acted it's effectiveness.

Other Limitations and Suggestions

Other factors such as non-specific positive therapist attention and therapist differences in treatment presentation may have influenced the results of this study. For example, the apparent effectiveness of the RH treatment may have been a result of the possible neutral, non-aversive qualities of the RH treatment, non-specific positive therapist attention and the effect of collecting of self report data. This suggests the need for controlling these factors with the use of a no-contact control group. This latter group would be contacted periodically only for the collection of self-report data and the results compared to that of other groups.

The E's proficiency in presenting treatments to the Ss were supposedly equated by the pre-treatment training, but no formal investigation was made to find out if they remained similarly proficient over the time of the treatment period. In addition, all of the Es reported that through repeated description the Covert Sensitization scenes became

aversive to them. This may have caused a weakened delivery of these scenes to the Ss by one or more of the therapists.

An examination of the data from the last follow-up week shows that the groups trained in relaxation by the author and the psychology undergraduate smoked less than did those groups trained by them in Covert Sensitization. The opposite effect occurred in the groups treated by the third therapist. The group trained in relaxation by the third therapist smoked more than the group trained in Covert Sensitization by him. A larger N would enable a statistical analysis of this factor. A possible experimenter effect might have been examined by an item on the post-treatment questionnaires asking the S to describe the E in terms of warmth, harshness, and so forth. One way to equate the Es in a future study would be to make a master treatment tape which could be heard by them before each meeting with a S and which would serve as a standard to be matched.

Of additional interest is a treatment innovation carried out by Mr. M., one of the CSH Ss whose data could not be used in the statistical analysis. Because three weeks into the program it was discovered that Mr. M. was using a self-made tape recording of the scenes as homework, his data was not used although he took part in all sessions and stopped smoking. One wonders if this S happened upon an effective technique. Perhaps the additional involvement of

making and listening to one's own tapes of the scenes would improve the effectiveness of the Covert Sensitization or RH treatments. Additional studies investigating the differential effectiveness of self-made tapes, ready-made tapes, self-administered tapes and therapist-administered treatments would be worthwhile.

Summary

Contrary to expectations, Covert Sensitization did not effectively reduce smoking behavior while relaxation treatments did. The former result may have been due to the use of weakly aversive scenes and/or a low frequency of punishment. The latter result may have been due to relaxation treatment of tension, a possible cause of smoking.

Uncontrolled factors which may have caused the results of this study have been discussed and suggestions have been made how one might deal with these factors. In addition, implications were made that both learning and cognitive variables may be important factors in the treatment of human behavior. If evidence can be presented that people can acquire aversive reactions through the manipulation of cognitive imaginal events, then our reliance on animal data in formulating theories of human learning is useful but also limiting. Therefore an area not yet thoroughly investigated must be dealt with, that of cognitive imaginal events.

Experimental studies investigating the aversive imagery technique of Covert Sensitization as a cigarette

smoking deterrent have not clearly testified to its effectiveness. They have either deviated from Cautela's technique and/or confounded their results by adding other components to it.

The present study tested the hypothesis that the successful results of Covert Sensitization (CS) requires both therapist-administered treatment and instructions that Ss also self-administer treatment. The self-administered treatment (homework) consisted of Ss imagining Covert Sensitization scenes twice a day between meetings with the Experimenter (E).

Thirty-six habitual smokers were randomly assigned to one of three training groups; one group of twelve was taught only to imagine Covert Sensitization scenes when described by the E (CSN); a second group of twelve was additionally instructed to practice imagining them twice a day between meetings (CSH); a third group of twelve was taught to relax using Wolpe's relaxation technique and told to practice relaxing twice a day between meetings (RH). The three Es, who were randomly assigned one group from each condition, trained each of the thirty-six Ss, and collected self-report data during six hourly sessions and four follow-up weeks.

Analysis of the data indicated that the groups smoked at different rates over time, and that the RH group smoked

less than the CSN group over the follow-up periods. Although all the groups smoked fewer cigarettes once treatment began, the CSN group then increased its smoking rate throughout both treatment and follow-up weeks and the CSH group increased its smoking once treatment stopped. However, contrary to expectations, the RH group generally continued its decrease toward zero cigarettes smoked.

Speculation about these results and implications for future research were discussed and it was suggested that the Covert Sensitization treatment was ineffective because of a low frequency of punishment or the possible use of weak aversive scenes by the Es.

The effectiveness of the RH treatment was analyzed as due to its dealing with tension, a possible underlying cause of smoking.

The reader was cautioned that these results may have been influenced by uncontrolled factors and ways to deal with these factors in future studies were discussed. Although the results of this study were inconclusive, this study has opened further areas for investigation.

APPENDIX I

PRE-TESTS

AND

POST-TESTS

Name:_____ Age:_____

Date:_____ Year in college:_____ Major:_____

Phone:_____ Address:_____

SMOKING QUESTIONNAIRE

1. When did you smoke your first cigarette?_____
2. How long have you been smoking?_____
3. How many cigarettes do you smoke per day?_____
4. When was the last time you had a cigarette?_____
5. What is the longest amount of time you've abstained from smoking since you've had a smoking problem?_____
6. Where do you usually smoke? At home: Kitchen, living room, bathroom, bedroom. At work: Before, during and/or after a job?
7. When do you habitually find yourself smoking? When tense, at parties, watching T.V., doing homeowrk, others:_____
8. What are your favorite brands? List your most favorite first.
   a._____ d._____
   b._____ e._____
   c._____ f._____
9. Does your husband (boyfriend)_____or wife (girlfriend)_____smoke?
10. If so, how much? A lot____ Moderately____ Little_____
11. Does, or did, your father smoke?_____If so, how much?_____
12. Does, or did, your mother smoke?_____If so, how much?_____
13. Do you drink alcoholic beverages? If so, what kind and how much?
    a. Hard liquor Yes___No___If so, how much per week?_____
    b. Beer Yes___No___If so, how much per week?_____
    c. Wine Yes___No___If so, how much per week?_____
14. Do you drink coffee? Yes___No___ Cups per day?_____
15. Do you drink milk? Yes___No___ Glasses per day?_____
16. Do you drink soda pop? Yes___No__Glasses per day?_____
17. Do you drink juices? Yes___No___ Glasses per day?_____
18. Do you chew gum? Yes___No___ Sticks per day?___per wk?____
19. Why do you smoke? Give any possible reason:_____
    _____
20. Do you want to stop? If so, why?_____
    _____
21. How probable is it as of right now that you will quit smoking within the next year? 0%___ 25%___ 50%___ 75%___ 100%____
22. Days and times you are free:_____

SCENE IMAGRY

DATE:_____
NAME:_____ Phone_____

Try to imagine the following scenes as clearly as possible. Really try to imagine you are there experiencing the scenes. Indicate by a check next to each scene how much discomfort or fear the scene gives. Even if these scenes are not apt to happen to you, try hard to imagine they are really happening.

1) You are sitting in a dentist's chair and he is about to drill your teeth.
( ) not at all ( ) a little ( ) a fair amount ( ) much
( ) very much

2) You are tied in a chair and a large gray rat is about to jump on your throat.
( ) not at all ( ) a little ( ) a fair amount ( ) much
( ) very much

3) The sound of screeching chalk on a blackboard
( ) not at all ( ) a little ( ) a fair amount ( ) much
( ) very much

4) A bee landing on your nose.
( ) not at all ( ) a little ( ) a fair amount ( ) much
( ) very much

5) You have just fallen into a cess-pool up to your knees. You can feel your knees and arms all wet and there is an awful stink.
( ) not at all ( ) a little ( ) a fair amount ( ) much
( ) very much

6) You have just cut your left arm and it is bleeding a great deal.
( ) not at all ( ) a little ( ) a fair amount ( ) much
( ) very much

7) A snake is wrapped tight around your arms and it's head is in front of your face.
( ) not at all ( ) a little ( ) a fair amount ( ) much
( ) very much

8) By mistake you have just taken a large swallow of vinegar and you feel a very bitter taste in your mouth.
( ) not at all ( ) a little ( ) a fair amount ( ) much
( ) very much

9) You open a garbage pail and you see and smell worms and maggots crawling all over the sides and bottom.
( ) not at all ( ) a little ( ) a fair amount ( ) much
( ) very much

10) You are wearing your favorite clothes, a car comes by and splashes mud all over you.
( ) not at all ( ) a little ( ) a fair amount ( ) much
( ) very much

11) You are walking along and a man walks along next to you. He blows some snots in his hands. He shakes his hands and the snots splatter on your face.
( ) not at all ( ) a little ( ) a fair amount ( ) much
( ) very much

12) You're at a party talking to somebody. Someone says to you, "That's a stupid thing to say," and everybody starts laughing at you.
( ) not at all ( ) a little ( ) a fair amount ( ) much
( ) very much

13) You are walking across a bridge. There is a loose plank. You fall through and hit the water and injure your leg. You can feel the water going into your nose and lungs, you become very frightened, you feel you are going to drown.
( ) not at all ( ) a little ( ) a fair amount ( ) much
( ) very much

FEAR INVENTORY

The items in this questionnaire refer to things and experiences that may cause fear or other unpleasant feelings. Write the number of each item in the column that describes how much you are disturbed by it nowdays.

	Not at all	A little	A fair amount	Much	Very Much
1. Noise of vacuum cleaners					
2. Open wounds					
3. Being alone					
4. Being in a strange place					
5. Loud noises					
6. Dead people					
7. Speaking in public					
8. Crossing streets					
9. People who seem insane					
10. Falling					
11. Automobiles					
12. Being teased					
13. Dentists					
14. Thunder					
15. Sirens					
16. Failure					
17. Entering a room where other people are already seated					
18. High places on land					
19. Looking down from high buildings					
20. Worms					

FEAR INVENTORY

	Not at all	A little	A fair amount	Much	Very Much
21. Imaginary creatures					
22. Receiving injections					
23. Strangers					
24. Bats					
25. Journeys by train					
26. Journeys by bus					
27. Journeys by car					
28. Feeling angry					
29. People in authority					
30. Flying insects					
31. Seeing other people injected					
32. Sudden noises					
33. Dull weather					
34. Crowds					
35. Large open spaces					
36. Cats					
37. One person bullying another					
38. Tough looking people					
39. Birds					
40. Sight of deep water					
41. Being watched working					
42. Dead animals					
43. Weapons					
44. Dirt					

FEAR INVENTORY

	Not at all	A little	A fair amount	Much	Very Much
45. Crawling insects					
46. Sight of fighting					
47. Ugly people					
48. Fire					
49. Sick people					
50. Dogs					
51. Being criticized					
52. Strange shapes					
53. Being in an elevator					
54. Witnessing a surgical operation					
55. Angry people					
56. Mice					
57. Blood a. Human b. Animal					
58. Parting from friends					
59. Enclosed places					
60. Prospect of a surgical operation					
61. Feeling rejected by others					
62. Airplanes					
63. Medical odors					
64. Feeling disapproved of					
65. Harmless snakes					

FEAR INVENTORY

	Not at all	A little	A fair amount	Much	Very Much
66. Cemetaries					
67. Being ignored					
68. Darkness					
69. Premature heart beats (missing a beat)					
70. Nude men (a) Nude women (b)					
71. Lightening					
72. Doctors					
73. People with deformaties					
74. Making mistakes					
75. Looking foolish					
76. Losing control					

NAME: _____

SMOKING QUESTIONNAIRE

Your answers to these questions will help us decide whether to keep the smoking program as it is, whether to restructure it, or whether to drop it. Thank you.

1. By how many cigarettes did you want to cut down when you started this program?

2. Has this program helped you cut down your smoking?
   Yes No (circle one)
   Can you suggest other reasons in addition to or besides this program that help explain your cut in smoking?

3. How many cigarettes on the average do you smoke now?_____
   How many cigarettes on the average did you smoke when you started this program?_____

4. Are you satisfied with the results of your program?
   Yes No (circle one)
   Explain what makes you feel this way:

5. Besides causing you to smoke less, has this program affected your life in any other way?

6. Were the treatments themselves difficult, painful, boring, etc.? How would you describe them?

7. If you had your present knowledge of the program at the time of enrollment would you have still enrolled?
   Yes No (circle one)

8. Would you have stayed through the entire program if you hadn't given a $5.00 guarantee? Yes No (circle one)

9. If your guarantee were returned, would you remain in the program if the treatments went on for another 6 weeks?
   Yes No (circle one)

10. How probable is it as of right now that you will quit smoking within the next year? 0% 25% 50% 75% 100% (circle one)

11. Please make note below of any comments you may have about the program, it's worth to you, and any suggestions you may have for improvements.

ANALYSIS OF PRE-TEST SMOKING QUESTIONNAIRE

	CS/H	CS/N	R/H
How long have you been smoking? (mean score in years)	8.55	11.45	9.52
How many cigarettes do you smoke per day? (mean score)	22.7	28.3	28.55
What is the longest amount of time you've abstained from smoking since you've had a smoking problem? (mean score in days)	20*	50.6	30.7*
Does your husband (boyfriend) or wife (girlfriend) smoke?	yes 2 no 6	yes 7 no 3	yes 5 no 3

	CS/H		CS/N		R/H		CS/H	CS/N	R/H
	yes	no	yes	no	yes	no	(mean amount)		
Does or did, your father smoke?	8	1	7	3	5	3	31	31.7	27
How many cigarettes a day?									
Does, or did, your mother smoke? How many cigarettes a day?	4	5	6	4	3	6	21.7	33.3	30
Do you drink hard liquor?	8	1	9	1	8	1			
Do you drink beer?	7	2	9	1	7	1			
Do you drink wine?	6	3	7	2	7	2			
Do you drink coffee? If so, how many cups a day?	7	2	8	2	6	3	5.8 N= 7	4.2 8	4.4 5

	CS/H		CS/N		R/H		CS/H	CS/N	R/H
	yes	no	yes	no	yes	no			
Do you drink milk? If so, how much? (c.p.d.)	8	1	10	0	8	1	3.1	3.75	3.3
							N= 8	8	8
Do you drink soda pop? If so, how much? (c.p.d.)	6	3	9	1	9	0	1.7	2.27	2.74
							N= 6	8	9
Do you drink juices? If so, how much? (c.p.d.)	7	2	7	3	6	3	1.25	1.21	1.3
							N= 6	7	6
Do you chew gum?	5	4	4	6	7	1			

Why do you smoke? Give any possible reason.** (next page)

CS/H	Enjoy CS/N	R/H	CS/H	Habit CS/N	R/H	CS/H	Tense CS/N	R/H
2	2	3	4	5	1	3	4	7

Why do you want to quit smoking?

CS/H	Health CS/N	R/H	CS/H	Family CS/N	R/H	CS/H	Too Expensive CS/N	R/H
9	9	7	1	3	0	3	4	7

*A Ss from each of these groups had quit smoking for 2 years. This score was not tabulated in the mean.
**Though the subjects could give any "possible answer", the words used were generally related to those above.

NAME: _____

SMOKING QUESTIONNAIRE (POST-TEST)

Your answers to these questions will help us decide whether to keep the smoking program as it is, whether to restructure it, or whether to drop it. Thank you.

1. By how many cigarettes did you want to cut down when you started this program?

2. Has this program helped you cut down your smoking? Yes No (circle one) Can you suggest other reasons in addition to or besides this program that help explain your cut in smoking?

How many cigarettes on the average do you smoke now? ____
How many cigarettes on the average did you smoke when you started this program? ____

4. Are you satisfied with the results of your program? Yes No (circle one) Explain what makes you feel this way:

5. Besides causing you to smoke less, has this program affected your life in any other way?

Were the treatments themselves difficult, painful, boring, etc.? How would you describe them?

7. If you had your present knowledge of the program at the time of enrollment would you have still enrolled? Yes No (circle one)

8. Would you have stayed through the entire program if you hadn't given a $5.00 guarantee? Yes No (circle one)

9. If your guarantee were returned, would you remain in the program if the treatments went on for another 6 weeks? Yes No (circle one)

10. How probable is it as of right now that you will quit smoking within the next year? 0% 25% 50% 75% 100% (circle one)

Please make note below of any comments you may have about the program, it's worth to you, and any suggestions you may have for improvements.

ANSWERS TO POST-TEST QUESTIONNAIRE

Question	CSH		CSN		RH	
	Yes	No	Yes	No	Yes	No
2	9	1	10	1	9	2
4	4	6	5	6	8	3
5	0	10	2	9	7	4
7	6	4	6	5	8	3
8	8	2	9	2	11	0
9	8	2	8	3	5	6

	0%		25%		50%		75%		100%	
10	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
CSH	2	1	3	2	3	3	1	3	0	1
CSN	2	3	1	3	3	3	4	2	1	0
RH	1	0	2	4	4	2	3	3	1	2

APPENDIX II

INSTRUCTIONS

Instructions to the Experimenters:

Session 1-CSH Group

1. Tell the S the rationale for CSH and that after each office treatment they are to practice it twice a day until your next meeting with them. The general rationale might be presented as follows:

You are one of a large group of people who have decided to quit smoking---probably because in some way it's had an adverse effect on your life. Smoking is essentially a strong, learned habit. It's a strong habit which we'll try to break with a technique which investigators claim to be very effective. The technique consists of teaching you to associate the now pleasurable habit of smoking with something very unpleasant. Once the habit is associated with unpleasantness rather than pleasure, it will lose it's strength, possibly even be eliminated. However, no matter how successful you'll eventually be at licking this habit, every treatment has it's ups and downs, so don't get discouraged. We'll be going over this technique today to give you an idea of it, then you're to use it twice a day until our next meeting.

2. Give the CS treatment. As you do, judge the aversive and relief qualities, way S looks and behaves; get him into the scene--feeling, and smelling things in it, not only looking at it. Tell him to use all of his senses as though he were really in the scene.

3. At the end of the treatment session:

   a. Tell S that whenever he's tempted to smoke to imagine he's vomiting on the cigarette.
   b. Tell him to keep his notebook up-to-date, so that you can collect each weeks data at the beginning of future sessions.
   c. Tell him not to discuss his treatment with anyone; infer his silence will strengthen his will power and and treatment effect.

d. Tell him not to start any other smoking reduction treatment while in this program for it might interfere with our results.

Session 1 CSN Group

Follow the procedure as outlined above except no homework is assigned this group.

Session 1 RH Group

1. Tell the Ss the rationale for the relaxation treatments and that they are to practice relaxation twice a day untill your next meeting with them.

   The rationale might be presented as follows:

   You are one of a large group of people that have decided to quit smoking--probably because in some way it's had an adverse effect on your life. Recent scientific evidence indicates that the essential causes of cigarette smoking are nervousness and tension on the part of the smoker. This means that if you're taught to reduce your general level of tension, your need for cigarettes may slowly go down. Once you learn to relax you can do so whenever you want to. However, no matter how successful you will get at licking this habit, every treatment has it's ups and downs, so don't get discouraged. We'll be going over this technique today to give you an idea of it, then you're to use it twice a day, once in the morning and once in the evening, until our next meeting.

2. Give the relaxation treatment.

3. At the end of the treatment session follow the procedure given in steps 3b, 3c, 3d above. Do not use step 3a with any S in the RH group.

Sessions 2 through 6 for all groups

1. Ask S for the data for the preceding week: be sure to reinforce him for practicing homework where appropriate as well as reinforcing him for using his notebook. Ask

each S where he smoked during the preceding week, when he smoked, and how many cigarettes he smoked each time. Be sure to use this information for the planning of new scenes.

2. Proceed through the treatments using material just gained. Work at getting him to experience the scene with all of his senses so that he's not just watching the scene, but taking part in it.
3. At the end of the session remind him to use his notebook during the forthcoming week, and if he's in a homework group, remind him to practice his homework.
4. At the end of the last treatment session reinforce S for whatever progress he's made as well as for keeping his notebook up-to-date. Remind him that he's to continue to keep it up-to-date since we'll be phoning him once a week for the next four weeks to collect data. Remind him that after we've collected the four weeks of follow-up data he'll get his $5.00 back.

The following is an example of the CS procedure:

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 these 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.

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.

Sample Covert Sensitization Scenes:

I want you to imagine you've just had your main meal and you are about to light a cigarette. As you are about to reach for the cigarette you get a funny feeling in the pit of your stomach. You start to feel queasy, nauseous and sick all over. As you touch the cigarette you can feel food particles inching up your throat. You're just about to vomit. As you light a match food comes up into your mouth. You try to keep your mouth closed because you are afraid that you'll spit the vomit all over the place. You bring the cigarette to your mouth. As you're about to open your mouth, you puke; you vomit all over your hands. It goes all over the table, over the other peoples' food. Your eyes are watering. Snot and mucous are all over your mouth and nose. Your hands feel sticky. There is an awful smell. As you look at this mess you just can't help but vomit again and again until just watery stuff is coming out. Everybody is looking at you with shocked expressions. You turn away from the cigarette and immediately start to feel better. You run out of the room, and as you run out, you feel better and better. You wash and clean yourself up, and it feels wonderful.

You've just finished eating your meal and you decide to have a cigarette. As soon as you make that decision, you start to get a funny feeling in the pit of your stomach. You say, "Oh, oh; oh no; I won't smoke that cigarette." Then

you immediately feel calm and comfortable.

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.

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.

You are walking into a party. You decide to have a cigarette. You are now pulling a cigarette from your pocket. As you pull it out you have a funny feeling in the pit of your stomach. Your stomach feels all queasy and nauseous. Some liquid comes up your throat and it is very sour. You try to swallow it back down, but as you do this, food particles start coming up your throat to your mouth and mix with the cigarette. As you inhale, puke comes up into your mouth. You try to keep your mouth closed and swallow it down. You inhale again to force it down. As soon as you inhale you can't hold it down any longer.

You have to open your mouth and you puke. It goes all over your hand, all over the cigarette. You can see it sticking to everything. Snots and mucous come out of your nose. Your shirt and pants are all full of vomit. Your host has some on his shirt. You notice people looking at you. You get sick again and you vomit some more. You turn away from the cigarette and immediately you start to feel better. As you run out of the cigarette, you start to feel better and better. When you get out into clean fresh air you feel wonderful. You go home and clean yourself up.

You have just gotten home from work; you are sitting in your easy chair in the living room. The TV is blaring out the news. There are cigarettes on the end table next to you. You can see the cigarettes, you are reaching for one now. You have it in your hand. You want to light up very much. You are raising it to your mouth; you can almost taste it already. It is against your lips. You're inhaling that first puff.

The smoke is dry; your stomach feels queasy. There is a harshness in your throat. You are beginning to feel very sick. Your last meal is beginning to irritate your intestine. You begin to gag; you can't control your gagging. You feel the undigested food coming up; you are very nauseous. The food is in your mouth; you can feel it forcing its way out of your mouth; you can no longer keep it down. You are vomiting onto your cigarette--over your shirt. It is disgusting; the smell is foul. You can't stop.

Wolpe, J., & Lazarus, A. A. Behavior Therapy Techniques. (Pergamon, 1966) Appendix 4, Relaxation Techniques, pp. 177-180.

RELAXATION OF ARMS (time: 4-5 min.)

Settle back as comfortably as you can. Let yourself relax to the best of your ability. . . . Now, as you relax like that, clench your right fist, just clench your fist tighter and tighter, and study the tension as you do so. Keep it clenched and feel the tension in your right fist, hand, forearm . . . and now relax. Let the fingers of your right hand become loose, and observe the contrast in your feelings. . . . Now, let yourself go and try to become more relaxed all over. . . . Once more, clench your right fist really tight . . . and hold it, and notice the tension again. . . . Now let go, relax; your fingers straighten out, and you notice the difference once more. . . . Now repeat that with your left fist. Clench your left fist while the rest of your body relaxes; clench that fist tighter and feel the tension . . . and now relax. Again enjoy the contrast. . . . Repeat that once more, clench the left fist, tight and tense. . . . Now do the opposite of tension--relax and feel the difference. Continue relaxing like that for a while. . . . Clench both fists tighter and tighter, both fists tense, forearms tense, study the sensations. . . and relax; straighten out your fingers and feel that relaxation. Continue relaxing your hands and forearms more and more. . . . Now bend your elbows and tense your biceps, tense them harder and study the

tension feelings . . . all right, straighten out your arms, let them relax and feel that difference again. Let the relaxation develop. . . . Once more, tense your biceps; hold the tension and observe it carefully. . . . Straighten the arms and relax; relax to the best of your ability. . . . Each time, pay close attention to your feelings when you tense up and when you relax. Now straighten your arms, straighten them so that you feel most tension in the triceps muscles along the back of your arms; stretch your arms and feel that tension. . . . And now relax. Get your arms back into a comfortable position. Let the relaxation proceed on its own. The arms should feel comfortably heavy as you allow them to relax. . . . Straighten the arms once more so that you feel the tension in the triceps muscles; straighten them. Feel that tension . . . and relax. Now let's concentrate on pure relaxation in the arms without any tension. Get your arms comfortable and let them relax further and further. Continue relaxing your arms ever further. Even when your arms seem fully relaxed, try to go that extra bit further; try to achieve deeper and deeper levels of relaxation.

RELAXATION OF FACIAL AREA WITH NECK, SHOULDERS, AND UPPER BACK (time: 4-5 min.)

Let all your muscles go loose and heavy. Just settle back quietly and comfortably. Wrinkle up your forehead now; wrinkle it tighter. . . . And now stop wrinkling your forehead, relax and smooth it out. Picture the entire forehead

and scalp becoming smoother as the relaxation increases. . . . Now frown and crease your brows and study the tension. . . . Let go of the tension again. Smooth out the forehead once more. . . . Now, close your eyes tighter and tighter . . . feel the tension . . . and relax your eyes. Keep your eyes closed, gently, comfortably, and notice the relaxation. . . . Now clench your jaws, bite your teeth together; study the tension throughout the jaws. . . . Relax your jaws now, let your lips part slightly. . . . Appreciate the relaxation . . . . Now press your tongue hard against the roof of your mouth. Look for the tension. . . . All right, let your tongue return to a comfortable and relaxed position. . . . Now purse your lips, press your lips together tighter and tighter. . . . Relax the lips. Note the contrast between tension and relaxation. Feel the relaxation all over your face, all over your forehead and scalp, eyes, jaws, lips, tongue and throat. The relaxation progresses further and further. . . . Now attend to your neck muscles. Press your head back as far as it can go and feel the tension in the neck; roll it to the right and feel the tension shift; now roll it to the left. Straighten your head and bring it forward, press your chin against your chest. Let your head return to a comfortable position, and study the relaxation. Let the relaxation develop. . . . Shrug your shoulders, right up. Hold the tension. . . . Drop your shoulders and feel the relaxation. Neck and shoulders relaxed. . . . Shrug your shoulders again

and move them around. Bring your shoulders up and forward and back. Feel the tension in your shoulders and in your upper back. . . . Drop your shoulders once more and relax. Let the relaxation spread deep into the shoulders, right into your back muscles; relax your neck and throat, and your jaws and other facial areas as the pure relaxation takes over and grows deeper . . . deeper, ever deeper.

RELAXATION OF CHEST, STOMACH AND LOWER BACK (time 4-5 min.)

Relax your entire body to the best of your ability. Feel that comfortable heaviness that accompanies relaxation. Breathe easily and freely in and out. Notice how the relaxation increases as you exhale . . . as you breathe out just feel that relaxation. . . . Now breathe right in and fill your lungs; inhale deeply and hold your breath. Study the tension. . . . Now exhale, let the walls of your chest grow loose and push the air out automatically. Continue relaxing and breathe freely and gently. Feel the relaxation and enjoy it. . . . With the rest of your body as relaxed as possible, fill your lungs again. Breathe in deeply and hold it again. . . . That's fine, breathe out and appreciate the relief. Just breathe normally. Continue relaxing your chest and let the relaxation spread to your back, shoulders, neck and arms. Merely let go .... and enjoy the relaxation. Now let's pay attention to your abdominal muscles, your stomach area. Tighten your stomach muscles, make your abdomen

hard. Notice the tension. . . . And relax. Let the muscles loosen and notice the contrast. . . . Once more, press and tighten your stomach muscles. Hold the tension and study it. And relax. Notice the general well-being that comes with relaxing your stomach. . . . Now draw your stomach in, pull the muscles right in and feel the tension this way. . . . Now relax again. Let your stomach out. Continue breathing normally and easily and feel the gentle massaging action all over your chest and stomach. . . . Now pull your stomach in again and hold the tension. . . . Now push out the tense like that; hold the tension . . . once more pull in and feel the tension . . . now relax your stomach fully. Let the tension dissolve as the relaxation grows deeper. Each time you breathe out, notice the rythmic relaxation both in your lungs and in your stomach. Notice thereby how your chest and your stomach relax more and more. . . . Try and let go of all contractions anywhere in your body. . . . Now direct your attention to your lower back. Arch up your back, make your lower back quite hollow, and feel the tension along your spine . . . and settle down comfortably again relaxing the lower back. . . . Just arch your back up and feel the tensions as you do so. Try to keep the rest of your body as relaxed as possible. Try to localize the tension throughout your lower back area. . . . Relax once more, relaxing further and further. Relax your lower back, relax your upper back, spread the relaxation to your stomach, chest, shoulders, arms and facial area. These

parts relaxing further and further and further and ever deeper.

RELAXATION OF HIPS, THIGHS AND CALVES FOLLOWED BY COMPLETE BODY RELAXATION

Let go of all tensions and relax. . . . Now flex your buttocks and thighs. Flex your thighs by pressing down your heels as hard as you can. . . . Relax and note the difference. . . . Straighten your knees and flex your thigh muscles again. Hold the tension. . . . Relax your hips and thighs. Allow the relaxation to proceed on its own. . . . Press your feet and toes downwards away from your face, so that your calf muscles become tense. Study that tension. . . . Relax your feet and calves. . . . This time, hand your feet towards your face so that you feel tension along your shins. Bring your toes right up. . . . Relax again. Keep relaxing for a while. . . . Now let yourself relax further all over. Relax your feet, ankles, calves and shins, knees, thighs, buttocks and hips. Feel the heaviness of your lower body as you relax still further. . . . Now spread the relaxation to your stomach, waist, lower back. Let go more and more. Feel that relaxation all over. Let it proceed to your upper back, chest, shoulders and arms and right to the tips of your fingers. Keep relaxing more and more deeply. Make sure that no tension has crept into your throat; relax your neck and your jaws and all your facial muscles. Keep relaxing your whole body like that for a while. Let yourself relax.

Now you can become twice as relaxed as you are merely by taking in a really deep breath and slowly exhaling. With your eyes closed so that you become less aware of objects and movements around you and thus prevent any surface tensions from developing, breathe in deeply and feel yourself becoming heavier. Take in a long, deep breath and let it out very slowly. . . . Feel how heavy and relaxed you have become.

In a state of perfect relaxation you should feel unwilling to move a single muscle in your body. Think about the effort that would be required to raise your right arm. As you <u>think</u> about raising your right arm, see if you can notice any tensions that might have crept into your shoulder and your arm. . . . Now you decide not to lift the arm but to continue relaxing. Observe the relief and the disappearance of the tension. . . .

Just carry on relaxing like that. When you wish to get up, count backwards from four to one. You should then feel fine and refreshed, wide awake and calm.

APPENDIX III

RAW DATA

WEEKLY MEAN NUMBER OF CIGARETTES SMOKED FOR EACH S IN EACH GROUP OVER THE ELEVEN WEEK PERIOD

Weeks													
1	2	3	4	5	6	7	8	9	10	11	Ss	Therapist	Group
34	25	24	23	18	19	21	19	22	17	19	1		
24	8	7	7	5	3	0	0	0	0	0	2	A	
33	33	33	31	29	27	10	25	30	25	26	3		
32	26	22	20	23	25	24	20	23	23	23	4		
21	14	13	10	9	7	8	8	7	5	5	5	B	RH
20	17	9	8	8	8	6	6	7	10	8	6		
22	22	18	19	24	23	19	19	17	15	8	7		
30	32	24	27	27	23	25	22	24	26	27	8	C	
18	15	14	13	12	12	12	11	11	9	9	9		
28	22	19	19	21	20	21	20	20	20	20	10		
26	16	21	19	27	18	19	19	13	12	19	11	A	
36	34	26	27	22	23	25	23	20	20	21	12		
30	30	18	16	15	18	13	3	13	17	17	13		
14	9	21	20	14	10	11	16	11	15	14	14		CSH
25	25	25	22	21	19	13	13	21	25	29	15	B	
40	37	34	34	34	31	30	33	31	32	33	16		
26	23	19	22	18	17	15	9	13	12	13	17		
22	30	19	14	17	14	15	19	17	22	23	18	C	

Weeks													
1	2	3	4	5	6	7	8	9	10	11	Ss	Therapist	Group
29	27	26	28	26	24	25	22	25	30	28	19		
21	13	13	14	21	21	20	23	20	19	24	20	A	
34	37	33	34	34	34	33	33	33	36	37	21		
23	23	26	21	18	18	19	13	12	10	5	22		
16	14	13	13	13	13	13	12	12	15	15	23		
22	23	24	24	24	26	28	26	23	23	26	24	B	CSN
17	18	17	15	11	10	10	10	11	11	11	25		
29	14	16	13	13	12	15	15	16	15	16	26		
21	20	20	20	19	18	18	19	19	21	22	27		
32	3	2	12	14	21	21	24	18	20	10	28	C	

APPENDIX IV

ATTRITION INFORMATION

Eight of the 36 volunteers chosen as Ss either did not present data that was usable for the statistical analysis or could not be contacted for data collection. Five of these eight Ss were in the groups handled by the C and G student (Mrs. A.), two were in the group handled by the undergraduate Psychology student (Mr. B.), and one was in the group handled by the author. The following accounts for these Ss:

1. Mr. G. was a member of the CSN group. His therapist was Mr. A. During the program a close friend of his died in an automobile fire caused by a cigarette. He left the program to attend the funeral. Follow-up contacts revealed that his smoking level stabilized at the point at which he left the program.

2. Mr. S. was a member of the CSN group. His therapist was Mr. A. He went to California during the program and didn't get his data back to us.

3. Mr. C. was a member of the CSH group. His therapist was Mr. A. He attended one treatment session. He later informed us that he had dined out with his wife after the session, got the urge to smoke, but became nauseous and did not do so. He hadn't smoked since that evening. Mr. C. was contacted periodically throughout the treatment and follow-up periods to ascertain whether he had started to smoke again. He told us he had abstained since the first treatment and had no desire for cigarettes. He gave the program credit for his abstaintion since he had been trying to

cut down for some time, but had been unable to do so until his initial CSH treatment.

4. Mr. S. was a member of the CSH group. His therapist was Mr. A. He voluntarily dropped out of treatment after the second session. When contacted, he described the treatment as too "silly" to take part in.

5. Mr. M. was a member of the CSH group; his therapist was Mr. A. He was dropped from the final analysis although he took part in all sessions and reduced his smoking to zero. Questioning three weeks into the program revealed that he was using a self-made tape recording of the scenes as homework. One wonders if the additional involvement of making and listening to ones own tape of the scenes would improve the effectiveness of the CS or RH treatments. Additional studies of differential effectiveness resulting among self-made and self-administered tapes, ready-made tapes and therapist administered treatments would be worthwhile; if taped treatments are indeed effective, these studies might answer the question of how many therapist-administered treatments are needed.

6. Mr. S. was a member of the RH group. His therapist was Mr. C. He enlisted in the Army during one of the follow-up weeks. Data during the last week of treatment indicated a 50 per cent reduction of smoking on his part. He wrote recently to tell us he no longer had his notebook, but had quit smoking completely. He believed his participation in

the program to be completely responsible for his ability to abstain.

7. Miss N. was a member of the RH group. Her therapist was Mr. B. Her brother died and she had to leave the program to care for his family.

8. Mr. S. was a member of the RH group. His therapist was Mr. B. He moved from the area during the follow-up period and could no longer be contacted. Data gathered from the last week of treatment shows at that point he was smoking .07 of his baseline.

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