THE EFFECTS OF THREE VERSIONS OF COVERT SENSITIZATION ON THE REDUCTION OF THE MALADAPTIVE BEHAVIOR OF SMOKING

By

DENNIS ALAN RAWLINGS

Bachelor of Science
Oklahoma State University
Stillwater, Oklahoma
1968

Master of Science
Oklahoma State University
Stillwater, Oklahoma
1970

Submitted to the Faculty of the Graduate College
of the Oklahoma State University
in partial fulfillment of the requirements
for the Degree of
DOCTOR OF PHILOSOPHY
May, 1973

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Thesis Approved:

Julia L. McHale
Thesis Adviser

Edward Nelson

R. J. Weber

Leon Hoff

D. D. Durham
Dean of the Graduate College

ACKNOWLEDGMENTS

I wish to acknowledge with sincere appreciation the advice and thoughtful guidance given me by my dissertation committee, Dr. Julia McHale, Dr. Robert Weber, Dr. Elliott Weiner and Dr. Gene Acuff. In addition a special appreciation is extended to the staff at Wilford Hall United States Air Force Medical Center who supported this study. More specifically, I wish to thank Dr. Robert F. Williams, whose critical judgment helped to steer this study through more narrow straits than this researcher cares to remember.

Last, but definitely not least, I wish to acknowledge my wife's patience and unending help. Without her support this project would have been exceedingly more difficult.

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CHAPTER I

INTRODUCTION

Over the last 35 years behavior therapists have become increasingly aware of the applicability of the aversive conditioning methods to the treatment of behavior disorders such as homosexuality, alcoholism, drug addiction and obesity; maladaptive behaviors that have proved difficult to treat by conventional interview methods or by positive conditioning techniques. This awareness among behaviorists has resulted in an increase in the development of techniques, procedures, and apparatus for use in aversive therapy. One such development has been the use of imagined or covert aversive stimuli contiguously paired with imagined maladaptive behavioral acts. This procedure has been called "aversive imagery," "aversive deconditioning," "imaginal counter-conditioning," and "covert sensitization." The term covert sensitization is used in the present study.

The term "covert" is used because neither the undesirable stimulus (e.g. cigarette) nor the aversive stimulus (e.g. nausea) is ever actually presented in treatment. These stimuli are presented in the patient's imagination only. The term "sensitization" indicates the patient is made intensely and unpleasantly aware of the maladaptive behavior which, it is generally felt, creates an avoidance response to the undesirable stimulus.

The present research had two goals. Primarily, the study attempted

to provide empirical evidence in the form of therapy outcome results to answer the question of which of three learning theory formulations best accounted for the effects of covert sensitization. Second, the research was an effort to provide empirical evidence relevant to the question of covert sensitization's effectiveness beyond simple placebo-attention effects.

Candidates for anti-smoking therapy were acquired through a newspaper advertisement soliciting people who wanted to quit smoking and who were willing to accept psychological assistance in quitting. The subjects thus obtained were randomly assigned to one of five conditions.

Treatment Condition I (P) consisted of a covert sensitization procedure modeled along a classical "Pavlovian" counter-conditioning paradigm. This condition was included because early workers with covert sensitization implied, in their articles, that it was the subjects' gradual loss of desire for the target stimulus (Gold and Neufeld, 1965; Anant, 1967a, 1967b, and 1968; Kolvin, 1967; Davison, 1968) alone that accounted for the outcome of their treatment regimes. Therefore, a Treatment Condition was used in which imagined target stimuli (cigarettes and smoking behavior) were paired contiguously with imagined noxious stimuli (feelings of nausea induced by therapist suggestions) in an attempt to test this idea.

Treatment Condition II (E-A) in the research followed Cautela's 1966 reported procedure exactly. This includes the above mentioned contiguous pairing of imagined target stimuli and imagined noxious stimuli. In addition, Cautela's 1966 procedure also included the use of two types of aversion "relief" imagery. One type occurs when a subject "runs away" from the paired imagined target and noxious stimuli

after having experienced strong feelings of nausea induced by therapist suggestion ("escape" imagery). The second aversion "relief" imagery occurs when the subject imagined approaching the target stimuli (cigarettes); imagined experiencing sudden noxious feelings (therapist suggested nausea stimuli); and terminated the aversive sensations by imagining rejection of the target stimuli and feeling immediately calm and relaxed ("avoidance" imagery). This is a procedure whereby a covert cigarette-avoidance-response to covert noxious stimulation is being conditioned. The avoidance of feelings of nausea was made contingent upon the avoidance of cigarettes.

Treatment Condition III (E-A/SC) employed the exact same procedures as the second Treatment Condition with the addition and emphasis of a specific instructional set for the subjects' daily practice. This instructional set, the researcher believes, converts covert sensitization into a self-controlled aversive self-conditioning process. The addition of this variable to covert sensitization was reported in the literature by Cautela in 1967. Thus, the third Treatment Condition has both the variables of classical counter-conditioning (Treatment Condition I); avoidance learning (Treatment Condition II) and introduces a third variable; the possibility of "in vivo," self-conditioning, in response to the occurrence of the target stimulus. This Treatment Condition is analogous to Premack's ideas (1959) about the creation of internalized self-control systems that function contingent upon the occurrence of frequent behavioral, cognitive or affective stimuli.

Treatment Condition IV (PLC) utilized a classical counter-conditioning paradigm exactly like the first Treatment Condition (P) with one exception; innocuous or mildly positive imaginal stimuli were

employed in an attempt to create a credible Placebo Condition. The imaginal stimuli were therapist induced suggestions that subjects resist approaching (imaginally) the target stimuli, cigarettes, through "will power." This Condition was devised to provide (1) a baseline for experimental Treatment Condition comparisons; and (2) provide evidence for or against covert sensitization's results beyond placebo-attention effects.

Treatment Condition V (C) was a No Treatment Control group. These subjects were promised therapy at a later date. They were asked to help with the "evaluation" of the anti-smoking therapy clinic by deferring treatment and reporting their smoking rate at the beginning and again at the end of the study when contacted by the researcher. They were also asked to record their daily smoking rates between these contacts. These subjects were very seriously encouraged to cut down and then quit smoking on their own while they were receiving no planned treatment. They were told this would help the treatment. This group served as: (1) a No Treatment Control Condition for comparison with the experimental Treatment Conditions; and (2) as an attempt to validate the lack of effects of the Placebo Treatment.

A quantitative self-report instrument and two qualitative self-rating instruments were used in the research. Subjects originally reported the number of cigarettes smoked weekly on a Smoking Information Questionnaire. At each treatment session they turned in a written self-report on the number of cigarettes smoked in the past seven days. It was assumed that if any treatment or treatments were effective there would be a significant reduction in the number of cigarettes smoked from beginning of treatment to termination. The data obtained was to

be analyzed by analysis of variance techniques.

Cigarette Enjoyment and Taste Rating Scales were also employed to assess any qualitative changes in attitude toward the target stimuli (cigarettes).

The following hypotheses were tested:

I. Reduction in smoking rate in Treatment Condition I (P) is predicted to be significantly greater than either (.05 level of chance) the Placebo Treatment or the No Treatment Control Conditions.

II. Reduction in smoking rate in Treatment Condition II (E-A) is predicted to be significantly greater than either (.05 level of chance) the Placebo Treatment or the No Treatment Control Conditions.

III. Reduction in smoking rate in Treatment Condition III (E-A/SC) is predicted to be significantly greater than either (.05 level of chance) the Placebo Treatment or the No Treatment Control Conditions.

IV. Reduction in smoking rate in Treatment Condition III (E-A/SC) is predicted to be significantly greater than (.05 level of chance) in Treatment Condition I (P).

V. Reduction in smoking rate in Treatment Condition III (E-A/SC) is predicted to be significantly greater than (.05 level of chance) in Treatment Condition II (E-A).

VI. Reduction in smoking rate in Treatment Condition II (E-A) is predicted to be significantly greater than (.05 level of chance) in Treatment Condition I (P).

VII. Reduction in smoking rate in the Placebo Treatment Condition

is predicted to be significantly greater than (.05 level of chance) in the No Treatment Control Condition.

CHAPTER II

REVIEW OF THE LITERATURE

The origins of aversive therapy lie in the experimental findings of Watson and Rayner (1920) and Pavlov (1927). These and other pioneer researchers demonstrated that any neutral stimulus paired with an aversive stimulus could acquire the properties of an aversive stimulus. When this occurred the neutral stimulus had become a conditioned aversive stimulus. The research of Ericksen and Keuthe (1956) offer experimental evidence that, through conditioning, even human thoughts can acquire the properties of conditioned aversive stimuli.

Though Ericksen and Keuthe's work is relatively recent, the use of thoughts or imaginal stimuli is not new in aversive therapy. Reports of the therapeutic use of imagery as the "target" stimuli (the stimuli to which an aversive response is to be conditioned) have been in the aversive therapy literature for over 35 years. For example, Max (1935) reported treating a homosexual patient by pairing electric shock with the patient's sexual fantasies, i.e., imaginal sexual stimuli. In fact, most of the clinical literature in aversive therapy for the treatment of homosexuality has used fantasy, projected slides or photographs as the stimuli to be aversively conditioned. This trend toward using covert stimuli as the target stimulus may be viewed as part of the total evolution of behavior therapy in general. This is especially true in view of the widespread use of procedures relying upon imaginal "target"

stimuli in other areas of behavior modification, e.g., desensitization therapy (Wolpe, 1958), emotive imagery (Lazarus and Abramovitz, 1962), implosive therapy (Stampfl and Levis, 1967), coverant control (Homme, 1965), etc. In the clinical setting the use of imagery in aversive conditioning has produced successful therapeutic results (Rachman, 1961; Feldman and MacCulloch, 1965; McGuire and Vallance, 1964). In the research setting Marks and Gelder (1967) found no significant difference in treatment outcome for patients shocked while imagining their deviant sexual acts as compared to patients shocked while actually carrying out their deviant acts.

From using the patient's imagined target stimuli paired with an external noxious agent to form conditioned aversions; to using the patient's imagined target stimuli paired with internal, imagined, noxious experiences (induced via therapist description) was just a logical advance in aversion therapy.

A good reason for this advance was the serious difficulties encountered with the use of external noxious stimuli in aversive therapy. With pharmacological methods, for instance, temporal control of the unconditioned stimuli was always imprecise; there was the ever present chance of unwanted side effects; the time of onset of nausea was unpredictable; and the number of trials over time had to be curtailed (Bandura, 1969).

A number of these difficulties could be avoided with the use of electrical rather than chemical stimuli. Rachman (1965a) made a general recommendation that electrical stimuli be used in aversive conditioning where ever feasible.

But no matter which of these aversive stimuli the clinician or

researcher chose both were highly unpleasant to the subject. Rachman (1965b) observed that increases in aggressiveness, negativism, and hostility were frequent patient responses to the use of these measures. Franks (1968) concluded that any external aversive stimuli strong enough to be traumatic was also likely to be accompanied by undesired physiological side effects.

In the face of these difficulties, the value of a method like covert sensitization is that it allows therapists to administer whatever stimulus would have the desired impact in treatment without concern about the drawbacks involved with shock apparatus, pharmacological injections and adverse physiological side effects. Therapists are really limited in alternative aversive stimuli only by the imaginative abilities of their patients.

The possibility of covert aversive therapy may have been suggested first by Lazarus (1958). Lazarus reported a case study on a patient exhibiting general anxiety, lack-of-assertiveness, and compulsions to continually recheck his work. An assortment of treatment procedures were used with the patient, including assertive training and other behavioral rehearsal techniques. For the treatment of the compulsion, a hypnotic state was induced in the patient and he was instructed to imagine himself completing a job--and rechecking it (the target stimuli). Each time he was instructed to imagine rechecking the work he was to feel himself becoming more and more anxious (imagined noxious stimuli) until he could stand it no more; then as soon as he ceased rechecking his work in his imagination, Lazarus suggested his anxiety immediately disappeared. Treatment continued for ten half-hour sessions at which time the patient reported he actually became uncomfortable and upset if

he rechecked his work more than once. With this change in his working behavior, of course, his production increased amazingly.

The potential in Lazarus' 1958 article was not immediately recognized. This may have occurred because it appeared at a time when the interest in chemical and electrical methods of aversive conditioning was still very strong. Nevertheless, as the limitations of these methods began to be recognized, a number of behavior modification therapists, working individually, began to explore aversive imagery as an alternative.

In 1965, Gold and Neufeld reported a case study using a procedure they called "aversive deconditioning." This is one of the earlier reported cases investigating aversive imagery. The patient was a teenage male homosexual referred for propositioning men in public toilets. He was relaxed and asked to imagine himself at a urinal alongside an unattractive old man. When the patient signalled that he did not find this imaginary old man sexually arousing and would not approach him the therapist said, "Well done." Over a number of sessions the image of the rejected male was gradually changed to a more attractive form but was increasingly surrounded by negative sanctions, such as a nearby policeman. Then these stimuli were also removed. Another aversive method was later employed in which the patient imagined an attractive male paired with "unpleasant suggestions," or an attractive female paired with "pleasant suggestions." After 17 treatment sessions over a one-year period the patient reported an avoidance of homosexual contact and increasing heterosexual interest.

Shortly after the publication of this case study, Cautela (1966, 1967, 1970a and 1970b) began reporting in a series of articles his

successful use of imagined noxious stimuli paired with imagined target stimuli in treating alcoholism, obesity, homosexuality and smoking. He labeled his procedure "covert sensitization," and the term and technique have been adopted by other investigators.

Cautela (1966) had the patient relax and instructed him to visualize himself making approach responses to the undesirable stimulus (for cigarette smoking; wanting a cigarette, looking for a package of cigarettes, reaching for the pack, touching the pack, taking a cigarette out, raising the cigarette to the mouth, etc.), but in his imagination he becomes increasingly ill as he approaches the target stimulus, until just at the point of consumption, he is overcome with nausea and vomits. Avoidance behavior was also reinforced by the use of "relief imagery" in which the patient imagined that resisting the desire to consume or obtain the target stimuli led to the immediate disappearance of the imagined noxious stimulus. In a later article Cautela (1967) reported he had also begun instructing his patients to shout STOP!, subvocally, and imagine vomit (if that was the aversive stimulus employed) on the target stimuli. The patient was instructed to do this any time he was tempted to approach the target stimuli.

Cautela's first published study (1966) was soon followed by case reports of other clinicians. Kolvin (1967) described a procedure of "aversive imagery" in the successful treatment of fetichism and gasoline addiction. Anant (1967a, 1967b and 1968) reported successful outcome with the use of a "verbal aversion" technique for alcoholism, promiscuity and drug addiction. Davison (1968) published a case history on a method he termed "client-controlled counter conditioning" which he employed to eliminate a young college student's sadistic fantasies.

Each of these published case studies involved a variation of the same basic method--an imagined noxious stimulus was paired with stimuli evoked by the imagined performance of a behavior deemed maladaptive.

Williams (1971) concluded that, to date, no general consensus exists as to the essential elements of the treatments used by the researchers reported above. A number of questions defining the most effective procedure for the basic method outlined above remain unanswered. For example, is relaxation training an aid or a hindrance to therapeutic outcome in covert sensitization? Should a hierarchy of stimulus events be employed or not. The question of the intensity of the aversive stimulus is also an unresolved issue.

The studies cited above vary greatly in many respects on the above points. The unresolved question of the most effective procedure is due to the lack of experimental data about (1) the overall effectiveness of covert sensitization and; (2) the specific effects of such variables as relaxation training, stimulus hierarchies, and intensity of aversive stimuli on the treatment. The only outcome research on the effectiveness of covert sensitization at present is based on Cautela's procedures and this research will now be reviewed.

Effectiveness of Covert Sensitization

Mullen (1966) and Viernstien (1967) were the first researchers to test the effectiveness of covert sensitization. Both studies focused on smoking reduction. Mullen (1966) used ten female student volunteers as subjects. Five subjects met in an experimental group where covert sensitization was given once a week in six 45-minute sessions. The other five served as a no treatment control group. The subjects were

first given relaxation training. They then imagined situations where smoking is typical; when the image was clear for all subjects, Mullen asked them to imagine they had each placed a cigarette in their mouths and immediately became very nauseous and vomited. This type of scene was alternated with suggested scenes where the subject resisted the temptation to smoke, and felt relieved and relaxed as a result. When treatment was completed a significant difference between the experimental and control groups was found in the mean number of cigarettes smoked per day. However, this difference was not found at a six-month follow-up. These results, while suggesting the advantage of covert sensitization over no treatment, are also open to alternative explanation as simple placebo-attention effects.

Viernstien's study (1967) sought to solve this problem with the use of additional treatment groups, which included a placebo treatment. The subjects were 28 female student volunteers; two experimenters alternated as therapists. The four treatments were: (1) "Relaxation-Aversion Imagery Therapy," equivalent to covert sensitization. This consisted of one week of relaxation training and six half-hour treatment sessions in which nausea imagery was alternated with "resistance" imagery; (2) "Relaxation-Aversion Therapy," the same as above except that nausea was suggested while the subjects actually held a cigarette in their mouths; (3) "Supportive-Education Therapy," which was a placebo treatment that included daily record keeping of the amount smoked, group discussions, anti-smoking films, role playing techniques, and therapeutic advise; and (4) the no-treatment control group which were instructed to try and stop smoking on their own. The results of the study showed significant reductions in the mean number of cigarettes smoked per day

in all treatment groups as compared to the no-treatment control. However, the differences between treatment means were not significantly different from each other either at the end of treatment or at a five-week follow-up. Again it was shown that covert sensitization was more effective than no-treatment, but these results also cannot be defended against the placebo-attention effects interpretation.

Rutner (1967) found similar results in another smoking reduction study. To five groups of eight subjects, Rutner gave one session each of five different treatments: (1) covert sensitization (Cautela, 1966); (2) coverant control (Homme, 1965); (3) breath holding (Mees, 1966); (4) contractual management (Tooley and Pratt, 1967); and (5) self monitoring. At the end of 21 days results indicated all five groups had reduced their smoking levels. Again there were no significant differences found between the treatments.

Ashem and Donner (1968) attempted to compare covert sensitization to a placebo treatment consisting of a backward conditioning paradigm. They also employed a no-contact control in their treatment of 23 volunteer alcoholics. In the backward conditioning treatment the subjects were asked to imagine scenes in which they experienced nausea and vomitting; when they showed overt signs of discomfort, they were told to imagine themselves consuming an alcoholic drink. Ideally, this corresponds to the backward classical conditioning paradigm; therefore, conditioning effects were unlikely, and any changes resulting from the treatment could be attributed to placebo effects. In comparison to controls, both the covert sensitization and backward conditioning groups scored better on an abstinence questionnaire given to each subject and his nearest contact. But once again the differences between

the two treated groups were non-significant. The authors state that subjects in the backward conditioning treatment "...quickly made an automatic association between the CS (alcohol) and the UCS (nausea)..." (pp. 10-11) so that the treatment was more than a simple placebo condition. The subjects verbalized this recognition to the authors of the study.

The studies reported in the literature so far have failed to demonstrate effects of covert sensitization beyond simple placebo expectancy. Primarily, the difficulty seems to be one of creating a placebo condition which has no real effects, yet remains credible to all subjects throughout the treatment.

Barlow, Agras and Leitenberg (1970) have attempted to solve this problem with another approach. These researchers designed a study using a within-subject paradigm in the treatment of two cases of homosexuality. Treatment took place in four phases. In the first, the placebo phase, the two subjects were given the expectancy of a decrease in homosexual arousal. The procedure consisted of six sessions of imagining arousing scenes while relaxed. Neither subject showed any decrease in homosexual arousal during this period. In fact, each showed slight increases in the reported number of homosexual urges and fantasies as well as in penile circumference changes. In the second phase, covert sensitization was applied for six sessions with an expectancy of an <u>increase</u> in homosexual arousal. Contrary to his expectancy, <u>S</u>1 showed a sharp decrease in reported urges and penile circumference changes; <u>S</u>2, however, showed a decrease in penile circumference changes, but reported a small increase in urges and fantasies. In the third phase of treatment, the placebo treatment was again introduced for eight

sessions for S1 and ten sessions for S2. Again, despite the expectancy set for a decrease in homosexual arousal induced in S1, both measures rose sharply; in contrast for S2 both measures declined sharply, i.e., change was in accordance with the placebo expectancy set. In the fourth phase, covert sensitization was combined with expectancy for decreases in homosexual arousal and S1 showed a drop to near zero on the two measures, while S2 showed some drop in urges and a drop to near zero in circumference changes. These results are, unfortunately, rather ambiguous due to subject differences in response to treatment. The authors state that for one subject, at least, covert sensitization produced improvement on both the self-report and objective measures despite expectancy to the contrary; in addition, expectancy of a decrease in homosexual arousal alone had little effect on both subjects (phase 1). And finally, when covert sensitization was combined with expectancy for a decrease in homosexual arousal there were significant reductions on both measures for both subjects (phase 4).

Thus, outcome research, at present, has demonstrated covert sensitization to be advantageous over untreated controls. In addition, the Barlow et al (1970) study suggested that covert sensitization may be effective beyond placebo effects. It now becomes pertinent to ask what theoretical formulations may best account for the effects of covert sensitization. Because there is no consensus as to procedure; and also a lack of research oriented to theory-testing, it is no surprise that the theoretical issues of covert sensitization are also ambiguous.

Theories of Covert Sensitization

Of those reporting case studies with aversive imagery treatments (Gold and Neufeld, 1965; Anant, 1967a, 1967b and 1968; Kolvin, 1967; Davison, 1968) there have been few attempts to elaborate the theoretical foundation of their clinical results. Most of these investigators seem to view covert sensitization as a form of "Pavlovian" counter-conditioning comparable to counter-conditioning with external noxious stimulation (see, for example, Lemere and Voegtlin, 1950). The reduction of undesirable responses is, from this point of view, the result of an avoidance behavior mediated by a reduction in the reinforcement value of the target stimulus. This reduction is brought about by the counter-conditioning process. Ashem and Donner (1968) expanded this position further, theorizing that an incompatible phobic-type response is actually being conditioned to the various stimuli which have previously evoked the maladaptive behavior.

Cautela (1966) himself originally held a similar view, stating that the target stimulus acquired aversive characteristics which the subject finds noxious and thus avoids. As the procedure's name implies, the subject became "sensitized" to that stimulus. In his later work, however, Cautela (1967, 1970) changed his view and now regards covert sensitization as a punishment process in which the pairing of approach behavior with aversive imaginal stimulation leads to the suppression of approach responses. His explanation rests on his assumption that punishment can be effective in permanently reducing the probability of responses. Cautela argued for the validity of this view on the basis of re-evaluation of the punishment literature (e.g., Kushner and Sandler,

1966; Lublin, 1969). Equally important, Cautela contended that the substitution of avoidance responses for approach behavior is augmented by the pairing of "escape" and "avoidance" imagery with relief from the aversive imagery. For this reason his procedure included "escape imagery" and "avoidance imagery" as an adjunct to sensitization.

Cautela's theoretical position is based on Mower's two-factor theory of avoidance learning as elaborated by Solomon and others (Solomon and Wynne, 1953; Turner and Solomon, 1967). Basically, this theory applied to the use of relief imagery in covert sensitization, holds that cues previously associated with aversive stimulation (e.g., nausea and vomiting; or in metapsychological terms, the "I'm about to be sick" realization) become discriminatory stimuli evoking avoidance responses.

The same punishment explanation was also used by Mullen and his co-worker (Mullen, 1966; Viernstien, 1967). Mullen, however, did not assert that punishment itself must necessarily produce permanent response decrement. Rather, he held that aversive imagery only temporarily suppressed undesired behavior. Thus from his point of view, "escape" or "avoidance" imagery is essential in order to reinforce avoidance behavior and produce a permanent alternative response.

Williams (1971) conducted a laboratory analogue of covert sensitization therapy in an attempt to provide evidence for either a "Pavlovian" counter-conditioning or an avoidance learning paradigm. Williams noted that counter-conditioning explanations hypothesize a reduction in reward value of the target stimuli while the avoidance learning explanation does not. He reasoned that changes due to counter-conditioning might be best reflected in evaluative measures of the target stimuli, while changes due to avoidance learning may be best reflected on ap-

proach measures.

Williams asked 72 subjects, equally divided between male and female student volunteers, to taste and subjectively rate three imported fruit juices which they had never tasted prior to that time. Then he had his subjects listen to a 30-minute tape recording of covert sensitization scenes in which they were asked to either imagine and experience themselves becoming (1) nauseous and vomiting, (2) very anxious and fearful or (3) nothing unpleasant at all, in response to approaching a juice they had tasted and rated prior to the experimental treatment. The subject group receiving neutral suggestions served as a control group.

After listening to the tape the subjects were immediately asked to taste the juices they had tasted prior to treatment and re-rate them on the same instruments. Subject were also manipulated into choosing one of the three juices as a gift for taking part in the study. This gave Williams an index of approach behavior to the target stimuli, as well as subjective evaluations by the subjects of the target stimuli. Results indicated the treatment conditions (nausea and anxiety) showed significant treatment effects when compared with the control group. However, Williams concluded that the data did not clearly support either a "Pavlovian" counter-conditioning or a punishment interpretation of covert sensitization.

Though Williams' (1971) study did not conclusively demonstrate either theoretical position to be causal in covert sensitization it is the only theory testing research conducted to date on the question. It was decided to adapt Williams' (1971) basic theoretical approach and design a study approaching the same problem somewhat differently.

Summary of Theoretical Positions

The basic difference between the "Pavlovian" counter-conditioning and the punishment explanations of covert sensitization is that the former postulates a change in the reward value of the stimulus before avoidance behavior can be observed and the latter does not. It is obvious that a basic theoretical problem in explaining covert sensitization is identifying the locus of its effects. Does the target stimuli simply lose its reward value with increased pairings with aversive stimuli and become a neutral stimuli in the subjects' environment ("Pavlovian" counter-conditioning)? Or is an avoidance response learned in regard to the target stimuli (Avoidance learning)?

A third explanation is also possible since the addition to covert sensitization of "in vivo" conditioning instructions by Cautela (1967). This third explanation theorizes that covert sensitization's true effect is the creation of self-control processes within subjects like those proposed by Premack (1959); or more recently, the symbolic self-control processes that Bandura (1969) has hypothesized. This last explanation is tested in the present research.

CHAPTER III

METHODS AND PROCEDURES

Design

The experimental design in this research was a five condition one-way analysis of variance. The data was obtained from (1) the subjects' self-reports of rate of smoking at the beginning, during, and at the end of the treatment; and (2) the subjects' evaluation of the enjoyability and taste of their own cigarettes on two rating scales before, during, and at the end of treatment.

The independent variables in this research were the five conditions (four treatment conditions, and one no-treatment control condition). The dependent variables were (1) the group differences in change of smoking rates measured prior to and at the end of treatment; and (2) changes in the attractiveness of cigarettes to subjects measured prior to and at the end of treatment.

The subjects were assigned to one of five conditions. Seventy-eight subjects were first divided by sex into two equal groups of 39 subjects each. Sixty-four subjects were then distributed randomly across the four treatment conditions with the exception of the sex factor. This produced four groups of subjects each consisting of eight males and eight females. Thus each treatment group contained 16 subjects. The remaining seven males and females were assigned to the control condition which contained 14 subjects.

The research was originally scheduled for eight sessions run by four therapists. To off-set a possible correlation between a decrease in smoking behavior and any individual therapist each therapist was scheduled to administer two sessions of each treatment condition. For example, therapist one began with Condition I (P); then the following week administered Condition II (E-A); then the third week Condition III (E-A/SC) and so on.

Due to subject attrition it became necessary to reduce the number of therapy sessions from eight to six with a subsequent alteration of the balanced therapist-treatment condition control. The schedule was followed, however through the six sessions. The final result was that every therapist administered all four treatments once and completed the administration of two of the remaining four in the originally planned order, thus still offsetting the possible bias mentioned earlier.

Another control to counteract experimenter bias was the placing of data from each weekly session in a sealed envelope immediately on its collection so that neither the researcher or therapists had knowledge of what the subjects reported on their rating forms.

Subjects

The subjects were all individuals recruited by newspaper advertisements announcing an experimental "pilot" smoking clinic in San Antonio, Texas. Anyone 18 years or older, either retired or active duty armed forces personnel or their adult dependents were considered eligible.

At the beginning of the study 78 subjects were accepted for the clinic. Thirty-nine subjects were male and 39 were female. The mean age for these 78 subjects was 38.8 years. Their age ranged from 20 to

61 years with a median age at 40.5 years. The mean number of years smoked for these 78 subjects was 20.2 with a range from 3 to 50 years and with the median at 26.5 years. The mean number of cigarettes smoked per week for these 78 subjects was 204. The number smoked per week ranged from 70 to 420 cigarettes with the median number smoked 245. The 78 subjects had a mean education level of 13.7 years. Their education ranged anywhere from 10 to 20 years with the median at 15 years.

Subject Procurement

All subjects were initially contacted through newspaper advertisements (Appendix A). The advertisements all indicated that treatment would be available through an experimental "program" but no specific references were made to any definite treatment method.

All interested individuals were directed in the newspaper advertisements to telephone a number for further information. When they called they were informed that to register for the clinic they had to go to a local Air Force hospital and fill out a short, confidential Smoking Information Questionnaire (Appendix B).

Any further questions, interested individuals were told, would be answered by the "program coordinator" (the researcher) who would be at the hospital four evenings a week to assist them in filling out the questionnaire. They were assured that there was no obligation to take part in the clinic even if they did fill out the questionnaire.

The advertisements were repeated for nine weeks with the result that 82 potential subjects filled out questionnaires. Seventy-eight of these subjects were selected to participate and informed of the time and place of an orientation meeting.

Instruments

Five instruments were used in this research. They will be discussed in the following order: (1) Smoking Information Questionnaire; (2) Flags: A Test of Space Thinking (Thurstone and Jeffrey, 1959); (3) Cigarette Enjoyment Rating Scale; (4) a Cigarette Taste Scale; and (5) an Anonymous Biased Data Reporting Questionnaire.

The Smoking Information Questionnaire was devised for this research and consisted of three parts. The first part gathered descriptive data about each of the subjects. The information asked for was the subjects' name, age, sex, address and phone number; number of years of education completed; how long they had smoked; the number of times they had tried to quit smoking; and how much they smoked at present.

The second part asked for information about the places the subjects smoked; what percentage of their smoking occurred in those places; and what they were doing while smoking in those places they listed.

The third part of the questionnaire consisted of four motivation-to-quit-smoking questions. The first question asked subjects to make an estimate of money they would be willing to pay if they could be "cured" of their cigarette smoking immediately. The second question asked subjects to rate themselves on how enjoyable cigarettes were to smoke. The third question asked subjects to rate how difficult they expected it to be to quit smoking. The fourth question asked subjects to rate themselves as to how strongly they felt they were motivated to stop smoking. The subjects rated themselves on questions two through four on seven point Likert scales. A sample questionnaire may be seen in Appendix B.

Flags: A Test of Space Thinking (Thurstone and Jeffrey, 1959) was used as a measure of individual differences in subject ability to visualize movement of imaginal stimuli. This test was purchased from the Industrial Relations Center of the University of Chicago.

Thurstone (1938) originally identified two space factors, concerned with visual orientation in space, as primary mental abilities. Flags: A Test of Space Thinking is a quick, easily administered measuring device of the first space factor. This factor Thurstone defined as the ability to visualize a ridged configuration when it is moved into different positions. A ridged configuration is a diagram, drawing or figure of some sort in which there is no internal movement or change when it is moved into a different position.

The test consists of three pages of directions, samples, and practice exercises, and four pages of test items. There are 21 items calling for six responses each. Each of the 21 items presents a flag at the left. At the right are six other flags representing either the same or opposite side of the flag presented at the left. These six flags are all in different positions. The subjects' task is to decide which side, the same or opposite, is represented by each of these six flags. Subjects are to respond by crossing out either "S" or "O" underneath each flag to indicate the same or opposite side of the flag presented at the left in each item.

The test has a five minute time limit and is a measure of the speed and ease with which a subject can visualize the same object when it is moved into different positions.

The instrument is a pencil-and-paper test which can be administered in groups. The raw test scores can be converted to standardized scores

provided in the test manual. The standardized scores are divided into the following ranges: Very Low, equalling two percent of subjects tested; Low, equalling 14 percent of subjects tested; Average, equalling 68 percent of the subjects tested; High, equalling 14 percent of the subjects tested; and Very High, equalling two percent of the subjects tested.

The test manual for Flags (1959) states that:

> A review of seven factorial studies...of Flags ...reveals that the primary loadings (correlations) are consistently on the first space factor.... These findings suggest that the present version of the test--which is very similar to the older version, the difference being that several flag designs are used rather than just one--will also be an efficient test of this factor and have equally high reliabilities. There have been no validation studies of this later version of the test up to the present time, however (p. 7).

The Cigarette Enjoyment Rating Scale was devised for the research. A sample may be seen in Appendix C. This rating form was a seven point Likert scale on which subjects were asked to rate their enjoyment of the cigarettes they had smoked since their previous treatment session. On the back of this form, subjects were asked to report the number of cigarettes they had smoked since the previous treatment session. They were also asked to report the number of daily practice trials they had performed since the last treatment session.

The Cigarette Taste Scale was devised for this research. A sample may be seen in Appendix D. This rating form was a 12 scale Semantic Differential on which subjects were asked to rate the taste of the cigarettes they had smoked since their last treatment session. The Semantic Differential rating forms consisted of 12 bipolar adjective scales taken from Osgood et al (1957). Six of the scales were selected

as most heavily loaded on the "Evaluative" dimension of meaning; these included Fresh-Stale, Foul-Fragrant, Worthless-Valuable, Tasty-Distasteful, Sweet-Sour, and Clean-Dirty. Of the six remaining scales, three were selected as most heavily loaded on the "Potency" factor; Heavy-Light, Soft-Hard, and Weak-Strong; and three were chosen as most heavily loaded on the "Activity" factor; Active-Passive, Sharp-Dull and Old-Young.

The Anonymous Biased Data Reporting Questionnaire was devised for this research. A sample may be seen in Appendix E. The purpose of this questionnaire was to allow subjects to identify, anonymously, any false data they had reported during the study. This questionnaire was open-ended and presented in its introductory statements two sets of reasons why a person might withhold true information concerning his smoking behavior. Subjects were asked to reflect on their past reports and report any discrepancy so that the "smoking research could be evaluated realistically."

Manuals for Treatment Conditions and Therapist Training

All therapists were provided with sequentially ordered instruction manuals giving them all necessary information for conducting treatment sessions. Each of these standardized manuals included a general introduction to the treatment situation and procedure; a sequential schedule outlining the order of events to take place in a session; a relaxation introduction procedure; a short, simple explanation of the way the treatment was going to work; 20 possible stimulus situations the subjects could be asked to visualize; and instructions for the subjects'

daily practice which was specific for each experimental group.

The 20 stimulus scenes used in the manuals were derived from the Smoking Information Questionnaire (Appendix F). The following is the rank order result of the 20 most frequently cited scenes in which subjects reported they smoked. Also included is the percentage of subjects citing that scene.

1. Watching television at home 60%
2. Driving my car 60%
3. Working at my desk at the office 60%
4. Reading at home in living room or den . 56%
5. After the evening meal at home 54%
6. Visiting with friends in my home 50%
7. Visiting with friends in their home . . 50%
8. Parties, dances or social gatherings . . 44%
9. After eating an evening meal in a restaurant 40%
10. After breakfast in the morning 40%
11. During coffee break at work 38%
12. While having coffee at home 30%
13. After eating lunch in a cafeteria . . . 30%
14. After eating lunch at home 23%
15. Talking on the telephone at work 23%
16. Talking on the telephone at home 22%
17. While in the bedroom at home 22%
18. While doing household chores 20%
19. While in a restroom 16%
20. Working around the yard 10%

The cut off point in the rank ordering of scenes was set at the upper 20 most common scenes.

The four therapists were all introduced to and role played the four treatment procedures at least two weeks prior to their first session. The difference and the similarities in treatment conditions were pointed out and discussed in a round-table discussion. Each therapist practiced by administering scenes from each manual while the others "acted" as subjects. When the researcher was confident that all therapists could perform all treatment condition sessions accurately, practice was stopped. The therapists continued to read the manuals and were

asked to rehearse on their own for one week prior to their first session. Total estimated role playing and group discussion time for the therapist training was about three and one-half hours.

Procedure

The procedure for the research will be presented under two major headings--pre-treatment and treatment.

Pre-Treatment Procedure

Two pre-treatment meetings were held by the researcher. The first was attended by all subjects and general orientation materials were presented. The second, held separately for each Condition group, consisted of training in relaxation and visual imagery.

Seventy-eight subjects attended the first pre-treatment meeting held, in the evening, in the auditorium of the local Air Force hospital. The researcher introduced himself to the audience of subjects as the "program coordinator" of a community psychology project--An Anti-Smoking Clinic--being offered by the Department of Mental Health in the Air Force hospital. Four Ph.D. clinical psychologists were introduced to the audience of subjects as the therapists who would conduct the treatment sessions. As the therapists were introduced, the universities from which they were graduated, their degrees and their current duties in the Department of Mental Health were mentioned to enhance their credibility; and to emphasize the difference between the "program coordinator" (the researcher) and the therapists. It was desired that the subjects not view themselves as research subjects, but as individuals receiving behavior therapy for smoking.

The researcher then made a general explanation of the smoking clinic. A sample of this explanation may be seen in Appendix G. Following this talk all subjects were asked to take a short test. The test was Flags: A Test of Space Thinking (Thurstone and Jeffrey, 1959). It was administered according to the test instruction manual. When the time allowed for the test was up, the materials were collected and the purpose of the test was explained as follows:

> This is a test of natural imaginative abilities. Since we are going to ask you to use your imagination a great deal in this clinic we would like to have some idea of how well you can visualize and imagine things. This will help myself and the therapists choose the treatment which will be most beneficial to you in your effort to unlearn your smoking habit. We will assign you to one of the four nightly groups on the basis of this test.

The actual purpose for using this instrument was to gather data offering a measure of individual differences in subject ability to visualize the movement of "imaginary configurations."

Next, Smoking Record Booklets were distributed to all subjects. These booklets were dime store pocket notebooks. Each had the date, "cigs smoked" and "practice" stamped in ink on every page for a period of ten weeks. All subjects were asked to begin keeping a daily record of the number of cigarettes smoked beginning the following morning and continuing until the end of the clinic. When the treatment sessions began, the subjects were told, they would have daily practice exercises which they would also be asked to record.

Finally, the researcher demonstrated a simple gross-muscle-system relaxation exercise on a stage in plain view of the subjects. The researcher said and did the following:

> First, sit up straight in a comfortable chair, preferably one with a back on it, about as high as your shoulders. Sitting straight like you see me, the first step is to stretch your arms out in front of you at shoulder height and clench your fists as tight as you can for seven counts. 1-2-3-4-5-6-7. When seven counts are up, let your arms drop, let them just flop down and relax. Then, still sitting up straight stretch your legs out, point your toes outward and clench your legs as tight as you can. Hold this pose for seven counts. 1-2-3-4-5-6-7. Now relax and let your legs flop down. Now, with legs outstretched again, and toes pointed back toward you, hold it for seven counts. 1-2-3-4-5-6-7. Then relax completely. Now tense up your groin and abdomen, hold it for seven counts, 1-2-3-4-5-6-7, then relax. Next, with your stomach in and chest thrust as far out as possible, hold this position for seven counts. 1-2-3-4-5-6-7. Now relax. Next, twist your head as far to the right as you can and try and touch your right shoulder with your chin. Hold it for seven counts, 1-2-3-4-5-6-7, now relax. Now repeat that but turn your head to the left, try to put that chin on your left shoulder. Hold it for seven counts, 1-2-3-4-5-6-7, now relax. Remember to just completely flop when you relax. Now do your arms again like we did at first. Hold it tight for seven counts, 1-2-3-4-5-6-7, now relax. Now make a sardonicus face, with your eyes wide open and teeth clenched and press your chin into your chest as hard as you can. Hold it for seven counts, 1-2-3-4-5-6-7, now relax. Now leave your head down on your chest, with eyes closed and breathe very deep and slow. With every exhale let yourself go, relax even more. Now roll your head, eyes closed, in a complete circle four complete times. Go to the right, 1-2-3-4, then to the left, 1-2-3-4. When you have finished rolling your head to both sides let your head hang down on your chest. Breathe very deeply and slowly, relaxing even more with each exhale. Use at least five to six breaths. 1-2-3-4-5-6. When you have done this, raise your head, open your eyes and <u>notice</u> how you feel.

All subjects were given a handout (Appendix H) describing the procedure and were instructed to practice the method twice daily until their next meeting. Any questions the subjects had were answered by the four therapists and the "program coordinator" at this time. The entire

meeting lasted about two hours.

During the two nights following the pre-treatment orientation meeting every subject was informed by telephone of the time and place of his or her treatment session. A subject was told that the session he or she had been assigned to was chosen on the basis of the "test of imagination" taken earlier that week, when actually subjects were randomly assigned. Very few subjects (eight) complained of any schedule conflict when told of their session time. All of these subjects agreed, after some patient listening and explaining on the part of the researcher, to attend the session he or she had been assigned.

The control subjects were also contacted in person and asked to fill out the Cigarette Enjoyment and Cigarette Taste Rating Scales used in the research. The subjects comprising the control condition seemed, generally speaking, disappointed that they had to wait for treatment. In contrast, however, they seemed pleased to be asked to "help" with the evaluation of the clinic's results by serving as control subjects. They were all <u>strongly</u> encouraged to stop smoking or cut down on their own while waiting for treatment. All subjects in the control agreed to try to stop and to also keep daily records of their smoking until the end of the clinic. Control subjects were not contacted again until the end of the research when they again filled out the above forms.

The week following orientation, the researcher met with each of the three experimental groups and the placebo group on Monday or Wednesday evenings for an hour and 15 minute session. Treatment Condition I (P) met Monday at 7:30; Treatment Condition II (E-A) met Monday at 8:45; Treatment Condition III (E-A/SC) met Wednesday at 7:30; and Treatment Condition IV (PLC) met at 8:45 on Wednesday. The subjects met with

the researcher in a conference room in the hospital. They were seated in comfortable chairs surrounding a long table. The room was quiet, comfortably air-conditioned and had lights which could be dimmed to allow easier relaxation. This room was used unaltered for all treatment sessions that followed.

In this group meeting the researcher began by presenting and explaining to all subjects the Cigarette Enjoyment and Cigarette Taste Rating Scales used in the research and questions on how to fill them out were answered.

Next, the researcher re-emphasized the importance of relaxation and used the Relaxation Induction procedure to induce deep relaxation in the subjects. This was made easy by dimming the lights, having the subjects do the gross-muscle-relaxation exercise first, then using the verbal method to induce deeper relaxation. The researcher said the following:

> Take a deep breath--and as you exhale go deep within yourself. With every breath you take--you will become more relaxed, more comfortable, and free of physical and mental tensions. With every breath you take go deeper and deeper into yourself--until you reach your own natural level of physical and mental relaxation.
>
> Now concentrate on your feet--focus all your mental concentration on your feet. Let your feet relax--let your feet become very heavy, let a confortable heavy, tired sensation fill your feet--your feet are heavy and very comfortable--very tired, very deeply relaxed--now let that confortable tired feeling move into your ankles.
>
> Your ankles are becoming very heavy, very tired, very relaxed--deeper and deeper--now the sensation is moving into your calves--let it penetrate deep into the muscles--your calves are becoming very heavy--very tired and comfortable--now let those heavy sensations move up through your knees--your breathing is becoming more and more regular--you

are going deeper and deeper into physical relaxation--very comfortable--very relaxed--very safe--very calm and peaceful.

The heavy, relaxed, feelings are now moving into your thighs--let it penetrate deep into your thigh muscles--relaxing all the muscles--more and more--every breath taking you deeper and deeper into relaxation. Your legs are now very heavy--deeply relaxed--very comfortable.

Let the relaxation flow into your hips--let it penetrate to the small of your back--let it circle your waist like a belt. Your hips are now becoming very heavy, very tired and comfortable--you are relaxing deeper and deeper--feeling less and less tension.

Let the sensation of relaxation move up your spine--let it spread out into all your back muscles relaxing you more and more--taking you deeper and deeper with each breath--let those heavy tired sensations spread through your ribs, into your chest--relaxing you more and more with each breath.

Let the sensations spread into your shoulder muscles--let those heavy, tired sensations go deep into your shoulder muscles--let those heavy, tired relaxing feelings move down your arms--through your biceps--your elbows--now into your forearms--and on out to your finger tips. Your body is now very relaxed from the shoulders down. Now let those heavy, tired sensations move into the muscles at the base of your neck--relaxing your neck very much--now let them move on up through your neck--your neck is becoming very tired, very heavy--very deeply relaxed. You are going deeper and deeper into relaxation--the comfortable, relaxed feelings are now moving up the back of your neck--over your scalp--around your ears--and down your forehead over your eyelids. Your eyes are becoming very heavy, very comfortable and relaxed. The relaxed sensations are spreading down into your cheeks--your lips and finally your jaw.

Your entire body from head to toe is now deeply relaxed--very comfortable--you are fully supported by the chair. You are very safe and comfortable--your feet are resting on the floor. You are relaxed and very much at ease.

I am now going to count slowly from 1 to 10--as I do you will reach a deeper level of physical

> relaxation. 1-2-3-4-5-6-7-8-9-10. Your entire body is now very relaxed--very comfortable, peaceful and calm. I'm going to count from 11 to 20. As I do, your mind will become clear, alert and free of the worries of the day, mental tensions and all uncomfortable, irritating feelings. While your mind becomes alert, your body will remain deeply and completely relaxed. 11-12-13-14-15-16-17-18-19-20. Your mind is now very clear, very alert--your body is very deeply relaxed--you are very comfortable--and very calm. You feel physically and mentally relaxed.

When relaxed, the subjects were asked to reflect, in their relaxed state, on how it felt; how easy it was to do; and how they could master it themselves in a few trials. The subjects were awakened, the lights turned on and then dimmed once again. The subjects were then again relaxed using the verbal Relaxation Induction procedure alone. They were encouraged to enjoy the relaxation and to believe it was possible for them to achieve this on their own. Subjects were taught to signal with an upraised finger when relaxed.

Next, subjects were asked to visualize themselves smoking in the two situations where they smoked most frequently. They were asked to visualize the two situations and still let themselves remain deeply relaxed. Any subjects signaling, with an upraised finger, that they were losing their relaxed state, were assisted by verbal suggestions from the researcher to relax again. The suggestions were continued until the subjects signaled they were comfortable and relaxed.

Next, the subjects were awakened and instructed to choose two methods from (1) the gross-muscle-system relaxation procedure; (2) verbally suggested relaxation; (3) deep breathing exercises; or (4) saying "Relax, Relax, Relax," to themselves very slowly, in time with natural, regular breathing. They were asked to "discover" which method

worked best for them as a self-control procedure. They were instructed to use this method to counteract anxiety associated with situations in which they felt the urge to smoke most strongly.

After the relaxation procedures had been demonstrated and practiced the researcher gave a general introduction to the treatment method. A sample of this introduction can be seen in Appendix I.

Following the general introduction the specific explanation for each condition was given (Appendix J). In Condition I a classical conditioning paradigm employing the example of a person who learned to avoid a previously learned behavior continually paired with shock was used.

In Condition II an avoidance-learning explanation was employed. The example used was that a person learning to terminate shock by stopping (avoiding) a previously learned behavior for which shock was administered.

The example used in Condition II was used again in Condition III with the addition of the concept of "in vivo" conditioning. "In vivo," or self-conditioning as it was called, was explained with an example of a person using a portable electrical apparatus to administer shock to himself, deliberately associating it with a previously learned behavior he wanted to stop performing.

In Condition IV, the placebo treatment, the subjects were given a classical conditioning explanation of how their treatment worked. Here, instead of shock, a positive reinforcement rationale was used. The example of a person continually verbally rewarded for avoiding the performance of a behavior he had previously learned was utilized.

In the last ten minutes of the training session the subjects in

each condition were given a trial experience with covert sensitization. The imagined noxious stimulus of nausea was used in the three experimental groups and innocuous imagined stimulus of "will power not to smoke" was used in the placebo group. All subjects in each condition were asked to imagine a scene which was constructed to fit any of the four treatment conditions (Watching T.V. at Home). When all subjects signaled they had experienced some strong sensations (either the unpleasant sensations of nausea or determination not to smoke) they were asked to "let their mind clear completely and relax." When all subjects signaled that they had done this, they were asked to repeat the scene; this time as a rehearsal, completely on their own, with no prompting from the researcher.

In this way all subjects were introduced, in their individual condition groups, to the covert sensitization treatment procedure they would receive during the research. For the week to follow each subject was instructed to choose and practice two methods of relaxation while imagining the two "scenes" in which they smoked most frequently. They were asked to relax themselves between 10 and 20 times daily while imagining these two scenes. They were asked to pick one relaxation method that worked best for them at least three days prior to their next meeting. This gave them an opportunity to master the relaxation process before their first therapy session which followed a week later.

Treatment Procedure

Condition I (P)

At the beginning of each session the therapist asked all subjects to be seated and to fill out the Cigarette Enjoyment and Cigarette Taste Rating Scales; to record the number of cigarettes they had smoked since the last session and the number of daily practice scenes performed for that week. These forms were then collected and sealed in an envelope.

When this was finished the overhead lights were dimmed. The therapist explained that cigarette smoking was a habit which persisted because it was pleasurable and that to stop smoking the subject had to associate a stronger negative feeling with smoking.

The subjects were asked to relax and visualize themselves in a scene wherein they desired to smoke and went through imaginary behavioral acts of smoking. This behavior was contiguously associated with the imagery of increasingly strong feelings of uneasiness, nausea, and finally, vomiting. The final imagined scene was one where the subject was covered with vomit and feeling very sick.

After having completed a scene, subjects were asked to relax and then instructed to do an immediate rehearsal of the scene making it as strong an affective experience as they could stand. Subjects were asked to signal when through with the rehearsal with an upraised finger. They were again asked to relax, then the next situation was begun and repeated in like fashion. Ten trials were completed in each treatment session using five of the 20 basic scenes in a sequence that rotated five new scenes each week. For example, the first five rank order

scenes were used in the first therapy session; the second five rank order scenes in the second therapy session; the third five rank order scenes in the third session and so on. This sequence was repeated for the fifth and sixth therapy sessions.

At the end of each session, subjects were told why and how they should rehearse the five weekly treatment scenes (Appendix K). Each subject was encouraged to practice a total of 20 trials a day doing each scene four times. Included in his Smoking Record Booklet was a daily practice schedule as a reminder. Only when a scene occurred in a particular subject's smoking pattern was it used in daily practice. Where a weekly scene did not fit a subject was instructed to construct a scene of his own that was a part of his smoking pattern and use it in daily practice.

Example Scene. Subjects were relaxed with the use of the Relaxation Induction procedure and asked to signal when they were relaxed with an upraised finger. Then the subjects were asked to imagine a scene such as the following:

Watching T.V. at Home

> You are in your own home, sitting in your favorite chair watching T.V. . . . Feel the chair you are sitting in beneath you . . . Feel it pressing against your back . . . Look around the room in which you are watching T.V., it is all very familiar. The T.V. is on and one of your favorite programs is playing. You see and hear the program. There is a package of cigarettes sitting beside your chair on a table. While you are watching T.V., you start to reach for a cigarette. As soon as you start reaching, you feel your stomach knot up and begin to churn. You feel sick--as if you might throw up. You touch the package and some bitter liquid comes up your throat and it is very sour. When you pull the cigarette out of the package,

> your stomach heaves and sends pieces of food up your throat and into your mouth. You try to swallow it back down. Now you really feel nauseous and sick to your stomach. As you are about to put the cigarette in your mouth, you puke all over the cigarette--your hand--and yourself. Now you are really sick. You vomit--again and again. The puke is greenish. It feels slimey and is all over your hands--and all over your clothes. You look down into your lap where you dropped the cigarette and see it floating in a little pool of puke--the smell is foul and sickening--seeing this makes you throw up again--and again--until you are only dry heaving. Your stomach is cramping--your eyes are burning and watery--you feel terrible sitting in this mess of puke.

At this point the scene was terminated and subjects were instructed to "let your mind clear completely and relax." Then the subjects were instructed to rehearse the scene they had just finished. They were asked to make it as noxious to themselves as they possibly could. The subjects were to signal when they had each finished a rehearsal by raising a finger. When all subjects signaled the completion of the rehearsal, they were instructed to "let their minds clear completely and relax." After a short pause a new scene was described by the therapist, then rehearsed and the session continued in this fashion until five scenes with a rehearsal each was completed.

Condition II (E-A)

In this condition the same general procedure as in Treatment Condition I (P) was employed with two additions. Immediately following the presentation of Condition I (P) the following additional instructions were given:

> You get up from your chair and turn away from the cigarettes and the vomit. You immediately begin to feel better being away from the cigarettes. You go to your bathroom and wash up and feel much

better being away from the cigarettes.

At this point the scene was terminated and subjects were instructed to "let their mind clear completely and relax." Then the subjects were instructed to rehearse the whole scene making it as noxious as possible.

When all subjects signaled the completion of the rehearsal of the first scene and that they were again relaxed, an avoidance version of the same scene was described to the subjects by the therapist as follows:

> You are watching T.V. at home, sitting in your favorite chair . . . While you are watching T.V. you decide to smoke. As soon as you decide to smoke you feel queasy and sick at your stomach. You say to yourself, "To heck with this; I'm not going to smoke!" As soon as you decide not to smoke you feel great. You overcame the desire to smoke and you are proud of yourself for doing it all by yourself.

After the subjects had visualized this scene they were instructed to "clear their minds completely and relax." Then they were asked to rehearse it on their own and to signal when finished, then instructed to relax as before. Then the next scene was described and so on. Ten scenes were used in this condition, five basic scenes and five "avoidance" scenes. At the end of each session subjects were told to practice a total of 20 trials a day as noted in Condition I (see Appendix K for instructions).

The two additions in this condition were (1) the "escape" imagery where the subjects imagined themselves running away from the cigarettes and the vomit, washing themselves off and feeling greatly relieved at being away from the cigarettes; and (2) the "avoidance" imagery where subjects visualized themselves feeling a desire to smoke, imagined that they began to feel nauseous and about to vomit, and visualized them-

selves deciding not to smoke and immediately feeling better.

Condition III (E-A/SC)

This experimental condition used the same scenes including the "escape" and "avoidance" imagery as Treatment Condition II (E-A). It was also conducted identically. The only variable added to this condition was an instructional set for daily practice in which subjects were instructed to (1) yell to themselves subvocally, STOP!; and (2) visualize, in explicit detail, a cigarette covered with vomit any time they had the desire to smoke. At the end of each session subjects were told to practice daily. See Appendix K for practice instructions.

Condition IV (PLC)

The general treatment procedures for this condition were similar to Condition I (P). The therapist explained that cigarette smoking was a habit that persisted because it was pleasurable and that to stop smoking the subject had to associate a stronger opposing feeling with smoking. Subjects were relaxed with the Relaxation Induction procedure. They were then asked to visualize themselves in a scene wherein they desired to smoke and went through imaginary behavioral acts of smoking. This behavior was contiguously associated with the imagery of "increasingly strong will power not to smoke." The final imagined scene was one where the subject rejected the cigarette by "will power" alone. The subjects were asked to imagine a sample scene such as the following:

Watching T.V. at Home

> You are in your own home, sitting in your favorite chair watching T.V. . . . Feel the chair you are sitting in beneath you . . . Feel it pressing

> against your back . . . Look around the room in which you are watching T.V., it is all very familiar . . . The T.V. is on and one of your favorite programs is playing. You see and hear the program . . . There is a package of cigarettes sitting beside your chair on a table. While you are watching T.V. you start to reach for a cigarette. As soon as you start reaching, you say to yourself, "I'm not going to smoke it!" As you touch the package you feel an even stronger determination not to smoke! . . . When you pull the cigarette out of the package, you say to yourself, "I don't need this cigarette and I'm not going to smoke it! . . ." As you are about to put the cigarette into your mouth, you suddenly say to yourself, "To heck with this; I don't want this cigarette! . . ." You throw it away and don't smoke.

The scene was terminated at this point. All subjects were instructed to "let their mind clear completely and relax." When all subjects signaled they had done so, they were asked to rehearse the same scene again making it as vivid an affective experience as possible. When they signaled they had finished the rehearsal, the therapist instructed them to relax and then began with the next scene and so on. Five basic scenes were used each session as in Condition I. At the end of each session subjects were instructed to practice daily (Appendix K).

Condition V (C)

In this condition the subjects were asked to try and stop smoking on their own. They were also asked to keep a daily record of their smoking and report what they were smoking at the end of the treatment period. These subjects received no treatment and served as a no treatment control condition in this study. They were contacted by the researcher only at the beginning and the end of the treatment period.

Immediately following the last therapy session all subjects completing treatment were asked to fill out the Anonymous Biased Data

Questionnaire. Control subjects were contacted individually within the week and also asked to fill out the same questionnaire. This instrument was used to discover whether subjects might admit anonymously that previous weekly reports had not been truthful.

A telephone interview was conducted with each of the 32 subjects completing the research. This short interview was conducted as a further check on the validity of the Cigarette Enjoyment and Cigarette Taste Rating Scales. The interview was conducted a week after all the therapy sessions were completed. Subjects were asked if they were experiencing what they would describe as (1) no feelings of cigarette hunger; (2) mild feelings of cigarette hunger; (3) moderate feelings of cigarette hunger; or (4) strong feelings of cigarette hunger at the conclusion of the six-week period of therapy.

CHAPTER IV

RESULTS

It is important to note that an attrition rate of 59 percent of the original 78 subjects in the study left a total of 32 subjects who completed the research. All quantative data reported on in this chapter are based on the before-after measures for these 32 subjects.

Table I shows the number of subjects who dropped out of treatment over the six therapy sessions in Conditions I through IV. For all general purposes Condition II (E-A) ceased to exist after the fourth session, only one subject remaining. Therefore no data from any of the Condition II (E-A) sessions will be included in the reported results.

Since no attrition occurred in the no treatment control Condition (V) (C) the researcher randomly selected eight subjects (four males and four females) to use for final comparison with each of the remaining three treatment conditions.

In order to determine what effect attrition had on the composition of the final group of 32 subjects some descriptive statistics were run. Table II shows the mean, median and range in subject age; number of years smoked; number of cigarettes subjects reported they smoked per week and educational level for both the 78 original subjects and the 32 subjects completing the research. As can be seen, no appreciable change occurred in terms of these statistical indices. The change in sex balance of subjects before and after treatment was 39 to 15 for males

and 39 to 17 for females. Again no appreciable difference is obvious.

TABLE I

NUMBER OF SUBJECTS TERMINATING TREATMENT PER THERAPY SESSION OVER TREATMENT CONDITIONS I, II, III, AND IV

Treatment Condition	Terminations Per Therapy Session						Total Number Terminating	Total Number Remaining
	1	2	3	4	5	6		
I (P)	1	3	4	0	0	0	8	8
II (E-A)	2	6	3	4	1	-	16	0
III (E-A/SC)	0	3	1	4	0	0	8	8
IV (PLC)	6	1	1	0	0	0	8	8

In view of the large attrition rate in this research it is worth nothing that Bernstein (1969) stated that 12 smoking clinics, reporting attrition rates, had loss rates ranging from 2 percent to 80 percent. The average attrition reported in these 12 studies were 48 percent, which is somewhat lower than the rate in the present research (59 percent) but still comparable.

Statistical Analysis

Two basic types of data were examined in the research: (1) those relating to reductions in smoking behavior; and (2) those relating to

changes in the attractiveness of cigarettes. A reduction in smoking (defined as a maladaptive behavior) was measured by comparing the number of cigarettes subjects reported they smoked per week prior to treatment with the number they reported at the end of treatment.

TABLE II

A COMPARISON OF MEAN, MEDIAN AND RANGE STATISTICS ON AGE, YEARS SMOKED, AMOUNT SMOKED PER WEEK AND EDUCATIONAL LEVEL FOR SUBJECTS IN ALL CONDITIONS (COMBINED) BEFORE THERAPY AND CONDITIONS I, III, IV AND V (COMBINED) AFTER THERAPY

	Before Treatment			After Treatment		
	Mean	Median	Range	Mean	Median	Range
Age	38.8	40.5	20-61	39.4	40.5	20-61
Years Smoked	20.2	26.5	3-50	23.0	26.5	3-50
Amount Smoked Per Week	204	245	70-420	210	245	70-420
Educational Level	13.7	15	10-20	13.5	16	12-20

Data was analyzed by the use of an analysis of variance technique according to Popham (1967). The sources of variance in the statistically significant data were analyzed further with a test of multiple comparisons of means according to Scheffe (Edwards, 1960). The primary results will be reported in the following order; changes in the number

of cigarettes smoked per week and reduction in attractiveness of cigarettes to subjects.

Following these reports the results of analysis of secondary data such as: (1) subject motivation to stop smoking; (2) individual differences in visual imagery ability; and (3) group response to an anonymous lie questionnaire will be presented.

Finally the results of two telephone interviews will be presented. One concerning termination behavior and the other concerning the final level of cigarette attractiveness.

Reduction in Cigarettes Smoked Per Week

Table III shows the mean differences and the deviation of the mean difference in number of cigarettes smoked before and after treatment for subjects in Conditions I (P), III (E-A/SC), IV (PLC) and V (C). As can be seen from Table III the mean difference in number of cigarettes smoked after treatment was greater in Conditions I (P) and III (E-A/SC) than in either the Placebo Condition (IV) or the No Treatment Control (V).

When the reduction in number of cigarettes smoked within each of the four Conditions was analyzed in terms of mean percentages, the following results were found: Condition III (E-A/SC) produced a 73 mean percent decrease in smoking rates; Condition I (P) produced a 63 percent mean decrease in smoking rates; Condition IV (PLC) produced a 38 percent mean decrease in the number of cigarettes smoked; Condition V (C) produced a nine percent mean decrease in smoking rates.

Table IV indicates the results of a simple analysis of variance of group differences in change of smoking rate before and after therapy.

This change was statistically significant at the .01 level of probability.

TABLE III

THE MEAN DIFFERENCES AND THE STANDARD DEVIATION OF THE MEAN DIFFERENCES IN NUMBER OF CIGARETTES SMOKED MEASURED BEFORE AND AFTER TREATMENT FOR CONDITIONS I, III, IV AND V

Conditions	Mean Differences	Standard Deviations
I (P)	106.0	75.73
III (E-A/SC)	167.1	122.81
IV (PLC)	57.4	34.90
V (C)	20.9	40.4

Table V shows the results of a test for multiple comparisons among means of Conditions I, III, IV and V. Treatment Condition III (E-A/SC) was significantly different from all other Treatment Conditions at the .05 level of probability. This result confirms Hypothesis III.

When the data are examined in graph form (Figure 1), it appears that considerable reduction in amount of smoking occurred in Condition I (P) as well as in Condition III (E-A/SC) although the reduction in Condition I (P) was not statistically significant.

TABLE IV

A SIMPLE ANALYSIS OF VARIANCE OF THE GROUP DIFFERENCES IN CHANGE IN SMOKING RATES BEFORE AND AFTER SIX THERAPY SESSIONS FOR CONDITIONS I, III, IV AND V

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square	F
Between Groups	3	131,821	43940.3	7.453 *
Within Groups	28	165,051	5894.6	
Total	31	296,872		

* $p < .01$ (Popham, 1967)

TABLE V

TEST FOR MULTIPLE COMPARISONS AMONG MEANS
OF CONDITIONS I, III, IV AND V

Comparisons Among Means of Treatment Condition	Value of A	Minimum Value of A Required for Significance
I vs IV	14,823.06	46,272.61
I vs V	29,326.06	
III vs IV	142,730.56 *	
III vs V	110,722.56 *	
I vs III	26,082.25	
IV vs V	2,450.25	
I + III vs IV	54,675.00 *	
I + III vs V	99,099.18 *	

* $p < .05$ (Scheffe's Test for Multiple Comparisons, Edwards, 1960)

Key to Condition Numbers
I (P)
III (E-A/SC)
IV (PLC)
V (C)

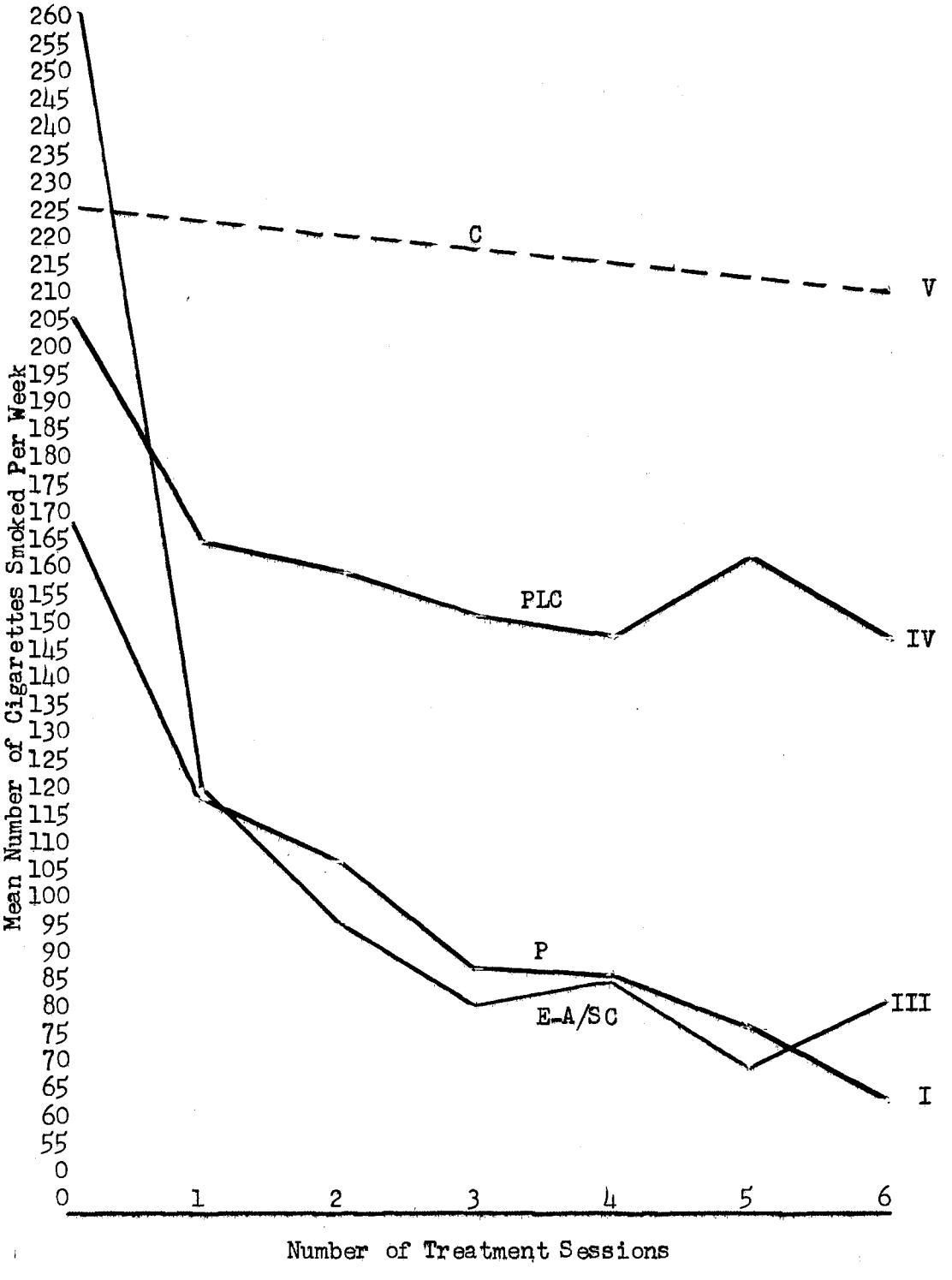

Figure 1. Mean Amount Smoked Prior to Each Therapy Session for Treatment Conditions I, III, and IV and the Mean Amount Smoked for Condition V at the Beginning and End of Six Weeks of No Treatment

Reduction in Attractiveness of the Cigarettes

The Cigarette Enjoyment Rating Scale gathered data on change in the subjects' reported enjoyment of the cigarettes they smoked. Table VI shows the means and standard deviations of the change (measured on a seven point Likert scale) in reported enjoyment of cigarettes before and after treatment for Conditions I (P), III (E-A/SC), IV (PLC), and V (C).

TABLE VI

THE MEANS AND STANDARD DEVIATIONS OF THE CHANGES IN THE SUBJECTS' REPORTED ENJOYMENT OF CIGARETTES ON, BEFORE AND AFTER TREATMENT MEASURES FOR CONDITIONS I, III, IV AND V

Conditions	Mean Changes	Standard Deviations
I (P)	2.66	3.98
III (E-A/SC)	2.86	1.56
IV (PLC)	1.25	2.21
V (C)	.25	.21

The Cigarette Enjoyment Rating Scale yielded significant differences between treatment conditions on before and after treatment measures for the four conditions compared. Table VII indicates that a simple analysis of variance of the group differences before and after

treatment was significant at the .01 level. A test of multiple comparisons among means indicated that only subjects in Condition I (P) and Condition III (E-A/SC) changed their reported enjoyment of cigarettes significantly in the negative direction (.05 level) compared to subjects in Condition V (the No Treatment Control). This is shown in Table VIII.

TABLE VII

A SIMPLE ANALYSIS OF VARIANCE OF THE GROUP DIFFERENCES IN CHANGE IN REPORTED ENJOYMENT OF CIGARETTES BEFORE AND AFTER SIX THERAPY SESSIONS FOR CONDITIONS I, III, IV AND V

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square	F
Between Groups	3	36.26	12.08	6.075 *
Within Groups	28	55.74	1.99	
Total	31	92.00		

* $p < .01$ (Popham, 1967)

The Cigarette Taste Rating Scale gathered data on change in the subjects' reported experience of the taste of their cigarettes. The differences in before and after treatment measures on the 12 separate Semantic Differential scales were examined individually by scale. A simple analysis of variance on each scale compared across Conditions

I (P), III (E-A/SC), IV (PLC), and V (C) produced no significant differences between any conditions.

TABLE VIII

TEST FOR MULTIPLE COMPARISONS AMONG MEANS FOR CONDITIONS I, III, IV AND V ON THE SMOKING ENJOYMENT RATING SCALE

Comparisons Among Means of Treatment Condition	Value of A	Minimum Value of A Required for Significance
I vs III	.250	19.900
I vs IV	7.562	
I vs V	22.562 *	
III vs IV	10.562	
III vs V	27.562 *	
IV vs V	4.000	

* $p < .05$ (Scheffe's Test for Multiple Comparisons, Edwards, 1960)

Key to Condition Numbers
I (P)
III (E-A/SC)
IV (PLC)
V (C)

The differences in before and after treatment measures on the total Taste Scale were then summed for all eight subjects within a condition. The means of the differences and the standard deviations

of the differences can be seen in Table IX.

TABLE IX

THE MEANS AND STANDARD DEVIATIONS OF THE SUMMED CHANGES IN REPORTED TASTE OF CIGARETTES ON BEFORE AND AFTER TREATMENT MEASURES FOR CONDITIONS I, III, IV AND V

Conditions	Summed Mean Changes	Standard Deviations of Change
I (P)	19.13	8.22
III (E-A/SC)	10.63	7.05
IV (PLC)	8.43	4.84
V (C)	7.50	4.37

The Cigarette Taste Rating Scale data yielded significant differences between treatment conditions on before and after treatment measures for the four conditions compared. Table X indicates a simple analysis of variance of the group differences before and after treatment were significant at the .01 level.

To determine the source of the variance in the overall comparison, a test of multiple comparisons was performed. Table XI shows a test of multiple comparisons among means and indicates that only subjects in Condition I (P) changed their reported taste experience in a negative direction (.05 level) compared to subjects in Conditions IV (Placebo)

and V (No Treatment Control).

TABLE X

A SIMPLE ANALYSIS OF VARIANCE OF THE GROUP DIFFERENCES IN CHANGE IN REPORTED TASTE OF CIGARETTES BEFORE AND AFTER SIX THERAPY SESSIONS FOR CONDITIONS I, III, IV AND V

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square	F
Between Groups	3	677.10	228.36	5.057 *
Within Groups	28	1146.61	40.95	
Total	31	1823.71		

* $p < .01$ (Popham, 1967)

Additional Data Results

The mean responses of subjects within Condition I (P), III (E-A/SC), IV (PLC), and V (C) on each of four questions relating to motivation to stop smoking were compared with a simple analysis of variance. There were no significant differences found on any of the four questions. None of the following: (1) the amount of money a subject said he would offer to be immediately "cured" of the cigarette smoking habit; (2) how enjoyable he rated his own cigarette smoking; (3) how difficult he rated it for himself to stop smoking; or (4) how motivated he rated it

for himself to stop smoking; significantly differentiated between the subjects in the four treatment groups. See Appendix L for data concerning (1) above.

TABLE XI

TEST FOR MULTIPLE COMPARISONS AMONG MEANS FOR CONDITIONS I, III, IV AND V ON THE CIGARETTE TASTE RATING SCALE

Comparisons Among Means of Treatment Condition	Value of A	Minimum Value of A Required for Significance
I vs III	289.000	362.142
I vs IV	462.250 *	
I vs V	540.562 *	
III vs IV	20.250	
III vs V	39.062	
IV vs V	3.062	

* $p < .05$ (Scheffe's Test for Multiple Comparisons, Edwards, 1960)

Key to Condition Numbers
I (P)
III (E-A/SC)
IV (PLC)
V (C)

The mean responses on each of the four motivation questions for subjects who quit treatment prior to the end of six therapy sessions were also analyzed across groups using a simple analysis of variance. There were no significant differences found on any of the four questions.

The mean responses, for subjects within Conditions I (P), III (E-A/SC), IV (PLC), and V (C) on the test of space thinking (Flags) were compared with a simple analysis of variance. No significant difference was found.

The lie questionnaire, titled Anonymous Biased Data Questionnaire, that all subjects were asked to respond to after the last therapy session produced very little information. Of the 32 subjects only three indicated that they had falsified anything. Each of these three admitted to having performed fewer daily practice scenes than originally reported. Two of them, in fact, admitted that they had hardly ever practiced. The third subject said he had usually doubled his real practice scenes making them about ten a day when in fact they were closer to three or four. All three subjects were men.

None of the subjects admitted that they had smoked more cigarettes than they had reported each week.

A follow-up telephone interview of the 40 subjects signing up for the clinic, beginning the therapy and then quitting, produced some general results. Most subjects reported two or more reasons for discontinuing their attendance in the clinic, but were willing to cite one main reason for terminating when questioned further. The subjects main reasons seem to fall into nine natural motivational categories. Table XII lists the main reasons given and indicates the number of subjects giving one reason.

TABLE XII

THE NUMBER OF SUBJECTS GIVING REASONS FOR TERMINATING PARTICIPATION IN THE SMOKING CLINIC WHICH FELL WITHIN NINE NATURAL CATEGORIES

Categories of Reasons Given by 40 Subjects	Number of Subjects Giving a Reason
"I'll probably quit on my own later."	12
Situational life problems, e.g., illness, family situation requiring subject to stay home, subject required to travel by employer, conflicting social obligations.	9
"It wasn't working for me, e.g., I couldn't do the practice; it was hard to visualize things right; I really tried and it didn't work for me; I never could relax."	7
"Too busy--didn't have the time."	4
"I was afraid I might get sick and be embarrassed."	3
"I began to smoke more and got more nervous than ever."	2
"I got sick at things I never got sick at before."	1
"It wasn't going to work for me, I guess I'm different."	1
"I didn't like the idea of the thing from the beginning."	1
Total	40

A telephone interview was conducted with the 32 subjects in Conditions I (P), III (E-A/SC), IV (PLC), and V (C). In response to an inquiry as to whether they had felt a cigarette hunger since the last therapy session, 30 subjects indicated that they had experienced a moderate to strong level of desire for cigarettes. Two subjects replied that it had not bothered them one way or another.

CHAPTER V

DISCUSSION

The present research was primarily concerned with the different effects of three versions of covert sensitization on the reduction of smoking behavior. The results supported only one of the seven hypotheses tested at a statistical level of probability of .05. The one hypothesis receiving statistically significant support was Hypothesis III.

The research also investigated change in the reported attractiveness of cigarettes following treatment by covert sensitization. Statistically significant negative change in the attractiveness of cigarettes was found in Treatment Conditions I (P), and III (E-A/SC), on the Enjoyment Rating Scale at the .05 level of probability. Statistically significant negative change in the attractiveness of cigarettes was found only in Treatment Condition I (P) on the Taste Rating Scale at the .05 level of probability.

Although Hypothesis I was not supported by the statistical analysis of the data, it appeared to have some validity. This was suggested by two results. First, when the data of Condition I (P) was examined in graph form it was seen to correspond closely to that of Condition III (E-A/SC). Second, when the reduction in the rates of smoking in Treatment Condition I (P) and Treatment Condition III (E-A/SC) were combined, and then compared with either the Placebo or No Treatment Control condition, a statistically significant difference was found in both cases

at the .05 level of probability. These results suggest that the "Pavlovian" counter-conditioning paradigm, though not statistically different from the Placebo or the No Treatment Control Conditions, did account for some of the overall variance in group differences. Thus there seems reasonable evidence to justify the conclusion that the counter-conditioning version of covert sensitization had some important impact upon the reduction of the smoking rate for subjects treated with that method.

Hypothesis III was the only hypothesis supported by the data. This result indicated that a significantly greater reduction in the rate of smoking occurred in Treatment Condition III (E-A/SC) combining avoidance learning with "in vivo" conditioning than in either the Placebo or No Treatment Control Condition. From this evidence the conclusion may be drawn that the paradigm of covert sensitization as avoidance learning with "in vivo" conditioning is the most logical theoretical explanation for the results of covert sensitization. This remains a tentative conclusion because one theoretical explanation was not tested in the research, i.e., simple avoidance learning.

From the foregoing it may be noted that Condition I ("Pavlovian" counter-conditioning) while not statistically significant still had considerable impact as a treatment method. Condition III (Avoidance learning plus "in vivo" conditioning) was highly statistically significant. Condition II (Avoidance learning) which combined aspects of both the above mentioned treatments might be expected to be significantly different at the .05 level, if compared to the Placebo or No Treatment Control Conditions. Unfortunately this logical expectation could not be tested due to the loss of Condition II (E-A) by attrition. The question of Condition II's (E-A) high attrition rate will now be con-

sidered.

One obvious answer is that Condition II (E-A) was scheduled at an unpleasant time for subjects. However, Treatment Condition IV (PLC) scheduled at an equally late hour did not produce any more attrition than the other two Treatment Condition groups which completed therapy. The most obvious difference between the two late evening groups was that the Condition II (E-A) employed aversive conditioning while the other used a placebo method. Thus it could be theorized that the aversive condition held some unknown factor facilitating high attrition.

It is the researcher's speculation that the unknown factor in Condition II (E-A) may have been the "avoidance" imagery in each aversive trial. It will be remembered that each subject was asked to imagine the aversive material associated with smoking. In addition he was to end his imagery with "avoidance" of the aversive materials. It is plausible to this investigator that each subject was being trained to avoid not only the maladaptive behavior but also the aversive treatment itself! In support of this hypothesis it can be said that Cautela's original method of covert sensitization (1966) contained "escape" and "avoidance" imagery but not "in vivo" conditioning procedures. In a 1967 publication Cautela reported an altered approach adding the "in vivo" conditioning imagery to his original avoidance learning paradigm of covert sensitization. Possibly Cautela felt his original approach was much too subject to stimulus generalization and conditioned undesirable avoidance behavior to the specific physical and interpersonal stimuli of therapy itself.

In any replication comparing the three versions of covert sensitization utilized in the present research the continued participation of

subjects would have to be insured. More convenient therapy times and some form of monetary "trust bond" could stabilize differential attrition rates. Smoking reduction studies reporting the smallest attrition rates have all used some kind of monetary commitment on the part of subjects to insure their participation (Bernstein, 1969). The experience in the present study definitely suggests the need for some such measure.

Hypothesis VII comparing the Placebo Treatment Condition of covert sensitization and the No Treatment Control Condition was not supported. This fact considered together with the confirmation of Hypothesis III, indicates that an avoidance learning "in vivo" conditioning version of covert sensitization is more effective than placebo treatment.

The investigation of the attractiveness of cigarettes following treatment produced results which were not clearly interpretable. A significant negative change in reported attractiveness of cigarettes was found for subjects in Treatment Condition I (P) on both the Cigarette Enjoyment and Taste Rating Scales. A significant negative change was found for Treat Condition III (E-A/SC) only on the more naive Enjoyment Scale. The two scales were employed together because the Enjoyment Scale was obviously a naive measuring device, easily fathomed by subjects and responsive to demand characteristics. The Taste Scale was felt to be less obtrusive and was used to corroborate the Enjoyment Scale.

None of the 12 Semantic Differential scales, constituting the Cigarette Taste Rating Scale, when analyzed individually across Conditions I (P), III (E-A/SC), IV (PLC), and V (C) produced significant changes in the negative direction. Significance in individual scales

would have been the strongest evidence for a genuine negative change in the attractiveness of the target stimuli--cigarettes. Significant differences were found on the Taste Scale only when the 12 scales were summed for each subject and analyzed across conditions.

This result was explored in a telephone interview with all subjects completing therapy. The interviewer inquired if they had experienced what they would describe as a "cigarette hunger" at the end of treatment. Thirty subjects indicated that they experienced a moderate to strong level of desire for cigarettes. Two subjects replied they did not.

From this evidence the most logical conclusion seems to be that almost none of the subjects completing the treatment experienced a genuine reduction in the attractiveness of cigarettes as some reported. More than likely they were complying with the demand characteristics of the research in responding to the two rating forms. This result lends further credence to the avoidance learning "in vivo" conditioning explanation for covert sensitization. It will be remembered that this formulation postulates that covert sensitization is, in reality, a self-instructional process. Individuals learn to apply this process to themselves in the face of their own desires for the target stimuli gained through maladaptive behavior. This view theorizes that the daily "in vivo" conditioning, reinforced by therapy sessions, strengthens an individual's ability to willingly avoid the maladaptive behavior for which he has sought treatment.

CHAPTER VI

SUMMARY

This research studied the effects of three versions of covert sensitization on the maladaptive behavior of smoking. The independent variables in the research were four Treatment Conditions and one No Treatment Control. The dependent variables were: (1) the group differences in change of smoking rate measured before and after treatment; and (2) the group differences in change in subject evaluation of cigarette enjoyability and taste measured before and after treatment. The experimental design was a five condition simple analysis of variance.

The research (a smoking clinic) was conducted in four stages: a nine-week period during which subjects were acquired by newspaper advertising; a two-hour orientation meeting, an hour and 15 minute small group meeting for introduction and explanation of the specific therapy for each treatment condition; and six, weekly, one-hour therapy sessions.

Subjects were acquired for the research through advertisements announcing an anti-smoking clinic in which behavior therapy would be employed. Subjects applied by completing a Smoking Information Questionnaire providing the following data about the subjects: demographic data; information on the stimulus conditions where smoking occurred; and an assessment of a subject's general motivation to stop smoking. Subjects were then invited to attend two orientation meetings.

Following their attendance at orientation meetings, subjects were

randomly assigned (except by sex) to one of five conditions. Sixty-four subjects were assigned to one of four Treatment Conditions with 16 subjects per condition. There were eight male and eight female subjects per Treatment Condition. Fourteen subjects, seven males and seven females, were assigned to the Control Condition. Once this was determined, subjects were contacted and informed of the time and place of their therapy sessions.

The following week subjects met in their therapy groups beginning treatment with one of four therapists. A different therapist conducted each treatment session each week. Condition I (P) subjects were treated with a covert sensitization method designed within a "Pavlovian" counter-conditioning paradigm. Condition II (E-A) subjects received an avoidance learning version of covert sensitization as their treatment. Condition III (E-A/SC) subjects were treated with an avoidance learning model of covert sensitization with added instructions for daily "in vivo" conditioning. Condition IV (PLC) subjects were treated with a counter-conditioning version of covert sensitization designed as a placebo therapy. Condition V (C) subjects received no therapy and served as a no treatment control. Therapy continued for six weeks.

There was a total attrition rate of 59 percent. Only 24 subjects in Treatment Conditions I (P), III (E-A/SC), and IV (PLC) completed the research. All subjects in Condition II (E-A) and eight each in Conditions I (P), III (E-A/SC), and IV (PLC) were lost by attrition. (To bring the No Treatment Control Condition into balance eight subjects --four male and four female--were randomly chosen to constitute a control group). The data on the 32 subjects who completed the research was analyzed with analysis of variance and multiple comparison statis-

tical techniques.

Hypothesis III predicted that an avoidance learning plus "in vivo" conditioning model of covert sensitization would reduce smoking rates significantly more than a Placebo or No Treatment Control Condition. Hypothesis III was supported by the data at a statistically significant level (.05).

The results obtained on the Cigarette Taste and Enjoyment Rating Scales suggested that subjects in the experimental conditions had experienced a reduction in the attractiveness of cigarette smoking. However, a follow-up interview revealed that almost all of the experimental subjects reported that they still felt a moderate to strong desire for cigarettes at the end of treatment. The changes on the rating scales, therefore, may be attributed to demand characteristics of the research as a whole.

In any future research of this type an effort should be made to maintain a large subject sample. A monetary "trust bond," to be returned upon the completion of the research, could be required of each subject. The literature suggests that this method is effective in reducing attrition rates.

The results suggested that a combination of avoidance learning and "in vivo" conditioning is the most logical theoretical explanation for the results of covert sensitization. However, the attrition in Condition II (E-A) while not changing sample characteristics, cost the study a test of one explanation for covert sensitization, i.e., avoidance learning. This remains a possible explanation for covert sensitization and a subject for further research.

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APPENDIXES

APPENDIX A

SAMPLE NEWSPAPER ADVERTISEMENT

San Antonio area smokers wishing to make good their New Year's Resolution to stop smoking will soon have psychological aid to help them break their own smoking habits.

Beginning in February, four Clinical Psychologists at Wilford Hall USAF Medical Center will initiate an eight-week smoking clinic. This pilot clinic will be open to any retired or active duty military personnel and their adult dependents.

This unique smoking clinic will employ a new treatment method in assisting each smoker to "unlearn" his own smoking habit. And a "learned habit" is exactly the way these psychologists explain smoking. Their belief is that smoking is an ordinary habit pattern learned during the smoker's life just like any other habit. In general, the smoker's habit persists because each cigarette is a mini-reward for the habit itself.

However, the old saying "you can't teach an old dog new tricks" does not apply to the habit of smoking. According to psychologists today, smoking can be viewed as a simple behavior pattern which, if approached properly, can be unlearned just as it was once learned.

The new learning approach used in this smoking clinic involves no deep probing of a smoker's emotional life. The pertinent information needed for treatment is how long a person has smoked, how much, and when and where he or she smoked. Once these simple facts are known, today's trained psychologists can use proven techniques to help people stop the smoking habits that often seem all but unbreakable.

The organizers of the smoking clinic beginning in February emphasize they are not promising anyone miracles. However, they are sincerely convinced from reported case histories that they are offering a good opportunity to any smoker wanting to break himself or herself of smoking.

For further information on the smoking clinic, call 673-3040 between 1100-1300 hours or 1600-2100 hours, Monday through Friday beginning January 18. Written inquiries should be addressed to Smoking Clinic, Department of Psychological Services, Wilford Hall USAF Medical Center, Lackland AFB, Texas 78236.

APPENDIX B

SMOKING INFORMATION QUESTIONNAIRE

NAME_____ SEX_____ AGE_____

Phone where you can be reached_____

Address where you can be reached by mail_____

_____

Amount of education completed_____

How long have you smoked cigarettes?_____

How many times have you previously attempted to quit smoking?_____

How many cigarettes do you estimate you smoke at this time? Make your estimate as close to the nearest $\frac{1}{4}$ of a pack as you can_____

In your own judgment, list below those specific places where you estimate you do the greater percent of your smoking. Use as many places as are necessary to roughly account for all of your smoking. For each specific place, estimate the percentage of your total smoking that you do there.

PLACES I SMOKE	PERCENTAGE OF TOTAL SMOKING
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.
8.	8.
9.	9.
10.	10.

ALL INFORMATION ON THIS INSTRUMENT WILL BE KEPT IN THE STRICTEST OF CONFIDENCE

To the best of your ability, describe the specific scenes and generally what you are doing in each scene that depicts the place you listed under Places I Smoke.

PLACES I SMOKE	SCENE AND WHAT I AM DOING
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.
8.	8.
9.	9.
10.	10.

* In the following questions, please be as candid and open about your answers as possible.

If you could be cured of your smoking habit simply by paying a sum of money, how much would you be willing to pay to insure that you would be cured of cigarette smoking? Though this is not possible--if it was--what would you be willing to pay to break yourself of smoking?_____

How enjoyable is a cigarette to you when you smoke? Rate yourself on the seven point scale below ranging from very enjoyable to not enjoyable. Rate yourself by circling one of the seven positions.

How difficult do you feel it is for you to stop smoking? Rate yourself on the seven point scale below ranging from not difficult to very difficult. Rate yourself by circling one of the seven positions.

How motivated to stop smoking do you honestly feel yourself to be? Rate yourself on the seven point scale below. Circle one of the seven positions.

* Thank you very much for your candor in responding to these questions.

APPENDIX C

SMOKING ENJOYMENT RATING SCALE

NAME _____

SESSION NUMBER _____

DATE _____

How much have you enjoyed the cigarettes you may or may not have smoked since your last treatment session? Please rate your general enjoyment of smoking on the seven point scale below. Check one of the seven spaces which range from Very Enjoyable to Not Enjoyable. Thank you.

Very Enjoyable |_____|_____|_____|_____|_____|_____|_____| Not Enjoyable

How many cigarettes have you smoked since the last treatment session?

_____

How many complete practice sessions have you performed since your last treatment session? _____

APPENDIX D

CIGARETTE TASTE RATING SCALE

NAME _____

SESSION NUMBER _____

DATE _____

Please rate the taste of the cigarettes you have smoked since your last session by checking one of the seven positions on each of the following scales.

FRESH		STALE
HEAVY		LIGHT
FOUL		FRAGRANT
ACTIVE		PASSIVE
WORTHLESS		VALUABLE
SOFT		HARD
TASTY		DISTASTEFUL
SHARP		DULL
SWEET		SOUR
WEAK		STRONG
CLEAN		DIRTY
OLD		YOUNG

APPENDIX E

ANONYMOUS BIASED DATA REPORTING QUESTIONNAIRE

Sometimes subjects in research or patients in therapy (which you have, in fact, been both) will unknowingly and unintentionally distort what they report to the researcher or to their therapist. These distortions occur in a variety of ways. For example:

(1) Subjects in research may unknowingly answer verbally or respond physically in a way that they feel will:

a. please the researcher as a person
b. displease the researcher as a person
c. give the researcher the results the subject feels he is looking for in his study
d. cover up the results the subject feels the researcher is looking for in his study.

(2) Patients in therapy sometimes unknowingly do the same thing to:

a. please the therapist as a person
b. displease the therapist as a person
c. show to himself that he is "cured" by temporarily acting differently or reporting that he or she has changed.

Much experimentation has shown researchers that this is a "fact of life" when doing research. Even they themselves are subject to this problem. The purpose of this questionnaire is, simply, to give us a chance to evaluate the results of this smoking clinic realistically. We would like you to take a hard look at yourself and ask yourself if you have, or feel you have, biased your reports to us in any real way.

APPENDIX F

TREATMENT SCENES FOR AVERSIVE THERAPY CONDITIONS

Desk at Work

You are at your job . . . You are sitting at your desk where you work . . . Feel the chair you use at work and how it feels against your back . . . You can hear all the usual sounds of daily work at your job . . . There is a package of cigarettes on the desk . . . While you are working you feel the urge to smoke, you stop working 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. As you touch the package of cigarettes, 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 overheated and nauseated--you have the cigarette in your hand and you are becoming sicker--and sicker. You have stomach cramps. As you hurridly place the cigarette between your lips, you taste the tobacco flavor of the cigarette--and that does it--you can't help it now--you begin to throw up. You can taste the puke--bitter and sticky and acidy on your tongue. You start gagging and vomiting. Chunks of slimey yellow puke are coming out your nose and mouth. You vomit all over the cigarette--all over your hand--and all over the pack of cigarettes. The cigarette in your hand is very soggy and full of vomit. There is a stink coming from the vomit--snots are running down your nose. Your hands feel slimey and full of puke--your whole desk at work is a mess. Your clothes are full of puke--your co-workers are looking at you with shocked expressions. You feel just terrible.

Pause 15-30 seconds--now let your minds clear completely and relax.

Driving a Car

You are driving your car . . . You can feel the seat beneath you . . . the steering wheel in your hands . . . You can see the road in front of you . . . and the traffic around you . . . You have a pack of cigarettes with you. While you are driving you start to reach for a cigarette. As you start reaching, your stomach knots up and begins to feel nauseous--you touch the package and bitter spit comes into your mouth. As soon as you get a cigarette out of the package, you begin to feel overheated and even sicker. You are becoming more and more nauseous. As you raise the cigarette to your mouth you feel your stomach turn over and you know you are going to vomit. You immediately pull the car off the road and stop safely off the road. You open the door and stagger out with the cigarette still between your lips. The taste of the cigarette sickens you causing your stomach to heave once and for all, and you vomit--all over the ground--the side of the car--and yourself. Your eyes are burning and watery--you have the dry heaves and nothing is coming up except a sour, yellow, bitter tasting bile. Your stomach hurts terribly. You look down at the ground and see your cigarette in a pool of vomit. The stink from this sight causes you to gag and retch again--and again. You look up and notice the passing drivers looking at you--you are covered with your own vomit, staggering against the car--you feel horrible--sick--and very embarrassed.

Pause 15-30 seconds--now let your minds clear completely and relax.

Watching T.V. at Home

You are in your own home, sitting in your favorite chair watching T.V. . . . Feel the chair you are sitting in beneath you . . . Feel it pressing against your back . . . Look around the room in which you are watching T.V., it is all very familiar . . . The T.V. is on and one of your favorite programs is playing. You see and hear the program . . . There is a package of cigarettes sitting beside your chair on a table. While you are watching T.V., you start to reach for a cigarette. As soon as you start reaching, you feel your stomach knot up and begin to churn. You feel sick--as if you might throw up. You touch the package and some bitter liquid comes up your throat and it is very sour. When you pull the cigarette out of the package, your stomach heaves and sends pieces of food up your throat and into your mouth. You try to swallow it back down. Now you really feel nauseous and sick to your stomach. As you are about to put the cigarette into your mouth, you puke all over the cigarette--your hand--and yourself. Now you are really sick. You vomit--again and again. The puke is greenish. It feels slimey and is all over your hands--and all over your clothes. You look down into your lap where you dropped the cigarette and see it floating in a little pool of puke--the smell is foul and sickening--seeing this makes you throw up again--and again--until you are only dry heaving. Your stomach is cramping--your eyes are burning and watery--you feel terrible sitting in this mess of puke.

Pause 15-30 seconds--now let your minds clear completely and relax.

Reading at Home

You are sitting in a comfortable chair in your living room reading a book . . . This is the chair in which you like to read . . . Feel the chair pressing against your back . . . Look around the room . . . It looks familiar. It is your living room . . . Your cigarettes are right beside you. While you are reading, you start to reach for a cigarette. As soon as you start reaching, your stomach begins to feel very shakey. You feel a cold chill go over you. You feel like you are sick and about to throw up. You touch the package of cigarettes and a few pieces of food bubble up into your throat. They are very bitter and sour. You try to swallow it back down. You take the cigarette out of the pack and now you really feel nauseous. Your stomach is heaving and churning around. 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. You are very sick and you vomit--again and again. The cigarette in your hand is very soggy and full of stinking vomit. The foul stink coming from the puke is sickening. Snots are running down your face. Your hands and the book in your lap are all full of green vomit--looking down you see the package of your favorite cigarettes covered with vomit in your lap--the smell is so sickening that you can't help yourself--you gag and vomit again on your cigarettes until they are buried under your green puke.

Pause 15-30 seconds--now let your minds clear completely and relax.

Evening Meal at Home

You are sitting at your dinner table where you eat your evening meal . . . The table in front of you has dishes and glasses from dinner . . . Feel the chair against your back . . . Look around and see the room you eat your evening meal in . . . It is all very familiar to you . . . You can still smell the odors of the meal you have just eaten . . . As you are sitting there you feel the urge to smoke a cigarette. You get up and start to reach for your cigarettes. As you reach for the pack of cigarettes you feel a little scurness in your stomach. Some bitter tasting liquid comes up your throat. It is sticky and acidy on your tongue. You swallow it at once and sit down at the table again. You set the pack on the table beside your plate. When you take a cigarette from the package your stomach suddenly knots up and you feel nauseous. You feel as if you are going to vomit. You place the cigarette into your mouth, light it and take a long drag on it. As you do this you feel a heaviness come into your throat--you are very sick at your stomach--your dinner is turning over in your stomach--the undigested dinner is coming up. You begin to gag. You can't control your gagging. The food is now in your mouth. You can feel it forcing its way out of your mouth. You can't keep from vomiting--you vomit all over the dinner plate--the cigarette in your hand--the pack of cigarettes--the table and yourself. Your cigarette falls in your plate in a pool of yellowish vomit. You see your cigarette floating in this vomit--the vomit stinks horribly. When you see this you become sick and vomit again--and again--and again. You vomit until only a bitter, sticky bile is coming out. You are having the dry heaves--your stomach

hurts very much. A sudden painful spasm of dry heaves causes you to double over and your face plunges down into the vomit in your plate--you can feel the vomit on your face--the smell of the puke on your face is horrible--the cigarette covered with vomit sticks to your chin--you have to pull it off. You look at it in your hand and you begin to dry heave again--you feel so sick you wish you could die.

Pause 15-30 seconds--now let your minds clear completely and relax.

Talking and Visiting at Friend's Home

You are visiting at a friend's home . . . You are comfortably seated in their best easy chair . . . Feel the chair pressing beneath you and against your back . . . Look around the room you are sitting in . . . It all looks very familiar . . . You can see and hear your friends talking to you . . . Your cigarettes are beside you on a table. While you are talking you reach for a cigarette. As soon as you start reaching, you feel your stomach become shakey and queasy. You feel like you might vomit. As you touch the pack of cigarettes, some liquid comes up your throat and it is very sour. As you take a cigarette from the package, pieces of food come into your mouth, but you swallow it back down. You go ahead and put the cigarette into your mouth trying to act as if nothing is wrong. As you light the cigarette, you can feel your stomach knot up and a spasm sends vomit, bitter and slimey into your mouth. You try to hold it back--to swallow--but you can't. You have to vomit. It goes all over your clothes--the chair--the rug and onto your friends. You vomit and vomit--again--and again. You see your cigarette package on the floor beside your chair where you dropped it. It is covered with yellow-green vomit--your nose is running. Your eyes are burning and watery. You are terribly embarrassed at the shocked and disgusted looks from your friends. The vomit smells foul. So foul that you gag again and vomit. The pain from the dry heaves is terrible. You have never been so embarrassed in your life.

Pause 15-30 seconds--now let your minds clear completely and relax.

Parties, Dances, Social Gatherings

You are at a party . . . Nice music is playing from a stereo system . . . The room is very crowded with many people you know . . . They are talking, laughing and some are dancing . . . They are all having a good time. They are standing all around you . . . You decide you would like a cigarette. You notice a friend smoking your brand and as you do, he offers you a cigarette . . . As you start to reach for the cigarette you get a funny feeling in the pit of your stomach. You feel all shakey as if you might get sick at your stomach. As you take the cigarette, your throat starts to get tight. You feel a brief spasm in your gut which sends up a bitter tasting bile. Now you are really beginning to feel nauseous. You raise the cigarette to your lips and are about to put it in your mouth when you feel chunks of undigested food come up your throat--and into your mouth. You swallow the vomit back down and put the cigarette in your mouth as if nothing is wrong. Instantly you become overheated and nauseous. Puke rushes up your throat and you suddenly vomit all over yourself and the people standing by you. The vomit smells terrible. It is slimey and yellow. It just covers your clothes and is forming a pool on the floor. You gag and retch until you can vomit no more--you feel hot and shakey--you notice all the looks from the people at the party--you feel very embarrassed and try to explain. As you do the odor of your vomit gets to you and you begin to vomit again while everyone watches. You feel very sick and very embarrassed.

Pause 15-30 seconds--now let your minds clear completely and relax.

Eating Out at Restaurant

You are eating out for the evening. You are in your very favorite restaurant . . . Look around at the inside of your favorite restaurant . . . You have just finished a big meal and you are very content. The table with the empty plates and dishes on it is right in front of you . . . You can feel the chair against your back . . . You can see other people eating dinner at nearby tables . . . You can hear the sounds of people ordering, eating and quietly talking with one another . . .

Your cigarettes are on the table in front of you. You decide to have an after dinner 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 throw up. You touch the pack of cigarettes and bitter--sticky--sour puke comes into your throat. You swallow it--acting if nothing has happened. As you take the cigarette out of the pack, chunks of food come up into your throat. Now you really 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 vomit splashes on the dinner table and onto people at a nearby table. The cigarette in your hand is very soggy and full of brownish vomit. There is a horrible foul smell coming from the vomit--mucous and snots are coming from your nose. Your hands feel all slimey--and full of vomit. The whole restaurant table is a mess. Your clothes are full of vomit. You feel horrible and very embarrassed. Everyone is looking at you.

Pause 15-30 seconds--now let your mind clear completely and relax.

Breakfast

You are in your own home . . . You have just finished your breakfast . . . You are sitting at the table where you eat breakfast . . . The breakfast dishes with some small food scraps still on them are sitting right in front of you . . . There is a package of cigarettes sitting beside your plate at the breakfast table. As you are relaxing after eating breakfast, you decide to have a cigarette. As soon as you decide this you get a funny feeling in the pit of your stomach . . . As you start to reach for a cigarette you feel queasy and sick at your stomach. As you touch the package, you can feel food particles inching up your throat. You feel as if you are about to puke. As you are about to put the cigarette between your lips, food comes up into your mouth. You try to keep your mouth closed because you are afraid that you will spit your breakfast out all over the place. But when the cigarette touches your mouth you can't help it--you puke all over your hands--all over the cigarette--and all over your breakfast dishes. Vomit goes all over the table--and over your clothes. Your eyes are watering. Snots and mucous are all over your mouth and nose. Your hand holding the cigarette is covered with slimey, sticky puke. There is an awful smell --as you look at the cigarette in your hand covered with puke, you just can't help but vomit--again and again--until just watery stuff is coming out.

Pause 15-30 seconds--now let your minds clear completely and relax.

Coffee Break at Work

You are at work . . . You can hear the usual sounds of work going on around you . . . You have been working hard and you feel you should break for coffee . . . There is a package of cigarettes sitting on your desk top. As you stand up to go and get your coffee you decide you sure could use a cigarette with your coffee. As you start to reach for the pack of cigarettes, your stomach begins to feel shakey. You feel like you might throw up. As you touch the package, your stomach begins to feel queasy and nauseous. You make up your mind to have a cigarette anyway. You go and get a cup of coffee.

You fix your coffee the way you like it and have a sip . . . It tastes good and hot. You have carried a cigarette between your fingers and now you decide to smoke it. Immediately, you begin to feel nauseous --almost as if you were going to vomit. You place the cigarette between your lips and begin to light it. Now your throat starts to get tight and you feel a spasm in your gut which sends up a stream of bitter-tasting bile. Now you are really nauseated and sick at your stomach. As you start to take the first drag on your cigarette, you suddenly gag and feel sick to death--your stomach heaves--vomit rushes up your throat and you puke all over the cigarette--all over your hand and the package of cigarettes. You can taste the coffee and tobacco flavor in the vomit--this makes you even sicker. You vomit again--and again. You puke on the cigarette in your hand--into your coffee cup--and all down the front of your clothes. Your eyes are burning and watery--your stomach is still heaving though it has nothing left to vomit. The cigarette in your hand is covered with slimey green vomit. Everyone

around you is looking at you covered with your own vomit--you feel dizzy and very embarrassed.

Pause 15-30 seconds--now let your minds clear completely and relax.

While Having Coffee at Home

You are at home sitting in a comfortable chair . . . You feel a little blue and you decide to have a cup of coffee to perk you up and refresh you . . . You go into the kitchen and make your favorite coffee . . . Smell the fresh aroma of coffee as you make it . . . When you are finished, you return to your favorite chair and sit down with your cup of coffee fixed as you like it . . . You can feel the chair pressing against your back and underneath you . . . You look around and see the room you are in . . . It is very familiar . . . You sip your coffee and it tastes just as you like it . . . Within easy reach of your chair is a package of cigarettes. While sipping your coffee you reach for a cigarette. As soon as you start to reach for a cigarette your stomach suddenly feels very sour and nauseous. You feel so sick you almost feel as if you will vomit. As you touch the package of cigarettes a thick liquid comes up in your throat--it is very sour. You gulp--and swallow it back down. As you pull a cigarette from the package and drop the package in your lap, you sense that puke is bubbling up in your stomach --and forcing its way up your throat. As you put the cigarette into your mouth you suddenly vomit, you vomit all over the cigarette--all over your hand--all over the package of cigarettes in your lap--and yourself. The cigarette in your hand is covered with greenish vomit. Mucous is running down your nose. You look down into your lap and see your cigarettes floating in a pool of disgusting, reeking vomit--this sight makes you sick and your stomach heaves again--and again--until there is nothing left to vomit. Your hands feel all slimey and your clothes are soaked with vomit.

Pause 15-30 seconds--now let your minds clear completely and relax.

Lunch at Work (Cafeteria, Club, Dining Hall)

It is time for the lunch hour and you are eating lunch out . . . You are seated at the table and you have just finished your lunch . . . You can hear the usual sounds of others eating lunch around you . . . Smell the aroma of the food . . . The table in front of you is covered with empty dishes . . . Feel the chair against your back and beneath you . . . You have cigarettes with you and you start to reach for one. As you reach for a cigarette, you get a funny feeling in the pit of your stomach like you are going to throw up. As you touch the package you begin to feel very nauseous and sweaty--you can sense your undigested lunch churning around in your stomach. As you take a cigarette from the package you feel pieces of food force their way into your throat. As you are about to put the cigarette between your lips you can feel vomit come into your mouth--it is bitter and acidy tasting. You try to swallow it back down at once--again you begin to put the cigarette between your lips--but this time you start gagging and retching--bigger chunks of food come into your mouth. Vomit fills your whole mouth--vomit and puke are now coming out of your nose and mouth--dropping on your shirt and all over your lunch table. Now you must vomit--again--and again you puke. Your vomit covers you and your lunch plate. Some goes into the lunch of others. Your puke covers the cigarette in your hand. The vomit is sticky and stinks. The smell of vomit makes you puke again--all over the cigarette--and your cigarette package--until you have nothing left. Your eyes are watery and burning. Your stomach muscles have terrible cramps. You look up--everyone is starring at you with looks of shock and disgust--you feel sick and very embarrassed.

Pause 15-30 seconds--now let your minds clear completely and relax.

Lunch at Home

You are at home and you have just eaten your lunch . . . You are sitting at your dinner table relaxing, having had a good lunch. See the table you are sitting at . . . You can see the room around you . . . It is all very familiar. You have a pack of cigarettes close by. You feel a desire to smoke a cigarette and you start to reach to get a cigarette. As you do, your stomach knots up and begins to churn. You feel like you might throw up. When you touch the package of cigarettes your stomach feels so queasy you feel sick enough to vomit. As you take the cigarette out of the pack you are really beginning to feel nauseous. Bits of food come up into your throat--they taste sour and acidy. You place the cigarette between your lips. As you do this, chunks of your lunch surge up your throat as your stomach heaves and churns. You swallow it --forcing it back down with a gulp. Now you light the cigarette as you sit and look at the lunch dishes--you are about to inhale when vomit rushes up from your stomach--gushes into your throat and forces its way out of your mouth. You are vomiting and puking. You are gagging and retching--all over the cigarette in your hand, and your lunch table. You can taste what you ate for lunch as you vomit it up again--and again. There is a horrible sour--bitter taste in your mouth. Your eyes are watering. Your face is red--your stomach is cramping. You look down on the table and see your cigarette package covered with brownish puke that stinks--and you can't help it--you vomit again. You gag and retch with the dry heaves--it is very painful. Your stomach muscles are throbbing with the pain of the dry heaves.

Pause 15-30 seconds--now let your minds clear completely and relax.

Talking on the Telephone at Work

You are at work, talking about business over the telephone . . . You can see the room you work in . . . It is all familiar to you . . . You can feel the telephone in your hand . . . You can hear the usual sounds of work going on around you . . . Your cigarettes are right nearby. While you are talking you reach for a cigarette . . . As you start reaching, your stomach begins to feel shakey and upset. When you touch the cigarette package, bitter spit comes up into your mouth--some pieces of food come up into your throat. You swallow them back down--you really feel nauseous. Your stomach is heaving--as you take the cigarette out of the pack and your stomach heaves again--as you are about to put the cigarette in your mouth, you puke all over the cigarettes--all over your hand--and all over your package of cigarettes. You look at the cigarette in your hand. It is very soggy and full of vomit--there is a stink coming from the vomit--your hands feel all slimey and full of green puke. Your clothes are soaked with vomit--you gag and retch with the dry heaves again--and again. You realize that the person on the other end of the line is asking what is wrong. You gag and puke again until you have nothing left to throw up--you are too embarrassed to try to explain and you hand up abruptly--this makes you feel even more horrible.

Pause 15-30 seconds--now let your minds clear completely and relax.

Talking on Telephone

You are sitting in a chair near the telephone in your own home . . . You are talking on your telephone . . . Look around and see the room from which you are talking . . . You can feel the chair you are sitting in . . . Feel it pressing against your back . . . You hear the usual sounds of your own home going on around you . . . While you are talking you reach for a nearby package of cigarettes. As you do you get a little nauseous feeling in your stomach. You feel like you are going to vomit. While talking, you work a cigarette out of the package and pick it up. Immediately your stomach feels very nauseous and upset. You are sick at your stomach. You raise the cigarette to your mouth and as you do your throat tightens, a brief spasm in your stomach sends up a bitter-tasting bile--you swallow it back down. When you put the cigarette between your lips, your stomach suddenly heaves and churns--you can feel puke filling up your stomach and surging up your throat. You can't help it now--you vomit--all over the cigarette in your hand--all over the telephone--and all over the package of cigarettes. Snots and mucous are running out of your nose. You are gagging and retching--and puking again. You hand is covered with a greenish slimey puke. The cigarette in your hand is soggy with vomit. You say you are sorry but you must hang up the telephone. You feel sick and ashamed you were so abrupt on the phone--your eyes burn and are watery--you have the dry heaves--the sight of the vomit on the cigarette in your hand makes you feel even sicker.

Pause 15-30 seconds--now let your minds clear completely and relax.

Bedroom at Home

You are in your bedroom at home . . . You are sitting on your bed . . . There is a package of cigarettes on the table beside the bed . . . You can feel the bed underneath you . . . Look around the room, it looks very familiar . . . While you are sitting there you reach for a cigarette. As soon as you start reaching for the cigarette you get a funny feeling in the pit of your stomach. You feel sick, as if you are about to throw up. As you touch the pack of cigarettes, a bitter, sour liquid rises in your throat. When you take the cigarette out of the pack, some pieces of food come into your throat. Now you feel hot--and sweaty--and very nauseous. Your stomach is beginning to cramp and you really feel as if you are about to vomit. As you are about to put the cigarette in your mouth, you vomit--all over the cigarette--all over your hand--and all over the package of cigarettes. The vomit falls on the bed and makes a pool on the floor. The cigarette in your hand is very soggy and full of green vomit. Your hands are covered with slimey puke. The vomit has a foul smell. It is so sickening that you gag again--and again. Your clothes are now soaked with puke. Your stomach aches from vomiting--and you feel terrible.

Pause 15-30 seconds--now let your minds clear completely and relax.

Household Chores

You are cleaning up around your house, doing a few minor household chores . . . At the moment you are emptying an ash tray in your living room . . . Feel the ash tray in your hand as you empty it . . . Look around your living room where you are cleaning up . . . See your furniture, your carpet. It is all very familiar to you . . . Your cigarettes are on a nearby table . . . You stop for a minute to rest and start to reach for a cigarette. As soon as you start reaching, you notice a sick queasy feeling in your stomach. You feel as if you were about to vomit. You touch the package of cigarettes and a little bitter liquid and a few pieces of food rise in your throat. Now you are really feeling nauseous --and your stomach is cramping. When you take a cigarette from the pack, some bigger chunks of food come into your throat. You swallow it back down. As you are about to put the cigarette in your mouth, you are overcome with nausea and you puke all over the cigarette--all over your hand--and all over the floor. You vomit again and again. The cigarette in your hand is very soggy and full of yellow puke. The vomit smells disgusting. It is horrible. You look down on the floor and see your pack of cigarettes lying in a pool of your vomit--you feel horrible. Your stomach muscles ache from the vomiting.

Pause 15-30 seconds--now let your minds clear completely and relax.

Talking and Visiting with Friends at Home

You are in your own home . . . You are sitting in your easy chair . . . Feel the chair beneath you . . . Friends have dropped by and you are just visiting and talking with them . . . You can see the room in which you are all visiting . . . There is a pack of cigarettes very close by. While you are visiting with your friends, you decide you want a cigarette. You get up to get the package of cigarettes. As you start to reach for the cigarettes, you feel a slight queasiness in your stomach--when you touch the package of cigarettes you suddenly feel your stomach knot up and heave as if you were about to vomit--as you pick up the package of cigarettes and take one out, a heaviness comes into your throat. You are beginning to feel very sick. When you place the cigarette into your mouth, you can feel your stomach turn over--your stomach is full of churning vomit. You begin to gag--you can't control your gagging. Some pieces of food come into your mouth. You try to hold the vomit back but you can't swallow it. You vomit--you are vomiting all over yourself--all over the cigarette--all over the carpet--and all over the furniture. Some of the puke goes on your friends. Now you have the dry heaves and only a dribble of yellow-bitter tasting liquid is coming out. You look down to the floor where you see your cigarette in a pool of vomit--your clothes are slimey and full of vomit. You are a complete mess. Your friends are starring at you with shocked expressions on their faces--you try to make apologies but as you talk, you gag and retch again. You feel so embarrassed and sick. You just really feel terrible.

Pause 15-30 seconds--now let your minds clear completely and relax.

Restroom

You are in a restroom . . . You are looking into the mirror and notice that your hair is mussed and needs combing. You have your cigarettes handy. While you are combing your hair you reach for a cigarette. As you start reaching, your stomach feels queasy. You feel sick as if you were about to vomit. Touching the pack of cigarettes you feel your stomach churn and a spasm in your gut sends a bitter, sticky liquid up your throat. You try to swallow it back down. As you take a cigarette out of the package, you feel another spasm in your stomach, pieces of food come up into your throat. As you are about to put the cigarette into your mouth, you suddenly vomit. You vomit all over the cigarette --all over your hand--and all down your clothes. The cigarette in your hand is very soggy and full of puke. Your hands are covered with vomit and feel very slimey--your clothes are full of puke. The vomit has a terrible foul smell--as you look down, you see your package of cigarettes in a pool of vomit on the floor--your clothes are full of vomit. You feel very sick and you are very embarrassed about the way you look and smell.

Pause 15-30 seconds--now let your minds clear completely and relax.

Working Around the Yard

You are working in the yard . . . You are straightening things up a little bit and you pause for a rest . . . You are standing by the door and your cigarettes are sitting on the step . . . As you sit down for a rest, you start to reach for a cigarette. As soon as you start reaching for the cigarette, you get an upset feeling in your stomach. You begin to feel sick at your stomach--like you are about to throw up. You touch the package and a bitter bile comes into your mouth. As you take a cigarette out of the pack, your throat starts to get tight and you feel a sudden spasm in your stomach which sends large pieces of food up into your mouth. Now you really feel sick and nauseous. As you place the cigarette in your mouth, you suddenly vomit all over the cigarette--all over your hands--and all over the package of cigarettes sitting on the step. You gag and choke on the vomit--the vomit has a foul smell and makes you puke--more and more. Your eyes are burning and watery. Your stomach aches from the vomiting--you feel terrible and sick to death.

Pause 15-30 seconds--now let your minds clear completely and relax.

APPENDIX G

GENERAL EXPLANATION OF THE SMOKING CLINIC

This really is an Anti-Smoking Therapy Program. We are NOT here to offer you a week of socializing with everyone agreeing smoking is harmful and we should all quit. I'm sure you realize that is only wishful thinking. We are also NOT here to scare your smoking habits away with programs of lectures to bore you; films of blackened lungs to frighten you; or moral exhortations for you to turn from sin to salvation and stop your smoking. Now there is nothing wrong with smoking clinics that use these methods, it's just that the thousands of clinics using these methods, held in America since the Surgeon General's Report in 1964, have not proved very successful. So naturally we chose to do something different.

What we chose to do, instead, is to offer an eight-week Anti-Smoking Therapy Program. We chose to base our program on the scientifically demonstrated principles of human learning. We can't possibly believe you, as humans, were born with a desire to smoke--we have to assume you learned it. Once we assume that smoking is a habit you have learned, and there is no evidence to believe otherwise, we can begin designing a program through which you unlearn your habit of smoking. This is exactly what we have done.

Now let me make one thing perfectly clear--you didn't learn to smoke overnight--we don't expect you to stop overnight. We want you to be able to break yourself completely of smoking--this, of course, is the ideal goal. At the very least we want you to be able to drastically reduce your smoking now and quit in the near future. Notice I said, "be able to." By this I mean that during the treatment program we expect you will begin to lose your desire to smoke, enjoy your cigarettes less and less as time goes by, and gradually gain control of your own habit--and finally quit when you are ready. Our program is designed to allow each of you to unlearn your habit of smoking at your own rate. Some of you will take longer--that's no problem. You will unlearn your habit at your own rate.

O.K., that is our primary goal--to help you stop smoking.

We have a secondary goal in this clinic. The other psychologists and I are convinced we have a method to definitely help people stop smoking. To answer the question of whether this treatment program is or is not effective, we are going to ask you to do two things to help us. (1) Keep daily records of your smoking during the eight-week program and report these to us each week. (2) We are also going to ask you to inform us via a postcard questionnaire we will mail you, three months, six months, and 12 months after the clinic ends as to how you are doing. This last bit of information will be followed by the USAF Tumor Registry at Brooks. I guess they want to know if we are successful also.

The basic method of treatment will be a behavior modification procedure known as covert sensitization. Just briefly, what that means is conditioning by the use of your own natural imaginative powers. The therapists will ask you to imagine situations that they described to you. It is through this process over the eight weeks that you will be

able to cut down on or stop smoking cigarettes entirely. We will explain more about this later.

Now let's talk about something that is important in this treatment process--relaxation. What is relaxation? Relaxation is freedom from physical and mental tensions. We will use and teach you to use relaxation during this clinic. Deep relaxation is great freedom from physical and mental tensions. We are not using hypnosis. In deep relaxation you have complete awareness of where you are and what you are doing. You are still in total control of yourself. Why do we concern ourselves with relaxation? What does it have to do with smoking? The main reason is that tension (which can be either the "blues" or the "jitters") from everyday stressful situations is usually the important stimulus for smoking in almost every smoker's daily pattern. Tension is often the "switch" which turns on your cigarette smoking habit.

We are going to teach you a number of safe, natural procedures through which you will be able to learn to reduce your physical and mental tensions more completely. You will learn to use these techniques over the course of our eight-week clinic. These techniques should enable you to learn how to gain control over and reduce to a comfortable level tensions which often cause you to reach for a cigarette.

A secondary reason for teaching you relaxation is that people can visualize and concentrate on imaginary scenes being described to them much more effectively when they are physically and mentally relaxed and have their eyes closed. Having you concentrate on imaginary scenes will be a very important part of this Anti-Smoking Therapy Clinic. Thus, with a little preparatory exposure to relaxation in general, you will be better prepared for the treatment proper.

APPENDIX H

GROSS-MUSCLE-SYSTEM RELAXATION PRACTICE HANDOUT

1. Arms outstretched, fist clenched tight--hold tense seven counts.
2. Legs outstretched, toes pointed outwards--hold tense seven counts.
3. Legs outstretched, toes pointed inwards--hold tense seven counts.
4. Sitting up straight, tense groin and stomach area--hold tense for seven counts.
5. Chest out, stomach in--hold tense for seven counts.
6. Chin on right shoulder (head turned)--hold tense for seven counts.
7. Chin on left shoulder (head turned)--hold tense for seven counts.
8. Arms outstretched, fist clenched tight--hold tense seven counts.
9. Sardonicus face (mouth and eyes) chin pressed into chest hold tense for seven counts.
10. Relax--let go completely--eyes closed--head down. Breathe deep and slowly--with each exhale let go and relax even more.
11. Roll head to the right making complete circle--relaxing as you roll your head--four complete rolls.
12. Roll head to left making complete circle--four complete rolls. Finish with head down on chest.
13. Head down on chest--breathe deeply and slowly--relax with each exhale. Breathe in--exhale--and let go--relax even more, five to six breaths.
14. Raise your head and open your eyes. Notice how you feel.

APPENDIX I

GENERAL INTRODUCTION TO THE TREATMENT METHOD

As an introduction to the treatment, we are going to begin to use tonight, I would like to briefly discuss five topics with you: (1) why do people like to smoke or to put it another way, what is it about smoking that is rewarding; (2) why do people smoke knowing it is safer not to do so; (3) exactly what is a smoking habit--what are we talking about when we say that you or someone else has a smoking habit; (4) why is smoking so hard a habit to break; and (5) finally, how can you break yourself of smoking in this therapy program?

First of all, what in general does any person gain from smoking cigarettes? Once a person has acquired the smoking habit there seems to be two general categories of reasons why he continues. Number one, smoking can really be quite pleasurable. The taste of tobacco, the aroma of tobacco, being able to put something in your mouth; these are all pleasurable events. Number two, the act of smoking a cigarette can reduce uncomfortable tensions. These are also two general categories of rewards any smoker receives from cigarettes. These rewards are important because they both happen immediately; and can occur with every cigarette smoked. In contrast, the threats of illness or death now associated with smoking always seem distant and unreal when compared to the immediate pleasure and tension-reducing reward value of each cigarette. The pleasure and tension reduction gained from a cigarette, no matter how small, is much more immediate and real; and almost always outweighs the distant, unreal fears of the possibility of illness and death. Thus the immediate rewards of smoking almost always outweigh what our common sense tells us about good health care. This is why people smoke even when they consciously know it is safer not to smoke. Now this is not a sign of moral weakness on the part of a smoker that continues to smoke in the face of illness. Rather habitual use of tobacco is simply a very strong habit. It is a strong habit because it has been rewarded so much.

I mentioned the smoking habit. What exactly is it? Let me approach that question this way. It seems very unlikely that any of you were born with a desire to smoke or a habitual smoking pattern. It is much more likely that sometime during your life each of you have acquired (1) a desire to smoke and (2) learned the habitual behavior patterns of cigarette smoking. When people acquire a habit we are usually saying that they have learned to think, feel and behave repeatedly, in a specific pattern. This specific pattern always occurs in relation to some aspect of themselves or their environment.

Let's stop for a moment and use an example to make this clear. I said before that smoking is a habit. I said a habit is a learned way of thinking, feeling or behaving which occurs repeatedly in a specific pattern. I also said these specific patterns occur in relation to some aspect of the environment or the person himself. Let's just talk about a habit for a moment. An excellent example of a habit is the salute in the military. The young trainee is taught to think of saluting as important, to feel good about it and to always behave appropriately by performing the salute when certain parts of his environment are present; such as a ranking person whom he salutes. Your smoking is the same way. It is also a habit. As in any habit, you have learned to think of

smoking as being of some value; you have grown accustomed to feeling the pleasurable or relaxing sensations a cigarette can provide and you have learned a behavior pattern to obtain these rewarding feelings. The behavior pattern is buying and smoking a favorite brand of cigarettes, smoking your own individual way, smoking at certain times and places, and smoking while doing certain things. Basically, this is the smoking habit.

Now once you have a smoking habit, why is it hard to break? Let's consider this. Almost every time you smoke, your own personal pattern of obtaining pleasure and reducing tension with cigarettes is at least minimally rewarded. It is a fact that when any behavior is rewarded it will usually reoccur again, especially if it is rewarded enough. This is true of cigarette smoking and the rewards are essentially what keeps the habit going even when you consciously want to stop.

Now this may not be much news to you. I imagine all of you, if you thought about it, could explain cigarette smoking as I have done. Well, if we understand this habit so well, then why is it so hard to stop when we want to stop? Again the reason is a simple one. Because your smoking is almost always giving you a little pleasure or reducing a little tension, your smoking is ALWAYS being rewarded to occur again. The catch is that smoking is almost NEVER being discouraged to occur again. Because your habitual smoking pattern, for years, has been generally more pleasurable than not and reduces tension very quickly, it is ALWAYS being strengthened, but hardly EVER weakened. Because the whole habit pattern is almost always rewarded, after a period of time it becomes very hard to break.

O.K.--How can this clinic help you to break your smoking habit? The answer is simple. Smoking is a learned pattern of behavior like any other pattern of behavior. What is learned can be unlearned. If this pattern ceases to be rewarding to you, like any behavior that is not rewarding, it will decrease or stop altogether.

O.K.--Once again, the reason why your pattern of smoking cigarettes has been hard to break is simply that you have almost NEVER smoked a cigarette when you were not receiving at least partially, the rewards of some pleasure or reduction of uncomfortable tension. And the solution to the problem is this: If you are made to repeatedly associate some strong contradictory feelings with your smoking then your desire to smoke will be decreased or be eliminated.

One other thing; I spoke before about smoking occurring in response to your environment. It is also true that your desire to smoke has been conditioned to many situations which instigate smoking. That is, in each of your lives, there are places and activities where your smoking habit is most strongly reinforced to occur. More than likely, these are situations where you may feel a need to relax and a cigarette may seem to help you. You smoke in these situations and not in others because your cigarettes are more rewarding in these situations. Again--by associating some strong contradictory feeling with your smoking in situations where you habitually smoke--your desire to smoke will be

decreased or eliminated.

Now--how do we go about this? You have already been told that you are going to use your imagination to change your smoking habit. You have already been instructed and practiced various ways of relaxing yourself. Now sit back in your chair, close your eyes and relax. Let yourself relax as you did earlier.

APPENDIX J

TREATMENT EXPLANATIONS

Treatment Explanation for Conditions

I, II and III

In each of the scenes I am going to ask you to visualize, I am associating your desire to smoke with nausea which is very unpleasant. Over time, this association will become strong enough to make smoking an unpleasant experience for you and you will lose your desire to smoke.

Please let yourself feel totally, let yourself experience, as completely as you can, what I describe to you. Don't just visualize it--let yourself really feel what I describe in each scene I read to you.

Treatment Explanation for Condition IV

In each of the scenes I am going to ask you to visualize, I am associating your desire to smoke with a contradicting emotional force--positive self determination. In each scene I will ask you to imagine yourself achieving the goal of refusing to smoke through the systematic use of your own positive self determination. Over time, the cumulative reward for not smoking will outweigh your desire to smoke and you will lose your desire to smoke.

Please let yourself feel totally, let yourself experience, as completely as you can, what I describe to you. Don't just visualize it--let yourself really feel what I describe in each scene I read to you.

APPENDIX K

INSTRUCTIONS FOR DAILY PRACTICE

Condition I

You are to repeat what you have experienced and learned here daily until your next meeting. What you should do is this:

(1) Practice five nausea scenes four times a day. That is, imagine the places where you smoke; visualize vividly what you are doing while smoking in those places; and gradually each step of the way--as you first think of smoking--reach for--touch--pick up--and then raise a cigarette to your mouth--feel nauseated and finally feel like vomiting in response to your smoking. Do this in every scene.

(2) Please use the scenes we described tonight. If you NEVER smoke in some of the scenes we described tonight; pick enough scenes from your own smoking pattern to make up the difference. Remember, do five nausea scenes four times a day. This will make a total of 20 scenes each day.

Remember, do them just as you have learned to do them here. Relax, close your eyes, then use your imagination to experience everything in each scene--even though it is very unpleasant.

Condition II

You are to repeat what you have experienced and learned here daily until your next meeting. What you should do is this:

(1) Practice five nausea scenes four times a day. That is, imagine the places where you smoke, visualize vividly what you are doing while smoking in those places; and gradually, each step of the way--as you first think of smoking--reach for--touch--pick up--and then raise a cigarette to your mouth let yourself feel nauseated and finally feel like vomiting in response to your smoking. Do this in every scene.

(2) Between each nausea scene you also do a self-control scene. This is the scene where you imagine you start to smoke but as you do, you begin to feel nauseous. You decide not to smoke and immediately you feel fine.

(3) This makes a total of 20 scenes: each scene has the nausea part where you finally feel like vomiting; and then the self-control part where you reach for a cigarette; begin to feel like you will vomit; decide not to smoke and feel fine. You should pause a few seconds between the two parts. Do these 20 scenes twice a day.

Please use the scenes we described tonight to do your practice. If you NEVER smoke in some of these scenes described tonight pick enough scenes from your own smoking pattern to make up the difference. Do them as you have learned to do them here. Relax, close your eyes, then use your imagination to experience everything in each scene--even though it is very unpleasant.

Condition III

You are to repeat what you have experienced and learned here daily until your next meeting. What you should do is this:

(1) Practice five nausea scenes four times a day. That is, imagine the places where you smoke, visualize vividly what you are doing while smoking in those places; and gradually, each step of the way--as you first think of smoking--reach for--touch--pick up--and then raise a cigarette to your mouth let yourself feel nauseated and finally feel like vomiting in response to your smoking. Do this in every scene.

(2) Between each nausea scene you also do a self-control scene. This is the scene where you imagine you start to smoke but as you do, you begin to feel nauseous. You decide not to smoke and immediately you feel fine.

(3) This makes a total of 20 scenes: each scene has the nausea part where you finally feel like vomiting; and then the self-control part where you reach for a cigarette; begin to feel like you will vomit; decide not to smoke and feel fine. You should pause a few seconds between the two parts. Do these 20 scenes twice a day.

Please use the scenes we described tonight to do your practice. If you NEVER smoke in some of these scenes described tonight pick enough scenes from your own smoking pattern to make up the difference. Do them as you have learned to do them here. Relax, close your eyes, then use your imagination to experience everything in each scene--even though it is very unpleasant.

(4) Finally, whenever you are tempted to smoke; or whenever someone offers you a cigarette and you are tempted to smoke it, do two things:

1) Say "Stop!" to yourself

2) Imagine you are vomiting on a cigarette.

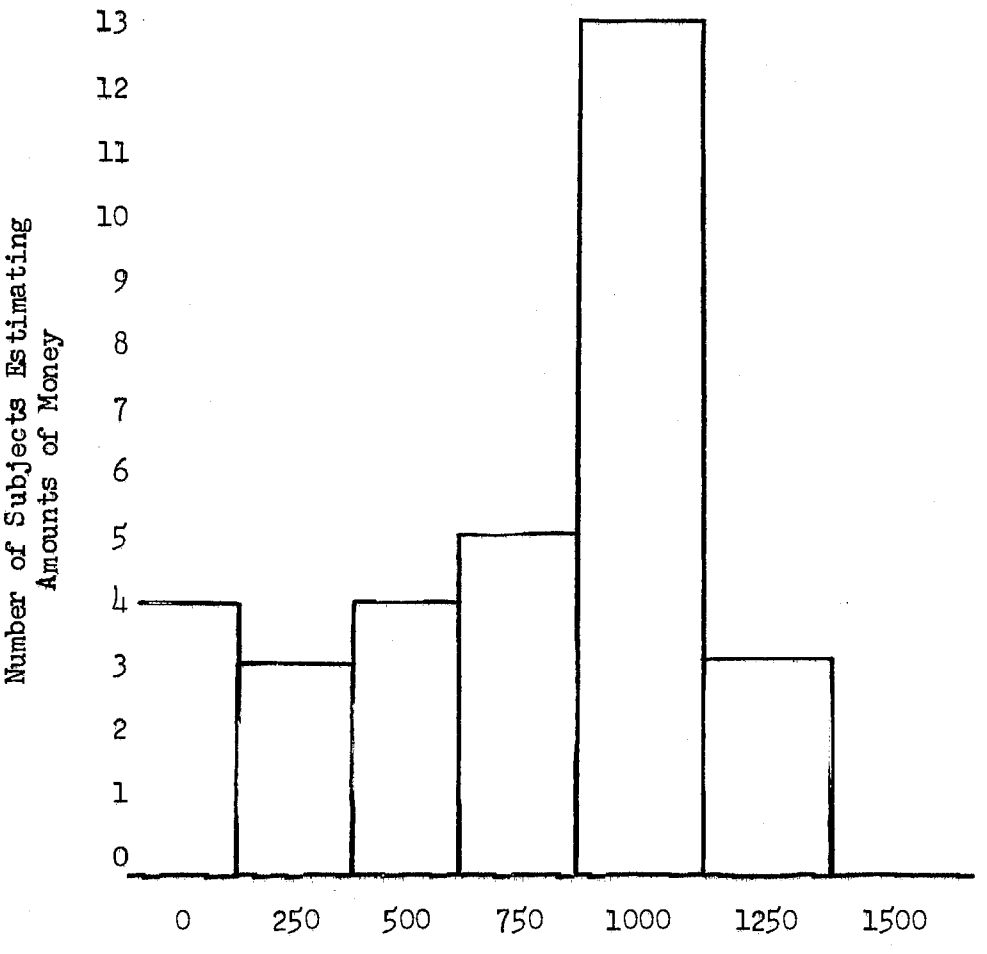
Condition IV

You are to repeat what you have experienced and learned here daily until our next meeting. What you should do is this:

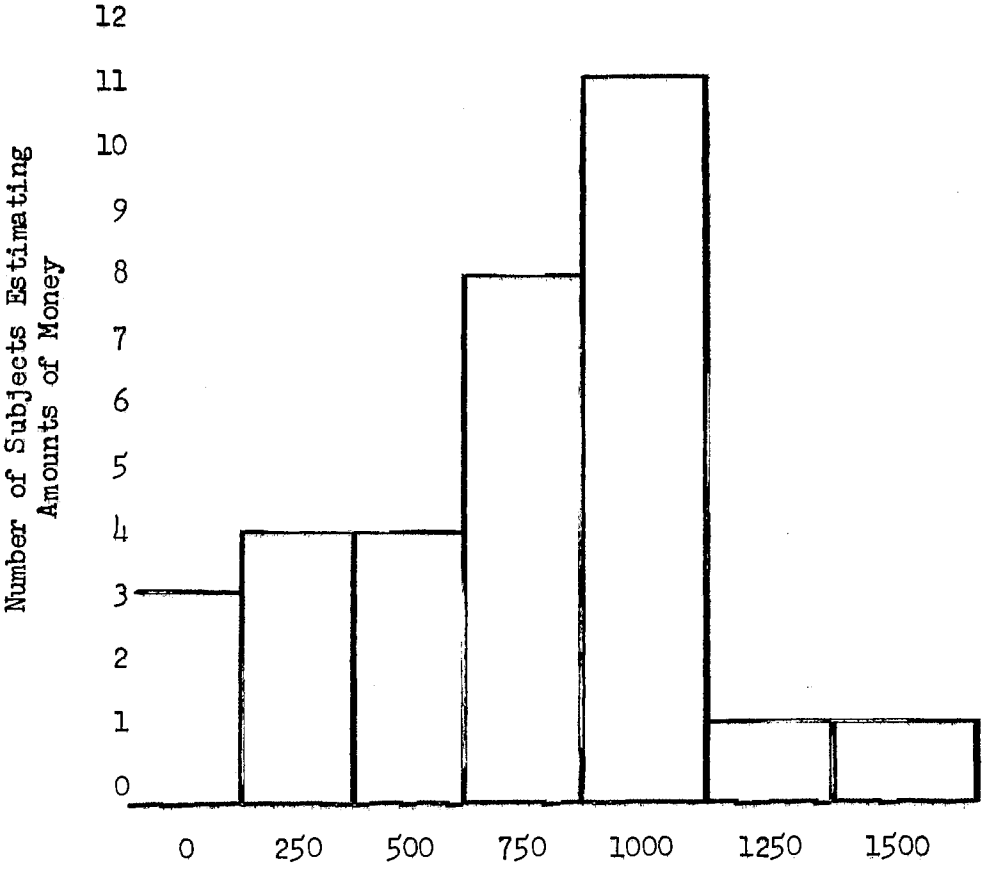
(1) Practice five will power scenes four times a day. That is, imagine the places where you smoke; visualize vividly what you are doing while smoking in those places; and gradually each step of the way--as you first think of smoking--reach for--touch--or pick up--and then raise a cigarette to your mouth, increase your will power not to smoke that cigarette; until, as you are about to put it in your mouth you visualize yourself rejecting the cigarette. End each scene with the imagery and strong feeling of "I didn't smoke the cigarette!"

(2) Please use the scenes we described tonight to do your practice. If you NEVER smoke in some of the scenes we described tonight pick enough scenes from your own smoking pattern to make up the difference. Remember, do five will power scenes four times a day. This will make a total of 20 will power scenes each day. Do them just as you have learned to do them here. Relax, close your eyes, then use your imagination to experience everything in each scene.

APPENDIX L



A Frequency Distribution of the Amount of Money Subjects Completing Therapy Estimated They Would Pay to be Immediately "Cured" of Smoking



A Frequency Distribution of the Amount of Money Subjects Terminating Therapy Estimated They Would Pay to be Immediately "Cured" of Smoking

VITA

Dennis Alan Rawlings

Candidate for the Degree of

Doctor of Philosophy

Thesis: THE EFFECTS OF THREE VERSIONS OF COVERT SENSITIZATION ON THE REDUCTION OF THE MALADAPTIVE BEHAVIOR OF SMOKING

Major Field: Psychology

Biographical:

Personal Data: Born in San Angelo, Texas, May 14, 1946, the son of George and Joan Rawlings.

Education: Attended elementary school in Midwest City, Oklahoma; Vacaville, California; Travis Air Force Base, California and Montgomery, Alabama; attended high school at RAF Molesworth and RAF Lakenheath, England, and graduated from Granada Hills High School in Granada Hills, California, in June, 1964; entered Oklahoma State University in September, 1964, and graduated in May, 1968, with a Bachelor of Science degree in Psychology; completed requirements for the Master of Science degree at Oklahoma State University in July, 1970; completed requirements for the Doctor of Philosophy degree at Oklahoma State University in May, 1973.

Professional Experience: Teaching introductory social psychology, January, 1970 to May, 1970; teaching psychology of human problems, September, 1970 to May, 1971; practicum experience at Payne County Guidance Clinic at Stillwater, Oklahoma, January, 1971 to August, 1971; psychology intern at Wilford Hall United States Air Force Base, San Antonio, Texas, from August, 1971 to September, 1972.