AN EXAMINATION OF THE EFFECTIVENESS OF COVERANT CONDITIONING IN THE REDUCTION OF CIGAETTE SMOKING

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ABSTRACT

AN EXAMINATION OF THE EFFECTIVENESS OF COVERANT CONDITIONING IN THE REDUCTION OF CIGARETTE SMOKING

By

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The purpose of this study was to test the effectiveness of coverant conditioning as a technique that can be used to extinguish cigarette smoking behaviors. This paradigm is based on Homme's use of Premack's P-hypothesis which states that a high probable behavior can reinforce a low probable behavior.

In order to test this habit-breaking technique, fifty-one, Lansing area residents and Michigan State University students who volunteered for the study were randomly assigned to one of three treatment groups. Group I Ss used a diary program and did not return after the second meeting; Group II Ss used the same diary program but met individually with an experimenter for an additional meeting to discuss the contents of their diaries; and Group III Ss used the same procedures as Group II and, in addition, were taught to use the coverant conditioning technique.

It was hypothesized that: 1) the mean number of cigarettes smoked in Group III would be significantly less than the mean number smoked in the other two groups at both a four- and eight-week period, and 2) there would be a significant difference in the percentages of dominant personality types (as measured by the Myers-Briggs Type Indicator) who were

able to decrease their smoking by more than 75%, between 75% and 25%, and by less than 25%.

The results of a multivariate analysis of covariance showed that while Groups III Ss smoked the least number of cigarettes at both measures, the only statistically significant difference among treatment groups was between Group I and Group III at the end of the first four weeks. A slight recidivism occurred for Groups II and III at the end of the second four-week period while Group I Ss continued to decrease their consumption so that there was a discernible interaction between the dependent and independent variables in Groups I and II at the final measure. A Chi-square test of homogeneity also revealed that there were no statistically significant differences of dominant types with respect to the three outcome categories. In addition, the follow-up questionnaire revealed mixed results which suggested that the degree of satisfaction and the continued use of the specific procedure assigned to each S increased concomitantly from a low in Group I to a high in Group III.

The implications of the findings indicate that working with a person who has some official status is a very powerful treatment (mean decrease from 26.57 to 12.63) in the reduction of smoking. When this Hawthorne effect is coupled with the coverant conditioning technique, the clinician has an effective tool in helping a motivated client extinguish his smoking behaviors.

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CHAPTER I

INTRODUCTION

College counselors very often see students whose presenting problems are highly specific. For example, clients will ask for help in stopping smoking, losing weight and breaking a variety of other maladaptive habits, being able to study more effectively, decreasing test and speech anxiety, obtaining dates as well as being more assertive in other social situations. While many counselors embrace a theoretical orientation that implies that the solution to these problems lies in helping the client gain insight into their causes and the underlying dynamics, an increasingly large body of research indicates that this approach is neither necessary nor helpful.

Wolpe (1966), Ullmann and Krasner (1966), Paul (1966) and Krumboltz and Thoreson (1964) as well as others have successfully used learning theory-based techniques such as systematic desensitization, operant conditioning, aversive conditioning, assertive training, modeling, and others to help the client acquire new behaviors that are more satisfying to him. In other words, these techniques have helped people lose weight, make successful speeches without fear, become more comfortable in social situations, establish dating relationships and solve other equally distressing problems. However,

there are still many specific, maladaptive behaviors which, as yet, seem unaffected by these as well as the more traditional procedures; and perhaps the most inexorable one is the habitual consumption of cigarettes.

Thus if a person seeks professional help in trying to stop smoking, the counselor, as yet, has no reliable strategy that he can use to help the client break this physiologically debilitating and often lethal habit. And because of this need to develop a successful strategy, it was the purpose of this study to examine a new method for helping motivated people stop smoking. The particular method that was under investigation is called coverant conditioning (Homme, 1965), and the effectiveness of this treatment procedure was tested by employing certain experimental groups that controlled for the effects of: 1) the experimenter-subject relationship, and 2) the increased self-awareness of one's smoking behaviors. In addition to examining the coverant technique, the experimenter attempted to discover whether it was possible to distinguish between the personality types of those smokers who were able to stop from those who failed.

The most unique aspect of the theory underlying the coverant conditioning paradigm is the assumption that man experiences what can be called private events or covert behaviors such as thoughts, feelings, and impressions. And the treatment of these private events is, for several researchers (Hefferline, 1962; Sulzer, 1962; Homme, 1965), psychology's new frontier. The region under the skin is no longer unreachable and the conditioning of new covert behaviors as well as the process of their acquisition, according to Hefferline (1962), "deserves even more intensive investigation for the light it

may throw upon the problem of 'internalization'. Transfer of behavior control from extereoceptive to internal stimuli must, it seems, lie at the core of this matter" (pp. 111-12). He further suggests that the stimulus-response paradigm be expanded to graphically represent the internal as well as the external process. He theorizes that S→r→s→R more adequately explains this process.

For example, a person who begins to converse with a stranger(S) may experience a sharp rise in anxiety(r) which then triggers the desire for a cigarette(s) which, when lighted(R), lowers his anxiety significantly. Thus, while meeting and talking with a stranger evokes the response of lighting a cigarette, Hefferline's model allows one to hypothesize about and subsequently attempt to treat the interior or private events which produced the observable response.

Skinner (1953) divided these covert behaviors into two groups: those that were purely private and those that were links in a chain of otherwise public events. He felt that the latter behaviors could be manipulated while the former were unreachable.

He even defined self-control as a self-management system in which the person becomes his own operant conditioner. The S has the power to obtain reinforcement but does not do so until a particular response has been emitted. For example, after he has cut the grass -- or some equally onerous task -- he then drinks a beer. Obviously the only reason that he is able to withhold the alcoholic reward until the task is completed is because he is motivated to withhold it.

However, Skinner doubted that self-extinction or the willful decision to decrease a behavior -- especially a pleasurable one -- would be effective. He wrote (1953) that self-control was really

external control by others and that one's environment and interpersonal relationships interacted to produce this control. The rewards and punishments that shape man's behavior, according to Skinner, are really dispensed by his fellow men in the myriad shapes and forms of approval or disapproval. But this hypothesis breaks down when it is used to explain, for example, the behaviors of the habitual smoker, drinker, or eater; for while the environment continually punishes him with everything from lung cancer and abject poverty to derision and loneliness, this person often maintains this self-defeating behavior.

Therefore it seems likely that there is some private area in man that controls some of his behavior. If one assumes that these private behavioral events obey the same laws as the non-private ones, then the frequency of their occurrence can be controlled by using a form of operant or, in this case, coverant conditioning. Homme (1965) has suggested that if the reinforcing event can be controlled, then these covert operants can be decreased or increased systematically.

If the behaviors that are to be increased or decreased are defined as low probable behaviors (LPB), then all that is necessary is to pair them with a highly probable behavior (HPB). Homme based this model on the P-hypothesis (Premack, 1959, 1961, 1963) which simply yet elegantly states that of any two responses, the independently more probable one will reinforce the less probable one. If behavior B is of a higher probability than behavior A, then behavior A can be made more probable by making behavior B contingent upon carrying out A. Premack (1963b) found that whenever items were presented in contingent pairs "no more-probable contingent event failed to reinforce any less probable free event; further, no more probable free event was reinforced by any less probable contingent event" (p. 86).

If a reinforcer is defined as a "contingent response whose independent probability of occurrence is greater than that of the associated instrumental response" (p. 87), then LPB's such as thinking about the lethal effects of cigarettes and also thinking about the benefits to be accrued by stopping smoking can be increased in frequency by pairing them with an HPB. Skinner (1957) pointed out that man uses self-prompts such as mental lists to help him remember some preplanned activity, and he also uses non-verbal self-probes to facilitate his verbal behavior. An habitual smoker could, then, construct a list of thoughts concerning cigarette consumption and use the items on the list (actual or mental) as self-prompts to increase his awareness of the effects of his smoking behavior on him. Because these newly developed behaviors are incompatible with smoking, they theoretically should decrease or extinguish cigarette smoking.

Homme has used the underlying principles of the P-hypothesis in several research studies that, while having a very small N, have yielded much support for the theory. In one study (1966a), a group of twenty-three high school dropouts completed an entire programmed course in both remedial reading and math by working through a specified number of frames in the text (LPB) and coupling this activity with a smoke or coffee break. Later in the year the HPB was being allowed to work on a specified number of frames of a programmed text in elementary Russian. Homme (1966a) has also used this paradigm in preparing three, wildly normal, three-year olds to sit quietly in a chair, focus on the blackboard and learn to recognize the various letters of the alphabet. After several days of immediately reinforcing the target behaviors, the children began to earn tokens for performing certain

LPB's that could be used later to buy an HPB. He found that certain HPB's were unanticipated, such as pushing the experimenter around the classroom while he sat on a chair equipped with casters.

In another study (1966a), one of Homme's colleagues treated a young girl who was blind and had become mute since her entry into a mental hospital. When the experimenter first confronted her, she grabbed his hand and smelled it. Instantly an HPB presented itself, and the researcher withheld his hand until the girl began to make sounds which were soon shaped into syllables and then words. Within a month, the S had a vocabulary of over 200 words.

In sum, Homme has found that the results that Premack obtained while working with rats and pigeons can be replicated in humans. And the work of others (Wolpe, 1958; Cautella, 1966; Paul, 1966) has indicated that pairing incompatible responses can extinguish certain undesired or debilitating behaviors.

In the present study, it was assumed that coverant conditioning would work only for those people who were clearly motivated to stop smoking, and therefore no tactics were used that would either frighten people out of their lethargy or convince the skeptics that they should give up smoking. Further, it was assumed from the beginning of the study that the volunteers were responsible for their own behaviors and that they were going to be taught a procedure that would enable them to "manage" their smoking and that the sessions in which the instructions were to be given would be highly task-oriented and devoid of any obvious support or reinforcement.

Finally, since no study has yet shown that coverant conditioning can be used to break the smoking habit, it was felt that no comparison

between this technique and others was necessary since the primary question that had to be answered was not how effective it was, but rather, was it an effective procedure. This question can be rewritten as a set of hypotheses that can then be tested, and they appear below.

Hypotheses

Hypothesis I. A group of subjects who are motivated to stop smoking and who are taught to use the coverant conditioning technique will show a statistically significantly greater reduction in cigarette consumption at the end of a four-week treatment period than all other experimental groups.

Hypothesis II. This same group will also show a statistically significantly greater reduction in the consumption of cigarettes at the end of an additional four-week period.

Hypothesis III. The percentage distribution of the dominant personality types of these subjects when compared across the outcome categories of a reduction in smoking of: 1) more than 75%, 2) between 25%-75%, or 3) less than 25% will not be equal.

CHAPTER II

REVIEW OF THE LITERATURE

The amount of research devoted to cigarette smoking is astounding, and any comprehensive review of it would constitute a study by itself. There are, however, several useful bibliographies that offer the interested researcher a thorough and continuous review of smoking literature from the early 1940's to the mid 1960's; and since such comprehensive reviews are readily available, it was not the purpose of this chapter to recapitulate what has already been accomplished.

Consequently, the discussion in this review has focused only on a detailed examination of the current research that is germane to the purposes of this study. Using this approach, the rationale underlying the strategies, treatment procedures, and general methodology has been defined and grounded in the results yielded from these studies.

A Review of the Reviews

Matarazzo and Saslow (1960), Ford, Starr and Ederer (1965), Prelaum (1965), Fine, Marchesani and Sweeney (1966) and Keutzer (1967) have done an exhaustive job of reviewing literally hundreds of studies which have examined the effectiveness of such treatments as the use of buffered lobeline sulfate, smoking clinics, educational programs, individual and group psychotherapy as well as research that was intended

to isolate certain personality dimensions that could differentiate between the smoker and the non-smoker.

Unfortunately, the recurring theme in all of these reviews seems to be that the traditional treatment procedures simply do not work. In general these authors conclude that while a few individual studies using different procedures have yielded significant results, these findings are the exception. Almost always, when those "successful studies" are replicated, the results are negative, placebo groups show significant reductions in smoking consumption, and delayed follow-ups yield a recidivism rate which obliterates any initial reductions in the Ss' smoking rates.

However, there are encouraging signs that those treatment methods that are psychologically based or, more specifically, derived from learning theory yield significant results when used to systematically modify smoking behaviors. These techniques can be grouped under the rubric of behavior therapy procedures (Eysenck, 1960; Wolpe, 1966; and Ullmann & Krasner, 1966) and employ either experimenter controlled treatments or self-control systems. Keutzer, Lichtenstein and Mees (1968) have published the most current review in which they examine case studies as well as clinical studies using control groups, and they conclude that the experiments using behavior modification methods yield the most consistent and promising results.

Behavior Modification Procedures

Experimenter-controlled Procedures. The procedures that have been developed from the learning theory paradigms of Hull or Skinner have been so primitive or cumbersome that their very impracticality

has prevented experimenters from obtaining successful results. While the equipment is often ingenious, the volunteers have to be stalwart in their commitment to stop smoking in order to tolerate the experimental treatments.

For example, Wilde (1964) and Franks, Fried and Ashem (1966) have used aversive conditioning in the form of blowing noxious amounts of cigarette smoke into the S's face with little real success. Aside from the very small sample sizes (seven and nine Ss respectively), the treatment method is both bizarre and horrific. The subject is required to breathe large amounts of hot, cigarette smoke which is blown into his face while he smokes a cigarette. After a predetermined amount of time, he extinguishes his cigarette and fresh air is then blown into his face. This procedure is employed several times a week and, as one might expect, there was a large experimental mortality rate.

In another study (Grimaldi & Lichtenstein, 1969) that uses the same form of aversive conditioning, the experimenters improved the methodology somewhat by adding another treatment group as well as a control group. Each of the twenty-nine Ss was required to make a deposit of twenty dollars that would be forfeited if he missed more than a specified number of sessions, which were held at least once each week. In this way, it was hoped that those volunteers who were not motivated would be screened out of the study.

In the contingent group the S was required to smoke a cigarette, breathe hot cigarette smoke which was blown from a machine and to look at the word "smoke" which was illuminated in front of him. When the S extinguished his cigarette, fresh air was substituted for the smoke and the words "fresh air" lighted up in place of the word "smoke."

Ss in the non-contingent group were required first to inhale the smoke from the machine as long as they could tolerate it and then to depress the ash tray which turned off the smoke machine. They were then instructed to light a cigarette and smoke it. Unlike the two treatment groups, the control Ss received only fresh air; and since they were yoked to the Ss in the experimental groups, the authors concluded that these Ss were exposed to the same experimenter and experimental effects.

However, the results of the study showed that at the end of the seventh week there was a significant reduction in cigarette smoking across all three groups and, further, that at the end of a month all of the Ss were smoking almost as many cigarettes as they did prior to the treatment. The experimenters concluded that hot, smoky air was not an effective "instrument" to use because it created many methodological problems, not the least of which was that it contaminated the fresh air that was blown in the faces of the control group members.

Using another form of aversive conditioning, McGuire and Vallance (1964) claimed significant results on a sample of one volunteer by using electric shock and pairing it with inhaling cigarette smoke. Powell and Azrin (1968) used an ingenious cigarette case with a lid that, when opened, activated a mechanism strapped to the S's arm which delivered an electric shock. Replete with a non-resetable counter, this clumsy device was so aversive that approximately 90% of the Ss withdrew from the experiment.

Undaunted, Azrin and Powell (1968) modified their earlier device by eliminating the shock mechanism and rigged the cigarette case so that it automatically locked for increasing intervals of time between

cigarette removals. With a sample size of five, the reported rate of total success is of questionable value. However, they were able to reduce the aversive qualities of the apparatus, which seems to be the most troublesome problem in using aversive conditioning techniques.

In a study much different from those discussed above, Kraft and Al-Issa (1967) assumed that anxiety was the cause of smoking and alcoholism and therefore used desensitization (Wolpe, 1958) on five hospitalized patients and achieved a significant reduction in the consumption of cigarettes over a two-year period. Tooley and Pratt (1967) employed a three-step procedure involving covert sensitization (Cautella, 1966), Homme's coverant conditioning (1965), and a contractual arrangement in which not smoking elicited certain rewards from spouse, experimenter and significant others. Since the experimenter had only two Ss, the success of completely extinguishing a two-pack per day habit is of little worth. It was, however, the first time that Homme's procedure had been tested. Unfortunately it was not systematically studied and there are too many confounding variables, not the least of which was that the two Ss were married!

Pyke, Agnew and Kopperud (1966) also employed systematic desensitization as part of a multiple-treatment procedure in attempting to modify cigarette consumption. They divided their total sample (N=55) into three groups, and used two of the three groups as controls. The Ss in Group I met in eleven group sessions and discussed those topics that were relevant to their "smoking problem." In addition, they were given educational information, were instructed to keep a record of every cigarette smoked and to plot daily and weekly graphs that would chart their progress. The final phase of the treatment was aimed

at decreasing their anxiety by administering systematic desensitization in individual sessions. GSR measures of the forearm and palm were taken in order to determine a decrease in each S's anxiety.

The Ss in Groups II and III were instructed only to monitor their smoking rate and did not participate in the group discussions nor receive desensitization. While there were significant differences between the treatment group and the control groups at the time that the initial follow-up was made (immediately after the treatment terminated), there was no difference between the three groups after four months.

While it would seem apparent that smoking behaviors are inimical to even a combination of treatment procedures, the authors did feel that desensitization had potential as a treatment method. They found that it would have to be modified so that the procedure could be shortened. For example, they found that three minutes was too long a time period for the Ss to maintain the desired level of relaxation after each item was presented; secondly, the relaxation level that was established using the GSR devices seemed to be unrealistically high. Consequently, the unanswered question is how the desensitization procedure could be shortened and therefore made more usable -- assuming that cigarette smokers use cigarettes to decrease their anxiety and that the anxiety can be clearly delimited.

Self-control Procedures. While sample sizes are often too small, in several studies under consideration, such was not the case. Resnick (1968) had a sample size of sixty and divided these Ss into three groups to test the hypothesis that cigarette smoking is reinforced by the consequences of it or, in other words, by the fact

that pleasure is almost always associated with the smoking of a cigarette. If, however, the reinforcement value of the consequences could be diminished, then, as Resnick proposed, the chain of behaviors would weaken and drop out.

He used stimulus satiation as his treatment procedure and instructed the Ss in one group to double their rate of cigarette smoking for one week and another to triple their rate while the control group Ss were simply told to stop smoking after one week. At the two-week follow-up the experimenter found that both treatment groups had significantly reduced their cigarette consumption while the control group had not. In addition, Resnick conducted another follow-up after four months and found no appreciable recidivism in the two treatment groups.

It is interesting to note that the experimenter reported that when he asked the Ss what they thought had caused them to reduce their smoking, they reported that it was will power; however, since the control group did not show significant reductions, it is extremely possible that stimulus satiation may have been an effective treatment procedure. It is, at least, a procedure that should be exposed to further testing and should be replicated by other studies that could also employ other experimental groups which could control for less observable factors that might have contributed to the significant results.

Ober (1968), in a much more complicated experiment, looked at a variety of treatment procedures which were adapted from more traditional hypothetical models. For example, one treatment group was taught to play a transactional smoking game which was derived from Berne's work.

Each S in this group was given a card which read: "I don't have to play the smoking game"; using the armchair method, the author theorized that if the Ss gained insight into their reasons for smoking they could then control their smoking behaviors. Another group of Ss were given a card and told to read it before they smoked; the card had the following statement written on it: "I have the control not to smoke this cigarette." In addition, they were given a self-control manual that explained various psychological principles such as chaining, shaping, modeling and reinforcement. In one sense, the manual was a programmed method that the S could use to learn about his own behavior.

Aversion therapy was also used but in a radically different way. The Ss in the aversion group were given pocket-sized shock mechanisms and were instructed to shock themselves whenever they desired a cigarette up to the moment of actually lighting it. The control group received no exposure to any treatment; and all of the Ss -- with the exception of those in the control group -- were seen for ten, fifty-minute sessions over a period of four weeks. There were a total of six treatment groups and one control, and the results indicated that all six groups reduced their smoking consumption significantly more than the control group for four consecutive weeks after treatment termination.

Unfortunately the positive results do not really support the conclusion that all methods are effective. Since the control group was of the no-contact variety, it could be expected that <u>any</u> procedure -- perhaps even the burning of incense -- would have more effect than none at all. The design of this study in no way allows one to measure the Hawthorne effect. In addition, the author readily admits that the Ss were repeatedly told that they were participating in a "scientific

study," and there is no way of knowing how much impact this message had on them. Telling the volunteers that the research project was official and somehow mysterious was not the only confounding variable. Another was the follow-up method that was used. Each S was required to give the names of two friends who were familiar with his smoking habits and who could, therefore, verify his self-report. There is, of course, no way of knowing whether or not telling one's friends commits the S to a more serious attempt at quitting smoking, since to fail might bring at least embarrassment if not derision from one's peers.

However this study is unique in that it is one of the first to test not only self-control procedures but to attempt to create new and more manageable methods that, while based on traditional models, are innovative enough to extend the experimental boundaries of research in behavior therapy techniques. Ober's work indicates clearly that a S can be trained to be his own aversive conditioner, transactional therapist or operant conditioner, and that is a major step in research on self-control procedures.

Whitman (1969) attempted to replicate part of Ober's work in a study in which he used self-control procedures as well as more traditional ones. He matched seventy-three Ss on the basis of age, number of cigarettes smoked and the years that they had smoked prior to treatment and assigned them to one of four groups.

There were three treatments used: 1) information dissemination, 2) aversive conditioning, and 3) self-control. The control group was also of the no-contact variety. Ss in the information group received pamphlets and watched movies that clearly conveyed the message that

smoking was dangerous. The aversive conditioning group members were given pocket-sized shock mechanisms and were instructed to shock themselves three times before they lighted every third cigarette. They were also told to put powdered quinine on their tongues if they still desired a cigarette. It was theorized that the bitter nature of quinine when combined with cigarette smoke would produce a highly noxious effect. The self-control group also used a manual identical to the one used in Ober's study, and it was hypothesized that becoming more aware of the reasons why the S smoked would make smoking an incompatible response. Each of these techniques was administered in a group setting and by non-professionals.

The results indicate that while there was a significant difference between all three treatment groups and the control group at the first follow-up (one week after the treatment terminated), there was no difference after three months between all four groups. Again it seems clear that any treatment appears to be more immediately effective than no treatment and therefore there seems little value in using a no-contact control group. And, as is the case in so many designs of the studies under review in this chapter, it is impossible to tease out the effects of merely participating in a study or working with an experimenter that, by his very position, must appear official and authoritative. Since all three groups reduced their smoking rate, either the three treatments were equally effective or the "participation" effect confounded the results.

To date, only one study has used Homme's coverant conditioning model to help motivated Ss stop smoking. In this research project (N=213), Keutzer (1967) investigated the differential effects of four

treatment procedures: 1) coverant control therapy, 2) pairing the aversiveness of holding one's breath with images of inhaling cigarette smoke, 3) negative practice of inhaling an unusual amount of cigarette smoke, and 4) a placebo drug. Each of these treatment groups met separately but for three consecutive sessions.

Of the four procedures perhaps the only one that needs to be defined is the second one listed above. This technique is simply a form of aversive conditioning but avoids using shock or other noxious forms of punishment. The S is instructed to hold his breath for fifteen to twenty seconds until it becomes mildly painful and then to think about one of the initial stimuli that triggers his desire for a cigarette. After the S masters this technique in the laboratory, he is instructed to use it outside at those times that he thinks about wanting a cigarette.

Along with the differential effectiveness of the four treatments, the experimenter examined whether or not sex, age, and level of education could be used as predictor variables; in addition Keutzer looked at both the number of cigarettes each S smoked as well as the number of times that each had reportedly tried to stop smoking. Further, she investigated the predictive value of five personality variables derived from instruments used by Eysenck and Cattell.

The results of this study were, with one exception, statistically non-significant. The one significant difference was between the smoking rate of those Ss who were treated and those Ss who were in the control groups. However, an analysis of variance of the four treatment group means did not yield a significant F value. Demographic variables, previous smoking history, extraversion, neuroticism, and the

personality dimensions failed to support the hypotheses in the direction predicted by the experimenter.

What may have accounted for such disappointing results is the fact that certain basic questions concerning the effectiveness of coverant conditioning, negative practice and the use of breath holding techniques must be answered before these procedures can be compared. It seems essential to find out whether the procedure works and what it is about the particular method that makes it work. With these answers in hand one can then proceed to test their differential effectiveness. In the case of coverant conditioning, no one has yet examined its worth using a design that would allow the researcher to tease out the parts that make it effective.

However, all of these studies demonstrate clearly that self-control procedures can be used easily by the volunteer who is motivated to stop smoking. Further, these procedures are unique and, while they need to be refined and tested, they seem to hold potential as effective ways of breaking the smoking habit.

Personality

Studies of personality and smoking have generally attempted to identify characteristics that differentiated between the smoker and non-smoker (Schubert, 1959; Eysenck, 1960; Straits & Sechrest, 1963; Weatherly, 1965; James, Woodruff & Werner, 1965; Cattell, 1967; Evans, Borgatta & Bohrnstedt, 1967; Smith, 1967; Zagona & Zurcher, 1967; Keutzer, 1967). Almost always these studies use college populations and such instruments as the Edwards Personal Preference Schedule (EPPS), Minnesota Multiphasic Personality Inventory (MMPI) and the 16 Personality Factor Questionnaire (16 PFQ).

Generally the findings have been consistently negative. In one of the above studies (Smith, 1967) the experimenter combined the test scores and peer ratings of 1,274 non-smokers, smokers, and heavy smokers and used them in a multiple discriminant analysis and was able to differentiate with a 68% accuracy between smokers and non-smokers and with a 76% accuracy between non-smokers and heavy smokers. The major importance of this study was that it demonstrated that certain personality characteristics could be used as variables in differentiating not only smokers from non-smokers but the degree of cigarette consumption within the smoking group.

In the only other study that showed positive results (James, Woodruff & Werner, 1965), a scale derived from Rotter's social learning theory was used to measure to what extent a person perceives events as determined by factors intrinsic and manipulable or extrinsic and manipulable by fate or others. Using 272 female and 185 male undergraduates, the hypothesis that smokers were more externally controlled was supported.

Other experimenters have taken a different tact in that they have tried to identify the underlying dynamics that might cause the desire to smoke. Stewart and Livson (1966) found that smokers are more rebellious both as children and as adults. Landy (1967) did not succeed in demonstrating that there were sex differences among smokers using the psychoanalytic model. Orality and impulsivity were found in only two studies (Jacobs, Knapp, Anderson, Karush, Meissner & Richman, 1965, 1966) to differentiate smokers from non-smokers.

There are, in almost all of these studies, several recurring problems that remain unresolved. Sample sizes are often small and

control groups are either non-existent or of questionable value. In addition, the measuring instruments that traditionally have been used often suffer from a lack of construct validity -- or value even as research instruments. Since each of these variables could confound the results of a study, it seems that before further research is carried out, more basic problems need to be solved. And since literally hundreds of studies have used this approach and have yielded insignificant findings, it may be that such an approach is too simplistic.

Matarazzo and Saslow (1960) argue convincingly in a thorough review of the research on psychologically and sociologically related characteristics of smokers that there are so many variables that interact across people that only a multiple factor explanation could be useful. If there are more than seventy million smokers in the United States (Matarazzo & Saslow, 1960), then it seems logical that personality typologies that describe general behavior patterns rather than specific traits or pathological tendencies would be more useful in attempting to categorize people. In other words, it is possible that there <u>are</u> real differences at the macro- rather than the micro-scopic level of human behavior between the smoker and the non-smoker or between the smoker and the person who is able to stop smoking.

Internalization Process

Often in the discussion section of research articles the experimenter muses over various alternative explanations that might have accounted for a lack of significant results. In the use of educational materials in treating smoking, investigators have speculated that the Ss who continue to smoke in the face of a four- or eight-week barrage

of information describing the lethal and personally detrimental effects of cigarettes are able to somehow short-circuit or "turn off" this information.

Brock and Balloun (1967) elegantly demonstrated that this phenomenon may actually exist. Using a total N of ninety-six Ss, the experimenters randomly exposed them to one of three tape recordings: 1) a presentation of research that indicates that smoking leads to cancer, 2) a presentation of research that indicates that there is no conclusive evidence that smoking leads to cancer, and 3) a neutral stimulus concerning India. In addition, static was introduced while the recordings were played and by pushing a button, the listener could clear the static temporarily. Males, who were heavier smokers, pushed the button more often to clear the static from the statement (number 2) that presented doubt concerning the link between smoking and cancer.

Another and equally important series of studies (Leventhal, Singer & Jones, 1965; Leventhal, Watts & Pagano, 1967) examined the effects of fear as a variable in the treatment of smoking. The results indicated that while shock tactics or a high-fear content message exerted an immediate effect on the intentions to quit smoking, it had no long range effect on behavior. The moderate fear presentation, while having little effect on immediate intentions to quit, did have a long-range, positive effect on compliance.

If, then, a treatment approach was structured so that the fear content of the information was moderate, then the variable of compliance would be more adequately controlled. However, an additional treatment procedure must be used that will prevent Ss from "tuning out" the cognitive material and thus avoiding dissonance which, in the case of cigarette smoking, may be used therapeutically.

Conclusions

It seems clear from a review of the literature that the evidence tentatively suggests that self-control procedures show some promise as successful treatment methods; however, with the exception of coverant conditioning, these techniques have failed to force the volunteer to internalize the message that smoking is an extremely lethal habit. While aversion techniques work initially, once they are terminated most Ss resume their pre-treatment habit of smoking.

It is possible, then, that using coverant conditioning has two distinct advantages over the other techniques. First it is neither cumbersome nor aversive and, secondly, it has built into it a system whereby the motivated smoker can not turn off the thoughts that would make smoking an incompatible response. What remains is to test its effectiveness in a way that will permit the researcher to account for certain factors such as the Hawthorne effect. In this way, a positive result can be interpreted with a great deal more surety than studies have as yet been able to do.

CHAPTER III

METHOD

The most important part of conducting a study which examines various ways of extinguishing smoking behavior is interesting potential Ss enough to create in them a desire to volunteer. And because extensive publicity coverage is the most effective way to accomplish this task, the major Lansing newspaper, suburban weekly publications, and the Michigan State University newspaper (potential circulation of 40,000 students) were contacted and articles were written that emphasized both the need to be motivated to stop smoking as well as the self-management aspects of the methods that were to be used. In addition, 5,000 residence hall mailboxes were stuffed with an announcement of the experiment (see Appendix A). Lansing-area clergymen were also contacted by mail (see Appendix B) and were requested to publicize the study in their respective congregations.

Motivation. Gutman (1967) pointed out that the most serious problem in carrying out research concerned with treating smoking behaviors was the S's lack of motivation and the subsequently large experimental mortality rate. One way to overcome this problem was to require each S to give the experimenter a check for ten dollars that was made payable to the American Cancer Society. These checks were returned to those volunteers that completed the treatment period; the checks of those who dropped out of the study or who did not return the

first follow-up questionnaire were sent to the Michigan Division of the American Cancer Society as a contribution. While other studies have charged a larger fee (Keutzer, 1967; Grimaldi & Lichtenstein, 1969), it was felt that the money was to be only a screening device that would prevent unmotivated people from participating; it was not to act as a confounding treatment effect.

Procedure

At the initial meeting of the study, the Ss were required to fill out a personal data sheet, take a personality inventory and to give the experimenter a check for ten dollars that was made payable to the American Cancer Society. During the next week the Ss were randomly assigned to one of the three groups described below. They were contacted by mail and reassembled exactly one week after their initial encounter to begin the "treatment."

Group I: No Contact-Diary Group. At the initial meeting of all of the seventeen Ss of this particular treatment group, an experimenter handed out a printed form (see Appendix C) which he identified as the diary procedure. The paper first described some fictitious research that corroborated the effectiveness of this procedure and then delineated the specific steps that the Ss were to follow in writing their diary.

The instructions directed the volunteers to keep a daily record of any feelings, attitudes and thoughts that related to their smoking. In addition, they were to add whatever else they felt was "therapeutic." After all of the questions of these Ss were answered during the initial meeting, they were told that no further contact was necessary (see

Appendix D). However they were required to send in each week's entries and in this way, while there was no contact, they were made to feel as though they were still participating in the study. At the end of the four-week treatment period and again at the end of another four-week period, they were contacted by mail in order to obtain the number of cigarettes that they were smoking.

While the diary procedure was created using the armchair method of hypothesizing, a close examination of each item will reveal that it aims directly at certain key behaviors and feelings that the smoker experiences during his waking hours. In this way, any diligent S was able to gain a great deal of insight into his habit and, if self-awareness was a factor of real import in reducing one's consumption of cigarettes, then Group I should have shown a statistically significant decrease.

Group II: Contact-Diary Group. These seventeen Ss were divided into two groups and were lead by people who were introduced as "graduate students who wanted to help people stop smoking." During this small group meeting, they were instructed to use the diary procedure in the same way as were those in Group I. They were also told to bring their week's diary recordings back the following week and were then seen individually for approximately twenty minutes.

The content of these interviews was limited to talking about the S's written comments (see Appendix E). In no way did the experimenter attempt to consciously give approval or disapproval (although the perceptions of the Ss cannot be controlled adequately); also, the experimenter neither referred to the S's past history nor to his progress and attempted to give neutral responses such as "Yes,

I see" or "Hmmm, you seemed to have smoked no cigarettes until after lunch", etc. In short he focused on the contents of the diary and the feelings, attitudes and thoughts of the S.

Posing as one interested only in the data, the experimenter tried to be a relatively neutral stimulus. However, if there were certain positive effects due to the Hawthorne effect, this group would have shown a significant reduction in cigarette consumption.

Group III: Contact-Diary-Coverant Conditioning Group. In addition to receiving the same instructions as Groups I and II, these seventeen subjects were also divided into two, small groups and taught to use coverant conditioning, a self-management procedure that makes some specified HPB contingent upon carrying out certain LPB's. Each S in the treatment group was asked to construct a list of reasons why he personally thought that cigarette smoking was harmful to him. For some people, having bad breath was a more undesirable characteristic of smoking than the probability of getting lung cancer, and thus the list was individually tailored to each S's system of priorities. In addition, the S also composed a list of reasons why quitting smoking was beneficial to him. Then the experimenter defined what an HPB was and used several examples. Together, each S explored with the experimenter some HPB's that were appropriate. For example, it was suggested that some of the female Ss could use putting on lipstick as an HPB, depending, of course, on the individual and how many times throughout the day she applied cosmetics. Another common behavior that was used as an HPB was getting a cup of coffee or any liquid.

Each person was instructed to think about or read the items he had included on his list (imaginary or actual) of LPB's and then to carry

out the HPB immediately afterward. The Ss were warned not to make cigarette smoking the HPB! They were also urged to keep a daily count of the consumption of cigarettes during the treatment period because a perceived reduction would act as an immediate reinforcer for the treatment effect. The general format for instruction in the use of coverant conditioning was standardized and written out so that all of the experimenters used the same procedure (see Appendix F).

These Ss were then told to report one week later for an individual conference to "check out" and solve any problems that they might have had in adjusting the conditioning technique to their individual dynamics.

General Procedures. During the initial meeting no attempt was made to tell the Ss to stop smoking -- as a matter of fact, that topic was entirely ignored. After all of the paper work had been completed, they were told to return the following week and that they would be divided into groups and that the treatment would begin at that time. However, at the end of the meeting certain educational materials were distributed to them, but no attention was directed towards them. The Ss were simply told that they might find the contents interesting.

These materials are published by the American Cancer Society and are entitled: IF YOU WANT TO GIVE UP CIGARETTES and SMOKING AND HEALTH. The first pamphlet contains information that describes common problems that people encounter while trying to stop smoking, and it offers ways of coping with them. The tone is sympathetic and extremely supportive, urging that even if one has failed in past attempts, it is still possible for him to successfully give up cigarettes. The other brochure is merely a condensation of salient information that was presented in the Surgeon General's Report. There is clearly no attempt

to frighten the reader; there are no photographs of diseased lungs or horrific descriptions of cancer operations.

Most current research (Ford & Ederer, 1965; Mausner, 1966; Keutzer et. al., 1968) had demonstrated that educational materials are not an effective treatment procedure in extinguishing smoking behavior, but that does not mean that they are devoid of any value. The particular pamphlets discussed above have a great deal of valuable information, and they lent a certain authenticity and hence credibility to the study. Secondly, there was a seven-day period between the first and second meetings during which the Ss were only required to make a frequency count of the cigarettes which they smoked that week. Hopefully, by giving the Ss some "official" materials to read during the interim period, it helped to sustain their motivation and interest in participating in this study.

Finally, since all Ss were randomly assigned to one of the experimental groups, two roommates and two couples were split so that half of each pair was placed in a different group. It was imperative that all of the Ss be cautioned, in an extremely subtle way, not to divulge the nature of the procedure that they were using. The experimenters met together before the study began and decided to tell the group members that since each group was using a somewhat different procedure, the results of the research depended on their not discussing their particular technique with anyone else. The experimenters reported that the Ss felt a real responsibility to keep experimental contamination at a minimum and enjoyed keeping what some referred to as "their secret."

Smoking Measures

Initial Smoking Record. The number of cigarettes that the Ss smoked before the experiment began was recorded by them during the time between the initial meeting and the first treatment session. They were asked to keep a daily count which was averaged in order to derive a base line value or pre-test score.

While the experimenter realized that self-report is sometimes capricious, he assumed that the Ss had been honest in their count. To insure that the pre-test frequency was as accurate a count as possible, the number of cigarettes that the S declared that he smoked on the personal data sheet (see Appendix G), which he filled out on the first night of the experiment, was compared with the count that the S made during the interim week. The form (see Appendix H) on which that count was recorded had a space in which he was to declare whether or not that week's total was a "normal" amount. If the S had been trying to reduce his smoking rate during that week, then the pre-test score was derived from the number reported on the first night's data sheet. If the two totals differed slightly, then the mean of the two scores was computed and used as the pre-test value.

Follow-up Questionnaires. In addition, at the end of the four-week treatment period and again after the eighth week a questionnaire (see Appendices I and J) was mailed to each S which asked him to compute how many cigarettes he was smoking at the time of the mailing. Because at both the four-week and eight-week follow-ups several of the Ss were delinquent in returning the material, they were contacted by phone and asked how many cigarettes they were presently smoking. In this way, their smoking rate was measured at each four-week period and

the post- and delayed post-test values were a true measure of each S's progress at the end of each four-week segment.

Since the other items on the questionnaire were not severely affected by a time delay, the Ss were urged to return the form as soon as possible. And to enhance their compliance, a stamped, addressed envelope was included with the questionnaire.

Design and Analysis. A repeated measures design was used in this study, and the time period between the pre- and immediate post-test as well as between the immediate post- and delayed post-test was divided into two, four-week periods. The Ss were randomly assigned to one of the three treatment groups. Initially there were twenty-one Ss in Groups I and II and twenty Ss in Group III; however, by the end of the study the experimental mortality had unequally reduced the size of all treatment groups. In order to obtain equal N's across all three groups, two Ss in Group II and one S in Group III were randomly selected and removed from the data analysis.

The statistical model that was used in analyzing the data was a multivariate analysis of covariance (MANCOVA) (Bock & Haggard, 1968). This particular statistic was used because it was felt that the immediate post-test and the delayed post-test were not statistically independent. In other words, it seems logical to assume that there is some degree of correlation between the number of cigarettes a S smoked at the time of the immediate post-test and the number that he smoked at the time of the delayed post-test. Bock and Haggard write: "Because the dependent variables are correlated and not statistically independent, the assumption of independence would be violated if a univariate analysis of variance were calculated." He goes on to explain that, "The

multivariate tests...are based on sample statistics which take into account the correlations between variables and have known, exact sampling distributions from which the required probabilities can be obtained" (p. 102). And since the pre-test scores represented such a wide range of individual differences, the covariance aspect of the model was appropriate and, since individual differences are a major source of error in comparing control and treatment groups, a MANCOVA would both eliminate some of the error and thereby increase the power of the test as well as prevent the violation of one of the assumptions underlying the statistical model.

In addition, a Chi-square statistic was computed to determine whether there were any significant differences in the dominant personality types between those Ss who were able to reduce their smoking rate by more than 75%, between 75% and 25% or by less than 25%. The contingency table that was constructed to obtain the Chi-square value had many cells that had expected values of less than five. While these low values have traditionally been transformed using Yates' correction, Lewontin and Felsenstein (1965) have found that, in their words, "...very small and even fractional expectations do not, in general, invalidate the χ^2 test although in extreme cases the χ^2 test is not completely conservative. Nevertheless even in such cases, the disagreement with the Monte Carlo probabilities is small" (p. 33). Thus the researchers have found that a χ^2 test of homogeneity is an extremely robust test even when the expected values are small and Yates' correction is not used.

Instrument. The personality instrument that was used in this study was the Myers-Briggs Type Indicator (MBTI) (Myers, 1962), which the Ss completed at the first night's meeting. This instrument is a self-report

inventory which is intended to measure variables stemming from the Jungian personality typology. It consists of four scales: Extraversion - Introversion (E-I), Sensation - Intuition (S-N), Thinking - Feeling (T-F), and Judging - Perceiving (J-P). The E-I scale presumably measures interest in things and people or concepts and ideas; the S-N scale, tendencies to perceive through the usual sensory processes or indirectly via the unconscious; the T-F scale, tendencies to judge (or evaluate) phenomena rationally and impersonally; and the J-P scale, tendencies to reach conclusions about phenomena or to become aware of them. These scales were expressly developed to classify people into type categories. Each of the four scales yields two raw scores which correspond to the two ends of the continuum, e.g., a thinking score and a feeling score, and these raw values are converted into four preference scores which, in turn, are converted into a personality type.

Researchers have used the MBTI to study client-counselor similarity and its effect on outcome (Mendelsohn & Geller, 1963; Mendelsohn, 1966) and found that the typologies were a meaningful way to describe general personality patterns. Mendelsohn and Kirk (1962) have also used the instrument to differentiate those students who use the counseling center from those who do not. Vaughan and Knapp (1963) used the MBTI to study such covert behaviors as pessimism.

Sample

Although there were sixty-two Ss that initially volunteered for the study, only fifty-one Ss (twenty-nine females and twenty-two males) completed it. And unlike many studies concerning smoking, the composition

of this sample included people involved in a variety of occupations. Table 1 depicts the types of jobs and the number of Ss in each occupational group.

TABLE 1

COMPOSITION OF INITIAL SAMPLE BY OCCUPATION (N=62)

Occupation	Number
Auto mechanic	1
Business	4
Computer Programmer	2
Housewife	17
Journalist	1
Management	4
Registered Nurse	2
Secretary	4
Student (MSU undergraduate)	17
Student (MSU graduate)	5
Teacher (Lansing School District)	2
Teacher (MSU)	3
	N=62

Another way of looking at the initial sample is to group them according to their dominant type using the MBTI. This data is presented in Table 2. It would appear that all but two of the dominant types are almost equally represented in both sexes. By non-statistical inspection, it seems that there are more male Extraverted Thinkers and there are more female Introverted Feelers. This finding may indicate that in order for men to volunteer to quit smoking they need to analyze in a very objective way the reasons why such an effort might be beneficial; women, on the other hand, might tend to volunteer because they have a private commitment or belief that they "ought" to stop smoking.

TABLE 2

COMPOSITION OF INITIAL SAMPLE BY MYERS-BRIGGS TYPES (N=62)

Personality Type	Number	
	Males	Females
Extraverted Sensors	3	5
Introverted Sensors	2	4
Extraverted Intuitives	4	6
Introverted Intuitives	3	4
Extraverted Thinkers	5	1
Introverted Thinkers	3	2
Extraverted Feelers	2	2
Introverted Feelers	5	11
	N=27	N=35

However, to determine whether or not the male and female Ss in this sample were different in terms of preferring one or more of the functions, a comparison was made between them and a population that was taken from the MBTI manual (Myers, 1962). The population was composed of 325 male and 273 female twelfth graders. Since the manual offers only six comparison groups which include both male and female values, it was felt that the academic twelfth grade students were most like the sample Ss.

Because of the nature of the scoring of the MBTI, a person obtains a score on each of the eight dimensions and since they are not mutually exclusive and therefore not independent, a comparison was made for each preference score separately. The alpha level was set at .01 to create a more stringent test and because the sample size was small. In

addition, the overall possibility of obtaining a significantly different value was eight chances out of one hundred.

Table 3 summarizes the results of the calculations. The only value that is significantly different is the female Introversion score, which might indicate that many of the women who volunteered for this study had very private and subjective reasons for quitting smoking and that these reasons would probably not include an objective analysis of the harmful effects of smoking. For example, these women would be more likely to explain that they wanted to stop because if they contracted cancer and died, there would be no one to take care of their children -- or they wouldn't be able to watch their children grow up.

While the initial sample was quite similar to the population, could the same conclusion be made concerning the sample that completed the study? In other words, did those Ss who either dropped out or who were randomly removed from the groups change the composition of the sample so that it differed from the population. Table 4 presents a summary of the Chi-square comparisons which indicate that the only significant difference was the female Introversion score.

In general, the sample of people who completed this study are very much like the larger population. They represent a broad range of occupations as well as personality types. It was assumed that they were motivated to stop smoking, and it appears that many of the female Ss wanted to stop for extremely subjective reasons.

TABLE 3

COMPARISON OF A POPULATION DISTRIBUTION OF PREFERENCE SCORES WITH THE INITIAL SAMPLE SCORES

	Males			Females		
Preference	Observed	Expected	χ^2	Observed	Expected	χ^2
Extraversion	14	17	.18	14	24	4.17
Introversion	13	10	.90	21	11	9.10**
Sensing	11	16	1.56	19	22	.41
Intuition	16	11	2.27	18	13	1.92
Thinking	16	15	.07	16	11	2.27
Feeling	11	12	.08	29	24	1.04
Judging	12	13	.08	11	16	1.56
Perceiving	15	14	.64	24	19	.47

** $\chi^2_{\text{Observed}} \geq$ df=1, α= .01=6.63

TABLE 4

COMPARISON OF A POPULATION DISTRIBUTION OF PREFERENCE SCORES WITH THE SCORES OF THOSE SUBJECTS WHO COMPLETED THE STUDY

	Males			Females		
Preference	Observed	Expected	χ^2	Observed	Expected	χ^2
Extraversion	10	14	1.14	11	20	4.05
Introversion	12	8	2.00	18	9	9.00**
Sensing	9	13	1.23	14	18	.88
Intuition	13	9	1.77	15	8	6.12
Thinking	13	12	.08	5	9	1.77
Feeling	9	10	.10	24	17	2.88
Judging	10	11	.09	10	14	1.14
Perceiving	12	11	.09	19	13	1.06

** $\chi^2_{\text{Observed}} \geq df=1, \alpha=.01 = 6.63$

CHAPTER IV

RESULTS

Treatment Effects. The most important dependent variable that was examined in this study was the differential effect that the various treatments had on the number of cigarettes each S smoked at the fourth and eighth week. Table 5 shows that while all groups seemed to reduce their smoking rate, the only significant difference ($F=10.46 \geq F_{df=1/47}$, $\alpha=.05, p < .002$) among the three was that between Groups I and III at the post-test measure. While there was some small recidivism in Groups II and III, the major factor which prevented any significant difference at the delayed post-test measure was the continued decrease in the mean number of cigarettes consumed in Group I.

TABLE 5

GRAND MEAN AND CELL MEAN DIFFERENCES
UNADJUSTED AND ADJUSTED FOR THE COVARIATES' EFFECT

Mean Differences	Pre-test	Post-test		Delayed Post-test	
		Adjusted	Unadjusted	Adjusted	Unadjusted
μ	26.57	0.37	12.63	3.45	13.12
$\mu_1 - \mu_3$	2.18	11.35	12.35*	5.03	5.82
$\mu_2 - \mu_3$	4.12	3.87	5.76	5.76	7.24

*$F=10.46 \geq F_{df=1/47, \alpha=.05}=4.04$

Figure 1 graphically illustrates the interaction that took place at the delayed post-test. While the diary-no-contact group did not drastically reduce their smoking at the end of the first four weeks, they did continue the reduction so that at the end of eight weeks, Group I smoked less cigarettes than Group II. As would be expected, the rank order of smoking rates in Group I shifted drastically and contributed to a low test-retest reliability. Table 6 shows that in Group I, the reliability of the pre- and the post-test was significant (.49); however, the reliability of the pre- with the delayed post-test was not statistically significant (.08), and the conclusion can be made that there was a random reordering of Ss with respect to amount of cigarettes smoked in the second four-week period.

TABLE 6

TEST-RETEST RELIABILITY WITHIN GROUPS
ACROSS THREE MEASURES

Measures	Pre-test			Post-test		
	Group I	Group II	Group III	Group I	Group II	Group III
Pre-test						
Post-test	.49*	.50*	.14			
Delayed Post-test	.08	.67*	-.06	.18	.77*	.75*

*$r \geq r_{df=16, \alpha=.05} = .47$

It would appear that the difference between Groups II and III increases slightly over time, but this difference was not statistically significant. The paralleled reduction in smoking consumption in these

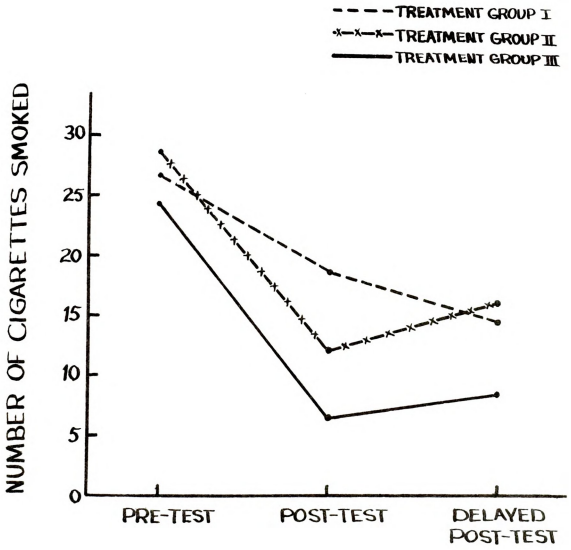

Figure 1. Mean number of cigarettes smoked for each treatment group at each 4-week period.

two groups and the slight and concomitant recidivism that occurred make it impossible to determine whether the coverant conditioning treatment was more effective than simply using the diary procedure and working with an experimenter.

The data in Table 6 indicates that the most stable group with respect to test-retest reliability was Group II. The correlation between the pre- and post-test was significant (.50); and, after the immediacy of the treatment effect began to diminish, the correlation rises to .66 between the pre- and delayed post-test. The correlation between the pre- and post-test in Group III indicates a radical shift occurred and this rank order change shifted even further during the second four-week period. In other words, there was such a completely random change in the number of cigarettes smoked by the Ss that there is a -0.06 correlation between the pre- and delayed post-test. However, the significant correlation between the post- and delayed post-test in Groups II and III (.77 and .75 respectively) indicate that once the treatment was terminated, the reported increases and decreases in smoking stabilized with respect to the rank order of the Ss. Statistical analysis of the data results in the following conclusions concerning the hypotheses:

Hypothesis I. A group of subjects who are motivated to stop smoking and who are taught to use the coverant conditioning technique will show a statistically significantly greater reduction in cigarette consumption at the end of a four-week treatment period than all other experimental groups. Failed to Confirm.

Hypothesis II. This same group will also show a statistically significantly greater reduction in the consumption of cigarettes at the end of an additional four-week period. Failed to confirm.

Personality Differences. In order to determine whether the Ss' dominant personality types were distributed in equal proportions across the three outcome categories, a contingency table was constructed (see Table 7). The total N in Table 7 is 54 because the three Ss who

TABLE 7

OBSERVED AND EXPECTED FREQUENCIES OF DOMINANT TYPE DISTRIBUTED ACROSS THREE OUTCOME CATEGORIES

Percentage Smoking Reduced	Sensors	Intuitors	Thinkers	Feelers	
< 75%	1 (3.61)	6 (3.61)	1 (2.50)	7 (5.28)	15
75%-25%	10 (6.26)	4 (6.26)	4 (4.33)	8 (9.15)	26
> 25%	2 (3.13)	3 (3.13)	4 (2.17)	4 (4.57)	13
	13	13	9	19	54

$\chi^2_{observed} < \chi^2_{df=6, \alpha=.05} = 12.59$

had completed the study but who were randomly deleted in order to equalize the N's of the three cells for the MANCOVA were returned to the sample pool. It was reasoned that they were originally part of the study and, therefore, their cigarette smoking rate and personality type could be compared without in any way changing the distribution of the sample.

The Chi-square statistic ($\chi^2 = 10.90 < \chi^2_{df=6, \alpha=.05} = 12.59$) was not significant. Literal inspection of Table 7 reveals that there was not even a discernible linear relationship between what type of person was able to reduce his smoking radically, moderately, or very little. Thus analysis of the data results in the following conclusions concerning the hypothesis:

Hypothesis III. The percentage distribution of the dominant personality types of these subjects when compared across the outcome categories of a reduction in smoking of: 1) more than 75%, 2) between 25%-75%, or 3) less than 25% will not be equal. Failed to confirm.

Follow-up Questionnaire Responses. There was no legitimate way to statistically analyze the Ss' responses to the items on either of the two questionnaires; however, they were quantified to some degree by converting them into percentages. And perhaps the first result that emerged from such an analysis was that Ss very often either do not bother to answer a question or ignore it and respond in a totally irrelevant manner!

Table 8 reviews the items that were included in the post-test follow-up. Groups II and III indicated that they had significantly reduced their smoking (88%) while a slight majority (59%) of those Ss in Group I failed to make a significant reduction. It would appear that working with an experimenter and with a clearly defined procedure helped the Ss maintain their motivation, because the Ss in the no-contact group reported that 47% lacked the drive to stop while only 6% and 12% respectively in Groups II and III reported a similar problem. At the end of four weeks, of the three groups only a slight majority (53%) of those Ss in Group III were still using the procedure that they had

TABLE 8

RESPONSES TO POST-TEST QUESTIONNAIRE

Treatment Group	Reason for Present Smoking Rate			Presently Using Technique		Useful		Was $10 Important	
	Stopped or Significant Reduction	No Motivation	Other	Yes	No	Yes	No	Yes	No
(I) Diary-No-Contact N=17	35%	47%	12%	41%	59%	24%	75%	6%	94%
(II) Diary-Contact N=17	88%	6%	6%	35%	71%	59%	41%	29%	71%
(III) Diary-Contact-Coverant Conditioning N=17	88%	12%	0%	53%	47%	71%	18%	6%	88%

Note.--Since not all of the Ss responded to all of the items and, further, since some of the responses were irrelevant, the percentage totals do not always equal 100%.

been taught and, concomitantly, the reported degree of satisfaction with the procedure increased from a low of 24% in Group I to a high of 71% in Group III. Finally, the majority of Ss in all groups responded that the risk of losing the ten dollars which they had deposited with the experimenter was not an important incentive in trying to reduce their cigarette consumption. In almost all cases where the S indicated that the money was important, it was because he was a student on a very limited budget.

In Table 9, the response percentages show that a very large number of Ss did not respond to some of the items. From the data that was available, it appears that the reason most often given by those Ss whose smoking rates increased in the second four-week period was either increased pressure and/or lack of commitment. On the other hand, those Ss who decreased their smoking consumption in the second four-week period declared that they had experienced less pressures or were committed and more resolute. The response to the item which queries how they felt about themselves as behavior managers when they looked back over the last eight weeks indicated that only a slight majority (53%) of the Ss in Group III felt quite positively about themselves.

There is a good deal more data that can be gleaned from these follow-up questionnaires, but it is not quantifiable. For example, seventeen Ss donated their checks to the American Cancer Society; many felt that they wanted a temperance-type approach replete with horrific movies and impassioned lectures describing the dangers of smoking; and those who were able to greatly reduce their cigarette consumption wrote thank you notes or lavished encomiums on the experimenter for his work. But perhaps the most startling response -- and the most aberrant -- was one written by a member of Group II in answer to

TABLE 9

RESPONSES TO DELAYED POST-TEST QUESTIONNAIRE

Treatment Groups	Reason for Present Smoking Rate		Reason for Decreased Smoking Rate			Self-Concept as a Behavior Manager		
	Pressure	Lack of Commitment	Commitment	Treatment Procedure + Commitment	Other	Quite Good	Neutral	Bad
(I) Diary-No-Contact N=17	18%	24%	12%	12%	6%	18%	29%	24%
(II) Diary-Contact N=17	12%	24%	24%	18%	0%	24%	29%	35%
(III) Diary-Contact-Coverant Conditioning N=17	12%	12%	29%	12%	12%	53%	12%	18%

Note.--Since many of the Ss did not respond to all of the items, the percentage totals do not equal 100%.

the last question on the post-test form, and it is reproduced here exactly as it was written:

> The $10 means nothing. The time can never be replaced and I am very upset that I invested any in the first place. I find myself absolutely amazed that "psychology" and "psychiatry" are actually legitimate and recognized as rendering any service whatsoever. This non-directive therapy bologna is a fat sham. As much service or help is available at a concrete wall. Only it doesn't carry on an interview with uh huh, uh huh, uh-huh -- it has the decency to remain mute and they never imply that help will be offered, where none is available. Now you can answer this question. Which is more moral, the non-directive "therapist" or the concrete wall?

Diary Entries. Like the follow-up data, the diaries that were completed and returned to the experimenter by the Ss in the no-contact group deny statistical treatment. However, they reveal the intense emotional involvement that, while immeasurable in precise terms, is a real part of the struggle to break the smoking habit. Excerpts from four diaries have been selected that recreate the daily vicissitudes of the smoker as he monitors his own behavior. While such self-monitoring is highly selective, it does offer at least a window into the private world which Homme described as the "region under the skin."

SUBJECT A

> 12 cigarettes--Evening while talking with my husband. Last night I didn't write. My husband and I had a discussion. All those things that I had been holding in--my resentment of his insensitivity, lack of interest--the whole bit. So I smoked and felt justified I suppose. Didn't feel guilty or disgusted. Didn't care since I didn't care much about myself or us in the situation. Maybe I need being supported and hear my husband say things like--no, it's not true--you are important.
>
> Guess I first started smoking today while at work. I substitute teach at the Boys Training School (disturbed delinquent boys 12-17 years) and had a particularly rough age group--or classes. Drank coffee and had cig. during the morning meeting....I came home--threw some TV dinners in oven. Had a couple of drinks and cigs and went to bed. My

husband came in room and we started our discussion--bad scene. Smoked on and didn't care.

Had a delightful day--nice to be away with Norm alone--Think I'll be able to cut down even more now--Didn't think much about smoking today. Got hungry and smoked on way home but also when I found a restaurant and coffee. Very nice. So tomorrow try to cut down even more.

Felt sociable. Back home, don't usually smoke much with kids around because they give me lots of grief about quitting, etc. Tomorrow I'm driving Norm to Detroit. I will visit friends in Detroit--will smoke alot--one is the sister of a very dear friend of mine who was killed in his private plane about 2 years ago--only 35--family has never really adjusted. I'm not going to think about quitting until Tuesday but did pretty well today. Busy and Norm didn't smoke either. There were times I wanted one but had a sour lime. Helped a bit.

SUBJECT B

(1) Smoked pretty evenly all day--that is, during rest and coffee breaks--upon waking, after meals, when doing business on phone, during evening.
(2) Smoked less than a pack today, and enjoyed most. Became nauseated during last part of some cigarettes. This clinic has inhibited my smoking usual amount, for do not reach for cigarettes when my body really doesn't crave them.
(3) Smoked more yesterday when found out my new baby is seriously ill. Thought this is no time to quit. Now think might as well, for if you wait for a good time, there is fear of backsliding when another crises hits. This way no excuse.
(4) Smoking is a friend. I feel lost and strained and as if I am waiting for something when don't have a cigarette. With the first cigarette the tension is relieved. Especially on days when you try to quit "cold turkey" there is the tension of will I make it or not?
(5) I feel disgusted and dirty about being a smoker and ashamed and angry. I'm not doing anything about it today except this.

(1) Smoked evenly all day.
(2) Tasted terrible--smoked from tension and habit only.
(3) My baby hospitalized after 7 hours of pain at home.
(4) Nerves probably worse because smoked and felt only adding to our problems by continuing self-destructive habit.

(1) Smoked during evening most. After baby's successful surgery and his finally sleeping so I had time to stay in parents' smoking room.
(2) I'm just hurting myself by smoking and the whole family because my efficiency is reduced.
(3) Above--not really an excuse. I smoke on good days too you know.

(1) All day-afternoon when baby slept some.
(2) Relief--had chance to rest.
(3) Baby has another hernia. O boy.
(4) About 22 cigarettes. Too tired to introspect about smoking.

(1) Evening while writing this.
(2) If a person was truly motivated they would not need a clinic. Those who need help like me are those who still want to smoke while knowing they should quit. That's why your method won't work.
(3) 1½ packs. I'm going to quit pretty soon.

SUBJECT C

(1) After mealtime.
(2) I didn't realize I smoked as many cigarettes today. I thought I was cutting down and keeping a closer count. Tried to deny myself more than usual.
(3) Got rushed right after lunch.
(4) When I feel tired and still have more tasks to do I feel a cigarette gives me a boost. Probably because I take the time to sit down and have the cigarette and this gives me the time to rest and then stimulates me to go on. Often have a cup of tea at this time and this gives me more energy.
(5) I hate myself for being a habitual smoker! Today I had a cup of tea without a cigarette and I found it gave me energy without the cigarette which I originally felt I needed.

(1) While getting dinner.
(2) I think I was hungry, also the confusion with the children and trying to get the meal on, while they were fighting as they were also hungry. Just didn't realize I was smoking that much.
(3) My husband is on vacation this week. He has brain damage and when he is home, feel myself more tense, as he is demanding and cross with the family. Find I'm the peacemaker.
(4) When I have had to settle arguments with the children--make a decision--I find myself with a cigarette--It helps for the time being.

(5) Don't feel I'm doing much or accomplishing much toward this habit. Maybe next week will be better for me to stop smoking--after my husband is back to work and I'm on my usual schedule, so that I have more time to myself and can do the things I like to do.

(1) Dinner hour and clean-up afterwards.
(2) I don't feel as disgusted with myself about these cigarettes, because I think the reason I'm smoking them is the unpleasantness I anticipate when my husband arrives home from work. Feel I can and am able to accept this more each day.
(3) Really don't feel that cigarettes help any with my nervous tensions. In fact, I think I feel worse after. That's why I really do want to quit.
(4) I'm not as disgusted with myself for being a habitual smoker as I now see how I was and am using it as a crutch. Feel I am cutting down and hope my 0 day is near.

SUBJECT D

Still smoked 2 cigs. when I got up this morning. I smoked 2 or 3 before dinner and about 10 from 12:00 to 3:00. I decided not to smoke at all after I got home from work today but did have 2 cigs while watching TV. My total for today was 16 or 17. I feel good about this as this is about half what I usually smoke. I did not get or feel nervous at any time and firmly believe that my smoking habit is caused by just not having enough to do. When I get a free moment I smoke a cig just to have something to do. I wish I could get up tomorrow and not smoke a cig all day.

I don't think that I will ever go one day without a cigarette. I got up this morning and was smoking one when my wife asked me what I was smoking for. I didn't even know that I was smoking a cig until she spoke to me. So the rest of the day I smoked one right after another. When I think about it I now feel kind of stupid but what I was doing was punishing myself. I have really gotten to hate these things and somehow am going to quit.

Same story second verse. I can now see how your idea or project of how to stop or cut down smoking will work. Every time I sit down to write these reports I feel more and more like a fool because I can't stop. This system is going to humiliate me until I just up and quit. I smoked a pack today but I just know that the time for me to quite is getting very close. I hope it will be tomorrow.

> Today I smoked six cigs. This has been my all-time low in probably ten years, and I feel very good about it. For some reason after I smoke the first one my wanting for a cig drops off considerably. I do not enjoy smoking after a meal like I used to but I still find myself lighting one anyhow, however after a couple of puffs I put it out. This is definitely a nervous habit and I am starting to get over it and know that soon I will not be smoking at all.

These four excerpts are fairly typical of all of those submitted by the Ss in Group I. While the personal problems varied in their degree of severity, there were certain commonalities. The Ss were often dubious concerning the efficacy of the treatment procedure, felt discouraged when they did not perceive an immediate decrease in their smoking rate and generally questioned their commitment to stopping. Further, their desire to stop and to use a procedure was always vitiated by whatever daily stresses they encountered. At such times the cigarette was seen as a tranquilizer, a palliative -- even as an adjunct for solving complex personal problems.

Yet, in almost every instance the smoker was quick to perceive the folly in which he was engaged. In sum, the diary technique was a highly effective way to increase the S's insight into his smoking behavior, but it appears that insight alone was not a very effective process in breaking the smoking habit.

CHAPTER V

DISCUSSION

Summary. The counselor who works in a college or community mental health setting is confronted with a variety of problems. Until the present time, he did not have in his repetoire any reliable means for helping a client reduce or extinguish his smoking behavior. Yet, because of the latest research on smoking, increasing federal controls on the tobacco industry, and the significant increase in anti-smoking advertisements, an increasingly larger number of people are aware of the deleterious effects of smoking and are asking for help in breaking their smoking habits. It seems imperative that professionals in the "helping" professions have at their disposal a researched method that can be used to help these people.

Therefore it was the purpose of this study to test the effectiveness of coverant conditioning as a technique that can be used to extinguish the cigarette smoking habit response. This paradigm is based on the P-hypothesis which states that a high probable behavior can reinforce a low probable behavior. When applied to cigarette smokers, their low probable behaviors are thoughts concerning the lethal as well as the socially and economically undesirable aspects of smoking; in addition, smokers rarely think about the advanatages of quitting. Some highly probable behavior is identified in a S's life and made contingent on "running off" a series of these thoughts.

It was theorized that these behaviors are incompatible with smoking and would therefore reciprocally inhibit its occurrence.

A review of the current research on smoking indicated that self-control procedures such as coverant conditioning showed the most promise in being used to reduce cigarette consumption. However, until the present study, no research had attempted to measure the effect of certain variables such as the Hawthorne effect as well as the value that increased insight might have in helping a smoker break his habit. In addition, no research had attempted to discover whether or not there were any general personality differences across those Ss who were able to reduce their consumption by relative amounts.

In order to test this habit-breaking technique, publicity was disseminated in the Lansing area which described the study and emphasized the self-management aspects of the procedures to be investigated. Initially sixty-two smokers volunteered to participate but, because of experimental mortality and the resultant adjustment for equal N's, only fifty-one Ss were used in the data analysis. These Ss were from all parts of the community and were not, as in most studies, merely composed of college students.

They were randomly assigned to one of three treatment groups and were given the MBTI at the first meeting. Chi-square tests of comparison revealed that the male Ss were not significantly different from the population on all eight dimensions of the MBTI; the only difference for the females was on the Introversion scale. This difference held up for both the initial sample of sixty-two Ss as well as the final sample group composed of fifty-one Ss.

The Ss also gave the experimenter a ten dollar check which was made payable to the American Cancer Society, which was to be forfeited if a S dropped out of the experiment during the first four weeks or did not return the first follow-up questionnaire. The money was used only as a screening device to prevent unmotivated people from volunteering for the study.

The treatment that was used in the no-contact group(I) was a diary procedure that was created by the experimenter and aimed squarely at those significant times during the smoker's day when he was most likely to smoke. It also attempted to make him aware of his feelings of self and the reasons why he smoked. Group II Ss used this same diary procedure and met with an experimenter for a twenty-minute session after having recorded their entries for one week. Group III Ss also used this diary and met with an experimenter individually for a twenty-minute period but, in addition, they were taught to use the coverant conditioning technique.

There were three observations made during the study: 1) a pre-test number of cigarettes smoked, 2) a post-test number four weeks later, and 3) a delayed post-test number after an additional four weeks had elapsed. At the completion of the eighth week, a MANCOVA was calculated and the only significant difference among treatment groups was between Group I and Group III on the post-test measure. A slight recidivism had occurred for Groups II and III at the delayed post-test while Group I Ss continued to decrease their consumption so that there was a discernible interaction between Groups I and II at the final measure. A Chi-square statistic also revealed that there were no differences of dominant types with respect to the three outcome

categories (<75% reduction, 25%-75%, >25%). In addition the follow-up questionnaires revealed mixed results which suggested that the degree of satisfaction and the continued use of the specific procedure assigned to each S increased in a linear fashion from a low in Group I to a high in Group III. The diary material of Group I also seemed to indicate that many of the Ss were involved in very complex personal problems, and they reported that these problems seemed to interfere with their successfully reducing their cigarette consumption.

Discussion

The overall results of this study would indicate that the coverant conditioning technique, while initially effective, seems, across time, no more powerful than a relationship in which the counselor helps the client examine how and why he maintains his smoking behavior. The data also reveals that there is clearly a linear relationship between outcome and an increasingly complex set of treatments; that is, insight+contact+ coverant conditioning yielded the greatest reduction in smoking. Yet other parts of the data suggest that there were many other variables that contributed to some extremely unsystematic and unexpected results. The reasons for these occurrences can be partially teased out of the data when the treatment groups are examined individually.

Treatment Groups. The Ss in Group I were given an untested procedure that was created from certain hypotheses about smokers and their habitual use of cigarettes. The experimenter could not anticipate its relative worth. The strategy was to give motivated Ss a credible device that might increase their insight into their smoking behaviors. In this way the results of Group I might be used to discover how much

effect insight and minimal participation in a "scientific" study might have on one's smoking behaviors.

It was reported by the experimenters that these volunteers were extremely dubious of the value of the procedure and had to be repeatedly convinced of its efficacy. In addition, they realized that they were not to return for further treatment and that others who have volunteered to participate were getting different and, in their mind, perhaps better procedures. In short, they seemed disappointed because there was no ritual, group participation, and other routines traditionally used by smoking clinics, and they felt somewhat cheated. Some even asked that at the end of the study the other procedures be made available -- as if they had already lowered their level of expectations to imminent failure.

The results show that during the first weeks these Ss, as a group, reduced their consumption the least of the three and that the reduction that occurred was systematic. The majority reported at the first follow-up that they had stopped using the diary procedure. It would seem as though such a solitary activity was an aversive experience, and many reported that it was annoying and time consuming; others wrote that the mere thought of the diary made them feel guilty about their smoking and that writing in it was not necessary. It would seem that most of the Ss were saying that since they were not going to share their diary entries with any one in an official capacity, they did not want to write in them any more than was required to obtain their ten dollar refund.

From the diary entries that were returned to the experimenter, it seemed apparent that these Ss lead relatively troubled lives. Yet it

can be assumed that the daily existence of these people was not significantly different from that of the other Ss in the study. However, in the second four-week period while the other Ss of Groups II and III were beginning to show a recidivism rate, the mean number of cigarettes smoked in Group I continued to decrease. Within the group there was a seemingly random reordering of members with respect to the number of cigarettes they smoked at the post- and delayed post-test time periods. Since they reportedly stopped using the diary procedure, the seemingly obvious conclusion is that, in a random fashion, many Ss employed self-control and began smoking less cigarettes.

Several questions concerning these results cannot be answered within the framework of this study's design. For example, there is no way of knowing what part the Ss' initial insight played in helping precipitate this reduction nor whether the treatment had a delayed effect. And many of the heaviest smokers decreased their smoking the greatest. Psychologically it could be predicted that the opposite would occur; that is, Ss who smoke thirty cigarettes each day are so habitually involved that they would have to exert a great deal more effort than the person who smoked only nine or ten per day. A more parsimonious explanation might also be that the values are regressing toward the mean.

A possible explanation for the general reduction of cigarette consumption in this group might be that perhaps the personal problems and pressures that these Ss experienced had decreased and they were more able to break the association between smoking and being more relaxed or less pressured. While such an interpretation is uncorroborated by any hard data, it does raise the question of whether a

significant reduction in stress is a necessary condition for reducing one's smoking behaviors. If such a decrease is contingent upon a happier life-period, then it may be extremely unstable, giving way to a large increment when situational stress is encountered.

Further research could begin to answer this question by investigating both a S's smoking rate and the problems he perceives as affecting him. Also, other insight devices need to be validated and, as a by-product, the whole issue of insight and changing smoking behaviors would then come under investigation. The results of such a study might indicate that insight is simply not a sufficient means of reducing such habitual behaviors as smoking.

The Ss in Group II were much more comfortable with the procedure that was assigned to them at the first meeting. They were faithful keepers of their diary and returned the following week to discuss it and their smoking with an experimenter. They were punctual in keeping their appointments and eager to talk. Such contact seemed sufficient enough that, while not significant, the Ss did reduce their smoking consumption relative to Group I. In addition, the test- retest coefficients for Group II were all significant, which indicates that the treatment effect was additive and accounted for a sizeable amount of the change.

The major weakness in the design with respect to this group is the fact that there is no way of knowing whether the recidivism that occurred at the delayed post-test would have stabilized or continued to creep up toward the pre-test mean. Another unanswerable question is whether more weekly sessions with an experimenter would have proved to be a powerful enough treatment to surpass the other two

groups in the size of the smoking reduction. And if the experimenters had been openly supportive of the Ss' attempts, the results might have shown an even larger and perhaps more stable decrease.

While this study has shown that the Hawthorne effect is a powerful one, future research ought to examine how it can be used as an effective treatment procedure. In addition, certain related variables should be studied systematically to discover their value in contributing to the Hawthorne effect. For example, a group of Ss should be given a good deal of warmth and support while another deprived as were the Ss in Group II. In addition, the MBTI could be used to match Ss and experimenter in order to measure the relative worth of such pairing. Also, the time factor could be analyzed to determine the optimum number of sessions that would be needed in order to obtain the best results.

However, the results of this study also indicate that coverant conditioning is a promising technique -- when linked with the effects created by working with another person. While not statistically significant, the way in which Group II and III Ss respectively reduced their cigarette consumption at the post-test measure substantiates its value. The results of the study also indicate that the treatment did not seem to effect all Ss equally; that is, the shifting in rank order that occurred during the first four weeks was random. Many of the heaviest smokers reduced their consumption the most. Again, this phenomenon seems to make little sense psychologically and, since it occurred in another group, it may be independent of treatment. Individual differences seems, at present, the most obvious -- but not very useful -- explanation. And adding to the confusion, once the immediate effects of the treatment had subsided, the rank order of the smokers from post- to delayed

post-test stabilized significantly. It is possible that not all of the Ss fully understood the way in which the HPB and LPB's were to be managed and that this confusion may have in some way contributed to the non-systematic reduction. The experimenters reported that during their individual interviews, many of the Ss confessed that they were still unclear about the use of the conditioning technique.

This lack of understanding is one of the major weaknesses in the methology of this study. Because the Group III Ss were not divided into sufficiently small enough groups, many left the session confused; smaller groups would have permitted the experimenters to perceive a person's confusion and perhaps even to have anticipated faulty learning. It was suggested that after the initial group meeting, the Ss be placed in dyads or triads for their period of instruction.

Other studies need to be conducted in which reliably researched communication techniques are employed in order to preclude a S's confusion. For example, placards and other visual aids could be used; perhaps a tape recording of a real or fictitious session in which an experimenter and a smoker work through the building of a list of LPB's and the identifying of several HPB's might be effective as a model. A variety of simple techniques should be developed that would prevent the S from becoming too familiar with his lists of LPB's, because such familiarity was reported to have effectively blocked out the items on a card from the S's perception. Several housewives, for example, placed the lists on the refrigerator door and used opening the door as their HPB. After the tenth opening of the door, they ignored the cards as if it had become an inherent part of the appliance. Ss must be taught to move the lists and also to change their HPB's; in addition,

color coding and other more ingenious devices need to be explored that would prevent this blocking from occurring.

Naturally the effectiveness of coverant conditioning as a habit breaking technique should be tested by using it on other maladaptive responses such as obesity, alcoholism, drug addiction as well as on academic problems such as managing one's studying behaviors. Homme even suggests that depression is a likely target behavior. As a result of such research, some of the questions raised in this study might be answered.

Looking back across the outcomes of both the individual groups and the variables that were examined in this study, it seems clear that there are some very practical findings which the counselor might use with a person who wants to stop smoking. At this time it would appear that merely helping the client gain insight or creating a supportive relationship is an insufficient procedure. However, there is some indication (post-test values) that by using the Hawthorne effect and the coverant conditioning paradigm the counselor is creating the optimum conditions for bringing about a behavioral change. Working vis à vis the S, the counselor can deal with any interference from personal concerns and also make certain that the client understands the procedure; the effect of using a self-management technique will enable the client to feel -- as the majority of the Ss in Group III felt in the last follow-up -- that he is able to manage his own behavior. This discovery may allow him to feel quite positively about himself.

Perhaps the single most important advantage of working in one-to-one relationship is that the paradigm can be revised on a weekly basis to fit the changing needs of the client. And certainly the most

valuable aspects of the Hawthorne effect can be utilized. At this time the results would suggest that the ratio of one client to one counselor would produce the optimum change. Further research might examine the relative effectiveness of using groups for subsequent interviews, because the client could expunge any residual guilt, confess any excessive smoking behaviors, garner support from the other members as well as to learn how they have adapted the technique to their specific life styles.

Personality. Unfortunately the entire area of personality differentiation remains unanswered in this study. Using the theoretical description of the various dominant types (ignoring the introverted and extraverted dimensions), it could be hypothesized that dominant Thinkers would be more apt to manage their smoking behavior because the thinking function enables one to organize logically, perceive objective relationships, and analyze with skill and facility. The sensing function, according to theory, should also be valuable in reducing smoking. Sensors are aware of their surroundings, how they feel, what they wear and whether or not a particular object or act is useful in a very practical way. If smoking research demonstrates that cigarettes are lethal and if a Sensor is given a tangible and non-theoretical method for stopping smoking, he should be relatively successful.

However, the results indicate that there are no statistically significant differences with respect to type and outcome. It is possible that these non-significant results are a function of the small sample size. Yet even when an attempt is made to identify trends by literal inspection of Table 7, the results are unsystematic.

Perhaps a possible explanation is that each type perceives and evaluates his reasons for stopping smoking in his own idiosyncratic way and converts them into an attempt which may or may not be successful. The Intuitor may enjoy a fantasy in which he does not smoke or has quit and be so pleased with the image that he translates it into reality. The Feeler may be so devoted to a promise or a personal cause that he, too, is able to be faithful to the procedure -- whatever it is. In other words, the commitment to stop and the ability to employ a procedure seems, at this point, to cut across all dominant personality types.

Conclusion. As in most research, the data in this study yielded some statistically significant answers and left other questions unanswered. The worth of coverant conditioning as a technique to be used in breaking the smoking habit response has not yet been validated. However, the differences between the three treatment groups at the post-test time period suggests that this procedure holds some promise as a means of effecting behavior change. But what is not known is the relative value that this procedure has for different types of people. It would seem, at the present time, that smoking research has not been able to discover what kind of people smokers are. Thus he and his smoking behaviors remain a complex entanglement of emotional and cognitive parts that are both intriguing and as yet enigmatic.

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APPENDICES

APPENDIX A

ANNOUNCEMENT OF RESEARCH STUDY

Announcement of Research Study

WHAT: Do you want to stop smoking but need help? If so, volunteer for a research project to be run this fall for three weeks that is testing three reliable ways of helping motivated people stop smoking. The methods to be used are called "self-management techniques" because the smoker learns what to do and then no longer needs any help in cutting down on the number of cigarettes he smokes.

WHEN: The first meeting is Tuesday evening, 7 p.m., October 7, 1969. For those unable to attend on Tuesday evening, they may register on Wednesday evening at 7 p.m., October 8.

WHO IS ELIGIBLE: Any person who is truly motivated to stop smoking is eligible to participate in the study. You do NOT need to be affiliated with MSU or any other educational institution.

WHERE: The study will be conducted on the MSU campus in Wells Hall. rooms 212C and 213C. Wells Hall is located on the south bank of the Red Cedar River, just west of Erickson Hall.

COST: There is no charge for participating in this study. However, each volunteer will give the experimenter a check for $10.00 at the first or second meeting, and this check will be held until the completion of the study. If anyone drops out before the study is completed (4 weeks), his check will be endorsed and turned over to the Michigan Branch of the American Cancer Society. All other checks will be returned.

HOW MUCH TIME WILL IT REQUIRE: There will be a meeting held once each week for three weeks. The first session will require about 1½ hours. The second and third meetings will take approximately one hour each.

If you don't smoke but you know someone who does, please show him this announcement.

APPENDIX B

LETTER TO LANSING AREA CLERGYMEN

Letter to Lansing Area Clergymen

Department of Counseling and Educational Psychology
Michigan State University

September 15, 1969

To Whom It May Concern:

I will be conducting a research study beginning October 7 and 8 that will test several experimental ways to help motivated people stop smoking. And I am writing this letter to ask for your help in passing on this information to your congregation. I have enclosed two copies of the description of the study which gives such information as time, date, and location. If you could include a note about my study in your church bulletin or in some way inform the members of your church and perhaps post these announcements in a readily accessible location, I would be most appreciative.

I feel that this study is especially important since it can directly help people, but it will not be an effective study unless a large number of smokers volunteer. If you can in any way encourage those members of your congregation who are interested in stopping smoking to attend the October 7 or 8 meeting, you, too, will be making a significant contribution.

I thank you in advance for any help that you can give me.

Very sincerely,

Richard D. Hark
321 E. Pointe Lane #G-10
East Lansing
Phone: 351-6146

APPENDIX C

DIARY TREATMENT PROCEDURE

Diary Treatment Procedure

In the last several years psychologists have found that focusing on one's feelings, thoughts, and attitudes has definite therapeutic value. For certain behaviors such as habit responses (smoking cigarettes is one), increasing one's self-awareness generally interferes with the habit so successfully that it is permanently stopped. In addition, the person also profits from exploring certain private events or thoughts that he may have ignored in the rush of every-day living. Thinking about the day's occurrences is also beneficial because often the smoker maintains his habit to keep from being "nervous" or "tense" when, in fact, examining the causes and feelings connected with the "nervousness" will help eradicate both the tension and the smoking habit.

For this reason, the treatment procedure outlined below should be followed as exactly as possible. The more faithfully the volunteer follows this procedure, the more success he will experience. In sum, this diary technique is a program which enables the smoker to manage his own behavior. If he is truly motivated, he can bring about the cessation of his cigarette smoking.

1. You are going to keep a daily diary for the next three weeks which will contain certain vital information to be outlined below. Because you will have 21 entries, you should record each day's smoking behaviors in some kind of notebook. It is important that the entries be in order and in a collected form.

2. Choose a time during the day when you can spend at least 30 minutes in quiet contemplation. Often, people try to write in their diary at the same time each day because this helps them remember to do it. Perhaps, in the evening, when all are in bed and the house is quiet might be an appropriate time to reflect on the day's experiences.

3. The first item to record is when you smoked the largest number of cigarettes that day. For example, if you smoked most of them while sitting at your desk in the office, then briefly note it.

4. Then record the feelings that you experience when thinking about those cigarettes you have just described. As an example, one person wrote: "As I sit here writing in my diary, I feel disgusted that I smoked almost a pack of cigarettes today while I worked at the office and I didn't even enjoy or realize that I smoked them."

5. Describe any special or unusual event that occurred that day during which you smoked excessively. (Leave this item out if it does not apply for a given day.)

6. Describe any feelings of nervousness or tension that you experienced and that you think are decreased by smoking. Write as many specifics as you can.

7. Describe how you feel about being a habitual smoker. Discuss what you are doing or not doing about your habit.

8. Record how many cigarettes you smoked that day and how you feel about yourself in retrospect.

APPENDIX D

EXPERIMENTER TREATMENT PROCEDURE I

Experimenter Treatment Procedure I

Note: You are the only experimenter who will be meeting with these volunteers. It is extremely important that you follow as closely as possible the procedure outlined below.

Subjects. The people with whom you will be working are smokers who are trying either to stop smoking or to significantly reduce the number of cigarettes that they are presently consuming. They are meeting collectively to learn what procedures they are to follow to help them accomplish this goal. This meeting will be the only one that they will attend, and it is therefore imperative that they clearly understand the procedures that they are to follow and the rationale behind the diary-no contact program.

ORIENTATION SESSION

Treatment. The treatment that they will undergo for the next four weeks is called the diary treatment procedure and is the product of several years of research in behavior management. You will be given some mimeographed pieces of paper that explain and outline the procedure that they are to follow. You will give each person a copy and then describe to them the theory behind the treatment (outlined in the next section).

Step 1 Theory. The theory underlying this particular approach states that increasing self-awareness and insight will produce a concomitant change in outward behaviors. Further, this process of self-examination can be effectively carried out by revealing interior or "private" thoughts so that they can be more clearly examined. With the help of a trained person, exploration of such private "events" can bring about significant behavior change (such as stopping smoking).

Ideas to stress in your explanation. Urge all of your subjects to follow the outline of the hand-out in writing the content of each diary entry. They do not have to discuss any personal problems or experiences that would be in any way embarrassing or damaging to them.

1. Increasing self-awareness is the key to success.
2. Writing thoughts on paper helps clarify self-awareness.
3. A daily process is the only way to maintain this self-awareness.
4. The change in behavior may be gradual and they are not to expect a miraculous decrease in smoking after only two days of writing.

5. Urge all subjects to be diligent and to maintain their motivation.
6. Enthusiastically underscore the idea that this procedure allows them to be the masters of their own behavior.

Sept 2 Questions. Answer all questions to the best of your ability without falsifying any information. If you are unable to answer, merely state that this is a research project and that some questions are as yet unanswered.

Step 3 No-contact monitoring. Give each person three, stamped, addressed envelopes and explain that on each subsequent Saturday he is to enclose his diary entries for that past week and mail them promptly. He is to be assured that the diary material will be treated confidentially and will be completely destroyed at the end of the research project. Make certain that no one leaves the session in a puzzled or dissatisfied state. This problem can be avoided by being patient with redundant questions and what may seem to you as "minor" concerns. Remember that these people have volunteered to stop smoking, and you are there to help them achieve that goal.

APPENDIX E

EXPERIMENTER TREATMENT PROCEDURE II

Experimenter Treatment Procedure II

Note: It is extremely important that each Experimenter strictly adhere to the following procedures.

Subjects. The people with whom you will be working are smokers who are trying either to stop smoking or to significantly reduce the number of cigarettes they are presently consuming. During this first meeting you will be talking collectively to those subjects who were assigned to you. Hereafter, you will meet with each person individually for approximately 20 minutes.

FIRST SESSION

Treatment. The treatment that they will undergo for the next four weeks is called the diary treatment procedure and is the product of several years of research in behavior management. You will be given some mimeographed pieces of paper that explain and outline the procedure that they are to follow. You will give each person a copy and then describe to them the theory behind the treatment (outlined in the next section).

Step 1 Theory. The theory underlying this particular approach states that increasing self-awareness and insight will produce a concomitant change in outward behaviors. Further, this process of self-examination can be effectively carried out by revealing interior or "private" thoughts so that they can be more clearly examined. With the help of a trained person, exploration of such private "events" can bring about significant behavior change (such as stopping smoking).

Ideas to stress in your explanation. Urge all of your subjects to follow the outline of the hand-out in writing the content of each diary entry. They do not have to discuss any personal problems or experiences that would be in any way embarrassing to them.

1. Increasing self-awareness is the key to success.
2. Writing thoughts on paper helps clarify self-awareness.
3. A daily process is the only way to maintain this self-awareness.
4. The change in behavior may be gradual and they are not to expect a miraculous decrease in smoking after only two days of writing.
5. Urge all subjects to be diligent and to maintain their motivation.

Step 2 Questions. Answer all questions to the best of your ability without falsifying any information. If you are unable to answer, merely state that this is a research project and that some questions are as yet unanswered.

Step 3 Final procedure for the first meeting. Inform them that they are to return next week (give date and time) and that they are to bring with them their week's writings so that you can explore with them the content of their diary. (NOTE: after this initial meeting, you will see each volunteer individually for no more than 20 minutes maximum.) Make certain that no one leaves the first session in a puzzled or dissatisfied state. This problem can be avoided by being patient with redundant questions and what may seem to you as "minor" concerns. Remember that these people have volunteered to stop smoking, and you are there to help them achieve that goal.

FOLLOWING SESSION

You have laid the ground work in the first session with your subjects. Now your goal is to "check out" the diary material which each person brings to his appointment. Please adhere to the following rules as exactly as is possible.

Contents of the interview. Things to do during the session:

1. In the first minute or two briefly scan the week's diary entries. Check to make sure that each day's record is present. If one or more are missing, simply say that you noticed that several day's writings are missing. If the subject explains, be agreeable and neutral. If he chooses not to explain, ask if he is finding it difficult to maintain his motivation. Answer any questions and then proceed to number 2.

2. Then read each day's entry, commenting only on the times when the subject discussed smoking or feelings about smoking. You are to be as neutral a stimulus as is possible. This means that you cannot make rewarding comments to the person such as, "I'm glad that you didn't smoke any cigarettes on Tuesday." Simply point out verbally what the subject has recorded and let him respond. For example, you might have read a section in which he described being disgusted with himself for being unable to keep from smoking after a meal. Look at him and say: "I see that you were disgusted with yourself for not being able to keep from smoking after a meal?" To any reply, nod your head, further reflect or add a neutral "Hmmm." (We will discuss this technique at a training session to be held before the research project begins.)

3. Move through the diary in this way, making certain that you do not exceed the 20 minute time limit. It is NOT necessary to cover all of the entries, but it IS necessary to talk with each subject an equal amount of time.

Remember: Do not act as a reinforcer. Let the subject do most of the talking. This restriction does not prevent you from being pleasant, courteous, and interested in the person's comments.

APPENDIX F

EXPERIMENTER TREATMENT PROCEDURE III

Experimenter Treatment Procedure III

Note: It is extremely important that each Experimenter strictly adhere to the following procedures.

Subjects. The people with whom you will be working are smokers who are trying either to stop smoking or to significantly reduce the number of cigarettes they are presently consuming. During this first meeting you will be talking collectively to those subjects who were assigned to you. Hereafter, you will meet with each person individually for approximately 20 minutes.

FIRST SESSION

Treatment

The treatment that those people with whom you are working will undergo is a combination of a diary procedure and a conditioning technique called coverant conditioning.

Diary. The diary procedure is a product of several years of research in behavior management. You will be given some mimeographed pieces of paper that explain and outline the procedure that they are to follow. You will give each person a copy and then describe to them the theory behind the treatment (outlined in the next section).

Step 1 The theory underlying this particular approach states that increasing self-awareness and insight will produce a concomitant change in outward behaviors. Further, this process of self-examination can be effectively carried out by revealing interior or "private" thoughts so that they can be more clearly examined. With the help of a trained person, exploration of such private "events" can bring about significant behavior change (such as stopping smoking).

The ideas to stress in your explanation of the diary method are:

1. Increasing self-awareness is the key to success.
2. Writing thoughts on paper helps clarify self-awareness.
3. A daily process is the only way to maintain this self-awareness.
4. The change in behavior may be gradual and they are not to expect a miraculous decrease in smoking after only two days of writing.
5. Urge all subjects to be diligent and to maintain their motivation.

Coverant Control. Coverant conditioning is a relatively new method (1965) that has been used to break habit responses. The theory behind it states simply that if there are two responses, the more probable one will reinforce the less probable one. For example, grandmother says: "Eat your spinach and then you can have a piece of chocolate cake." This statement is a clear illustration of the two types of behavior. Eating spinach is a low probable behavior (LPB) for most young children while eating cake is a highly probable behavior (HPB).

In the case of the smoker, the LPB's are thinking about all of the negative aspects of smoking as well as all of the benefits to be gained from quitting. Obviously, if he thought about such things, he would find it much more difficult to smoke. Therefore, if a volunteer is motivated and if he can "make himself" think these LPB's, then he will soon be unable to continue to smoke.

Thus your second task -- after you have explained the diary procedure -- is to teach your subjects the use of coverant conditioning. The following outline should be used as literally as is possible.

1. Explain what LPB's and HPB's are using the spinach-cake example (another one is cutting the grass before drinking a beer).
2. Explain that LPB's for smokers are frequent thoughts about the various disadvantages of smoking and the advantages of stopping.
3. Ask each subject to make a list of five or six reasons why he thinks that smoking is detrimental to him. (This list must be tailored to each individual's own system of priorities. Some people may be more disturbed by yellow or stained teeth and bad breath than the high probability of contracting lung cancer.)
4. Look at each person's list to make certain that they understand your request.
5. Now ask each person to make a list of five or six reasons describing why he would benefit from stopping smoking. (Again this list must be tailored to each person's value system.)
6. Examine each person's list to make sure that they understand your request.
7. Explain to your group that an HPB is a behavior that is very likely to occur throughout the day. It does not have to be particularly rewarding -- although that aspect is an advantage. For example, some people drink large quantities of fluids each day. This behavior is an HPB. Some women apply lipstick or other cosmetics or comb their hair frequently throughout the day. Others must get up from their desk many times to make a call or to carry out some transaction. There are many possibilities and a group discussion may help others think of some that otherwise would have gone undiscovered. Therefore take some time to have all of your subjects share their ideas and to clarify any misunderstandings.

8. The pairing of the two sets of behaviors is simple. Before the subject carries out an HPB, he pauses long enough either to literally read or mentally review the items on his two LPB lists. It is helpful if the subject actually carries these lists jotted, perhaps, on each side of a small, pocket-sized card. Then, of course, the subject acts out the HPB.

   THERE ARE TWO BEHAVIORS TO AVOID WHEN SELECTING AN HPB: the subject cannot use smoking as an HPB and he cannot use a behavior that is controlled by another person or object. In other words, when a phone rings a person must pick it up and answer it immediately; when a customer appears, he must be waited on promptly. Therefore the person would have no time to run through his list of LPB's before carrying out such an HPB. HPB's are behaviors that the subject controls such as making a phone call or going to see a client or customer.
9. Although a person can use more than one HPB at a time, it is more effective if he uses only one because it is more difficult to forget to run through the LPB's when he has isolated a particular highly probable behavior.
10. Make certain that all of your subjects clearly understand the procedure and have their LPB's and HPB clearly defined. Be patient and courteous and remember that a question that may seem redundant or minor is important to the person who asked it.

The following schematic chart may help your subjects understand the procedure and can easily be drawn on a blackboard.

LPB's		LPB's		HPB's (one of these)
1. cause cancer		1. I would live longer		1. getting a coke and/or a drink of water
2. gives me bad breath		2. my lungs would be clean		2. making a business call
3. my clothes smell	+	3. I wouldn't be short of breath	→	3. combing hair and/or applying cosmetics
4. fingers are stained		4. I wouldn't have bad breath		4. beginning a new task
5. my wife won't kiss me		5. I'd feel like I was the master of my fate		

FOLLOWING SESSION

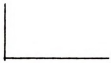
At the next meeting, you will be working with each subject individually. Your main concern is to "check out" how he is using coverant conditioning and to help him adjust or solve any problems that he encounters. Perhaps a change of an HPB will be necessary or the clarification of the theoretical basis of coverant conditioning. In addition -- once you have made certain that he is using this procedure effectively -- discuss with him the use of his diary. Do not spend an unequal portion of time on either of the two procedures. The total amount of time that you should spend with each subject is 20 minutes.

It is important to remember that when you work with your subjects, you are to remain a neutral stimulus. That is, you are not to offer reward or encouragement when they report success. You are there primarily to instruct and to solve any problems that may arise. Naturally you can be courteous, sympathetic, and interested in the remarks of each subject. A nod of the head or reflected statement (we will discuss this technique in a pre-treatment training session) can be relatively neutral and still not indicate to the person that you are not interested in him as a person who is struggling to stop smoking.

APPENDIX G

PERSONAL DATA FORM

Personal Data Form



Name: Mr.
Mrs._____ Phone: _____
Miss

Sex: M___ F___ Age _____

Local Address: _____ _____ _____ _____
Street City State Zip

Permanent Address: _____ _____ _____ _____
Street City State Zip

As accurately as possible, how many cigarettes do you smoke per day (1 pack = 20 cigarettes). _____

Are you presently a student? Yes___ No___ If so, where: LCC ___, MSU ___, other _____

What is your present occupation? _____

APPENDIX H

PRE-TEST SMOKING RATE FORM

Pre-Test Smoking Rate Form

RDH Smoking Research Project
Baseline Week

Name _____

Smoking Record

(Bring with you to next appointment)

DAY	Number of Cigarettes Smoked
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____
5. _____	_____
6. _____	_____
7. _____	_____

In comparison with your smoking habits over the last three months, does this week's smoking rate seem to be (1) about the same, (2) more, or (3) less than usual.

[Check one]

If not, what is your usual smoking rate. _____

APPENDIX I

POST-TEST FOLLOW-UP FORM

Post-Test Follow-Up Form

Name _____ Date _____

Dear Volunteer,

This questionnaire is the first of two follow-ups that I will be making. I would appreciate it very much if you would take several minutes to complete it and return it in the stamped, addressed envelope. When I receive it, your check will be sent to you.

Please be as specific as possible. If you need more room to respond to the questions, use the back of this page or attach another one.

1. How many cigarettes are you presently smoking EACH DAY: _____.

2. If you are still smoking almost as much as you were prior to the treatment, what explanation can you give.

3. Did the technique that you learned work for you? Why or why not? Are you still using it?

How important was the fact that you invested $10.00 in the clinic and had to follow the rules in order to get it back? Was there any feeling of incentive or investment?

APPENDIX J

DELAYED POST-TEST FOLLOW-UP FORM

Delayed Post-Test Follow-Up Form

NAME _____ DATE _____

Dear Volunteer,

This questionnaire is the second and last one that I will be sending you. I would appreciate it very much if you could respond to the items and send it back immediately so that I can analyze my data as soon as possible. I have included a stamped, addressed envelope for your convenience. Thanks very much for your cooperation!

Please be as specific as possible. If you need more room to answer one or more of the questions, use the back of this page or attach another one.

1. How many cigarettes are you presently smoking EACH DAY: _____.

2. If your smoking rate has gone up since the last follow-up, how can you explain it.

3. If you are still smoking a reduced rate or have still not smoked any cigarettes since the last follow-up, how might you explain it. Do you ever use the procedure that you learned to help control your desire?

4. How do you feel about yourself in terms of being able to manage your smoking behavior as you look back over the last 8 weeks?