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The development of an instrument to predict cessation in a smoking program using aversion therapy

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THE DEVELOPMENT OF AN INSTRUMENT TO PREDICT CESSATION IN A SMOKING PROGRAM USING AVERSION THERAPY

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In particular, a warm thanks goes to David R. King for help with all those complicated statistical problems. His patience and careful explanation made for a more precise report on my part.

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Chapter 1

INTRODUCTION

"Torture . . . beyond human power to bear."[1] This is Freud's own description of attempting to give up the smoking habit. At the age of 85, Freud died with an artificial jaw due to cancer, severe heart problems, and his 20 cigars a day habit, making him a tragic prototype of tobacco addiction.

Cigarette smoking has received much attention from medical and social researchers. The 1964 Surgeon General's report on the relationship between smoking and health brought an increase in related research with the emphasis on the adoption and retention of the smoking habit; few studies dealt with cessation.

Currently, the author is employed at a center for the control of smoking, using aversion therapy. An attempt will be made to develop an instrument for predicting success in this smoking program. Information used to make this assessment was gathered off a four page pre-treatment questionnaire used by the center. Behavioral, attitudinal, and demographic information of the smoking client are covered on this form.

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[1]Edward M. Brecker, Licit and Illicit Drugs (Boston: Little, Brown and Company, 1972), p. 229.

The history, effects, and statistics of smoking follow. How the center's program is run, and it's therapeutic modality will be described. Also covered are related studies on the dynamics of smoking behavior, development of the habit, and previous research on the cessation of smoking.

THE PROBLEM

Statistics on Cigarette Smoking

Fifty-two million persons smoke cigarettes in the United States.[2] Today, about 37 percent of the U.S. population over seventeen smoke. This breaks down to 43 percent of all men, and 31 percent of all women. A pack-a-day habit costs about $225 a year.[3] In California, about two out of every five persons smoke.

Among California's non-smoking population, 43 percent are ex-smokers, with married people, men, and those in higher income brackets leading the way. In fact, it seems that quitting smoking is a growing trend in the United States. Although the "quit race" averaged about 6 percent for several years, 16 percent said they quit during the past year.[4]

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[2] A Statement on Cigarette Smoking by the American Cancer Society (American Cancer Society, Inc., 1974), pamphlet.

[3] The Cigarette Paper (American Cancer Society, Inc., 1976), poster.

[4] Cancer in California (American Cancer Society, Inc., California Division, 1976), Vol. 22, No. 1, 1976, p. 7.

History of Cigarette Smoking

A cigarette as it is known today was first marketed in quantity toward the end of the 19th century. Improved cigarette paper, lower prices, and intensive advertising of new brands contributed to the rise in popularity of cigarettes.

The explosive increase after 1910 can also be attributed to public health campaigns of that era against the chewing of tobacco. Sputum of the chewers, according to public health warnings, spread tuberculosis and perhaps other diseases. Most who gave up chewing turned to cigarettes. The ashtray replaced the cuspidor and lung cancer replaced tuberculosis as the major lung disease.[5]

Effects of Cigarette Smoking

Basically, nicotine first stimulates and then depresses. Immediate physiological effects of smoking include: an increase in respiration rate, pulse rate, blood pressure, and a lowered temperature in the extremities, with more strain on the heart due to blood flow resistance. Slower reflexes, a dulled sense of taste and smell, inhibited visual acuity, excess digestive juice secretion, and an increased secretion of the stress hormones are other effects of smoking. Nicotine in high doses, much higher than those encountered in smoking, results in convulsions. It also produces nausea and vomiting, especially in novice smokers. The drug

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[5]Brecker, Licit and Illicit Drugs, p. 229.

nicotine is known to have powerful actions on the brain and spinal cord, but how these are connected with the smoking habit is less clear. The multiplicity of actions from nicotine are known, the question that remains is, do people smoke cigarettes in order to get the nicotine into their respiratory systems, into their blood streams, or into their brains?[6]

The Need

The smoking program, hereafter referred to as The Center, guarantees its smoking program. That is, at the end of the five day aversion therapy, a client may ask for a refund. To receive a refund the client must state his disappointment to the Director, and then smoke a cigarette in front of him, thereby negating the five days of aversion.

Due to the expense of administering five days of therapy, plus the enusing bad publicity a dissatisfied customer may spread, it is important that there be some criteria for predicting success in the program. Knowing a client may be unsuccessful or have a difficult time could prove valuable information for both the Center and the therapist working with that client.

The Smoking Program

The smoking program consists of three phases:

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[6]Murray E. Jarvik, "The Role of Nicotine in the Smoking Habit," ed. Wm. A. Hunt, Learning Mechanisms in Smoking (Chicago: Aldine Publishing Co., 1970), p. 163.

First, is the five day countdown period. During this phase the client is encouraged to focus on his smoking habit and eliminate as many cigarettes as possible. Booklets with questions and tests are used so the smoker will be more aware of his habit and reasons for quitting. This is essentially a preparation phase.

Secondly, the client attends for one week, five one-hour aversion sessions. The aversion therapy is done with a machine that delivers an impulse between two electrodes worn on a band attached to the clients forearm. The impulse does not penetrate the skin, it merely delivers an uncomfortable, but not painful, sensation to the client whenever he touches or puffs on a cigarette. The entire aversion portion of the program is designed to replace a smoker's positive associations of smoking with negative ones, and develop in him an aversion to smoking. Related topics are discussed each session to explain the physiological and psychological changes of withdrawal from cigarettes. More importantly, alternative behaviors are offered to encourage the client to adjust his daily routine to that of a nonsmoker.

Eight weeks of follow-up sessions are the third phase of the program. The client is asked to attend one group session a week for eight weeks, after which he has successfully completed the aversion program. During the remainder of the first year, each client is contacted by telephone periodically.

Aversion Therapy

Behavioral modification using aversion therapy is the Center's approach to smoking cessation. Aversion therapy is based on B. F. Skinner's instrumental conditioning.

The rationale of aversion therapy is that the conditioned anxiety response established through therapy will become associated with the undesired behavior and cues, which will lead to the establishment of an incompatible response. Change in behavior is determined by the observable performance, but for the Center's purpose, behavior change is communicated verbally by the client, e.g., "I didn't smoke today."

Aversive conditioning is a well known but controversial behavior therapy. It has been employed in the treatment of responses that are or can be disadvantageous to the individual, and which usually also incur social disapproval. Alcoholism, drug addiction, homosexuality, transvestism, fetishism, obesity, and smoking, are conditions most often treated by aversion therapy.

The aim of aversion therapy is to create an aversion to the undesired habit either by applying a noxious stimulus when the act is performed or by pairing a noxious stimulus with the cues which usually evoke the behavior.

Aversive procedures are of a major value in that they provide a rapid means of achieving control over injurious behavior while alternative and more rewarding

behavior can be established simultaneously. The favorable results attained by this method are attributed to the alteration of stimuli that evokes the behavior but also the creation of reinforceable response patterns. The answer to the low recidivism rate, therefore, lies in the scope of the treatment program, rather than just the electrical stimulus.

The Purpose

The purpose of this study is to develop an instrument to predict the success (the term success is used to mean total cessation of smoking) of clients who actively participate in the aversion therapy.

Every client fills out a four page pre-treatment questionnaire prior to entering the program. This form asks for demographic material, length of their smoking habit, previous attempts to quit, attitudes about smoking, and attitudes and reasons for quitting now.

The author will develop an instrument to use the information obtained on the preliminary questionnaire as a possible predictor of a client's ability for success through the Center's program.

Definition of Terms

A smoker in this study is a person who uses nicotine in the form of cigarettes, pipes or cigars, whether it be on a regular basis or not. A smoker may be considered so whether

he inhales or not. Nonsmokers are those persons who have not or do not use cigarettes, pipes or cigars.

Cessation will be used to indicate total abstinence from smoking over a six month period. It refers to the stopping of all forms of smoking, not just a gradual use of less cigarettes over a period of time, or the switch from cigarettes to pipes or cigars.

The terms addiction and habit will be used interchangeably, as they represent a continuum rather than clearly defined, separate terms. Addiction is defined as a state of periodic or chronic intoxication produced by repeated consumption of a natural or synthetic drug. Habituation refers to a condition resulting from consumption of a drug.

According to Allport (1961) the term attitude has two distinctions:

1) An attitude always has an object of reference; one has an attitude toward something
2) Attitudes are usually pro or con, favorable or unfavorable; they lead one to approach or withdraw from the object.[7]

Therefore, attitude can be seen as a position indicating action, feeling, or mood.

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[7]Gordon W. Allport, Pattern and Growth in Personality (New York: Holt, Rinehart and Winston, 1961), p. 347.

Basic Assumptions of the Study

Three basic assumptions are a part of this study:

First, the author assumes that each client completed the questionnaire honestly. At the bottom of each form is a statement asking for the client's signature to indicate the information provided is accurate, to their knowledge.

Secondly, the researcher is assuming persons who enter the Center's smoking program truly desire to quit smoking, and not to merely experience the five day sessions and then ask for a refund.

Thirdly, if there is a difference between those capable of success and those not capable, the instrument developed will make this evident.

Limitations of the Study

The population of this study is a select one; those participating in the Center's smoking program. This population may not represent the attitudes and behaviors of all smokers attempting to quit.

Attempts to apply this instrument to smokers trying to stop through other means and programs may not be successful or accurate. The program employs an aversive method, and therefore attracts a particular population willing to participate in that type of technique.

Significance of the Study

The instrument developed will hopefully be useful for predicting success in the Center's smoking program.

For the field of social work it may be useful as a tool to assist clients who desire to quit, are interested in aversion therapy for this means, and would like to assess or predict their capability of success.

Hypothesis

It is the author's intent to develop an instrument to predict cessation through a smoking program using aversion therapy. This intent is based on the hypothesis that the prediction of potentially successful clients can be determined through the assessment of a client's stated demographic, attitudinal, and behavioral descriptions, made available through the Center's pre-treatment questionnaire.

Chapter 2

REVIEW OF THE LITERATURE

Introduction

A review of the relevant literature follows. Studies reported will be concerned primarily with the development, continuation, and cessation of the smoking habit.

Development of the Smoking Habit

Studies concur that most smokers begin to smoke regularly shortly before, during, and immediately after puberty. The Lieberman Research team carried out a comprehensive survey about the initiation of smoking in 1969. Lieberman's nationwide sample of 1,562 adolescents, showed that the median age of first experiments with smoking is twelve years, but that one-quarter of those who tried cigarettes did so before they were ten.[1]

There is a growing body of theory and data dealing with the factors which support the initiation of smoking. Three important mechanisms are: the use of smoking for role definition, for social affiliation, and as a source of emotional rewards.

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[1]Bernard Mausner and Ellen S. Platt, Smoking: A Behavioral Analysis (New York: Pergamon Press, 1971), pp. 5-10.

Cigarette smoking can be an important source of role-defining behavior. The act of smoking has symbolic significance; it is associated with adult status, freedom, daring, and with attractiveness.

The Lieberman report showed slightly higher proportion of teenagers whose fathers smoked, 29 percent were smokers, as compared to 22 percent smokers among the children of nonsmoking fathers. Mothers had a greater significance, 32 percent as opposed to 23 percent. Also, those with older siblings who smoked, 43 percent were smokers compared to 20 percent with nonsmoking siblings. Lastly, Lieberman found that friends are extremely influential. Among smokers, 56 percent reported that most of their friends smoked as compared to 14 percent among nonsmokers.

Pressure to conform to group norms is given as a leading reason for smoking among high school students in reports by Salber and colleagues (Salber, Walsh and Taylor, 1963).[2] Social factors that promote smoking fall into two categories: smokers habits may be aroused by the smoking of others, and smokers may derive emotional support from each other. Frequently, when one member of a group lights a cigarette there is a tendency for others to follow suit. The mutual giving of pleasure from the communal sharing of

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[2]E. J. Salber and others, "Reasons for Smoking Given by Secondary School Children," Journal of Health and Human Behavior, 4 (1963), 118-129.

cigarettes and matches, and the act of smoking together may account for the social contagion in smoking.

The preponderance of young teenagers who gave social reasons for smoking while older respondents stressed the relaxing and tension-reducing effects of cigarettes were indicated in the Lieberman research.

There is no information about the forces affecting those who begin to smoke in college, in the army, or during their first experiences at work. It seems that virtually no one starts smoking after the early twenties.[3]

Lawton (1962) says, "Initiation of smoking is seen as a largely social and psychological phenomenon mediated by the mechanisms of curiosity, imitation, identification, status striving, and rebellion."[4]

Motives for Continuing

Accompanying the social role of smoking there develops the idea that one is a "smoker", which in turn becomes an integral part of a smoker's self concept.

Photographs of two male and two female models in candid poses with cigarettes were used by Weir (1967).[5] Two more of the same photographs were used minus the cigarettes.

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[3]Gordon W. Allport, Pattern and Growth in Personality (New York: Holt, Rinehart and Winston, 1961), p. 347.

[4]M. P. Lawton, "Psychosocial Aspects of Cigarette Smoking," William L. Dunn, Jr. (ed.), Smoking Behavior: Motives and Incentives (Washington, D. C.: V. H. Winston and Sons, 1973), p. 104.

[5]Allport, Pattern and Growth in Personality.

Respondents used an extensive adjective check list for characterizing the models in each photograph. Weir concluded that his subjects' descriptions of a smoker could reflect the image they hope to project by smoking.

Tomkins (1968)[6] suggests that another function of smoking, which occurs as people begin to interact, may be a consequence of tension, where smoking may function as a pacifier. Tomkins is also the originator of the three major types of smokers, those who smoke for pleasure, those who smoke for tension reduction, and those who are psychologically addicted. Construction of questionnaires consisting of items based on that typology have yielded factors patterned after Tomkins' types.

Maintenance of the smoking habit is a complicated issue. No one set of factors is consistently responsible for the continuation of the habit. Inconsistency from moment to moment, day to day, and even phases in one's life cycle, all contribute to the maintenance of the smoking habit.

Cessation of Smoking

Discontinuation of smoking may be related to the beginning of a person's smoking habit. Studies indicate a definite pattern of those who are successful quitters.

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[6]S. Tomkins, "A Modified Model of Smoking Behavior," Bernard Mausner and Ellen S. Platt, (eds.), Smoking: A Behavioral Analysis (New York: Pergamon Press, 1971), p. 14.

The Complete Report on Smoking and Health by the United States Department of Health, Education and Welfare, states:

> The rate of smokers who discontinue has constantly been found to be highest among those who start late in life, have smoked the least number of years and whose average cigarette consumption has been smallest.[7]

Different methods for ending the smoking habit have been used. They include: nicotine substitute drugs, a five day plan of lectures, buddies, films, desensitization-aversion therapy, physician counseling, group discussion, and hypnosis. Results of these methods are offered as percentages of successful participants, descriptive aspects of the clients are usually not mentioned. The focus is on the method, not the participants. Significant studies that included descriptive aspects of the participants follows.

Eisinger (1972) attempted to discover possible predictors of smoking behavior change.[8] A multiple discriminate analysis of four variables was successful in predicting change. Variables used were: perceived possibility of being a nonsmoker in five years, perceived difficulty in quitting, having the health of an acquaintance adversely affected by smoking, and being of a psychologically addictive typology. Results showed total cessation among: older participants, males, those not highly educated and those who had attempted to quit before.

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[7]U.S. Department of HEW, The Complete Report on Smoking and Health (New Jersey, 1965), p. 359.

[8]Richard A. Eisinger, "Psychosocial Predictors of Smoking Behavior Change," Social Science and Medicine, 6 (1972), 137-144.

Bosse and Rose (1973)[9] researched the relative importance of age and interpersonal factors in smoking cessation. Interpersonal factors in this case refer to motivation provided by interaction with emotionally significant others. The conclusions showed significantly more quitters among older participants, a higher success rate among those who knew someone whose health had been affected, and that the interpersonal factors with older smokers made a difference.

In a study predicting smoking recidivism, Eisinger (1971)[10] obtained responses to selected items on the basis of their theoretical relationships to success. The results fell into five categories:

1. Environmental-- successful quitters had children under age 12 in their homes.
2. Verbal--successful abstainers expressed a desire to improve their health.
3. Smoking history--the most successful were long term smokers.
4. Future expectations--successes stated they would not be smoking in five years.
5. Expense--successful participants did not use this for a reason for quitting.

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[9]R. Bosse and Charles L. Rose, "Age and Interpersonal Factors in Smoking Cessation," Journal of Health and Social Behavior, 14 (December 1973), 381-387.

[10]Richard A. Eisinger, "Psychosocial Predictors of Smoking Recidivism," Journal of Health and Social Behavior, 12 (December 1971), 355-362.

One outstanding response Eisinger notes was, "The expression of moral reasons for quitting was found to be a 'perfect predictor' of successful abstinence."

In conclusion, most researchers interested in the cessation of smoking realize three separate but interrelated processes are considered essential in the reduction or cessation of the smoking habit (Mausner and Platt, 1966).[11] The first is a change in attitudes about cigarettes and smoking; second, a desire to alter or cease the habit; and third, a behavioral change, are all viewed as necessary for successful cessation.

Methodology

The researcher used the pre-treatment questionnaire form from the Center as a source of data that might be discriminating between individuals who will and those who will not succeed in an aversion therapy program for the cessation of smoking.

The questionnaire contains a possibility of 78 answers. Those answers offering demographic information, attitudinal and behavioral answers to a client's smoking habit were selected for analysis. A total of 23 questions were chosen for this study.

A discriminative analysis was used to determine the combination of variables and their attendant weight that best

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[11] Mausner and Platt, Smoking: A Behavioral Analysis.

predict success and failure in the smoking program. Discriminant analysis is a technique that employs both factor analysis and multiple regression techniques to extracts a linear equation (a set of weighted scores) that best discriminates between the success and failure groups.

Seventy-two (72) cases were chosen for study from the total number of clients (121) eligible for the study; both successful and those not successful were included. Criteria for selection was having completed the program, and having a minimum of six months pass from the beginning date of therapy to the onset of this research.

Summary

Reviewing the literature shows the smoking habit to begin during adolescence, motivated by peer pressure, and family role models. Cessation studies indicate certain aspects of smokers to be more prevalent in successful abstainers than those not successful. These include age, sex, and health. Attitude change, decision-making and behavioral changes are all important ingredients for successful cessation.

Predicting success by doing a discriminant analysis with information gleamed from the pre-treatment questionnaire of past clients will develop an instrument useful in predicting the success of future clients.

Chapter 3

METHODS AND PROCEDURES OF RESEARCH

Introduction

The discriminant analysis offered through the Statistical Package for the Social Sciences was the chosen instrument for its ability, "To distinguish between . . . discriminating variables that measure characteristics on which the groups are expected to differ."[1]

In this particular study, characteristics of successful clients and characteristics of unsuccessful clients were examined.

Selection of Subjects

A list of clients who might be eligible for this research was obtained through the cooperation of the Center.

In order to determine eligibility it was necessary for a client to have entered the program no less than six months prior to the onset of the data collection.

After eliminating those clients who refunded or rescinded, telephone contact was attempted with the remainder. Only 72 could be reached by phone to determine whether they were or were not smoking.

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[1]Norman H. Nie, et al., Statistical Package for the Social Sciences (McGraw-Hill Book Company, 1975), p. 435.

The ensuing analysis came from the information gathered off the Pre-Treatment Questionnaire of all 72 clients.

Instruments Employed

The primary instrument employed was the discriminant analysis. Frequencies and cross-tabulations were computed before attempting the discriminant procedures.

Statistical Treatment

Data were collected from the files and computed with the SPSS format. Steps in the statistical analysis included:

I. Frequencies
   - A. Frequencies of total population
   - B. Frequencies of successful clients
   - C. Frequencies of unsuccessful clients

II. Cross-tabulation
   - A. Cross-tabulation of outcome of six months with suitable variables

III. Discriminant Analysis
   - A. Discriminant analysis computed for all variables
   - B. Wilk's lambda computed to test for statistical significance of discriminating information not already accounted for by earlier functions

IV. Second Discriminant Analysis

A. Second discriminant analysis computed with those variables proving to be significant or have meaning from the first analysis

B. Assessing a prediction measurement, statistically, from the outcome of the second analysis.

Chapter 4

ANALYSIS OF THE DATA

Introduction

The general purpose of this study was to develop an instrument to predict cessation in a smoking program using aversion therapy. An important aspect of this study was the selection of an evaluative tool that could be employed to measure or indicate the difference between successful and unsuccessful clients.

An examination of the frequencies, computing cross-tabulations, and finally the use of discriminant analysis illustrates the similarities and differences of both groups. From the total population of seventy-two, those clients not smoking at the end of six months totaled twenty-six, and those who returned to smoking totaled forty-six.

Frequencies

Frequency tabulations were voluminous. Cited below are those variables mentioned in the literature. Variables showing a significant difference between successful clients (those not smoking at the six month phone contact) and unsuccessful clients (those smoking at the six month phone contact), are also included. The analysis is presented in four groups; demographic questions, behavior related questions,

health related questions, and finally program related questions. Tables 1 through 5 illustrate the discussion below.

Demographic Related Questions

Age. The mean age of the total population was forty-one years, the youngest client being twenty-one and the oldest seventy-five.

Successful clients averaged forty-two years of age, with the range beginning at twenty-five years to sixty. Unsuccessful clients showed a mean of forty-four years with an age span between twenty-one and seventy-five.

Sex. The total population shows a predominance of females at 56.2 percent, males at 43.8 percent.

Both groups mirror the predominance of females. The successful group had 17 females (65.4%), with 9 males filling the remainder 34.6 percent. Again, 29 females were the majority of the unsuccessful group (52.2%), and 22 males were 47.8 percent.

Marital Status. The majority of the population who attended the program are married. The four categories of this question divided up as such:

	Successful Group	Unsuccessful Group
Single	3.8	6.5
Married	80.8	58.7
Divorced	11.5	21.7
Widowed	3.8	13.0

The unsuccessful group shows a marked increase in the divorced and widowed categories compared with the successful group.

Ages of Children. Children under twelve years in the home has been cited as a predictive variable in previous studies of smoking cessation. Interestingly, 34.6 percent of the successful group in this study had children under twelve, while the unsuccessful group reported having children under twelve only 19.6 percent of the time.

The population in this study is an older one, therefore, the majority of people reported they did not have children under twelve. Also, many clients did not respond to this question.

Income. The highest percentages of the total population was primarily in two income categories, $15,000-19,999 and $25,000 or more. The distributions appeared as follows:

	Successful Group	Unsuccessful Group
Less than $5,000	0	4.3
$5,000-9,999	7.7	17.4
$10,000-14,999	7.7	4.3
$15,000-19,999	30.8	13.0
$20,000-24,999	15.4	19.6
$25,000 or more	26.9	21.7
No response	11.5	19.6

Education. Almost 60 percent of the sample attended college, regardless of success or failure.

Although the literature cites less success with the highly educated, 61.6 percent of the successful group have attended college and/or are college graduates. More distribution is seen in the categories of less education with the unsuccessful group. However, 56.6 percent of the unsuccessful group were in the college categories, still revealing the high education level of persons attending the Center to stop smoking. (Refer to Table 1.)

Behavior Related Questions

The majority of the sample began smoking between the ages of sixteen and twenty.

Three clients began smoking at the age of ten or under for the successful group, with the majority, 76.9 percent, beginning between sixteen and twenty years.

No one in the unsuccessful group began before ten years of age. Most started in the sixteen through twenty bracket with a few starting as late as their mid- and later twenties. This is contrary to the literature reviewed. Completed studies have indicated more success with those clients who have started smoking later in life than the usual onset in the adolescent years.

Using the clients' age and the age they started smoking, the duration of their smoking habit was calculated. The total sample had been smoking from three to fifty-eight years. Years smoked for the successful group ranged from eight to fifty-three, and the unsuccessful group ranged from

Table 1

Frequency Tables
Demographic Information

Question	Successful Total No.	Successful %	Not Successful Total No.	Not Successful %	Total Population Total No.	Total Population %
Age:						
21-30	5	19.2	9	19.6	14	19.4
31-40	8	30.8	8	17.4	16	22.2
41-50	6	23.0	15	32.6	21	29.2
51-60	6	23.0	10	21.7	16	23.6
61-70	1	3.8	2	4.3	3	2.7
71-80	0	0	2	4.3	2	2.7
TOTAL	26	100%*	46	100%	72	100%
Sex:						
Male	9	34.6	22	47.8	31	43.0
Female	17	65.4	24	52.2	41	57.0
TOTAL	26	100%	46	100%	72	100%
Marital Status:						
Single	1	3.8	3	6.5	4	5.5
Married	21	80.8	27	58.7	48	66.6
Divorced	3	11.5	10	21.7	13	17.8
Widowed	1	3.8	6	13.0	7	9.6
TOTAL	26	100%	46	100%	72	100%

*100% totals are the rounded frequency totals.

Table 1 (Continued)

Frequency Tables
Demographic Information

Question	Successful Total No.	Successful %	Not Successful Total No.	Not Successful %	Total Population Total No.	Total Population %
Children:						
No children	6	23.1	12	26.1	18	25.0
twelve years	9	34.6	9	19.6	18	24.7
twelve years	10	38.5	25	54.3	35	47.9
No response	1	3.8	0	0	1	1.4
TOTAL	26	100%	46	100%	72	100%
Income:						
$5,000	0	0	2	4.3	2	2.7
$5,000-9,999	2	7.7	8	17.4	10	13.7
$10,000-14,999	2	7.7	2	4.3	4	5.5
$15,000-19,999	8	30.8	6	13.0	14	19.4
$20,000-24,999	4	15.4	9	19.6	13	17.8
$25,000	7	26.9	10	21.7	17	23.3
No response	3	11.5	9	19.6	12	16.4
TOTAL	26	100%	46	100%	72	100%
Education:						
Some high school	1	3.8	7	15.2	8	11.0
High school grad.	8	30.8	9	19.6	17	23.7
College 1-3 yrs.	6	23.1	13	28.3	19	26.0
College grad.	10	38.5	13	28.3	23	31.5
No response	1	3.8	4	8.7	5	6.8
TOTAL	26	100%	46	100%	72	100%

three years to fifty-eight years of smoking.

Frequency of Habit. The total population smoked an average number of thirty-seven cigarettes a day or, a pack and a half.

Successful clients generally smoked between one, to one and a half packs (20-30) a day, while the unsuccessful smoked more on a daily basis, averaging one pack and a half, to two packs (35-40).

Attempts to Stop. The average number of attempts to stop smoking by the total sample was 2.7.

Successful clients averaged 3.4 attempts to stop, and the unsuccessful averaged 2.3 attempts. This does concur with the literature, which states that the more unsuccessful attempts a person has had, the more likely are his chances to succeed in a future attempt.

Reasons for Smoking. This question is weighted by instructing the client to choose their first, second, and third, reasons for smoking. The list of six choices includes: alertness, relaxation, out of habit, something to do, to resist depression, or other reasons. For clarity on the frequency distributions of this question see Table 2.

Most of the clients chose relaxation as their primary reason for smoking. The total population gave relaxation as their first reason for smoking (46.6%), successful clients 46.2 percent, and unsuccessful clients 47.8 percent. More often than not, this question was not completed or completed

incorrectly, explaining the low frequency distributions for all categories. (Refer to Table 2.)

Health Related Questions

Having health problems due to smoking or having a friend negatively affected by smoking is considered to be a positive factor in contributing to successful cessation, according to the literature. Three-quarters of the unsuccessful group stated they had health related problems due to smoking, indicating again that this group did not follow the norm stated in the literature.

Reasons Wishing to Stop. For reasons wishing to stop, the majority responded with health reasons. Interestingly, the unsuccessful group responded with the cost of smoking as a reason to stop. Giving cost as a reason has been considered not a good predictive indicator of successful cessation in previous studies.

Doctor Told Stop. Half of the total sample stated that their doctor had never told them to quit smoking. Half of the successful group answered affirmatively to this question, but only 41.3 percent of the unsuccessful group has had their doctor tell them to stop smoking. (Refer to Table 3.)

Program Related Questions

How Important to Stop. This question has five choices, each indicating a client's sense of importance about quitting at the time of enrollment. The total sample responded most

Table 2

Behavior Related Questions Frequencies

Questions	Successful Clients		Unsuccessful Clients		Total Population	
	Total No.	%	Total No.	%	Total No.	%
Age of Onset:						
10 and younger	3	11.5	0	0	3	4.7
11-15	0	0	7	15.2	7	9.7
16-20	20	76.9	30	65.2	50	69.4
21-25	3	11.5	7	15.2	10	13.9
26	0	0	2	4.3	2	2.8
TOTAL	26	100%	46	100%	72	100%
Frequency of Habit:						
10 or fewer cigarettes	0	0	0	0	0	0
11-20	3	11.5	10	21.7	13	18.0
21-30	10	38.5	7	15.2	17	23.6
31-40	8	30.8	20	43.4	28	38.9
41-50	1	3.8	2	4.3	3	4.2
51-60	2	7.7	5	10.9	7	9.7
61+	0	0	2	4.3	2	2.8
No response	2	7.7	0	0	2	2.8
TOTAL	26	100%	46	100%	72	100%

Table 2 (Continued)

Behavior Related Questions Frequencies

Questions	Successful Clients Total No.	%	Unsuccessful Clients Total No.	%	Total Population Total No.	%
Attempts to Stop:						
0 Attempts	2	7.7	7	15.2	9	12.3
1	7	26.9	12	26.1	19	26.0
2	6	23.1	10	21.7	16	21.9
3	3	11.5	5	10.9	8	11.0
4	0	0	7	15.2	7	9.6
5	0	0	1	2.2	1	1.4
6	1	3.8	1	2.2	2	2.8
7	4	15.4	2	4.3	6	8.2
8	0	0	0	0	0	0
9 or more	3	11.5	1	2.2	4	5.5
TOTAL	26	100%	46	100%	72	100%
Reasons for Smoking:						
Alertness						
1st choice	0	0	2	4.3	2	2.7
2nd choice	0	0	2	4.3	2	2.7
3rd choice	5	19.2	10	21.7	15	20.8
Not chosen	21	80.8	32	69.6	53	73.6
TOTAL	26	100%	46	100%	72	100%

Table 2 (Continued)

Behavior Related Questions Frequencies

Questions	Successful Clients		Unsuccessful Clients		Total Population	
	Total No.	%	Total No.	%	Total No.	%
Relaxation						
1st choice	12	46.2	22	47.8	34	46.6
2nd choice	4	15.4	11	23.9	15	20.8
3rd choice	0	0	0	0	0	0
Not chosen	10	38.5	13	28.3	23	31.9
TOTAL	26	100%	46	100%	72	100%
Habit						
1st choice	8	30.8	16	34.8	24	34.2
2nd choice	4	15.4	6	13.0	10	13.7
3rd choice	4	15.4	3	6.5	7	9.6
Not chosen	10	38.5	21	45.7	31	43.0
TOTAL	26	100%	46	100%	72	100%
Enjoy the Activity						
1st choice	2	7.7	2	4.3	4	5.5
2nd choice	6	13.1	7	15.2	13	17.8
3rd choice	2	7.7	5	10.9	7	9.6
Not chosen	16	61.5	32	69.6	48	66.7
TOTAL	26	100%	46	100%	72	100%

Table 2 (Continued)

Behavior Related Questions Frequencies

Questions	Successful Clients		Unsuccessful Clients		Total Population	
	Total No.	%	Total No.	%	Total No.	%
Resist Depression						
1st choice	1	3.8	1	2.2	2	2.7
2nd choice	4	15.4	11	23.9	15	20.8
3rd choice	1	3.8	5	10.9	6	9.6
Not chosen	20	76.9	29	63.0	49	68.0
TOTAL	26	100%	46	100%	72	100%
Other Reasons Specified						
1st choice	1	3.8	6	13.0	7	9.6
2nd choice	0	0	0	0	0	0
3rd choice	2	7.7	1	2.2	3	4.1
Not chosen	23	88.5	39	84.8	62	86.1
TOTAL	26	100%	46	100%	72	100%

Table 3

Health Related Questions Frequencies

Questions	Successful Clients Total No.	%	Unsuccessful Clients Total No.	%	Total Population Total No.	%
Reasons for Quitting:						
Health	18	69.2	31	67.4	50	68.5
Tired of smoking	3	11.5	1	2.2	4	5.5
Please spouse	1	3.8	2	4.3	3	4.1
Social pressure	1	3.8	0	0	1	1.4
Cost	0	0	2	4.3	2	2.7
Messy habit	0	0	2	4.3	2	2.7
The challenge	0	0	2	4.3	2	2.7
No response	3	11.5	5	10.9	8	11.0
TOTAL	26	100%	46	100%	72	100%
Doctor Told Quit:						
Yes	13	50.0	19	41.3	32	44.4
No	11	42.3	25	54.3	36	49.3
No response	2	7.7	2	4.3	4	5.5
TOTAL	26	100%	46	100%	72	100%

frequently with the "very important, but not vital" category (41.4%).

The successful group also mirrored the total sample, with 46.2 percent of the responses in the same category. The first two categories, "life and death" and "very important, but not vital," were selected by the unsuccessful group with 39.1 percent for both categories.

Belief in Treatment. The majority of clients marked the "not sure" category for how effective they felt the program would be for them.

In comparison, the unsuccessful group showed a higher percentage of answers in the moderate belief category (17.4%), than the successful clients (11.5%), or population as a whole (15.1%). (Refer to Table 4.)

Cross-tabulations

Cross-tabulation measures the association of how strongly two variables, randomly chosen, relate to each other or significantly effect one another.

The second procedure in the analysis of the data was performing cross-tabulations. The outcome variable, successful or not successful, was tabulated with the variables contained in the pre-treatment questionnaire.

Only one variable proved to be of any significance in the cross-tabulations. How a client was referred to the Center, ads, friends, or articles, was significant at a .0028 level. More unsuccessful clients were referred through

Table 4

Program Related Questions Frequencies

Questions	Successful Clients Total No.	%	Unsuccessful Clients Total No.	%	Total Population Total No.	%
How Important To Stop:						
Life & death	9	34.6	18	39.1	27	37.5
Very important but not vital	12	46.2	18	39.1	30	41.1
Important but not very	1	3.8	1	2.2	1	1.4
Preferable	1	3.8	4	8.7	5	6.8
Just as soon smoke	1	3.8	0	0	1	1.4
No response	0	0	5	10.9	8	11.0
TOTAL	26	100%	46	100%	71	100%
Belief in Treatment:						
Strong belief	4	15.4	6	13.0	10	13.7
Moderate belief	3	11.5	8	17.4	11	15.1
Not sure	13	50.0	27	58.7	40	55.5
No response	6	23.1	5	10.9	11	15.1
TOTAL	26	100%	46	100%	72	100%
Anticipated Difficulty:						
Slight difficulty	1	3.8	1	2.2	2	2.7
Moderate difficulty	7	26.9	9	19.6	16	21.9

Table 4 (Continued)

Program Related Questions Frequencies

Questions	Successful Clients		Unsuccessful Clients		Total Population	
	Total No.	%	Total No.	%	Total No.	%
Anticipated Difficulty:						
Extreme difficulty	15	57.7	34	73.9	50	68.5
No response	3	11.5	2	4.3	5	6.8
TOTAL	26	100%	46	100%	72	100%

advertisements. Successful clients showed an increase in referrals through friends. Articles proved to have little significance in referring any clients to the Center.

Discriminant Analysis

Discriminant analysis was the last and most important statistical procedure. Two discriminant analysis programs were computed. The first program included all available data gathered. Second computations utilized variables showing major group differences between the successful and unsuccessful groups.

Basically, the discriminant program analyzes and then classifies. Variables are analyzed for their ability to provide satisfactory discrimination for cases with known group membership. Then, a classification procedure permits the placement or classification of new cases with unknown membership. Thus, if the selected characteristics do well in predicting which group a client has been placed, use of these characteristics can be used to predict the likely outcome of new clients.

First Discriminant Analysis

All data gathered was included in the first discriminant analysis. Twenty-three variables of the total 48 were selected as having significant predictive value. In order of imporance they include:

1. Expect improved senses when no longer smoking

2. Belief in how effective treatment will be
3. Sex of client
4. Expect increased strength and endurance
5. Expect improved sexual responses
6. How client was referred to Center
7. Weight problem
8. Number of attempts to stop
9. Group attendance
10. Age of client
11. Expect a refreshed wake-up feeling
12. Expect better circulation
13. Reasons for smoking: out of habit
14. Longest time stopped
15. Expect more vigor
16. Reason for smoking: alertness
17. Cigar smoker
18. Reason for smoking: relaxation
19. Anticipated difficulty in quitting
20. Expect freedom from enslaving habit
21. Expect increased mental ability
22. Reasons for stopping
23. Age of onset.

As a digression, it should be noted that group attendance (variable 9 in the above analysis list) is a treatment variable and not appropriate for this analysis. However, it did prove to have predictive value, and should

be mentioned at this point, as an important part of insuring success in the program and therefore should be highly recommended to all clients completing the five days of aversion therapy.

Second Discriminant Analysis

Use of the literature helped select variables for the second analysis; i.e., it is easier to quit if onset was late in life, the shorter the duration of the habit the easier, etc. In addition, variables of significant value from the first analysis were included.

In order are the nineteen predictive variables from the second analysis:

1. Belief in effectiveness of treatment
2. Expectation of strength and endurance when no longer smoking
3. Expect improved senses
4. Age of onset
5. How referred
6. Expect better circulation
7. Number of attempts to stop
8. Longest time stopped
9. Sex of client
10. Expect improved sexual responses
11. Weight problem
12. Age of client
13. Expect refreshed wake-up feeling

14. Reason for smoking: habit
15. Anticipated difficulty quitting
16. Expect freedom from an enslaving habit
17. Reason for smoking: alertness
18. Reason for smoking: relaxation
19. Expect more vigor.

This analysis reveals a new ordering of variables previously selected as potentially valuable items. Belief in the effectiveness of the treatment became the primary predictive variable. Age of onset and the longest time stopped smoking gained more predictive importance in the second analysis. See Table 5 for comparison of both discriminant programs.

Predicting With Discriminant Analysis

Variables selected by the discriminant analysis as predictors are given a numerical score or weight, based on their predictive significance. In this case, belief in treatment received the highest predictive score or weight. To place or classify a new client in either a successful or unsuccessful group, the variable scores are used in an equation.

The predicting equation uses all predictive variables cited in the second discriminant analysis. The completed Pre-Treatment Questionnaire of a new client would be coded. Each coded answer on the questionnaire is then multiplied with each variable score of the discriminant analysis.

Table 5

Variables Selected by Two Discriminant Analysis Programs

	First Analysis		Second Analysis
1.	Expect improved senses	1.	Belief in treatment
2.	Belief in treatment	2.	Expect strength and endurance
3.	Sex of client	3.	Expect improved senses
4.	Expect increased strength and endurance	4.	Age of onset
5.	Expect improved sexual responses	5.	How referred to Center
6.	How referred to Center	6.	Expect better circulation
7.	Weight problem	7.	Number of attempts to quit
8.	Number of attempts to quit	8.	Longest time quit
9.	Group attendance	9.	Sex of client
10.	Age of client	10.	Expect improved sexual responses
11.	Expect refreshed wake-up	11.	Weight problem
12.	Expect better circulation	12.	Age of client
13.	Reason for smoking: habit	13.	Expect refreshed wake-up
14.	Longest time quit	14.	Reason for smoking: habit
15.	Expect more vigor	15.	Anticipated difficulty
16.	Reason for smoking: alertness	16.	Expect freedom from habit
17.	Cigar smoker	17.	Reason for smoking: alertness
18.	Reason for smoking: relaxation	18.	Reason for smoking: relaxation
19.	Anticipated difficulty quitting	19.	Expect more vigor

Table 5 (Continued)

Variables Selected by Two Discriminant Analysis Programs

	First Analysis	Second Analysis
20.	Expect freedom from habit	
21.	Expect increased mental ability	
22.	Reasons for quitting	
23.	Age of onset	

These computations culminate in a prediction score. A score falling below zero predicts a client will be in the successful group, and score above zero predicts a client will be in the unsuccessful group. (See Appendixes A and B for an example.)

Interestingly, questions unique to the Center's Pre-Treatment Questionnaire, but not usually mentioned in other studies, were selected by the discriminant program as having predictive value for this program.

In particular, seven of the seventeen "expected" categories on the questionnaire were considered valuable. Four, out of the six available responses for reasons to smoke, surfaced as predictors.

Among the first ten predictive variables in the discriminant analysis, four items have also been successful predictors in other studies. Age of onset of the smoking habit, number of attempts to quit, longest time quit, and sex of client are the variables mentioned in the literature.

Conclusion of Data Analysis

This research has brought to light variables that predict success in this smoking program. Statistical analysis of the variables provided a prediction equation for determining which group, successful or unsuccessful, a new client is likely to belong after treatment.

Chapter 5

CONCLUSIONS

Introduction

The conclusions are based on the findings derived from the statistical analysis described in Chapter 4. After data interpretation the following list of findings were made:

1. A difference between successful and unsuccessful clients in frequency distributions was found.
2. Cross-tabulation revealed little significance other than the importance of how a client is referred to the Center.
3. Discriminant analysis found 19 variables of predictive value in classifying a client to either group.
4. The population samples varied in frequency and predictive variables from other literature cited.

Therefore, on the basis of these findings it is possible to conclude that:

1. The items included in the analysis can be used to distinguish between successful clients and unsuccessful clients.
2. These items should be adopted as the variables that predict a client's ability for success.

3. A client's belief in the treatment has more influence on his ability to succeed according to the discriminant analysis, but should not be used as a sole predictor.
4. All the variables having predictive value should be viewed as part of a group variable that predict, and none should be given undue weight.

Based on these conclusions and findings, the proposed instrument for use in predicting success or failure in the smoking program is a revised and reorganized Pre-Treatment Questionnaire.

Time, money, and expediency, necessitate a pre-treatment questionnaire capable of assessing a client's potential success. The questionnaire is the author's proposed instrument for use in predicting successful cessation.

The questionnaire as the proposed instrument can be used to provide information capable of predicting along with the use of the prediction equation discussed in Chapter 4. Not only can the questionnaire and the equation quantitatively predict success, but the proposed reorganized, revised questionnaire can qualitatively estimate success. In a sense, knowledgeable review of the completed questionnaire by the Center can act as a "diagnosis" of a new client's ability to succeed in the program.

The following revised, reorganized questionnaire is the researcher's proposed instrument. The Pre-Treatment

PRE-TREATMENT QUESTIONNAIRE

THE FOLLOWING INFORMATION IS FOR CENTER PURPOSES ONLY AND WILL BE HELD IN STRICTEST CONFIDENCE. PLEASE ANSWER ALL QUESTIONS AS ACCURATELY AS POSSIBLE.

Part I

Name_____Date_____

Address_____City/State/Zip_____

Phone: Home_____Business_____

Age: ____ Date of Birth_____Sex____Height____Weight____

Marital Status: Single ____Married____Divorced____Widowed_____

Number of Children_____Ages of Children in the Home_____

Employer_____Position_____

Physician_____Physician's Address_____

When was your last physical examination?_____

Part II

1. I first started smoking cigarettes on a daily basis at age_____
2. I now smoke _____cigarettes daily.
3. I smoke a pipe yes_____ no_____
4. I smoke a cigar yes_____ no_____
5. I have made _____serious attempts to stop smoking.
6. The longest I have ever been able to stop smoking was for _____ (length) in _____ (year).
7. When I stop smoking, I expect to attain the following effects: Please mark an "X" for only those that apply.

_____generally better health

_____restoration of good breathing

_____better circulation

_____a look about me that is younger, brighter, and more alive

_____an improved self-image and self respect

_____a feeling of a greater sense of responsibility towards my goals and values

_____more energy, strength, and endurance through the day

_____improved senses, such as taste, smell, vision, hearing

_____improved sexual responses

_____a refreshed waking-up experience

_____a longer life

_____a higher level of mental functions, improved memory, better thought organization

_____restoration of the esteem and respect of loved ones

_____total freedom from an enslaving habit

8. Following are a list of factors which most people indicate are their reasons for smoking. Please number in order of importance what is true in your own case: 1 - 2 - 3, etc.

_____smoking helps me wake up, feel more alert

_____smoking gives me pleasure, helps me feel more relaxed

_____I smoke for no particular reason...it is just a habit that doesn't seem to serve any purpose

_____I enjoy holding a cigarette, lighting up, flicking ashes, etc.

_____smoking keeps me from feeling bad, helps me overcome depression

_____other reason, please state explicitly_____

9. What is your current attitude about cigarettes? Mark those that apply.

_____cigarettes are a nuisance, they get in my way

_____cigarette smell is offensive to me

_____cigarettes are a poison to my body

_____I consider cigarettes a close friend

_____cigarettes ease tense social situations for me

_____being a "smoker" is part of my self image

10. Can you visualize yourself as a nonsmoker 5 years from now? ___yes ___no

11. Are moral reason(s) involved in your decision to quit smoking? ___yes ___no

12. Does your spouse smoke? ___yes ___no

13. Are there more smokers than nonsmokers in your group of friends? ___yes ___no

Part III

1. The health problems I now have that I feel are the result of and/or aggravated by smoking are _____.

2. My physician has told me to stop smoking. ___yes ___no

3. I have problems controlling my weight. ___yes ___no

4. Has the health of someone close to you been affected negatively by smoking? ___yes ___no

PART IV

1. How did you find out about this program? Check as many as apply.

A. Advertising: Radio _____ Newspaper____Television____

B. Heard about program from a friend_____

C. Referred by physician_____

D. Read an article about the clinic_____

E. Other, please specify_____

2. How important do you feel it is for you to stop smoking at this time? Check one.

_____matter of life and death--great urgency

_____important but not urgent

_____important but not that important

_____not important but preferable

_____would just as soon continue smoking

3. How much do you believe this treatment program will be effective in helping you to stop smoking? Check one.

_____strongly believe

_____moderately believe

_____am not sure

_____doubt if it will help

_____strongly disbelieve

4. How much trouble do you expect to have stopping?

____extreme ___moderate ___slight

5. Do you take any of the following medications? Check those which apply.

_____digitalis

_____nitroglycerine

_____diuretic (water pills)

_____high blood pressure medications

Part V

The following background information is very important for the Center's continuing research. Your cooperation is appreciated.

1. What is your age? 10-17___ 18-24___ 25-34___ 35-49___

   50-64____ 65+_____

2. What is your total annual household income before taxes?

   Under $5,000____ $5,000-9,999___ $10,000-14,999___

   $15,000-19,999___ $20,000-24,999___ $25,000 & over ____

3. What is the highest level of education you have attained? (Check one)

   Still attending school____ Attended high school____

   High school graduate____ Attended college 1-3 years_____

   College graduate_____

4. What is the natural color of your hair? Black ____

   Blond_____ Brown_____ Red_____

5. What is the color of your eyes? Blue____Brown_____

   Hazel_____

6. What is your complexion? Dark ___Fair___Olive___Ruddy___

7. What is your mother's ancestry? African___Asian___

   East European___Mediterranean___North European___

8. What is your father's ancestry? African____Asian___

   East European___Mediterranean___North European___

Questionnaire already in use by the Center is included in the Appendix (Appendix C) so comparisons can be made by the reader.

Reorganization of the questionnaire was done so as to group similar questions in one section, instead of having them scattered throughout the questionnaire. Part I of the questionnaire asks demographic questions. Part II asks behavior related questions about a person's habit. Part III deals with health related issues, and Part IV asks questions about program related issues and factors that may interfere with administering the therapy.

Part V was unchanged. This information is collected by the Center for further research purposes. Although there is a difference of opinion between author and the Center on the information asked, the categories were left intact.

Revisions were few. A rewording of questions, for clarification on how to answer or for obtaining more specific information, was done to questions 7 and 8 in Part II. Questions not having significant predictive value were eliminated.

Additions to the questionnaire include items mentioned in the literature as having predictive value:

Part I = Ages of children <u>in the home</u>

Part II = Questions:

9. What is your current attitude about cigarettes?
10. Can you visualize yourself as a nonsmoker?
11. Are moral reason(s) involved in your quitting?
12. Does your spouse smoke?
13. Are there more smokers than nonsmokers in your group of friends?

Part III = Questions: 4. Has the health of someone close to you been negatively affected by cigarette smoking?

For qualitative interpretation of the questionnaire a certain amount of background knowledge is required. Awareness of the variables shown to be predictive of success in other studies is necessary; i.e., age of onset, health related problems, ages of children in the home, etc.

Also, familiarity with the descriptive statistics in this study would be helpful. Knowing the characteristics of previous successful and unsuccessful clients is needed.

Most importantly, understanding the significance of the weighted, predictive variables and their meaning as a group, could further the accuracy of predicting the outcome of an enrolling client.

A combination of the predicting equation and a qualitative assessment of a client's pre-treatment questionnaire could guide a therapist's approach in dealing with that particular client, perhaps increasing chances for successful cessation.

Chapter 6

RECOMMENDATIONS AND SUMMARY

Introduction

Developing an instrument to predict cessation in a smoking program using aversion therapy was the purpose of this study. Discriminant analysis selected nineteen variables capable of predicting success. The prediction equation was the result of the discriminatory program. A revised, reorganized Pre-Treatment Questionnaire is the proposed instrument for predicting success. Prediction may be calculated with the equation or assessed qualitatively with careful review of a client's answers.

Recommendations

Taking into consideration the results from the statistical analysis and the subsequent conclusions, the following recommendations are presented:

1. That the items in this research be utilized, both the qualitative and quantitative means of prediction.
2. That the proposed revised, reorganized Pre-Treatment Questionnaire be implemented.
3. The items be given further study to determine if these constitute the total number of predictive variables.

4. More detailed data be collected for implementing further research on smoking cessation.
5. That treatment variation be taken into consideration in further research.
6. Staff members be aware of the importance of the questionnaire in assessing a client's particular needs in therapy.
7. Staff at the Center be aware of the predictive value of the proposed questionnaire.
8. That collection and comparison of data descriptive of the population be implemented for awareness of a possible change in persons entering the program.

It should be kept in mind that prediction simply involves the extrapolation of data about the present to a specified point in the future. Unfortunately, developing a prediction instrument does not account for changes in the environment or for individual differences, it simply describes a population already affected by the treatment.

Summary

The aim of this study was to develop an instrument to predict cessation in a smoking program using aversion therapy.

Data were collected from the Pre-Treatment Questionnaires of clients already completing the program. Information gathered

was based on the characteristics proving successful in previous research on smoking cessation. Statistical analysis included: frequency distributions, cross-tabulation, and discriminant analysis.

Frequency distributions between successful and unsuccessful clients showed significant differences. Cross-tabulation was not revealing. Discriminant analysis pinpointed nineteen predicting variables. An equation using all nineteen variables was explained as a means of predicting the possible success of a new client.

The proposed prediction instrument was the Pre-Treatment Questionnaire, revised and reorganized to more accurately define or predict a successful client. Both quantitative and qualitative methods of assessing a client's treatment outcome were offered.

Basic recommendations includes: implementing the revised Pre-Treatment Questionnaire, recognizing the usefulness of the questionnaire in assisting therapists administer the treatment, and encouraging future research on predictive factors in successful smoking cessation for this program.

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APPENDIXES

APPENDIX A

A prediction score is arrived at through use of an equation. This equation uses every predictive variable cited in the second discriminant analysis. The code given each variable is multiplied with the standardized coefficient, and with the addition of the constant, produces a predicting score. A score falling below zero places a client in the successful group, and a score above zero places a client in an unsuccessful group. An example of this equation follows:

Client #1 (.21395) (belief in treatment code = 3) +

. . . (-.3715) (expect vigor = 1) +

(-3.4267) = -1.323

It is the unstandardized coefficients that help determine which group, successful or unsuccessful, an incoming client may belong. Standardized coefficients numerically express the relative weight of a variable within a group of variables. The unstandardized coefficients numerically weigh and compare the effects of each variable in different populations or, in this case, in different sub-populations. Appendix B is illustrative of the variable scores of the second discriminant analysis.

This is an example of an unsuccessful client. The final score is above zero, indicating a predicted placement in the unsuccessful group, regardless of the sign before the predictive score.

APPENDIX B

SECOND DISCRIMINANT ANALYSIS

	Variables	Coefficients: Standardized	Unstandardized
1.	Belief in treatment	.52652	.21395
2.	Expect strength and endurance	.47949	1.20309
3.	Expect improved senses	-.46175	-0.96312
4.	Age of onset	.44449	-0.04345
5.	How referred	.42001	0.82833
6.	Expect better circulation	.40192	1.08433
7.	Number of attempts to stop	.38910	0.16191
8.	Longest time stopped	.36123	0.03499
9.	Sex of client	.32034	0.72444
10.	Expect improved sexual responses	-.31610	0.66228
11.	Weight problem	-.29164	0.19860
12.	Age of client	-.28305	-0.02335
13.	Expect refreshed wake-up feeling	-.26603	-0.56565
14.	Reason for smoking: habit	.26285	-0.07146
15.	Anticipated difficulty	.24341	-0.15560
16.	Expect freedom from enslaving habit	.22033	0.64859
17.	Reason for smoking: alertness	-.19790	0.05981
18.	Reason for smoking: relaxation	-.18675	0.05540
19.	Expect more vigor	.14962	-0.37147
	Constant		-3.42967

APPENDIX C

PRE-TREATMENT QUESTIONNAIRE

THE FOLLOWING INFORMATION IS FOR CENTER PURPOSES ONLY AND WILL BE HELD IN STRICTEST CONFIDENCE. PLEASE ANSWER ALL QUESTIONS AS ACCURATELY AS POSSIBLE.

PART I

Name _____ Date _____
Last First Initial

Address _____ City/State/Zip _____

Phone: Home _____ Business _____

Age____ Date of Birth _____ Sex_____ Height _____ Weight _____

Marital Status: ___ Single ___ Married ___ Divorced ___ Widowed

Number of Children _____ Ages of Children_____

Employer _____ Position _____

Physician _____ Physician's Address _____

When was your last physical examination?_____

PART II

1. How did you find out about this program? (check as many as apply)

   A. Advertising: Radio _____ Newspaper _____ TV _____
   B. Heard about program from a friend _____
   C. Referred by physician _____
   D. Read an article about the clinic _____

2. I first started smoking cigarettes on a daily basis at age _____

3. How many cigarettes do you smoke each day?_____

4. Which brand(s) of cigarettes do you usually smoke? List the ones you usually smoke, with the most frequent one first. Circle F next to the brand if it is a filter cigarette; circle M if it is mentholated.

   A)_____ M F B)_____ M F

5. List the brand(s) you dislike most, designating whether it is filter (F) or mentholated (M).

   A)_____ M F B)_____ M F

6. Do you smoke a pipe? _____ If yes, how many pipefuls daily? _____

7. Do you smoke cigars? _____ If yes, how many daily? _____

8. Do you experience any unpleasant effects when you have your "first cigarette"? _____ If so, describe:

   _____

9. Are there periods when you smoke more than usual?_____ If yes, describe when and where:

   _____

10. How many cigarettes do you usually smoke at a party or other social gathering?_____

11. There are periods (this may be during the day or for longer periods) when even heavy smokers do not smoke. Please describe when, where and for approximately how long this is in your case.

_____

_____

12. Approximately how many serious attempts to stop smoking have you made? _____

13. The longest I have ever been able to stop smoking was for _____ in _____
Length of Time Year

14. I returned to smoking after that time because _____

_____

_____

15. State the nature of the difficulties you encountered while trying to stop smoking (give mental and physical symptoms, if any)_____

_____

16. If you have been to other smoking control clinics before, please describe, telling where, when and whether they were effective in helping you stop smoking, and for how long you stopped. _____

_____

17. What health problems do you now have that you feel are the result of and/or aggravated by smoking?_____

_____

18. Why do you want to stop smoking? _____

_____

19. Have you ever been told to stop smoking by a physician? ____ When? _____ Why? _____

_____

20. When I stop smoking, I expect to attain the following effects:_____(mark if true)

_____ generally better health

_____ restoration of good breathing

_____ better circulation throughout the body

_____ easier, deeper, more satisfying sleep

_____ a look about me that is younger, brighter, and more alive

_____ an improved self-image & self-respect

_____ a greater sense of security

_____ a feeling of a greater sense of responsibility towards my goals and values

_____ more energy, strength & endurance through the day

_____ improved senses, such as taste, smell, vision, hearing

_____ improved sexual responses

_____ a refreshed waking-up experience

_____ a longer life

_____ a healthier mental attitude

_____ a higher level of mental functioning (i.e.) improved memory, better thought organization

_____ restoration of the esteem and respect of loved ones

_____ total Freedom from an enslaving habit

21. How important do you feel it is for you to stop smoking at this time? Check one of the following:

___ matter of life and death - great urgency

___ very important but not vitally urgent

___ important but not very important

___ not important but preferable

___ would just as soon continue smoking

22. How much do you believe this treatment program will be effective in helping you to stop smoking? Check one of the five categories below:

___ strongly believe

___ doubt if it will help

___ moderately believe

___ strongly disbelieve

___ am not sure

23. How much trouble do you expect to have stopping?

___ moderate ___ extreme ___ slight

24. Following are a list of factors which most people indicate are their reasons for smoking. Place number "1" before the reason that you feel is most important in your own case; place number "2" before the reason you think is second in importance; place number "3" before the third most important reason, etc. Put a "0" before any factors which do not apply in your own case.

___ smoking helps me wake up, feel more alert

___ I enjoy holding a cigarette, lighting up, flicking ashes, etc.

___ smoking gives me pleasure, helps me feel more relaxed

___ smoking keeps me from feeling bad, helps me overcome depression

___ I smoke for no particular reason...it is just a habit but doesn't seem to serve any purpose

___ Other reasons, please state explicitly

25. Check the appropriate columns of the following other habits that apply to you:

	None	Light	Moderate	Heavy
coffee	____	____	_____	_____
liquor (or beer or wine)	____	____	_____	_____
pep pills or diet pills (e.g.) sleeping pills	____	____	_____	_____
tranquilizers (e.g.) Librium	____	____	_____	_____

26. Do you have any of the following heart symptoms? Check those which apply.

___ palpitations

___ swelling of the legs

___ chest pains on exertion

___ high blood pressure

___ shortness of breath while lying in bed

___ heart attack (coronary)

27. Do you take any of the following medications? Check those which apply.

___ digitalis ___ nitroglycerine ___ diuretic (water pills) ___ high blood pressure medications

28. a. Do you have trouble controlling your weight? ___ yes ___ no

b. If so, are you: ___ overweight ___ underweight

I certify that the above information is complete and accurate to the best of my knowledge.

Signed _____

Date _____

PART III

The following background information is very important for Schick's continuing research. Your cooperation is appreciated.

1. What is your age? 10-17 ___ 18-24 ___ 25-34 ___ 35-49 ___ 50-64___ 65 & over___

2. What is your Total Annual Household Income Before Taxes? Under $5,000 ___ $5,000-9,999 ___

$10,000-14,999 ___ $15,000-19,999 ___ $20,000-24,999 ___ $25,000 & over ___

3. What is the highest level of education you have attained? (Check one.)

Still attending school ___ Attended High School ___ High School Graduate ___

Attended College 1-3 Years ___ College Graduate ___

4. What is the natural color of your hair? Black ___ Blond ___ Brown ___ Red ___

5. What is the color of your eyes? Blue ___ Brown ___ Hazel ___

6. What is your complexion? Dark ___ Fair ___ Olive ___ Ruddy ___

7. a. What is your mother's ancestry? African ___ Asian ___ East European ___

Mediterranean ___ North European ___

b. What is your father's ancestry? African ___ Asian ___ East European ___

Mediterranean ___ North European ___