

PREDICTOR VARIABLES AND THE
DETERMINATION OF CONTINUING
SUCCESS IN THE MODIFICATION
OF SMOKING BEHAVIOR

Thesis for the Degree of M. A.
MICHIGAN STATE UNIVERSITY
RICKI ELLEN KANTROWITZ
1975

0835

LIBRARY
Michigan State
University

BINDING BY
HAG & SONS'
BOOK BINDERY INC.
LIBRARY BINDERS
SPRINGPORT, MICHIGAN



3 1293 10439 0517



RETURNING MATERIALS:
Place in book drop to
remove this checkout from
your record. FINES will
be charged if book is
returned after the date
stamped below.

W ~~DATE~~
067
JUL 15 1997

6193844

ABSTRACT

PREDICTOR VARIABLES AND THE DETERMINATION
OF CONTINUING SUCCESS IN THE MODIFICATION
OF SMOKING BEHAVIOR

By

Ricki Ellen Kantrowitz

Much research on cigarette smoking has dealt with how to improve the success of smoking withdrawal programs. While many smokers are temporarily aided by such programs, their level of smoking tends to increase at follow-up. It is felt, therefore, that the emphasis of smoking research should not be on how to eliminate smoking, but on how to help smokers maintain their reduced levels. If subjects who sustain their reduced levels can be differentiated from those who do not, various tactics could be employed to deal with the potential failures, thereby heightening the program's impact and maintaining success rates at follow-up.

This investigation was designed to assess whether at the end of a three month follow-up, the participants who remained successful could be distinguished from those who were initially successful but had become recidivists. A combination of scores on various predictor variables was expected to form the basis for distinguishing the groups.

The criteria of success were defined in two ways. First, "successes" were those who had reduced their smoking level from 75-100% of baseline. Of the 24 participants who met this criterion at the end of treatment, eight were continuing successes at follow-up, while 16 had become recidivists. Second, using a more stringent definition, "successes" were those who were totally off cigarettes at the end of the program. Of the 15 abstainers at the end of treatment, six were continuing abstainers at follow-up, while nine were nonabstainers.

Fourteen separate hypotheses were formulated concerning the predictive value of variables which research has shown to correlate with either short-or long-term cessation. In addition, nine other variables plus the scores on each of the four subscales of the Horn-Waingrow Scale were examined as to their predictability. The data were collected from pre- and post-treatment questionnaires, the Rotter Internal-External Locus of Control Scale, the Eysenck Personality Inventory (Form B) and the Horn-Waingrow Scale.

Despite the exploratory nature of the study, limitations based on a relatively small sample size and large numbers of variables examined, some significant findings did emerge. The most significant results concern the hypotheses dealing with negative affect smoking. This dimension refers to those who smoke to reduce negative affect, such as anger or tension (Horn-Waingrow Scale). The results demonstrate that these smokers, even if temporarily successful, are likely to become

recidivists ($p < .005$). On the other hand, people who do not smoke to reduce negative affect are likely to remain successful once they have quit smoking or reduced their smoking level ($p < .05$). Thus, as also demonstrated by the multivariate analyses, recidivism is highly correlated with a need to reduce negative affect.

Length of success during treatment was also significant ($p < .025$, $n=24$; $p < .05$, $n=15$) as a predictor variable: those who were successful for 4-5 weeks were more likely to remain off cigarettes or at their reduced level than those successful for a shorter time. Other variables that significantly differentiated long-term successes from failures were three of the four smoking subscales, Marital Status and Concern about Weight Gain During Treatment. Suggestions were made about using the variables explored in this study in future smoking research.

The results of this investigation demonstrate that a combination of predictor variables can be used to form criterion-specific predictor scales for follow-up success. Implications and recommendations based on these findings were discussed.

ACKNOWLEDGMENTS

I would like to express my sincere appreciation to my committee chairman, Dr. Richard Russell, who provided patient and understanding assistance. Without his constant encouragement and guidance this paper would not have been possible. I would also like to thank my other committee members, Dr. Gordon Williams and Dr. Dozier Thornton, for their interest in my work and for their helpful suggestions.

In addition, I am indebted to Dr. Douglas Miller, who gave generously and unselfishly of his time. As a result, he helped me not only to understand and become excited by statistics but also to have very positive feelings about research.

Thanks are also due to my co-therapists, Bob and Meredith, who helped to run the study and to the many participants of the smoking clinic, who made the entire project possible.

I am extremely grateful to Donna, Linda, Cheryl and Paula, who provided me with continual support and encouragement and who put up with my complaining and anxiety--even though they had many pressures of their own.

Finally, I want to thank my parents and my brother, who have always encouraged me to strive for my goals and have always been there when I needed them.

TABLE OF CONTENTS

	Page
LIST OF TABLES	v
 Chapter	
I. INTRODUCTION.	1
Smoking Withdrawal Techniques	4
Research Methodology.	5
Improving Success Rates	9
Smoking Type.	10
Personality Variables	15
Internal-External	15
Introversion-Extroversion	17
Other Predictor Variables	18
Demographic Variables	19
Age.	19
Sex.	19
Social Class	20
Smoking Characteristics	20
Level of Smoking at Outset	20
Duration of Previous Quitting Attempts	21
Environmental Factors	21
Significant Others	21
Treatment Effects	22
Success at End of Treatment.	22
Length of Success During Treatment	22
Difficulty in Quitting	22
Confidence	23
Summary	23
Hypotheses.	24
Follow-Up Data; Other Considerations.	27
II. METHOD.	28
Subjects.	28
Group Leaders	28
Procedure	28
Assignment to Treatment	29
Treatments.	30
Operant Learning.	30
Covert Sensitization.	30

Chapter	Page
Supportive Counseling	31
Attention Placebo	31
Will Power.	31
No Treatment.	32
Post-Treatment Measures	32
Follow-Up	32
Criteria of Success	33
III. RESULTS	34
Treatment Outcome	34
Follow-Up Analyses.	35
Smoking Type.	35
Personality Variables	38
Demographic Variables	38
Smoking Characteristics	39
Environmental and Treatment Factors	41
Additional Variables.	43
Multivariate Analyses	45
IV. DISCUSSION.	49
V. SUMMARY	58
APPENDICES	62
A HORN-WAINGROW SCALE	62
B PRETREATMENT QUESTIONNAIRE.	64
C POST-TREATMENT QUESTIONNAIRE.	66
D CATEGORIZATION OF VARIABLES FOR USE IN THE PEARSON PRODUCT-MOMENT CORRELATIONS .	69
E PEARSON PRODUCT-MOMENT CORRELATIONS OF 27 CATEGORIZED PREDICTOR VARIABLES WITH RAW AND CATEGORIZED CRITERIA.	70
REFERENCES	71

LIST OF TABLES

Table		Page
1.	Fisher's exact probability test for the analysis of smoking type and personality predictor variables of two different-sized samples at three months follow-up.	37
2.	Fisher's exact probability test for the analysis of demographic and smoking characteristic predictor variables of two different-sized samples at three months follow-up	40
3.	Fisher's exact probability test for the analysis of environmental and treatment predictor variables of two different-sized samples at three months follow-up.	42
4.	Fisher's exact probability test for the analysis of nine additional predictor variables of two different-sized samples at three months follow-up.	44
5.	Step-wise regression results for differing numbers of predictor variables	47

ba

pa

to

as

li

ti

in

wh

big

of

the

ati

bro

Alt

dis

rad

As

of

CHAPTER I

INTRODUCTION

Until recently, the image of the smoker in our society has been a very positive one. This image was created, in part, by the large advertising campaigns financed by the tobacco industries. In the media, the smoker was portrayed as a sophisticated, sexy individual who knew how to enjoy life. Once lured to cigarettes- by such extrinsic motivation as curiosity, or the desire to be accepted or reduce inferiority feelings (Logan, 1970)- about half of the people who tried them began to take up the smoking habit (Dunn, 1973).

After 1964, when the Surgeon General's report linked cigarette smoking to numerous diseases, the positive image of the smoker began to erode. It was found, for example, that "cigarette smoking is a major cause of death and disability. It is the primary cause of lung cancer, chronic bronchitis and pulmonary emphysema" (Terris, 1968, pp. 6-7). Although a strong tobacco lobby resisted the effort, advertisements for cigarettes were removed from television and radio, and much emphasis was placed on anti-smoking campaigns. As well, much research was begun, to get a better understanding of the diverse aspects of smoking behavior.

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

While the immediate effect of the evidence against cigarettes was that many smokers tried to cut down or quit completely, within a few months the sale of cigarettes again increased (Bernstein, 1970). The fact that so many of the people who wanted to quit were unable to, suggests that many factors are working against the elimination of the smoking habit. These include the strong hold the smoking habit has on adults and the vested interest of tobacco growers, the tobacco industry and advertisers (Horn, 1969).

The individual, rather than society, has determined the extent of his smoking behavior. Unlike drugs or alcohol, which are considered a menace not only to the individual but also to others, smoking has been considered a maladaptive act, affecting only the smoker himself. Therefore, even in light of the detrimental effects of cigarettes, smokers have been encouraged, rather than coerced to quit (Horn, 1969). Yet, the fact that the sale of cigarettes continues to rise each year (Badger, 1975) suggests that the persuasion and encouragement given by antismoking campaigns have had little influence.

However, in very recent times, the sentiments of many nonsmokers are beginning to change. Research has found, for example, that nonsmokers are exposed to and can be adversely affected by the pollutants cigarette smoke puts in the air (Badger, 1975). Many people now believe that, while the smoker has the right to ruin his own health, he does not have the right to impair the health or even the comfort of

others (Roisman, 1971). Some nonsmokers have begun to unite in groups- i.e., ASH-Action on Smoking and Health or GASP-Group Against Smoker's Pollution- in order to put pressure on smokers and on legislators to get laws passed restricting smoking in public places.

With the growing demand for smoking restrictions and the further substantiation of the causal links between smoking and many serious diseases, it can be expected that the positive image of the smoker will continue to disintegrate. Smokers who have not been aware of the health hazards or have tried to ignore them will be more frequently confronted by the media and by militant nonsmokers and will probably contemplate, if not attempt, to discontinue their smoking behavior. Yet, if the past success rates for quitting attempts are considered, it appears that most people who try to discontinue will not be successful. Less than 20%- and some studies have indicated that it is actually less than 10%- of the smokers who try to quit are successful (Bernstein, 1970).

As in the past, people who find themselves incapable of quitting on their own will often turn to outside agencies- heart or lung associations-, clinics or research projects to help them quit. Yet, even with this support, the majority will remain smokers. Although over a decade has passed since the discontinuation of smoking behavior became a major topic for researchers (Bernstein, 1970), knowledge about which methods are effective is very limited. Although researchers

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

have tried to analyze what factors are important in the maintenance and termination of smoking and have tried to understand why they have failed in their attempts to help people, "the art of assisting smokers who wish to stop is in a most primitive state" (Mausner & Platt, 1971, p. 104).

Smoking Withdrawal Techniques

The limited results are not due to a paucity of methods, for hundreds of techniques, both individually and in combination, have been tried in the attempt to get smokers to stop. A partial listing of these methods include educational programs, fear-arousing lectures, programmed learning, role playing, nicotine substitutes, the use of tranquilizers, five day plans, stimulus satiation, aversive techniques and conditioning, personal counseling, discussion groups, hypnosis, group therapy and psychoanalysis (Schwartz, 1969).

Some methods that have been used in smoking withdrawal programs have been gimmicks. Other programs have tried techniques based on theoretical rationales. For example, those who use counseling or therapy as techniques for smoking withdrawal generally stress that the causes- i.e., the emotions and motivations associated with initiation and maintenance of the smoking behavior- are crucial factors that have to be dealt with before a person can stop smoking (Schwartz, 1969). On the other hand, the growing success and popularity of behavior therapy have prompted the use of such techniques as aversive conditioning, desensitization and operant learning programs in smoking modification

2

1

1

3

3

3

2

2

ha

4

Or

res

dis

dis

ade

ade

pla

suoc

1997

1997

1997

1997

1997

1997

(Eysenck, 1973). Learning theorists believe that smoking is a learned modifiable behavior, and as such, they have worked primarily with changing the observable behavior, ignoring causal factors (Bernstein, 1970; Schwartz, 1969).

However, no matter what the technique or theoretical basis, the success rates in smoking modification programs are very low. Elliott and Tighe (1968) have reported that the number of people who are abstinent at the end of treatment usually ranges from 30 to 50% when studies with large samples are considered. This drops to 15 to 30% at the follow-up stage, which is usually measured anywhere from six to 18 months after the end of treatment.

Research Methodology

Several extensive reviews of discontinuation methods have been written (Bernstein, 1970; Keutzer, Lichtenstein, & Mees, 1968; Lichtenstein & Keutzer, 1971; Schwartz, 1969). On the whole, these authors have been highly critical of the research methodology employed and, consequently, have often discredited the findings of various studies. Their criticisms are based on numerous factors, including the lack of adequate follow-up data, inadequate control and/or attention placebo groups and inconsistency about what constitutes success in a smoking modification program. Also, Bernstein (1970) has suggested that research has too often been conducted to answer insignificant or even inaccurate questions.

Many studies collected data on their subjects until the end of treatment, but did not include any follow-up procedures. In some cases this was due to a lack of understanding about

research, but in many instances, the investigators were primarily concerned about measuring short-term treatment effectiveness. Yet, the conclusions to be drawn about the effectiveness of different techniques based only on end of program data are often quite deceptive. For example, Thompson and Wilson's (1966) Five Day Clinic had an extraordinarily high success rate of 72.6% at the end of the program. However, when data was collected just ten weeks later, the rate fell to 29.7%. Moses (1964) had a success rate of 70% in a program using hypnosis, but at follow-up the rate fell to 18%. Without the follow-up data, both of these techniques would have appeared to have been much more successful than other types of treatments. In fact, Hunt and Matarazzo (1970) have shown, in a summary of 17 reliable and valid studies of long-term quitting that the percentage of nonrecidivists (smokers who are off cigarettes at the end of the treatment program and remain off at follow-up) decreases as a function of time since original success, in a negatively accelerated fashion. Therefore, studies that do not report follow-up data should not be considered valid.

One other problem with follow-up data concerns those who report incomplete data or are selective in the subjects they contact. For example, Ejrup reported a follow-up success rate of 61% for his clinic at Stockholm. However, the Norwegian Research Group, following up all of the subjects in the study, in contrast to Ejrup's selective contacts, found that the long-term success rate was really 23% (Schwartz,

1969). Therefore, follow-ups not only should be included, but also should be as inclusive as possible.

The limited use of control groups has also detracted from the conclusions that can be drawn about treatment effectiveness. For example, Bernstein (1970) feels that while smoking clinics do help some people quit smoking, the fact that they have no control groups and high drop-out rates reduces what they can add to the understanding of the process of smoking withdrawal. Some studies that have included controls have drawn them from different populations than the treatment groups- i.e., comparing rates of quitting for smokers in the regular population and volunteers in a smoking clinic would provide deceptive information about the effectiveness of the technique used. Bernstein (1970) suggests that several types of control groups should be used in each study- including those who are told they are unacceptable for the program; those told they will have to wait to receive treatment; those told to quit on their own-using will power and determination; and those put in attention placebo treatments. By controlling for nonspecific treatment factors- i.e., experimenter contact, expectation, social pressure and attention- very different conclusions might be made about treatment effectiveness. For example, it has generally been concluded that it is these nonspecific factors, rather than specific treatment effects, that account for the fairly similar success rates for all the different methods used. Therefore, for people who really want to quit almost any

te

re

12

va

ti

fr

nu

wh

on

th

nu

re

of

re

si

ter

th

ua

ra

ion

mer

see

que

src

hig

technique will bring successful short-term results, although relapse will almost always occur (Bernstein, 1970; McCallum, 1970; Mair, 1970).

Another weakness in research methodology includes the variability in what constitutes success in smoking modification. In some studies success is considered percent reduction from baseline (i.e. 50%, 85%), in others it is the absolute number of cigarettes reduced (i.e. cutting down by 10 or 15), while in still others, total abstinence is considered the only success. When researchers do not adequately describe their criteria for success- i.e., by not specifying the number of abstainers even though they are examining percent reduction- comparison among studies is difficult.

As a response to these and other criticisms, and because of more sophisticated and well-conceptualized methods and research designs, more of the current studies have been considered to be well-controlled, reliable investigations (Lichtenstein & Keutzer, 1971). Yet even with acceptable results, the conclusions that can be drawn from these treatment evaluation studies provide little relevant information about long-range smoking discontinuation. Finding that different behavioral treatments have comparable results at the end of treatment and that these results diminish at follow-up, does not seem to be answering the right questions. Instead, the question to be answered is not how to reduce or eliminate smoking (especially since some techniques have had extremely high short-term success rates) but how to maintain the reduced

lev

exp

giv

tree

tree

cha

are

shol

bel

fail

type

to s

impl

be m

1973

know

is d

the

demo

beha

thes

abil

incre

(1977

level (Pyke, Agnew, & Kopperuch, 1966).

Improving Success Rates

In treatment-centered studies, smokers are uniformly given the same treatment or randomly assigned to different treatments whose success rates are to be compared. Each treatment is, therefore, expected to be capable of promoting change in each subject. This assumes, as well, that there are basic, uniform factors that are generalizable to all smokers (Eysenck, 1973; Guilford, 1966).

The advocates of an opposing position feel that such beliefs are not tenable, that such approaches are doomed to failure (Eysenck, 1973). They argue that there are different types of smokers, who require different methods to get them to stop. What a person gets out of smoking has important implications for identifying the type of treatment that will be most effective with the particular individual (Eysenck, 1973; Guilford, 1966; Hochbaum, 1965; Horn, 1969). Therefore, knowing how to help someone terminate his smoking behavior is difficult, if not impossible, without first understanding the many variables- including personality, environmental and demographic- that are important in maintaining his smoking behavior.

The information gained from better understanding how these factors interact both with types of treatments and with ability to maintain smoking cessation, would be helpful in increasing the success rates of different methods. Eysenck (1973) feels that all methods of behavior modification

re

ca

de

cc

en

(S

pa

cc

cta

be

dur

fre

the

mai

ica

rat

litt

beer

Smok

type

(196

beha

being

affec

sugge

require careful analysis and theoretical insight before they can be used with success.

Once crucial factors are identified, screening procedures designed to classify participants at the start of a program could be instituted in order to assign subjects to the programs felt to be most effective for their particular "type" (Schwartz & Dubitzky, 1968). Also, those participants having patterns of variables suggesting a good chance of recidivism could be identified. These "high risk successes" could have changes made in their program- so that their treatments could be extended, they could be invited back for booster sessions during the follow-up period, or they could be contacted more frequently during follow-up. This would serve to maximize the effectiveness of the withdrawal program and to stress maintenance of cessation. Unfortunately, while this theoretical approach and the numerous suggestions based on this rationale have been considered and discussed for several years, little empirical research supporting these recommendations has been conducted (Mausner & Platt, 1971).

Smoking Type

One rationale for classifying smokers into different types has been advanced by Tomkins (1966, 1968). Tomkins (1966) proposed that the "key to the understanding of smoking behavior is to be found in the management of affect...Human beings are innately motivated to maximize their positive affect and minimize their negative affect" (pp. 17-18). He suggested that one can learn to use smoking to relieve negative

a

7

s

a

s

t

m

o

in

sm

of

li

sa

bo

he

and

the

and

Sch

lat

& H

Whi

rar

ies

of

Port

affect and evoke positive affect. Based on this approach, Tomkins postulated the existence of four different types of smokers- positive affect, negative affect, habitual and addictive. The positive affect smoker uses smoking as a stimulant, as a relaxant, or enjoys the sensorimotor qualities of smoking itself. The second type smokes to reduce negative affect- i.e., tension, fear or distress. Therefore, cigarettes are used as a sedative. In habitual smoking, the individual no longer correlates his smoking with emotion, but smokes because it is a habit. He rarely thinks about smoking, often finding himself smoking without being aware of having lit up. In the addictive type (addictive is not used in the same sense as drug addiction), the smoker uses cigarettes for both positive affect and to reduce negative affect. As well, he experiences negative affect when he is without a cigarette and is always aware of when he is not smoking.

Although Tomkins described the general characteristics of the four types, he did not provide a means of operationalizing and identifying what type a certain individual is. Initially, Schwartz and Little, but primarily Horn and Waingrow formulated a questionnaire based on Tomkins' typology (Ikard, Green, & Horn, 1969). This questionnaire is composed of 23 items, to which the respondents reply with one of five alternatives- ranging from always to never (see Appendix A). Several studies, including one in which a national probability sampling of adults (Ikard et al., 1969) was used, have generally supported Tomkins' typology. When factor analyzed, the scale

a

r

a

r

c

E

t

o

(3

so

FR

(2

of

(1

SM

so

"I

ci

in

th

ad

Hol

ass

in

bro

and

appears to contain six factors. Three of them- stimulation, handling and pleasurable relaxation- are viewed as positive affect smoking. The other three factors- negative tension reduction, habit and psychological addiction- are each considered to be associated with one of the other three smoking types. The Horn-Waingrow Scale enables each smoker to identify for himself why he smokes and what factors increase or decrease the likelihood of his giving up smoking (Schwartz, 1969).

Several other researchers have used the Horn-Waingrow scale, but have modified it or expanded it, in the hopes of providing further information about smokers. Ikard et al. (1969) did some revising in order to isolate various aspects of the pleasurable relaxation factor. Mausner and Platt (1971) extended the scale, so that it includes a measure of smoking to define one's self-image and smoking to aid in social affiliation. They renamed the scale, calling it a "Test of Patterns of Support for Smoking". They also criticized Tomkins' implication that the four smoking types are independent of one another. Instead, they suggested that the factors form a continuum, with pleasure at one end and addiction at the other. Coan (1973) added 20 items to the Horn-Waingrow Scale, thereby trying to develop new factors associated with smoking. He not only classified the smokers in his sample into types, but he divided the types into two broad categories, one of which he called adjusted smoking and the other, maladjusted smoking.

Other investigators have developed different procedures

and
used
sion
scal
they

best
of th

Maus

relie

On th

reasc

test

malac

habit

chara

Given

that

smoke

about

types

& Pla

those

altern

reduce

as a v

and scales to differentiate types. McKennell (1968, 1973) used factor analysis to type smokers according to the occasions in which they smoke. Firth (1970) also devised a scale to differentiate smokers by the situations in which they usually smoke.

The usefulness of the concept of types of smokers in better understanding smoking behavior can be shown by some of the research findings when scales were used. For example, Mausner and Platt (1971) showed that persons who smoke to relieve tension were generally more anxious than nonsmokers. On the other hand, smokers who used cigarettes for other reasons and nonsmokers had similar patterns of scores on a test of generalized anxiety. Coan (1973) found that his maladjusted smokers were characterized by tension and ingrained habit and addictive symptoms, while the adjusted smokers were characterized by greater pleasure and relief from tension. Given these differences in smoking type, one would predict that treatments would not be equally effective with all smokers.

In the literature, various suggestions have been made about what kinds of techniques seem best suited to certain types of smokers (i.e., Eysenck, 1973; Firth, 1971; Mausner & Platt, 1971; Tomkins, 1966). It has been suggested that those who smoke for pleasure should be taught how to obtain alternative sources of gratification. Smokers who want to reduce negative affect should be taught relaxation procedures as a way of dealing with tension, or they should learn to

subst

avoid

smoki

by sm

is th

to qu

axie

diffe

For e

negat

fello

& Tom

might

age o

syste

analy

the v

dimen

behav

who h

facto

Those

but t

other

reduc

substitute other behaviors if the negative affect cannot be avoided. Habitual smokers should be made very aware of their smoking, learning to recognize the cues that they respond to by smoking and asking themselves each time they go to smoke if they really want to. Addictive types should be encouraged to quit all at once and to realize that they can handle the anxiety that "not smoking" produces.

Predictions have been made about how successful these different types will be in terminating their smoking behavior. For example, pleasure smokers should find it easiest to quit, negative affect smokers should have the next easiest time, followed by habitual smokers and addicted smokers (Ikard & Tomkins, 1973; Tomkins, 1968).

However, these predictions are not as useful as they might seem, for it has been found that only a small percentage of smokers can be classed as pure types in Tomkins's system (Mair, 1970). Research has been conducted which analyzes how people with different patterns of scores on the various dimensions or even different levels on the same dimension do in quitting and sustaining their nonsmoking behavior. Mausner & Platt (1971) found that individuals who had a very high score on the psychological addiction factor were not likely to change their smoking behavior. Those with high scores were likely to cut down initially, but then resume. Low addictive scores, in interaction with other variables, predicted change. Subjects high on tension reduction and on pleasure failed to change. Eisinger (1972)

had similar results with the addictive scale. He looked at spontaneous quitting in a sample that was given the Ikard revision of the Horn-Waingrow Scale in 1966 and then reinterviewed in 1968. Low addictive scorers quit more often than moderates, who quit more often than high scorers. He also found the habitual factor to be predictive of success. High habit scorers quit more often than moderate or low scorers. Schwartz and Dubitzky (1968) also discovered that low addiction was a fairly crucial variable in initial success. As well, the negative affect score largely determined the rate of recidivism. A high negative affect score along with one other high score was generally associated with recidivism. The lowest recidivism rates were in the group that had high addiction or habit scores or both, and low negative affect scores.

Personality Variables

In addition to the findings about smoking types and cessation and recidivism, there may be distinctive personality characteristics associated with successful efforts to stop smoking (Weatherley, 1965). Two personality characteristics that have been frequently examined in connection with smoking research are 1) generalized expectancies of internal and external control of reinforcement, and 2) introversion-extroversion.

Internal-External

Internal-external control was defined by Rotter (1966) and James, Woodruff, and Werner (1965) as a "measure of the

e

f

l

d

h

c

e

w

r

t

w

r

(:

(:

(:

b

s:

my

S:

a

s:

th

th

on

di

extent to which a person perceives events as determined by factors intrinsic to himself or manipulable by himself [internal] versus the extent to which he views events as determined by fate, chance or the manipulations of others [external] " (p. 184). Smith (1970) reviewed the findings of five studies and concluded that smokers tend to be more externally oriented than nonsmokers.

Research relating internality to success in smoking withdrawal has not been entirely clear. James et al. (1965) noted that, after the Surgeon General's report was published, those in their sample who believed the report and quit smoking were more internally oriented than those who believed the report and did not quit. However, Bernstein (1970), Foss (1973), Keutzer (1968), Mausner and Platt (1971), Straits (cited in Schwartz & Dubitzky, 1968), and Straits and Sechrest (1963) did not find the internal-external factor predictive of behavior change. Yet, at least Keutzer (1968) noted that her sample was more internal than the population in general. This is in accord with the findings (Mausner & Platt, 1971; Straits, cited in Schwartz & Dubitzky, 1968) that internals attempt to stop smoking more often than externals, whether successful or not. Yet, Mausner and Platt (1971) suggest that success itself is based on many factors, both within the person and in his environment, and internality may play only a small part.

The ability of the internal-external dimension to predict long-term success, as contrasted with temporary behavior

of

A

for

the

the

the

the

the

the

the

the

(the

the

in

2

the

the

the

the

ex

the

the

the

(the

change, has not yet been determined (Mausner & Platt, 1971). A study by Mausner and Platt, which did include a long-range follow-up, found that internality was predictive of success. If internality does prove to be predictive of long-term maintenance of cessation, it may be because those motivated to quit by external forces rather than an internal commitment are more prone to fail (Eisinger, 1971).

Introversion-Extroversion

Eysenck and Eysenck (1968) describe the typical introvert as a "quiet, retiring sort of person, introspective, fond of books rather than people...distant except to intimate friends....The typical extrovert is sociable and needs to have people to talk to" (p.6). As well, it has been hypothesized (Eysenck, 1965) that the extrovert has a kind of "stimulus hunger", making him prefer coffee, alcohol, cigarettes, impulsive and risk taking behavior. Smith (1970) reviewed 25 studies that compared smokers to nonsmokers on this trait. Twenty-two found smokers to be more extroverted than nonsmokers and none found an opposite trend. Among smokers, Eysenck (1973) found a significant relationship- with heavy smokers more extroverted than medium smokers, who were more extroverted than light and exsmokers.

Few studies have looked at the interaction of this trait with treatment outcome or follow-up success, and those that have analyzed this variable have had inconsistent findings. Eysenck, Tarrant, Woolf, and England (1960) and Straits (cited in Schwartz & Dubitzky, 1968) observed that successful

Q
T
T
T
T
C
T
S
S
A
W
H
t
Q
t
d
w
2
va
ha
ar
ni
se
pe
va

quitters were lower in extroversion than continuing smokers. Bernstein (1970) and Keutzer (1968) found no correlation between introversion-extroversion and treatment outcome. In terms of follow-up, Ryan (1973) found an interaction between social class and this trait. Upper class quitters had higher extroversion scores than nonquitters, but lower class quitters were more introverted. However, the population was more introverted than expected by national norms. Straits (cited in Schwartz & Dubitzky, 1968) found that successes were less sociable than people who quit and failed. As well, Elliott and Tighe (1968) found that social drinking was a difficult situation for their abstainers to master. Higher levels of sociability and drinking have been ascribed to extroverts.

Other Predictor Variables

In addition to personality characteristics and smoking types, any attempt to explain smoking behavior which "ignores demographic variables (such as sex, age, income, social class) would only be a deceptive oversimplification" (Ryan, 1973, p. 240). As well as helping to explain smoking behavior, certain variables- including demographic, psycho-social, environmental- have been somewhat successful in predicting treatment outcome and, in some instances, follow-up success. Multivariate techniques have been crucial to the development of predictor scales. They allow for the determination of the predictive power of a number of variables in combination, or of a given variable when the others are controlled, and for determining

the relative weights of the variables (Sanford, 1967).

Some variables that have been observed to be especially successful in predicting smoking behavior change and could be important in predicting follow-up success include:

Demographic Variables

Age- Most studies have concluded that smokers who successfully quit are usually older than those who do not change their smoking level (Bosse, 1972; Bosse & Rose, 1973; Delarue, 1973; Guilford, 1967; Straits, 1967). However, Leone, Musiker, Albala, and McGurk (cited in Schwartz & Dubitzky, 1968) obtained higher success rates for younger subjects. Also, decrease in smoking has not always been found to relate to age (Eisinger, 1972; Keutzer, 1968; Mausner, Mausner, & Rial, 1968).

The few studies that have examined the correlation between age and long-range success have noted that older people were more successful in quitting than the younger participants, and they were a much smaller part of the recidivist group (Eisinger, 1971; Ryan, 1973).

Sex- Men have been much more successful than women in terminating their smoking behavior (Delarue, 1973; Eisinger, 1971, 1972; Hutchinson & Emley, 1973; Ikard & Tomkins, 1973; Mausner et al., 1968; Ross, 1967; Ryan, 1973). Yet, Hammond and Garfinkel (1964) noted that women were more successful in discontinuing and Keutzer (1968) and Guilford (1967) found no significant difference between the sexes. However, Guilford did find that while there were no differences in rate of

quitting for subjects in treatment groups, men were more successful than women in groups without treatment.

In a one year follow-up of a smoking clinic (Delarue, 1973) 33.9% of the men and 20.8% of the women were totally abstinent. In a seven month follow-up, Ryan (1973) observed that 14.2% of the male active smokers were able to stay off as compared to only 3.9% of the females. However, Eisinger (1971) noted in his survey, that while men were much more successful in quitting, rates of recidivism for each sex were about equal.

Social Class- Ryan (1973) observed that the upper class smokers were much more successful in quitting than the lower class. Mausner and Platt (1971) also found that the lower class members were less likely to give up smoking.

Schwartz and Dubitzky (1968b) found that it was the lower class smokers who were more successful at quitting; however, by the one year follow-up a much greater number of the lower class quitters had become recidivists, so that upper and lower class subjects had about the same rate of success.

Smoking Characteristics

Level of Smoking at Outset- Mausner et al. (1968) noted that previous reports have indicated varied patterns of relation between level of smoking and smoking behavior change. They feel this is due to the interaction of several factors which may differ in different groups. Therefore, while light smokers probably find it easier to change, heavy smokers may take the treatment more seriously.

Q

S

S

T

T

H

T

S

L

L

S

S

L

L

a

r

i

f

p

s

o

o

o

o

fo

(M

Ma

th

Summaries of spontaneous quitting (Eisinger, 1972; Horn, cited in Mausner & Platt, 1971; Lichtenstein & Keutzer, 1971; U.S. Surgeon General's Report, 1964) show that light smokers quit more often than heavy smokers. In treatment programs, the findings are not consistent. Heavier smokers were sometimes found more likely to quit (Mausner et al., 1968; Mausner & Platt, 1971) and sometimes less likely than light smokers to quit (Delarue, 1973; Schwartz & Dubitzky, 1968). In some studies no significant relationship was found (Keutzer, 1968; Lichtenstein, Poussaint, Bergman, Journey, & Shapiro, 1967).

In follow-up studies, low frequency smokers showed a significant tendency to remain abstinent (Schwartz & Dubitzky, 1968; Thompson & Wilson, 1966; Winnett, 1973).

Duration of Previous Quitting Attempts- Lichtenstein et al. (1967) indicated that previous length of time off cigarettes was not significantly related to success in quitting in their study. However, Thompson & Wilson (1966), in a follow-up conducted ten weeks after the completion of their program, found that 46% of those who had previously stopped smoking for a month or more were successful, while only 18% of those who had not stopped for that long a time were successful.

Environmental Factors

Significant Others- Smokers with nonsmoking spouses were found to be more likely to want to quit and to attempt to quit (Meyer, Friedman, & Lazarsfeld, 1973). Individuals who were married to nonsmokers were also more successful at quitting than those married to smokers (Mausner et al., 1968; Schwartz,

4 D.

rela

1964

rain

Pla

high

whi

2

smol

form

rem

1964

(19

the

rel

ind.

the

ret

& T.

thos

less

abil

the

& Dubitzky, 1968; Straits, 1967). Eisinger (1972) found no relationship between this factor and success.

In a study which included only males (Schwartz & Dubitzky, 1968), quitters with nonsmoking wives were better able to maintain their success through follow-up. Studies using Five Day Plans as the main withdrawal method have reported that a higher proportion of continuing abstainers have families which do not include smokers (Mausner & Platt, 1971).

Treatment Effects

Success at End of Treatment- Smokers who only reduce their smoking level by the end of treatment usually regress to their former levels, while those who abstain are much more likely to remain successful (Lichtenstein, 1971; Lichtenstein et al., 1967; Schwartz, 1969; Winnett, 1973). For example, Lynch (1963) found that the relapse rate for smokers who just reduced their level of smoking was 50% within three months, while the relapse rate for total abstainers was 9%.

Length of Success During Treatment- It has also been indicated that there exists a large negative relation between the length of time that the smoker has abstained from cigarettes and the probability he will resume smoking (Elliott & Tighe, 1968; Hammond & Garfinkel, 1964), implying that those who have been off cigarettes for a longer time will be less likely to resume.

Difficulty in Quitting- Tomkins (1968) suggests that the ability to resist becoming a recidivist is correlated with the difficulty that one had in quitting. If one finds it very

a
 c
 t
 c
 a
 f
 b
 g
 b
 r
 p

difficult to quit, he will be less likely to resume smoking; however, if quitting has been easy, recidivism will be more likely.

Confidence- One of the best predictors of long-range success in termination of smoking behavior is a belief that one can stop smoking (Eisinger, 1971; Guilford, 1967; Horn, 1968; Mausner & Platt, 1971). This belief has generally been measured by pretreatment questionnaires or general population surveys.

Summary

It is obvious that the concept of predictors represents a complex problem. Predictors are often not reliable, and the stability of the findings depends a great deal on the populations used (Borgatta, 1967). However, there are numerous benefits to be gained from the use of predictor variables in assessing follow-up success. With criterion-specific scales, composed of variables shown empirically to correlate with long-term cessation, the success of different withdrawal treatments could be greatly improved.

In the current study, the primary objective is to compare a group of successful quitters or reducers at a three month follow-up to a group who were temporarily successful but have become recidivists. It will be seen if the members of each group can be differentiated by key characteristics that have been found to be predictive of success or failure in past research. As well as testing hypotheses about individual predictor variables, post hoc analyses will be performed to

determine the relative contributions of each variable to the criterion of long-term success and to determine interactions between variables. As Schwartz and Dubitzky (1968) have suggested, such an undertaking would add much knowledge about the interaction between treatment and subject characteristics associated with smoking withdrawal.

Hypotheses

I. Smoking Types:

- A) By the three month follow-up, those smokers who scored high on the negative affect dimension, combined with a high score on one or more of the other smoking factors, will be the most likely of the successes to have become recidivists.

Schwartz and Dubitzky (1968) observed that those smokers who had high negative affect scores, in addition to other high scores, would usually become recidivists. That is, those who use smoking to reduce their negative feelings find it difficult to substitute other behaviors to deal with their emotions.

- B) At the follow-up, those with high scores on addiction or habit or both, combined with a low score on negative affect will have the lowest rates of recidivism.

Schwartz and Dubitzky (1968) noted that a low negative affect score, combined with high addiction or habit scores, predicts a low rate of recidivism. Thus, although it is difficult for habitual and addictive smokers to stop smoking, if they do not use cigarettes as a crutch to deal with their problems, they should be able to sustain their smoking behavior change.

II. Personality Variables:

- A) By follow-up, internals who were successful at treatment should have a lower rate of recidivism than successful externals.

This should occur because the external forces that were part of the treatment program- i.e., authority of the group leader, peer pressure- ended with the final meeting, so that quitters are left on their own to continue their nonsmoking behavior.

- B) By follow-up, introverts who were successful at the end of the program should have a lower rate of recidivism than successful extroverts.

This prediction is based on the findings (Elliott & Tighe, 1968; Straits, cited in Schwartz & Dubitzky, 1968) that sociable people- i.e., extroverts- would be likely to find themselves more often in social situations where they would be tempted to smoke.

III. Other Predictor Variables:

A) Demographic Variables:

- 1) At follow-up, a smaller proportion of older-age successes, as compared to younger successes, should be part of the recidivist group.

This is based on the findings by Eisinger (1971) and Ryan (1973) that older quitters were better able to maintain their success.

- 2) At follow-up, male successes should have a lower rate of recidivism than female successes.

Delarue (1973) and Ryan (1973) observed that a greater percentage of the men in their studies was able to remain long-term successes.

- 3) At follow-up, lower class participants should have a higher rate of recidivism than upper class subjects.

Schwartz and Dubitzky (1968) found that a much greater number of their lower class successes had become recidivists by the time of the one year follow-up.

B) Smoking Characteristics:

- 1) At follow-up, light smokers should show a lower rate of recidivism than heavy smokers.

In the literature, it has frequently been indicated that the low frequency smoker has a tendency to remain abstinent significantly longer than heavy smokers (Schwartz & Dubitzky, 1968; Thompson & Wilson, 1966; Winnett, 1973).

- 2) Those smokers who have been off cigarettes for at least one month on a previous occasion, should have a higher rate of success at follow-up (lower recidivism) than those who have never quit for that long a time.

Thompson and Wilson (1966) found a higher percentage

of successes at a ten week follow-up came from the group that had quit previously for a month or more.

C) Environmental Characteristics:

- 1) Married successes with nonsmoking spouses or single successes living in nonsmoking households should form a smaller portion of the recidivist group at follow-up than successes with smoking spouses.

Studies (Mausner & Platt, 1971; Schwartz & Dubitzky, 1968) have indicated that a higher proportion of recidivists come from households where someone smokes.

D) Treatment Effects:

- 1) Subjects who are totally abstinent at the end of treatment should be less likely to regress, when measured at the three month follow-up, than successes who have cut down but have not ceased completely.

This is based on the consistent finding (i.e., Lynch, 1963) that abstainers are more likely to remain successful than reducers.

- 2) The longer the length of time that the subject was a success during the treatment portion of the program, the less likely he will be to regress during follow-up.

It has been noted that there is a negative relation between the length of time that a smoker has abstained and the probability of his resumption (i.e., Hammond & Garfinkel, 1964).

- 3) The harder the time the subject had in quitting, the less likely he will be to become a recidivist.

This is based on a rationale suggested by Tomkins (1968) rather than any empirical evidence. Tomkins feels that if quitting has been easy, recidivism will be likely, but if it has been difficult, one will be less likely to start smoking again.

- 4) Successes who state that they are confident of their ability to remain at their reduced smoking level should be more successful at follow-up than those who are not as confident in their ability.

A belief that one can stop smoking has been found to be a very powerful predictor of long-range success in quitting (i.e. Mausner & Platt, 1971). This has generally been measured on pretreatment measures. It seems as if, when given a post-treatment questionnaire, subjects should be even better able to

predict how they will do, for they are aware of how they have done in the program and what expectations they have for themselves during follow-up.

Follow-Up Data: Other Considerations

These hypotheses concern single order correlations of each predictor variable with the criterion of success. Of equal importance will be the multiple correlations. These post hoc analyses will determine the interrelatedness of the variables, as well as their relative contribution in the prediction of the attainment of long-term cessation.

In addition to the aforementioned variables, there are other variables which will be examined in the post hoc analysis. They were not included in the above predictions, because of equivocal findings concerning the relationships of the variables to treatment outcome and follow-up success. These variables are education, income, age at start of smoking, number of years one has smoked, number of attempts at quitting, concern about present health and concern about any weight gained during treatment.

Sub

arr

at

to

con

the

par

Pro

and

tra

dir

gro

Pro

Ass

invi

meet

info

told

CHAPTER II

METHOD

Subjects

Subjects were informed about the research project by announcements and articles in local newsmedia. Those smoking at least 20 cigarettes a day and willing to commit themselves to a six week smoking cessation program were encouraged to contact the Michigan Lung Association, under whose auspices the study was being conducted. A total of 96 subjects took part in the main study.

Group Leaders

Group leaders were three graduate students, two female and one male, majoring in clinical psychology. They were trained in the different treatment techniques by the project director, a Ph.D. clinical psychologist. Each leader ran one group under each of the six treatment conditions.

Procedure

Once the names were received from the Michigan Lung Association, the group leaders called the volunteers and invited them to attend one of three group organizational meetings. At these meetings, the participants were briefly informed about the general purpose of the program and were told that they would be assigned to treatment groups

acc

mat

Sub

mem

mem

bas

ret

wer

tol

The

cer

App

rai

add

sec

the

mea

Per

sur

A

ext

lev

int

tre

according to the results of the personality and questionnaire material they would be administered at the end of the meeting. Subjects were also given record forms, narrow slips of paper numbered from 1 to 60, on which they were to keep track of the number of cigarettes they smoked each day, to establish a baseline. They were told to keep the strips in their cigarette packs and each time they took out a cigarette, they were to cross off a number and record the time. They were told to return these forms at the first meeting.

The questionnaire material consisted of three segments. The first was a survey, which asked for information about certain demographic, environmental, motivational factors (see Appendix B). The second part was the smoking type questionnaire developed by Horn and Waingrow (see Appendix A) in addition to the 23 item extension by Coan (1973). The final section was a survey by Firth (1971), designed to identify the occasions in which people smoke.

The personality tests included the Rotter scale (1966), measuring internal-external locus of control and the Eysenck Personality Inventory-Form A (Eysenck & Eysenck, 1968) measuring the introversion-extroversion trait.

Assignment to Treatment

On the basis of the scores attained on the internal-external scale and on pretreatment estimates of daily smoking level, subjects were randomly assigned by stratified blocks into one of six experimental conditions. Each of the six treatments were then divided into three sections, one for

6

3

2

1

1

2

2

3

1

P

in

to

Th

re

P

sy

in

i.

Si

he

pr

we,

the

unp

each leader. When necessary, some switching of names was done in order to accommodate scheduling conflicts or preferences, although when this was done, an attempt was made to keep the Rotter scores nearly identical.

Treatments

All experimental groups were run for eight sessions, over a six week period. All groups had five to seven members assigned at the outset.

Operant Learning- This treatment was an operant program based on learning principles. Many of the procedures were modeled after the techniques described in a weight reduction program developed by Stuart and Davis (1974). Subjects were instructed to keep an accurate record of their smoking behavior, including environmental and motivational determinants. The program included gradually reducing the number of cigarettes smoked per day, as well as limiting the number of places where one could smoke. Reinforcement decks and a token system were used to give immediate reinforcement for nonsmoking behavior. Aversion decks and other mild aversive tactics, i.e., providing information about health hazards, were used. Significant others were asked for assistance. Group leaders helped individuals tailor the program to their specific needs.

Covert Sensitization- This treatment was based on a procedure developed by Cautela (1966, 1970). The subjects were told that they smoked because they found it pleasurable; therefore, the focus of the treatment would be to develop new unpleasant associations to cigarettes. This was done in two

S

W

Th

W

d

a

st

ch

Ar

ai

cc

to

le

he

to

fo

ha

th

mi

co

ab

an

ser

sec

by

steps. The first consisted of training the subjects to relax, using a deep-muscle technique developed by Jacobsen (1938). Then aversive feelings were produced by having the subjects vividly imagine a typical smoking scene and by pairing it with detailed descriptions of nausea. Ten aversive scenes were alternated with ten escape scenes, where subjects avoided smoking. Subjects were told to practice the relaxation and the scenes at home.

Supportive Counseling- Similar to groups like Alcoholics' Anonymous, this treatment used peer pressure and support to aid subjects in their quitting attempts. Each session was conducted as a discussion group and was used by the members to share and discuss similar feelings, experiences and problems connected with smoking and quitting. The group leader helped to direct and focus the conversation on smoking-related topics and offered encouragement.

Attention Placebo- Subjects in this treatment were informed that they had been placed in this group because smoking had become a habit which they did without awareness and was, therefore, not under the direct control of their conscious mind. They were told that they would be subconsciously re-conditioned, which would change their subconscious attitudes about quitting. Slides, which the subjects thought contained anti-smoking messages but actually were combinations of nonsense syllables, were presented subliminally on a tachistoscope. A more detailed description of this technique is given by Sipich, Russell, and Tobias (1974).

Will Power- Subjects in this group were told that they

were

using

high

own

eff

by

gro

the

big

con

dis

unt

tha

end

by

as

the

Pos

re

Se

we

to

en

Po

We

were the types of people who could quit most successfully by using sheer will power and determination. Gimmicks and techniques would not work for them, for they had to quit on their own- which they could do, if they were persistent in their efforts. After the initial session, subjects were contacted by telephone, at intervals equal to the group meetings. The group leaders continued to encourage these subjects to use their will power and also recorded an estimate of number of cigarettes smoked in the last 24 hour period.

No Treatment- Subjects in the no treatment group were contacted by telephone and told that because of scheduling difficulties they would not be able to be offered a treatment until about ten weeks later. They were apologized to and told that they would be given priority in the next session. At the end of the six week program, these controls were recontacted by telephone and their current level of smoking was obtained, as well as information about their free times and interest in the next session.

Post-Treatment Measures

At the conclusion of the last session, subjects were readministered the Rotter Internal-External Locus of Control Scale and the Eysenck Personality Inventory (Form B). They were also asked to answer questions concerning their reactions to the treatments and to provide further information about environmental, smoking and personality variables (see Appendix C).

Follow-Up

Subjects were contacted by telephone once a week for ten weeks following the conclusion of the treatment phase and at

a three month follow-up. They were asked to provide an estimate of their smoking level. All contacts were made by someone other than the subject's own group leader. Subjects will also be contacted at six month and one year intervals.

Criteria of Success

In this investigation, only the data for those subjects identified as "successes" at the conclusion of the six week smoking withdrawal program were examined. Program "successes" were those who had reduced their level of smoking from 75-100% of baseline (see above for a description of establishing baseline). Twenty-four treatment subjects, 42% of those who completed the minimum number of sessions, met this criterion. These 24 "successes", nine males and 15 females, had a mean age of 37.2. At the three month follow-up these subjects were re-evaluated in terms of the number of cigarettes they were currently smoking. On the basis of this follow-up these individuals were placed into one of two categories- continuing success (75-100% reduction) or recidivism (less than a 75% reduction). Eight of the 24 were continuing successes, 16 of the 24 had become recidivists.

Since much past smoking research has considered only total abstainers to be successful, a separate analysis was done on the 15 treatment subjects, 26% of the treatment group, who had totally quit smoking cigarettes by the end of the program. These 15 abstainers, five males and 10 females, had a mean age of 37.3. At the three month follow-up, six of the 15 were continuing abstainers, while nine had become nonabstainers.

CHAPTER III

RESULTS

Treatment Outcome

Of the 96 subjects who initially took part in this investigation, 73 completed the program. In order to assess the differential effectiveness of the five treatment groups (Operant Learning, Covert Sensitization, Supportive Counseling, Attention Placebo and Will Power) a two factor repeated measures analysis of variance was performed. The results indicated significant time effects $F(5, 260)=50.63, p < .001$, but no significant treatment or treatment by time interaction effects. Hence, while all subjects improved over the treatment phase of the program, there were no differences between treatment groups. To include the No Treatment subjects, a one-way ANOVA was performed on the post-treatment smoking levels. Significant treatment effects were observed, $F(5, 67)=6.62, p < .01$. Scheffe's post hoc comparisons indicated significant differences between Covert Sensitization and No Treatment and between Supportive Counseling and No Treatment, $p < .05$. No other comparisons were significant. A second repeated measures ANOVA was conducted on the follow-up data. While smoking levels increased over the ten week follow-up period, the repeated measures ANOVA did not demonstrate significant time, treatment or time by treatment interaction effects.

Follow-Up Analyses

In the first portion of the statistical analyses done for this study, each of the 14 predictor variables that were used in the hypotheses were related in tabular form to the two criteria of success at the three month follow-up: continuing success and continuing abstinence (see Tables 1-3). Due to the small sample size and the resulting violations of some of the assumptions for a chi-square analysis, it was necessary to use Fisher's exact probability test (Siegel, 1956). This test was used to determine whether the continuing success vs. recidivist groups differed significantly in the proportion in which they fell into the classifications of specific variables. Similar analyses were conducted for the continuing abstainer vs. nonabstainer groups. Since only a 2 x 2 contingency table was used, it became necessary to dichotomize all variables- often requiring the collapsing of categories or the use of the sample mean as a dividing point.

Smoking Type

Smoking type was measured by use of the Horn-Waingrow Scale (see Appendix A). Each of the smoking types was composed of subsets of the 23 items that loaded most highly with it when a rotated factor analysis was performed on the test data of a national probability sampling of adults who smoked (N=2094) (Ikard et al., 1969). Therefore, negative affect was composed of items 3,7,11,14,17,19; habit included questions 2, 8,15,20; addiction contained numbers 5,10,13,18,22; and positive affect was composed of the remaining eight items. The

factors were scored by assigning point values to each of the five response alternatives- ranging from always=5, frequently=4 to never=1. The high, medium and low categories were based on an absolute scoring system and were patterned after the scoring method devised by Ikard et al. (1969). In order to be placed into a high category on a particular factor a respondent had to average more than an "occasional" response- that is, at least a 3.5 response. Thus on the eight item positive affect subscale anything in the range of 28 to 40, inclusive, was considered high. A low score meant an average of less than "occasional"- a score of 2.5 or less per item. Thus on this factor, 8-20, inclusive, composed the low category.

The first smoking type prediction (henceforth referred to as HiNA)- that smokers who had a high score on negative affect along with a high score on one or more of the other three smoking factors would be the most likely of the successes to become recidivists- was statistically significant ($p < .005$) for both criteria of success: continuing success and continuing abstinence (see Table 1).

The second smoking type hypothesis (LoNA) was that those individuals who had a low score on negative affect, in combination with a high score on addiction, habit or both would be less likely to become recidivists. Since none of the 24 treatment successes had low negative affect scores- based on the above scoring system- it was necessary to consider the medium range as being a "lower" score on negative affect. For both criteria of success, this combination of smoking type scores resulted in a significant finding ($p < .05$) (see Table 1).

Table 1

Fisher's Exact Probability Test for the Analysis of Smoking
Type and Personality Predictor Variables of Two
Different-Sized Samples At Three Months Follow-Up

	Continuing Success n=8	Recidi- vist n=16	Continuing Abstainer n=6	Nonab- stainer n=9
I. <u>Smoking Type</u>				
A. High negative affect score plus at least one other high score (HiNA)				
No	8	4	6	1
Yes	0	12	0	8
Significance level	$p < .005$		$p < .005$	
B. Medium negative affect score plus high score on addiction, habit or both (LoNA)				
Yes	4	1	3	0
No	4	15	3	9
Significance level	$p < .05$		$p < .05$	
II. <u>Personality Variables</u>				
A. Rotter Locus of Control Scale				
Internal 0-7 (0-6) ^a	4	5	4	3
Externals 8+ (7+)	4	11	2	6
Significance level	N.S.		N.S.	
B. Eysenck Personality Inventory				
Introverts 0-14 (0-15)	4	8	2	6
Extroverts 15+ (16+)	4	8	4	3
Significance level	N.S.		N.S.	

^aNumbers outside parentheses indicate the range of values of the categories for the continuing success-recidivist group (n=24); numbers inside parentheses indicate the range of values for the continuing abstiners-nonabstainer group (n=15).

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28

29

30

31

32

(

D

W

M

Personality Variables

Two different predictions were formulated about the effects of personality variables. The scores received on the post-treatment administration of the Rotter Internal-External Locus of Control Scale were divided into two categories for the continuing success vs. recidivist group ($\bar{x}=7.7$, $n=24$) and the continuing abstinence vs. nonabstinence group ($\bar{x}=6.6$, $n=15$). Those scoring below the mean were considered internals, those above the mean were classified as externals. These two means are similar to the mean scores for 26-45 year old males ($\bar{x}=7.7$, $SD=4.2$, $n=25$) and 26-45 year old females ($\bar{x}=8.7$, $SD=3.9$, $n=25$) reported by Staats (1974). The prediction that successful internals would be less likely to become recidivists than externals was not confirmed (see Table 1). The mean scores received by the success groups on Eysenck Personality Inventory, Form B, were 14.7, $n=24$; 15.5, $n=15$. Introverts were those scoring below the mean, extroverts were those scoring above the mean. These means were similar to that reported by Eysenck and Eysenck (1968) for a group of male and female American college students ($\bar{x}=15.2$, $SD=3.5$, $n=239$). The hypothesis that introverts would be less likely than extroverts to become recidivists was not supported (see Table 1).

Demographic Variables

Several demographic variables-age, sex and social class-were also examined (see Table 2). Those individuals above the mean for age ($\bar{x}=37.2$, $n=24$; $\bar{x}=37.3$, $n=15$) were considered

older, those below the mean were called younger. The prediction that a smaller proportion of older-age successes would be part of the recidivist group was not confirmed. As well, there was no significant difference between the rate of recidivism for males and females. Social class standing was estimated on the basis of the procedure developed by the U.S. Bureau of Census (1967), which rates occupation and education of the head of the household and family income. On the basis of this information, smokers were then grouped into one of three categories- lower, middle or upper. Lower included all those considered lower or lower-middle class. Upper included all those identified as upper or upper-middle class. Those placed entirely in the middle were eliminated from this particular comparison, in order to see the effect of the extreme groups. Thus, n=15 for the continuing success-recidivist comparison and n=9 for the continuing abstainer-nonabstainer group. The expectation that lower class participants would be more likely to become recidivists was not substantiated.

Smoking Characteristics

Smoking characteristics were considered to be an important dimension in successful attempts at quitting cigarettes. However, the prediction that low frequency smokers would have a lower rate of recidivism than high frequency smokers was not statistically supported (see Table 2). The lower frequency category- 0-27 cigarettes- was created by collapsing the light and moderate categories developed by Schwartz and Dubitzky (1968) and the higher frequency category- 28+- by combining

Table 2

Fisher's Exact Probability Test for the Analysis of Demographic
and Smoking Characteristic Predictor Variables of Two
Different-Sized Samples At Three Months Follow-Up

	Continuing Success n=8 ^a	Recidi- vist n=16 ^a	Continuing Abstainer n=6 ^a	Nonab- stainer n=9 ^a
III. Other Predictors				
A. <u>Demographic Variables</u>				
1. Age				
Above mean 37.2 (37.3) ^b	3	10	2	6
Below mean	5	6	4	3
Significance level	N.S.		N.S.	
2. Sex				
Male	3	6	3	2
Female	5	10	3	7
Significance level	N.S.		N.S.	
3. Social Class				
Upper	3	4	2	2
Lower	3	5	2	3
Significance level	N.S.		N.S.	
B. <u>Smoking Characteristics</u>				
1. Amount Smoked				
Lighter 0-27	4	7	3	4
Heavier 28+	4	9	3	5
Significance level	N.S.		N.S.	
2. Previously off cigarettes for at least one month				
Yes	3	10	2	6
No	5	6	4	3
Significance level	N.S.		N.S.	

^aFor variable III.A.3, social class, because of the use of extreme groups, n=15 for the total continuing success-recidivist group, n=9 for the continuing abstainer-nonabstainer group.

^bNumbers outside parentheses indicate the range of values of the categories for the continuing success-recidivist group (n=24); numbers inside parentheses indicate the range of values for the continuing abstainer-nonabstainer group (n=15).

their heavy and very heavy categories. The prediction that subjects off cigarettes for at least one month on a previous occasion would be more likely to remain successful at follow-up was not confirmed.

Environmental and Treatment Factors

Environmental and treatment variables were expected to have predictive value. Yet, the hypothesis that those having nonsmoking spouses and nonsmoking households would be more likely to remain successful than those having household members who smoked was not supported (see Table 3).

The prediction that those individuals who were totally abstinent at the end of the program ($n=15$) would be more likely to be successful at three months than those identified as successes (75-99% reduction) but not totally off cigarettes was not substantiated. It was also hypothesized that the length of time one was successful (75-100% reduction) during the treatment phase would be an important factor in follow-up success, with those successful the longest more likely to remain successful. The variable was divided into two- with one class being 4-5 weeks of success (almost the entire program) and the other class including 1-3 weeks of success. For both criteria of success- continuing success and continuing abstinence- this variable significantly differentiated the groups, with $p < .025$ for the former, and $p < .05$ for the latter. The prediction that those who felt that they had a difficult time quitting would be less likely to become recidivists was not confirmed. Difficulty was assessed by the

Table 3

Fisher's Exact Probability Test for the Analysis of Environmental
and Treatment Predictor Variables of Two Different-
Sized Samples At Three Months Follow-Up

	Continuing Success n=8	Recidi- vist n=16	Continuing Abstainer n=6	Nonab- stainer n=9
<u>C. Environmental Characteristics</u>				
1. Other Smokers in Household				
No	6	10	4	5
Yes	2	6	2	4
Significance level	N.S.		N.S.	
<u>D. Treatment Effects</u>				
1. Abstinence at end of program				
Yes	6	9	-	-
No	2	7	-	-
Significance level	N.S.			
2. Length of Success During Treatment				
4-5 Weeks	5	2	4	1
1-3 Weeks	3	14	2	8
Significance level	$p < .025$		$p < .05$	
3. Difficulty in Quitting				
Difficult	5	6	3	2
Less Difficult	3	10	3	7
Significance level	N.S.		N.S.	
4. Confidence				
Confident	5	11	4	6
Not Confident	3	5	2	3
Significance level	N.S.		N.S.	

choice of response on a five point scale. Responding with extremely or fairly difficult was considered quitting with difficulty, while the other responses were considered quitting with less difficulty. Finally, the hypothesis that those who were confident of their ability to remain off cigarettes or stop smoking altogether would be more likely to remain successful was not found to be significant. Amount of confidence was based on the response along a five point scale, with will not smoke and probably will not smoke making up the confidence classification.

Thus, of the 14 original predictor variables, three- HiNA, LoNA, and Length of Time Successful During Treatment- significantly differentiated continuing successes from recidivists and continuing abstainers from nonabstainers.

Additional Variables

Several other variables were examined in order to see if they added any significant information to the present study, although formal hypotheses were not formulated because of equivocal findings in previous research. Of the nine variables selected- Age Started ($\bar{x}$ =15.3, n=24; $\bar{x}$ =15.2, n=15), Years Smoked ($\bar{x}$ =18.3, n=24 and n=15), Number of Previous Attempts to Quit, Concern about Weight Gain During Treatment, Marital Status, Concern about Physical Ailments (open-ended question), Health Problems (forced-choice question), Education ($\bar{x}$ =14.2, n=24; $\bar{x}$ =13.5, n=15) and Income (based on the average income of six categories- $\bar{x}$ =16.5, n=24; $\bar{x}$ =17.7, n=15)- none significantly differentiated continuing successes from recidivists or continuing abstainers from nonabstainers (see Table 4).

Table 4

Fisher's Exact Probability Test for the Analysis of Nine Additional Predictor Variables of Two Different-Sized Samples At Three Months Follow-Up

	Continuing Success n=8	Recidi- vist n=16	Continuing Abstainer n=6	Nonab- stainer n=9
1. Age Started				
Older than 15	3	11	3	6
15 or younger	5	5	3	3
Significance level	N.S.		N.S.	
2. Years Smoked				
More than 18	5	8	4	4
18 or less	3	8	2	5
Significance level	N.S.		N.S.	
3. Number of Previous Attempts to Quit				
0 or 1	5	6	3	4
More than 1	3	10	3	5
Significance level	N.S.		N.S.	
4. Concern about Weight Gain				
No	3	12	2	6
Yes	5	4	4	3
Significance level	N.S.		N.S.	
5. Marital Status				
Married	5	12	3	8
Other	3	4	3	1
Significance level	N.S.		N.S.	
6. Concern About Physical Ail- ments(open-ended question)				
Yes	3	7	2	3
No	5	9	4	6
Significance level	N.S.		N.S.	
7. Health Problems (forced-choice question)				
Yes	2	6	2	3
No	6	10	4	6
Significance level	N.S.		N.S.	
8. Education				
More than 14 years (13) ^a	3	7	3	4
Less than or equal to 14	5	9	3	5
(13) Significance level	N.S.		N.S.	
9. Income				
More than or equal to 17 thousand (18)	5	8	4	6
Less than 17 thousand (18)	3	8	2	3
Significance level	N.S.		N.S.	

^aNumbers outside parentheses indicate the range of values of the categories or means for the continuing success-recidivist group (n=24); numbers inside parentheses indicate the range of values or mean for the continuing abstainer-nonabstainer group (n=15).

Multivariate Analyses

In order to examine the magnitude of the relationships between the independent variables and the criteria of success, as well as to eliminate the need to dichotomize all variables (as in the Fisher test), Pearson product-moment correlations were derived. The correlation matrix for each of the criteria of success (continuing success and continuing abstinence) was formed by the intercorrelations of the criterion, 23 predictor variables and the scores received on each of the four smoking type factors. Initially the data were entered in both raw (i.e., .78 reduction) and categorized form (success=1, recidivism=2). Since the categorized data provided the highest criterion-predictor variable intercorrelations (see Appendix D & E), they were selected for use in building the multiple regression equations.

Several different multiple regression equations were computed to assess the degree to which the use of additional variables increased efficiency in prediction. A step-wise regression program from SPSS (Statistical Package for the Social Sciences, 1975) was used. This computer program first enters that variable with the highest correlation with the criterion. Then, in step-wise fashion, each of the remaining variables are entered separately, according to the amount of variance independently accounted for in the criterion with the effects of previously entered variables partialled out. Those predictor variables that do not account for an adequate amount of the remaining variance are not included in the final equation.

Of the 14 predictor variables used in the original hypotheses, three (HiNA, LoNA, Length of Success During Treatment) had a significant criterion-predictor variable correlation ($p < .05$). These three were selected for entry into the first multiple regression equation. For both the $n=24$ and $n=15$ samples, the resulting multiple correlations were significant ($p < .01$) (see Table 5), indicating that this combination of three variables accounted for a significant amount of variance in the criterion. Secondly, the decision was made to enter all 14 of these original variables into multiple regression equations, without preselection of those that were the best predictors. Twelve of these variables were used in the final multiple R ($p < .05$, $n=24$; $p < .01$, $n=15$), with two being eliminated because they failed to account for a sufficient amount of variance. In the third set of regressions, any of the 27 predictor variables that were correlated with the criterion at the $p < .10$ level were entered. Although seven variables were entered, only six were used in the final equation. The multiple R was significant ($p < .01$) for both the $n=24$ and $n=15$ samples. Finally, all 27 of the predictor variables were entered, with 22 being used for the $n=24$ sample and 3 being used for the $n=15$ sample. The final multiple R (.999, $n=24$) was not significant ($p < .05$) due to the fact that with the interaction of small sample size with 22 variables the minimal degrees of freedom that resulted required a perfect multiple R (1.00) for significance. The final multiple R (1.00, $n=15$) was significant ($p < .01$).

Table 5

Step-Wise Regression Results
for Differing Numbers of Predictor Variables

Sample* Size	Original No. of Var. in Regression	Final No. of Var. in Regression		Sample R ²	Degrees of Freedom	Sig. Level	Expected Population		Sig. Level
		Equation	Equation				R	R ²	
n=24	1	1	.71	.50	22	$p < .01$	.69	.48	$p < .01$
	3	3	.77	.59	20	$p < .01$	.73	.53	$p < .01$
	7	6	.82	.67	17	$p < .01$	.74	.55	$p < .05$
	14	12	.89	.79	11	$p < .05$	.75	.56	N.S.
	27	22	.999	.999	1	N.S.	.88	.77	N.S.

n=15	1	1	.86	.76	13	$p < .01$	.85	.72	$p < .01$
	3	3	.90	.82	11	$p < .01$	.88	.77	$p < .01$
	7	6	.94	.87	8	$p < .01$	.88	.77	$p < .05$
	14	12	1.0	1.0	1	$p < .01$	1.0	1.0	$p < .01$
	27	3	1.0	1.0	11	$p < .01$	1.0	1.0	$p < .01$

*The first sample (n=24) is concerned with the comparison of continuing successes with recidivists; the second sample (n=15) is concerned with the comparison of continuing abstainers with nonabstainers.

The final multiple Rs from each of the eight regression equations generated in this investigation were based on a small sample size and a large number of potential variables. Since both of these factors inflate the multiple R (Guilford, 1965), a correction formula was applied to all of the final Rs- including the R obtained from just the single variable (HiNA) which accounted for the highest proportion of variance in each equation. This formula shrank the multiple Rs to a more realistic estimate of the population parameters (see Table 5).

Several F tests (Guilford, 1965) were performed to compare the multiple correlations generated with only one variable (HiNA), three variables, seven variables, 14 variables and all 27 variables. Results indicated that there was no significant difference between the multiple R that resulted from the use of one variable (either using the inflated sample R or the estimated population parameter) and that resulting from the use of any other combination of variables. Hence, it would appear that for this sample, HiNA alone was approximately as useful as a combination of HiNA with other predictor variables in accounting for the variance of the criterion.

CHAPTER IV

DISCUSSION

The results of this investigation suggest that some predictor variables, both individually and in combination with other independent variables, can be used to successfully predict follow-up outcome for those individuals who were successful (75-100% reduction from baseline) at the end of treatment. Analyses of the interrelationships among variables have provided not only the information needed to significantly differentiate continuing successes from recidivists or continuing abstainers from nonabstainers, but also the bases for making a number of possible hypotheses and suggestions for future research.

The nonparametric statistical analyses (Fisher's exact probability test) were performed in order to pinpoint those variables that showed most promise for increasing the predictability of the multiple regression equations. At this level of analysis, separate variables were not expected to contribute a great deal to theory development (Schwartz & Dubitzky, 1968), but only to suggest certain areas for consideration. Out of the approximately two dozen variables examined, only three--having a high score on negative affect along with at least one other high smoking type score (HiNA), having a low score on negative affect together with a high addiction or habit score

(LoNA), and length of success during treatment- showed any relationship to either the continuing success or the continuing abstinence criteria. Since the sample size was relatively small, these significant findings do suggest both the presence of some very strong associations in this sample and also the potential importance of these variables for future research. Hence the findings of this investigation support the conclusion that the best predictor of whether a treatment success would become a follow-up recidivist or nonabstainer was if he had a high score on the negative affect dimension of the Horn-Waingrow Scale, combined with a high score on any of the other smoking dimensions (HiNA). On the other hand, those who had the LoNA combination were significantly more successful in the long run. These findings seem to confirm those of Schwartz & Dubitzky (1968) that negative affect is highly correlated with recidivism. The significance ($p < .05$) of the variable concerning length of success during treatment supports the finding by Hammond and Garfinkel (1964) that there is a negative relation between the length of time a smoker has abstained and the probability of his becoming a recidivist.

The Pearson product-moment correlations confirmed the findings of the Fisher analyses, for HiNA, LoNA and Length of Success During Treatment had the highest correlations with the criteria of success: continuing success and continuing abstinence. Three of the four smoking type dimensions also had high correlations with the criteria of success. In fact,

the negative affect dimension alone correlated nearly as highly ($r=.66$ for $n=24$) or as high ($r=.87$ for $n=15$) with the criteria as the HiNA variable (which combined a high negative affect score with at least one other high smoking type score). Since the negative affect variable also correlated very highly with the HiNA variable ($r=.85$, $n=24$; $r=1.00$, $n=15$), it seems that much of the predictability of the combination variable (HiNA) was actually based on the negative affect score alone. The ability of the negative affect dimension to stand alone as a predictor variable should be further examined in future smoking research. Two other variables, Marital Status ($p < .05$, $n=15$) and Concern about Weight Gain During Treatment ($p < .10$, $n=24$) were significantly correlated with the criteria, but because they were not significant for both groups ($n=24$ and $n=15$) they may well be demonstrating chance or idiosyncratic characteristics associated with the small samples. These variables should be given further consideration when other studies, with larger samples, are conducted.

Frequently multiple correlations produce findings that would be hard to estimate when looking only at the zero order correlations (Nunnally, 1967). Yet in this study, due to HiNA's extremely high zero order correlation with the criteria of success ($r=.71$ for continuing success; $r=.86$ for continuing abstinence) the results were logical and clear-cut. HiNA consistently (in all eight regression equations) accounted for the highest portion of the variance. This fact, as well as the fairly high correlations of the other significant

independent variables with HiNA, indicated that there were relatively small gains made when other variables were added to the regression equations. Thus, as the F tests clearly show, the use of this one variable as a predictor of follow-up outcome was about as efficient and effective as the use of any of the regression equations with more variables.

If a curvilinear regression analysis had been used, the multiple R might have been even higher. Yet, since this correlation would have undoubtedly capitalized on the unique characteristics of this particular small sample, there would have been much shrinkage in the correlation when the study was cross-validated. Even using the more standard linear correlation, some shrinkage would be expected as a matter of course when the study was replicated. The correction formula for shrinkage was applied since, for samples under 100, there tends to be an insufficient subject-variable ratio which biases the multiple R upward (Guilford, 1965). This shrinkage brought the estimated population correlations for HiNA down to .69 ($n=24$) and .85 ($n=15$), which are still highly significant correlations ($p < .01$). Even thus corrected, the correlations would still be expected to shrink some more when the study was replicated. This would generally be the case not only because of the difficulty of matching the samples exactly, but also because the variables that were used in the equations were those that were preselected because they had a very high correlation with the criterion, thus taking advantage of chance fluctuations in the particular sample (Guilford, 1965).

It is not surprising that the majority of variables failed to distinguish the long-term successes and failures from each other. Previous researchers, sometimes using hundreds of variables, have found only a small proportion of the variables studied to be effective predictors for any particular sample (Coan, 1973; Guilford, 1966; Schwartz & Dubitzky, 1968). Since the purpose of these studies was to reveal the relationships that did exist, those variables with nonsignificant results were largely ignored. However, in this investigation, it should be noted that small sample size and the resulting statistical limitations may have accounted for the paucity of findings. The need to use the Fisher exact test rather than chi-square made it necessary to collapse all possible categorizations of variables into two discrete groups. The sample mean on a particular variable was often used as the dividing line between the two categories of the variable; yet, because of the small sample and the effect of extreme scores on the mean, this may not have always been the most effective way of splitting the scores. As well, dichotomizing variables may have obscured trends in data that may actually be curvilinear in nature. If the sample had been large enough to divide variables into three or four categories or to compare the very extremes (as done for social class) there might have been different results. Another limitation caused by the sample size was the inability to follow Guilford's (1966) suggestion that each variable should be examined separately for each sex. She found that women were much less predictable than men,

having results inconsistent with earlier research, while men's generally were consistent. Coan (1973) also found that men and women differed on many of the variables he examined. Thus in the future, all such investigations should attempt to have a much larger sample size. In this way, more categories could be included for each variable and if both sexes were participants in the study the results could be interpreted for the sexes individually and in combination.

Clearly, the best way to have a more dependable estimate of the predictive worth of the selected variables (i.e., HiNA or a combination of variables) would be to replicate this study (McNemar, 1969). A much larger sample should be used in this endeavor- with a minimum of 10 subjects per variable (Miller & Kuncze, 1973)- in order to reduce the effects of chance. If the sample is small, only a few variables (perhaps only HiNA) should be examined. If the variables prove their worth as predictors- with estimated outcomes significantly correlating with the obtained outcomes in this second sample- further investigations testing their generalizability should be conducted.

There was very little difference between the results of the continuing success-recidivism comparisons and the continuing abstinence-nonabstinence comparisons. The hypothesis that predicted that treatment abstainers would do better at follow-up than treatment successes was not significant. Yet, it is interesting to note that all of the successes at follow-up were abstainers, having been completely off cigarettes by

the end of treatment or at the three month follow-up. This suggests that, while abstainers did no better or worse than successful reducers at follow-up, there is still sufficient reason for clinic leaders to stress the value of getting smoking levels down to zero and remaining there.

The ability to significantly predict follow-up outcome on the basis of a few variables has many implications for future smoking withdrawal programs and smoking research. For those participants identified as having a recidivist pattern of scores, more follow-up calls could be made or some extra booster sessions set up. They could be assigned a "buddy"- one of the other program participants- or an anti-smoking counselor (Mausner & Platt, 1971) to whom they could turn when especially needy of support. Yet, if this was all that was done, the knowledge gained from this study would not be used to its best advantage. Unlike various demographic and social variables (i.e., age, social class) which if highly correlated would have merely supplied heightened predictability, the high correlations of HiNA and LoNA, as well as Length of Success During Treatment, suggest very definite changes not only for improving follow-up, but also in the type of treatment to be used.

No matter what their pattern of scores on the Horn-Waingrow Scale, all subjects used in this study were successful for some period of time. Even those who used smoking to help them reduce negative affect were able, temporarily, to handle the stress and tension in their environments in other

ways. Yet, for the recidivists, these new or different methods for handling emotion, as well as the treatment effects, were not adequate to sustain their initial success. While almost any program might work for those who rarely use cigarettes to reduce negative affect (since once they have quit and realized their success they apparently no longer depend on the support or influence of the program), those who use cigarettes to deal with their negative feelings need a treatment that will have long-lasting effects and specifically help them to deal with their problems in other ways. Treatment must be aimed at how and what to substitute for cigarettes so that people can successfully withstand the tension and stress in their lives. Of course, since not that much is known about alternate methods of tension-reduction, gaining an understanding of the process of tension reduction itself is a necessary first step, having practical as well as theoretical importance (Mausner & Platt, 1971). If programs could be tailored to fit the needs of these high negative affect smokers, they could leave the program not only with pride in their initial success, but also with a strong arsenal of responses to be used in place of cigarette smoking when they felt tense.

The significance of the Length of Success During Treatment variable also provides some practical suggestions for the treatment phase of a smoking program. The smokers who were successful for a longer time during this program tended to be more successful in the long run. Smokers should, therefore, be greatly encouraged to stop smoking or cut down

drastically as soon as possible. As well, if some participants are not able to quit or reduce their smoking until late in the program, there should be enough flexibility in the structure of the program so that a few extra sessions could be arranged for them. This would serve to maximize the effectiveness of the treatment.

The results of the univariate and multivariate analyses demonstrated that certain predictor variables can be used to significantly differentiate long-term successes from recidivists. Thus, despite the exploratory nature of this study and the limitations based on the relatively small sample size and the large number of variables examined, some understanding has been gained about factors that influence follow-up outcome. Obviously, the identification of an individual as a potential recidivist is only a first step, for in order to then sustain the initial success the specific needs of the individual must be met. This involves understanding not only the influences of both the treatment and the follow-up period but also what factors have maintained smoking in the individual- i.e., what type of a smoker a person is. The combined use of all of this information would not only improve the success rate of the treatment phase, but what is even more important, increase the success rate at follow-up.

CHAPTER V

SUMMARY

Much research in smoking has dealt with how to improve the success of smoking withdrawal programs. While many programs are now capable of achieving high success rates, these success rates tend to drop off considerably at follow-up. Thus, even those who are aided by smoking cessation treatments often become recidivists. It is felt that the emphasis of smoking research should be not on how to eliminate smoking, but more importantly, once smokers have quit, how to help them maintain their reduced levels. This could be done most effectively if, on the basis of a number of predictor variables, those who are most likely to sustain their reduced smoking levels could be distinguished from those who are not. Then various tactics could be employed to deal with the potential failures, thereby heightening the program's impact and maintaining success rates at follow-up.

This investigation was designed to assess whether at the end of a three month follow-up, the participants who were successful at the end of the six week treatment program and who remained successful could be differentiated from those who were also initially successful but had become recidivists. A combination of scores on various predictor

variables was expected to form the basis for distinguishing the groups. The criteria of success were defined in two ways. First, "successes" were those who had reduced their smoking level from 75-100% of baseline. Of the 24 subjects who met this criterion at the end of the program, eight were continuing successes at follow-up, while 16 had become recidivists. Second, using a more stringent definition, "successes" were those who were totally off cigarettes at the end of the treatment phase. Of the 15 abstainers at the end of treatment, six were continuing abstainers at follow-up, while nine were nonabstainers.

Fourteen separate hypotheses were formulated concerning the predictive value of different types of variables (i.e., smoking type, personality, demographic). In addition, nine other variables plus the scores on each of the four subscales of the Horn-Waingrow Scale were examined as to their predictability. The data were collected from pre- and post-treatment questionnaires, the Rotter Internal-External Locus of Control Scale, the Eysenck Personality Inventory (Form B) and the Horn-Waingrow Scale.

Despite the exploratory nature of the study, the limitations based on a relatively small sample size and large numbers of variables examined, some significant findings did emerge. The most significant results concerned the hypotheses dealing with negative affect smoking. If a person smokes to reduce negative affect (high score on the negative affect dimension of the Horn-Waingrow Scale) and also smokes for other important reasons (high score on at least one other

smoking type dimension) (HiNA), even if temporarily successful he is likely to become a recidivist ($p < .005$). On the other hand, a person who does not smoke to reduce negative affect, even when scoring high on the habit and/or addiction subscales is likely to remain successful once he has quit or reduced ($p < .05$). Thus the pattern of scores on the four dimensions of the Horn-Waingrow Scale and its relationship to follow-up outcome suggest that recidivism is highly correlated with the need to reduce negative affect. The HiNA variable accounted for much of the variance of the two criteria of success (as shown by the results of the stepwise multiple regression equations). This variable was as effective alone as in combination with any number of other independent variables in predicting follow-up outcome. Even when the correction formula for shrinking sample bias was applied to the correlation of HiNA, the estimated population correlation was significant ($p < .01$). Thus, this variable appears to be a most powerful predictor in this sample. In the future the correlation of this variable (as well as the multiple correlations formed by a combination of this and other predictor variables) should be cross-validated and then tested for generalization effects. The samples used should be large enough to avoid being effected by statistical bias.

Length of success during treatment was also significant ($p < .025$, $n=24$; $p < .05$, $n=15$) as a predictor variable: those who were successful for 4-5 weeks were more likely to remain

off or at their reduced level than those successful for a shorter time. The correlation matrices revealed that three of the four smoking subscales were highly correlated with the criteria (Positive Affect- $p < .05$ for $n=24$ and $n=15$; Negative Affect- $p < .01$ for $n=24$ and $n=15$; and Habit- $p < .05$ for $n=24$ and $n=15$). Finally, Marital Status ($p < .05$, $n=24$) and Concern about Weight Gain ($p < .10$, $n=15$) were also significant but only in their respective subsamples.

Thus, a combination of predictor variables (sometimes taken individually, as with HiNA) can be used to form a criterion-specific predictor scale for follow-up success. These findings have important implications for how follow-up should be conducted, for if recidivists can be identified they can be given extra sessions, extra support and closer monitoring during the follow-up period. The significant variables also provided some bases for recommending changes in treatment. First, the participants in a smoking cessation program should be encouraged to quit as soon as possible and if they are unable to achieve success until much later, the length of the treatment phase should be extended. Secondly, high negative affect smokers should have treatments which aim to help them to handle or reduce the tension and stress in their lives in other ways than cigarette smoking. If such treatments can be created and implemented, which may first mean gaining an understanding of the process of tension reduction itself, subjects would be more likely to be continuing successes at follow-up.

APPENDICES

APPENDIX A

HORN-WAINGROW SCALE

Directions: Below is a listing of 23 comments offered by cigarette smokers to describe or account for their smoking. Please circle one of the five numbers to show how each statement applies to you.

1=Never 2=Seldom 3=Occasionally 4=Frequently 5=Always

- | | | | | | |
|--|---|---|---|---|---|
| 1. I smoke cigarettes to stimulate me, to perk myself up. | 1 | 2 | 3 | 4 | 5 |
| 2. I've found a cigarette in my mouth and didn't remember putting it there. | 1 | 2 | 3 | 4 | 5 |
| 3. When I am trying to solve a problem, I light up a cigarette. | 1 | 2 | 3 | 4 | 5 |
| 4. When I smoke a cigarette, part of the enjoyment is watching the smoke as I exhale. | 1 | 2 | 3 | 4 | 5 |
| 5. I am very much aware of the fact when I am not smoking a cigarette. | 1 | 2 | 3 | 4 | 5 |
| 6. Part of the enjoyment of smoking a cigarette comes from the steps I take to light up. | 1 | 2 | 3 | 4 | 5 |
| 7. When I feel "blue" or want to take my mind off cares and worries, I smoke cigarettes. | 1 | 2 | 3 | 4 | 5 |
| 8. I smoke cigarettes automatically, without even being aware of it. | 1 | 2 | 3 | 4 | 5 |
| 9. I smoke cigarettes in order to keep myself from slowing down. | 1 | 2 | 3 | 4 | 5 |
| 10. I get a real gnawing hunger for a cigarette when I haven't smoked for awhile. | 1 | 2 | 3 | 4 | 5 |
| 11. When I feel uncomfortable or upset about something, I light up a cigarette. | 1 | 2 | 3 | 4 | 5 |
| 12. Handling a cigarette is part of the enjoyment of smoking it. | 1 | 2 | 3 | 4 | 5 |
| 13. Between cigarettes, I get a craving that <u>only</u> a cigarette can satisfy. | 1 | 2 | 3 | 4 | 5 |
| 14. I light up a cigarette when I feel angry about something. | 1 | 2 | 3 | 4 | 5 |

- | | | | | | | |
|-----|--|---|---|---|---|---|
| 15. | I light up a cigarette without realizing I still have one burning in the ashtray. | 1 | 2 | 3 | 4 | 5 |
| 16. | I find cigarettes pleasurable. | 1 | 2 | 3 | 4 | 5 |
| 17. | When I feel ashamed or embarrassed about something, I light up a cigarette. | 1 | 2 | 3 | 4 | 5 |
| 18. | When I have run out of cigarettes I find it almost unbearable until I can get them. | 1 | 2 | 3 | 4 | 5 |
| 19. | Few things help better than a cigarette when I'm feeling upset. | 1 | 2 | 3 | 4 | 5 |
| 20. | I smoke cigarettes just from habit, without even really wanting the one I'm smoking. | 1 | 2 | 3 | 4 | 5 |
| 21. | Smoking cigarettes is pleasant and relaxing. | 1 | 2 | 3 | 4 | 5 |
| 22. | I do not feel contented for long unless I am smoking a cigarette. | 1 | 2 | 3 | 4 | 5 |
| 23. | I smoke cigarettes to give me a "lift". | 1 | 2 | 3 | 4 | 5 |

APPENDIX B

PRETREATMENT QUESTIONNAIRE

Directions: Please fill in or check the appropriate spaces.

1. Sex: Male _____ Female _____
2. Age: _____
3. Marital Status: Never Married _____ Married _____ Divorced, Separated or Widowed _____
4. In your family, were you the: only child _____, oldest child _____, not oldest or youngest _____, youngest _____
5. Number and Ages of your children: _____
6. What is the highest grade of school you have completed: _____
7. What is your present occupation and if married what is your spouse's occupation: _____
8. Check the appropriate family income from all sources last year:

Under \$5,000 _____	\$10,000 to 14,999 _____
\$5,000 to 7,499 _____	\$15,000 to 19,999 _____
\$7,500 to 9,999 _____	\$20,000 to 25,000 _____
	Over \$25,000 _____
9. On the average, how many cigarettes do you now smoke each day: _____
10. How old were you when you first tried a cigarette: _____
11. At what age did you become a regular cigarette smoker: _____
12. How many times have you seriously attempted to stop smoking: _____
13. What was the longest period of time you stayed off cigarettes: _____
14. Do you expect that one year from now you will be smoking: More _____, The same _____, Less _____, None _____
15. How often do you usually inhale the cigarette: almost every puff of each cigarette _____, a few puffs of each cigarette _____, a few puffs of some cigarettes _____, not at all _____
16. Indicate the cigarette smoking category for each person:

	Smoker	Ex-Smoker	Never Smoked
a. Wife(girlfriend) or husband(boyfriend)	_____	_____	_____
b. Most co-workers	_____	_____	_____
c. Most friends	_____	_____	_____
d. Father (when you were growing up)	_____	_____	_____
e. Mother (when you were growing up)	_____	_____	_____

17. Does your wife (girlfriend) or husband (boyfriend) approve of your smoking: Yes _____ No _____
18. Which one of the following best describes your parents' attitude toward your smoking before you were 21: they didn't care whether I smoked or not _____, they discouraged smoking but did not prohibit it _____, they strongly opposed smoking _____, they prohibited me from smoking _____
19. Have you known anyone whose health has been adversely affected by smoking: Yes _____ No _____
20. Do you agree with the statement that "research will find a cure long before most of today's smokers will get any of the diseases that smoking is supposed to cause": Yes _____ No _____
21. Do you have to watch your weight closely so that you will not gain weight: Yes _____ No _____
22. Do you do much social drinking (with a few friends): Several times each week _____, several times each month _____, about once a month _____, only once in awhile _____, I do not drink _____
23. Why have you now decided to quit smoking? _____

24. Do you expect that quitting will be: very difficult _____, difficult _____, easy _____
25. Why did you decide to attend this program? _____

APPENDIX C

POST-TREATMENT QUESTIONNAIRE

Directions: Please fill in or check the appropriate spaces.

E= Questions to be answered by everyone

Q= Questions to be answered by quitters only

NQ= Questions to be answered by nonquitters only

- Q 1. I quit smoking and have had no cigarettes since: the first week of the program____, the second week____, the third____, the fourth____ the fifth____
- NQ 2. I have not quit but I have reduced the number of cigarettes I smoke to approximately: 3/4 of where I started____, 1/2 of where I started____, 1/4 of where I started____, less than 1/4 but not down to 0____
- NQ 3. I have remained at the same level____or I have increased the number____
- E 4. a) When you began this program how many people in your household (not including yourself) smoked?
b) How many people in your household (not including yourself) now smoke?_____
- E 5. Is anyone else from your household currently participating in any portion of this program? Yes____, No____ If yes, who?_____
- E 6. Are any close friends currently participating in a portion of this program? Yes____ No____ If yes, who?_____
- E 7. How many people around you (friends and family):
Knew you were trying to quit? Many____Some____ Few or none____
Encouraged you to quit? Many____Some____ Few or none____
Discouraged you about quitting? Many____Some____ Few or none____
- E 8. If you work, does anyone who smokes share an office with you?
Yes____ No____
- E 9. Did you try to replace smoking with another type of activity? Yes____ No____ If yes, what?_____ How successful were you?_____
- E 10. When you started this program did you have any health ailments that were related to smoking? Yes____ No____ If yes, what_____
- E 11. Did you have any physical or emotional reactions to quitting or reducing smoking (for example, weight gain, nervousness, tremors...) Yes____ No____ If yes, Describe them_____

E 12. If you gained weight how much did you gain? _____ Are you worried about this weight gain? Yes _____ No _____

E 13. Have you experienced any benefits (physical, emotional or other) from quitting or reducing? Yes _____ No _____ if yes, Describe them _____

E 14. My current desire for a cigarette is:

completely mild moderate strong intense
gone

Q 15. My confidence in not smoking again is such that I feel I . . .

will smoke probably will don't know if probably will will not
again smoke again I'll smoke not smoke smoke

Q 16. How difficult was it for you to quit?

extremely fairly somewhat difficult fairly extremely
difficult difficult but not too hard easy easy

NQ 17. My confidence in my quitting smoking in the next three months is such that I:

will definitely probably will don't know probably will defi-
not quit not quit if I'll quit will quit nitely quit

NQ 18. How difficult did you find your attempts to reduce and/or quit smoking?

extremely fairly somewhat difficult fairly extremely
difficult difficult but not too hard easy easy

NQ 19. Do you feel that you made a serious and concerted effort to quit smoking? Yes _____ No _____ If yes, why do you think you were unable to quit? _____

E 20. The treatment that I was placed in was of the following value in my efforts to quit (reduce):

was detrimental.	not helpful.	some-	useful	extremely	essen-
The program made	I could	what	but	useful	tial, I
it more difficult	have quit	help-	not	but not	could not
for me to quit or	(reduced)	ful.	essen-	essential	have quit
reduce.	without it.		tial		without it.

E 21. If you were in a part of the program that involved regularly scheduled group meetings, how helpful do you feel the other group members were in assisting you to reduce or quit smoking?

very supportive	moderately	no	moderately	very unhelp-
and helpful	supportive	effect	unhelpful	ful and non-
	and helpful		and nonsupportive	supportive

- E 22. If you were in a part of the program that involved regularly scheduled group meetings, how helpful do you feel the group leader was in assisting you to reduce or quit smoking?

very supportive and helpful	moderately supportive and helpful	no effect	moderately unhelpful and nonsupportive	very unhelp- ful and non- supportive
--------------------------------	---	--------------	--	--

- E 23. If you were in a part of the program that did not include regularly scheduled group meetings, how helpful did you find the telephone contacts in assisting you to reduce or quit smoking?

very supportive and helpful	moderately supportive and helpful	no effect	moderately unhelpful and nonsupportive	very unhelp- ful and non- supportive
--------------------------------	---	--------------	--	--

- E 24. The thing that was most effective in getting me to quit or reduce was _____

- E 25. In evaluating your participation in the program, how do you feel about yourself?

very unhappy and dissatisfied with myself	unhappy and dissatis- fied	did not effect me	happy and satisfied	very happy with myself and satisfied
---	----------------------------------	-------------------------	------------------------	--

- E 26. Do you view yourself any differently after having finished this program? Yes _____ No _____ If yes, how? _____

- E 27. We would greatly appreciate your comments about the program
a) What did you like about it? _____

b) What would you like to see changed? _____

c) If you were given "home assignments" did you do them? Yes _____
No _____ What didn't you do? _____
Why? _____

- E 28. What is your current address:

What are the phone numbers at which we can reach you?

What are good times for us to call you? _____

- E 29. Any additional comments would be appreciated _____

APPENDIX D

CATEGORIZATION OF VARIABLES FOR USE IN THE
PEARSON PRODUCT-MOMENT CORRELATIONS

Variable	Categories
Criterion (n=24)	Success (1), Recidivist (2)
Criterion (n=15)	Abstainer (1), Nonabstainer (2)
Positive Affect	Low (1), Medium (2), High (3)
Negative Affect	Low (1), Medium (2), High (3)
Habit	Low (1), Medium (2), High (3)
Addiction	Low (1), Medium (2), High (3)
Rotter	Internal (1), External (2)
Eysenck	Introvert (1), Extrovert (2)
Age	Above Mean (1), Below Mean (2)
Sex	Male (1), Female (2)
Social Class	Upper (1), Middle (2), Lower (3)
Number Smoked	Light (1), Heavy (2)
Previous Quitting	One month or more (1), Less than 1 month (2)
Other Smokers	No (1), Yes (2)
Abstinence	Yes (1), No (2)
Length of Success	4-5 Weeks (1), 1-3 Weeks (2)
Difficulty	Difficult (1), Less Difficult (2)
Confidence	Confident (1), Not Confident (2)
Age Started	Above Mean (1), Below Mean (2)
Years Smoked	Below Mean (1), Above Mean (2)
Attempts to Quit	0 or 1 (1), More than 1 (2)
Concern-Weight Gain	No (1), Yes (2)
Marital Status	Married (1), Single (2), Divorced, Separated, Widowed (3)
Concern-Physical Ailments (open-ended question)	Yes (1), No (2)
Health Problems (forced-choice question)	Yes (1), No (2)
Education	Graduated College or more (1), Some Years of College (2), Graduated High School (3), Years of High School (4)
Income (in thousands)	25+ (1), 20-25 (2), 15-19 (3), 10-14 (4), 7.5-9 (5), 5-7.4 (6)
HiNA	Not Having HiNA Combination (1), Having HiNA Combination (2)
LoNA	Having LoNA Combination (1), Not Having LoNA Combination (2)

APPENDIX E

PEARSON PRODUCT-MOMENT CORRELATIONS

OF 27 CATEGORIZED PREDICTOR VARIABLES WITH RAW AND CATEGORIZED CRITERIA

Categorized Predictor Variables	n = 24 ^a		n = 15 ^a	
	Raw Data Criterion	Categorized Criterion	Raw Data Criterion	Categorized Criterion
Positive Affect	.41**	.47**	.39*	.46**
Negative Affect	.45**	.66***	.70***	.87***
Habit	.14	.41**	.18	.42**
Addiction	.11	.15	.05	.23
Rotter	.11	.18	.18	.21
Eysenck	-.01	0	-.23	-.11
Age	-.06	-.24	-.20	-.33
Sex	-.13	0	.18	.29
Social Class	.01	.04	-.07	.07
Number Smoked	.01	.05	.02	.05
Previous Quitting	-.31	-.24	-.52**	-.33
Others	.04	.12	-.12	.11
Abstinence	.12	.18	---	---
Length-Success	.49**	.51***	.57***	.58***
Difficulty	.35*	.24	.43**	.29
Confidence	.12	-.06	.15	0
Age Started	-.09	-.30	-.10	-.17
Years Smoked	-.04	.12	.12	.22
Attempts to Quit	.23	.24	-.04	.05
Weight Gain	-.43**	-.37*	-.47**	-.33
Marital Status	-.19	-.15	-.40**	-.50**
Physical Ailments	.12	-.06	.15	0
Health	.01	-.12	.13	0
Education	-.08	.03	-.02	.18
Income	.19	.13	.12	.17
HiNA	.54***	.71***	.70***	.87***
LoNA	.36*	.51***	.56***	.61***

^aThe first sample (n=24) is concerned with the comparison of continuing successes with recidivists; the second sample (n=15) is concerned with the comparison of continuing abstainers with non-abstainers.

* $p < .10$

** $p < .05$

*** $p < .01$

REFERENCES

REFERENCES

- Badger, T.D. Mind if I smoke? Medical Dimensions, March, 1975, 15-17.
- Bernstein, D.A. Modification of smoking behavior: An evaluative review. In W.A. Hunt (Ed.), Learning mechanisms in smoking. Chicago: Aldine, 1970.
- Borgatta, E.F. (Discussant) Symposium: Intervention processes-Theoretical and practical implications of reported research. In E.F. Borgatta & R.R. Evans (Eds.), Smoking, health and behavior. Chicago: Aldine, 1968.
- Bosse, R. Affective and cognitive social factors in smoking cessation. Doctoral Dissertation, Boston University Graduate School, Boston, 1972, in Smoking and Health Bulletin, August-September 1973, 142 (Abstract).
- Bosse, R., & Rose, C. Age and interpersonal factors in smoking cessation. Journal of Health and Social Behavior, 1973, 14, 381-387.
- Cautela, J.R. Treatment of compulsive behavior by covert sensitization. Psychological Record, 1966, 16, 33-41.
- Cautela, J.R. Treatment of smoking by covert sensitization. Psychological Reports, 1970, 26, 415-420.
- Coan, R.W. Personality factors associated with cigarette smoking. Journal of Personality and Social Psychology, 1973, 26, No. 1, 86-104.
- Delarue, N.C. The anti-smoking clinic: Is it a potential community service? Canadian Medical Association Journal, May 1973, 108(9), 1164-1165, 1168, 1171-1172, 1192.
- Dunn, W.L., Jr. Experimental methods and conceptual models as applied to the study of motivation in cigarette smoking. In W.L. Dunn, Jr. (Ed.), Smoking behavior: Motives and incentives. Washington, D.C.: V.H. Winston & Sons, 1973.
- Eisinger, R.A. Psychosocial predictors of smoking recidivism. Journal of Health and Social Behavior, 1971, 12, 355-362.
- Eisinger, R.A. Psychosocial predictors of smoking behavior change. Social Science and Medicine, 1972, 6, 137-144.

- Elliott, R., & Tighe, T. Breaking the cigarette habit: Effects of a technique involving threatened loss of money. The Psychological Record, 1968, 18, 503-513.
- Eysenck, H.J. Smoking, health and personality. New York: Basic Books, Inc., 1965.
- Eysenck, H.J. Personality and the maintenance of the smoking habit. In W.L. Dunn, Jr. (Ed.), Smoking behavior: Motives and incentives. Washington, D.C.: Winston & Sons, 1973.
- Eysenck, H.J., & Eysenck, S.B.G. Manual for the Eysenck personality inventory. San Diego, Calif.: Educational and Industrial Testing Service, 1968.
- Eysenck, H.J., Tarrant, M., Woolf, M., & England, L. Smoking and personality. British Medical Journal, 1960, 1456-1460.
- Firth, C.D. Smoking behavior and its relation to the smoker's immediate experience. British Journal of Social and Clinical Psychology, 1971, 10, 73-78.
- Foss, R. Personality, social influence, and cigarette smoking. Journal of Health and Social Behavior, 1973, 14, 279-286.
- Guilford, J.P. Fundamental statistics in psychology and education. New York: McGraw-Hill, 1965.
- Guilford, J.S. Factors related to successful abstinence from smoking-Final report. Los Angeles: American Institutes for Research, July, 1966.
- Guilford, J.S. Sex differences between successful and unsuccessful abstainers from smoking. In S.V. Zagana (Ed.), Studies and issues in smoking behavior. Tucson, Arizona: The University of Arizona Press, 1967.
- Hammond, E.C., & Garfinkel, L. Changes in cigarette smoking. Journal of the National Cancer Institute, 1964, 33, 49-64.
- Hochbaum, G.M. Psychosocial aspects of smoking, with special reference to cessation. American Journal of Public Health, 1965, 55, 692-697.
- Horn, D. Some factors in smoking and its cessation. In E.F. Borgatta & R.R. Evans (Eds.), Smoking, health and behavior. Chicago: Aldine, 1968.
- Horn, D. Man, cigarettes, and the abuse of gratification. The International Journal of the Addictions, Sept. 1969, 4(3), 471-478.
- Hunt, W.A., & Matarazzo, J.D. Habit mechanisms in smoking. In W.A. Hunt (Ed.), Learning mechanisms in smoking, Chicago: Aldine, 1970.

- Hutchinson, R.R., & Emley, G.S. Effects of nicotine on avoidance, conditioned suppression and aggression response measures in animals and man. In W.J. Dunn, Jr. (Ed.), Smoking behavior: Motives and incentives. Washington, D.C.: Winston & Sons, 1973.
- Ikard, F.F., Green, D.E., Horn, D. A scale to differentiate between types of smoking as related to the management of affect. The International Journal of the Addictions, Dec., 1969, 4(4), 649-659.
- Ikard, F.F., & Tomkins, S.S. The experience of affect as a determinant of smoking behavior: A series of validity studies. Journal of Abnormal Psychology, 1973, 81, No. 2, 172-181.
- Jacobsen, E. Progressive relaxation. Chicago: University of Chicago Press, 1938.
- James, W.H., Woodruff, A.B., & Werner, W. Effect of internal and external control upon changes in smoking behavior. Journal of Consulting Psychology, 1965, 29, No. 2, 184-186.
- Keutzer, C.S. Behavior modification of smoking: The experimental investigation of diverse techniques. Behavior Research and Therapy, 1968, 6, 137-157.
- Keutzer, C.S., Lichtenstein, E., & Mees, H.L. Modification of smoking behavior: A review. Psychological Bulletin, 1968, 70, 520-533.
- Lichtenstein, E. Modification of smoking behavior: Good designs-Ineffective treatments. Journal of Consulting and Clinical Psychology, 1971, 36, No. 2, 163-166.
- Lichtenstein, E., & Keutzer, C. Modification of smoking behavior: A later look. In R. Rubin, A. Lazarus, H. Fensterheim, & C. Franks (Eds.), Advances in behavior therapy: Proceedings of the third conference of the association for advancement of behavior therapy. New York: Academic, 1971.
- Lichtenstein, E., Poussaint, A., Bergman, S., Jurney, T., & Shapiro, R. A further report on the effects of the physician's treating of smoking by placebo. Diseases of the Nervous System, Nov., 1967, 28, 754-755.
- McCallum, R.M. The modification of cigarette smoking behavior: A comparison of treatment techniques. Doctoral Dissertation, University of Missouri, 1970. Ann Arbor, Michigan: University Microfilms, 1971, No. 11874.
- McKennell, A.C. British research into smoking behavior. In E.F. Borgatta & R.R. Evans (Eds.), Smoking, health and behavior. Chicago: Aldine, 1968.

- McKennell, A.C. A comparison of two smoking typologies. London: Tobacco Research Council, 1973.
- McNemar, Q. Psychological statistics. New York: Wiley & Sons, 1969.
- Mair, J.M. Psychological problems and cigarette smoking. Journal of Psychosomatic Research, 1970, 14, 277-283.
- Mausner, B., & Pratt, E. Smoking: A behavioral analysis. New York: Pergamon Press, 1971.
- Mausner, J.S., Mausner, B., & Rial, W. The influence of a physician on the smoking of his patients. American Journal of Public Health, 1968, 58, No. 1, 46-53.
- Meyer, A.S., Friedman, L.N., & Lazarsfeld, P.F. Motivational conflicts engendered by the on-going discussion of cigarette smoking. In W.L. Dunn, Jr. (Ed.), Smoking behavior: Motives and incentives. Washington, D.C.: Winston & Sons, 1973.
- Miller, D.E., & Kunce, J.T. Prediction and statistical overkill revisited. Measurement and Evaluation in Guidance, 6, No. 3, 1973, 157-163.
- Moses, F.M. Treating smoking habits by discussion and hypnosis. Diseases of the Nervous System, March, 1964, 25, 184-188.
- Nunnally, J.C. Psychometric theory. New York: McGraw-Hill, 1967.
- Pyke, S., Agnew, N.M., & Kopperuch, J. Modification of an overlearned maladaptive response through a relearning program: A pilot study on smoking. Behavior Research & Therapy, 1966, 4, 197-203.
- Roisman, A.Z. Nonsmokers have rights, too. National Tuberculosis and Respiratory Disease Association Bulletin, April, 1971, 57(4), 10-13.
- Ross, C. Smoking withdrawal research clinics. In S.V. Zagona (Ed.), Studies and issues in smoking behavior. Tucson, Arizona: The University of Arizona Press, 1967.
- Rotter, J.B. Generalized expectancies for internal versus external control of reinforcement. Psychological Monographs, 1966, 80(1), Whole No. 609).
- Ryan, F.J. Cold turkey in Greenfield, Iowa: A follow-up study. In W.L. Dunn, Jr. (Ed.), Smoking behavior: Motives and incentives. Washington, D.C.: Winston & Sons, 1973.

- Sanford, N. Overview I. In S.V. Zagana (Ed.), Studies and issues in smoking behavior. Tucson, Arizona: The University of Arizona Press, 1967.
- Schwartz, J.L., & Dubitzky, M. Psycho-social factors involved in cigarette smoking and cessation. Final report of the Smoking Control Research Project, July 1, 1964-June, 1968. Berkeley, Calif.: The Institute for Health Research, Sept., 1968.
- Schwartz, J.L., & Dubitzky, M. Requisites for success in smoking withdrawal. In E.F. Borgatta & R.R. Evans (Eds.) Smoking, health and behavior. Chicago: Aldine, 1968 (b)
- Siegel, S. Nonparametric statistics for the behavioral sciences, New York: McGraw-Hill, 1956.
- Sipich, J., Russell, R., & Tobias, L. A comparison of covert sensitization and "nonspecific" treatment in the modification of smoking behavior. Behavior Therapy and Experimental Psychiatry, 1974, 5, 201-203.
- Smith, G.M. Personality and smoking: A review of the empirical literature. In W.G. Hunt (Ed.), Learning mechanisms in smoking. Chicago: Aldine, 1970.
- SPSS (Statistical Package for the Social Sciences), Northwestern University, Version 6.0, 1975.
- Staats, S. Internal vs. external locus of control for three age groups. International Journal of Aging and Human Development, 1974, 5(1), 7-10.
- Straits, B.C. Resume of the Chicago study of smoking behavior. In S.V. Zagana (Ed.), Studies and issues in smoking behavior. Tucson, Arizona: The University of Arizona Press, 1967.
- Straits, B.C., & Sechrest, L. Further support of some findings about the characteristics of smokers and nonsmokers. Journal of Consulting and Clinical Psychology, 1963, 27, 282.
- Stuart, R.B. & Davis, B. Slim chance in a fat world: Behavioral control of obesity. Champaign, Ill.: Research Press, 1974.
- Terris, M. A social policy for health. American Journal of Public Health, 1968, 58(No. 1), 5-12.
- Thompson, D.S., & Wilson, T.R. Discontinuation of cigarette smoking: "Natural" and with "therapy". Journal of the American Medical Association. 1966, 196, 1048-1052.

- Tomkins, S.S. Psychological model for smoking behavior. American Journal of Public Health and the Nation's Health, 1966, 56, Supplement 56, 17-20.
- Tomkins, S.S. A modified model of smoking behavior. In E.F. Borgatta & R.R. Evans (Eds.), Smoking, health and behavior. Chicago: Aldine, 1968.
- U.S. Bureau of Census, U.S. Census of Population, 1960: Subject Reports. Social Economic Status (Final Rep. PC(2), Pt. 56.) Washington, D.C.: U.S. Government Printing Office, 1967.
- U.S. Surgeon General's Advisory Committee on Smoking and Health. Smoking and health. Public Health Service Publication No. 1103. Washington, D.C.: U.S. Department of Health, Education and Welfare, 1964.
- Weatherley, D. Some personality correlates of the ability to stop smoking cigarettes. Journal of Consulting Psychology, 1965, 29, 483-485.
- Winnett, R. Parameters of deposit contracts in the modification of smoking. The Psychological Record, 1973, 23, 49-60.

MICHIGAN STATE UNIV. LIBRARIES



31293104390517