

PREDICTORS OF ADHERENCE TO SMOKING CESSATION:
SELF-EFFICACY, SELF-ESTEEM, PERSPECTIVE TRANSFORMATION
AND NICOTINE THERAPY

A DISSERTATION
SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF DOCTOR OF PHILOSOPHY
IN THE GRADUATE SCHOOL OF THE
TEXAS WOMAN'S UNIVERSITY

COLLEGE OF NURSING

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DENTON, TEXAS
DECEMBER 1994

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ACKNOWLEDGEMENTS

I wish to thank Dr. Maisie Kashka for her valuable direction and evaluation; and Dr. Barbara Lease for her insight and statistical assistance.

I am grateful to the agencies and subjects who participated in my study; who continue to aim toward the goal of smoking cessation.

And finally, I wish to recognize my husband Ed, for his encouragement to me throughout my doctoral program and dissertation.

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ABSTRACT

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DECEMBER 1994

The purpose of this study was to investigate predictors of smoking cessation adherence at three months among smoking cessation program participants in the state of Texas. Predictors included: perspective transformation, self-efficacy, self-esteem, transdermal nicotine therapy, and demographics.

Using purposive sampling, and a longitudinal design with treatment partitioning, subjects ($N = 75$) attending ten different smoking cessation programs in Texas were measured at three points in time: the beginning and end of their program, and at three months. A demographic profile, Brod and Hall's Adapted Self-Efficacy Scale (Stanton et al., 1992), and Rosenberg's Self-Esteem Scale (1979) were completed by subjects at their initial program session. The Adapted Revised Marsh Revelation Scale (Van Nostrand, 1992), and a progress report were mailed to subjects at the end of

their program. Subjects were interviewed via telephone at the three-month follow-up. Seventy-five subjects completed responses at the beginning of their program and at the three month follow-up, but a 46% mortality rate (34 subjects) was realized in the return of mailed instruments at the end of their program.

Thirty-three percent (25) of the subjects were adherent to smoking cessation at three months. Fifty-six percent (42) of the subjects reported using the nicotine patch. Findings of discriminant function analysis indicated that self-efficacy and self-esteem significantly predicted smoking abstinence at three months ($N = 75$, $p = .0025$). Perspective transformation, however, decreased ability to predict smoking or non-smoking groups at three months ($N = 41$, $p = .2969$). Thus, perspective transformation was an insignificant predictor of smoking cessation adherence.

Multiple regression analysis indicated that self-efficacy and self-esteem ($N = 41$) did not predict perspective transformation ($R^2 = .11$, $F = 5.029$, $p = .100$). The results of the Chi-Square test ($N = 75$) indicated that use of the nicotine patch was not related to smoking outcome ($\chi^2 = .2435$, $p = .6216$). Demographics, analyzed by logistic regression ($N = 75$), were insignificant in predicting success in smoking cessation adherence (67.16% overall

predictive ability).

Conclusions from this study identified self-efficacy and self-esteem as significant predictors of smoking cessation adherence at the three month follow-up period. Perspective transformation, the transdermal nicotine system, and demographics were not significant in predicting smoking cessation adherence. An implication from this study is that the internal attributes of participants in smoking cessation programs may influence outcome more than physical addiction or demographic barriers.

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CHAPTER I
INTRODUCTION

Approximately twenty-nine percent of Americans continue to smoke cigarettes despite intensive public health efforts to encourage smoking cessation (U.S. Department of Health and Human Services, 1989). A variety of educational self-help measures, smoking cessation programs, medical adjunctive therapies, and social-environmental policies exist today which support non-smoking.

Several studies indicate that approximately seventy percent of participants in formal smoking cessation programs will relapse to smoking within a year (Gintner, 1988; Shiffman, 1993; Stevens & Hollis, 1989; Wynd, 1992). In view of these high relapse rates, it is important to understand the psychological factors which differ between the successful quitters and the relapsers. Nicotine transdermal systems (Transdermal Nicotine Study Group, 1991) have been suggested as offering both physiological and psychological support during the smoking cessation process.

Problem of Study

How effective are selected psychological, therapeutic, and demographic variables in predicting adherence to smoking cessation? A review of the literature on smoking cessation

and adherence to non-smoking indicates that numerous variables have been investigated in order to answer this question. Is it possible to predict if smokers will successfully adhere to smoking cessation based on demographic attributes, psychological factors, and therapeutic approaches used in efforts to give up smoking? Specifically, are self-efficacy, self-esteem, prospective transformation, and nicotine therapy predictive of smoking cessation? Further, do predictive relationships exist between self-efficacy, self-esteem, and prospective transformation? Lastly, are particular demographic variables related to success in smoking cessation?

Purpose of Study

The purpose of this study was to measure the psychological variables of self-efficacy, self-esteem, and perspective transformation of adults in the state of Texas who participated in a smoking cessation program with the option of using nicotine therapy, and to compare the subjects' scores with their level of smoking cessation adherence over a period of three months. There were four specific purposes of this study which are stated as follows.

The first purpose of this study was to detect if self-efficacy, self-esteem, and perspective transformation were predictive of smoking cessation adherence. The second

purpose was to investigate if self-efficacy and self-esteem predict perspective transformation. The third purpose was concerned with whether the use of nicotine transdermal patches during a smoking cessation program increased success in smoking cessation adherence. The fourth purpose was to identify relationships which existed between the demographic variables of the subjects and smoking cessation adherence.

Rationale for the Study

Each day, approximately 1200 Americans die from preventable smoking-related diseases such as lung cancer, heart disease, and chronic obstructive pulmonary disease (Roper, 1991). Despite public knowledge of the risks associated with smoking, approximately one third of all adults in the United States continue to smoke. The results of this habit are realized not only in the diminishment of personal wellness, but also in emotional and financial costs placed upon families, society, and the health care system in order to provide care for those suffering smoking-related diseases.

If smoking is to be reduced to a prevalence of no more than 15% of the population by the year 2000, as projected in Healthy People 2000: National Health Promotion and Disease Prevention Objectives (U.S. Department of Health and Human Services, 1991), the current rate of decline in smoking

prevalence must be doubled. To meet this objective, it is imperative that research be expanded on smokers who endeavor to quit. This researcher responded to two research needs as outlined in Healthy People 2000: 1) the need for research on regular smokers trying to quit, and 2) the need for research on preventing relapse. Specifically, this study addressed one of the three research objectives from Healthy People 2000 which was: to identify the determinants of relapse for former smokers.

Research studies which address relapse determinants can effectively aid nurses in health promotion activities. As role models, nurses and other health care providers have the opportunity to encourage, support, and educate clients regarding smoking cessation. Research-based nursing interventions can assist clients to analyze their smoking cessation failures, and to plan individualized treatment modalities.

Psychological attributes strongly affect a smoker's quit attempts and relapse. A gap in the literature was noted regarding the process of perspective transformation and smoking cessation adherence. Perspective transformation is a changed way of looking at self, one's behaviors, and relationships after one has been exposed to new knowledge and insight. Van Nostrand (1992) measured perspective transformation in a sample of smokers and ex-smokers using

the Adapted Revised Marsh Revelation Scale. The findings of this study indicated no significant difference between the two groups. Van Nostrand's subjects had either successfully quit smoking for one to five years, were in the process of smoking cessation, or were currently smoking. Thus, individuals were measured at different points in their smoking cessation process. This researcher believed that perspective transformation could be measured more validly, and ex-smokers and smokers compared more reliably, if all subjects were measured at the same point of their smoking cessation process.

The psychological variables of self-esteem and self-efficacy appear related to the concept of perspective transformation. Self-efficacy and self-esteem have been cited as valuable indicators of success in health promotion efforts (Condiotte & Lichtenstein, 1981; Prochaska, Crimi, Papsanski, Martel & Reid, 1982; and Stanton, Ditmar, Wooldridge, & Kuo, 1992). A co-variance of self-efficacy, self-esteem, and perspective transformation would support the model of perspective transformation, and facilitate understanding of the smoking cessation process.

Lastly, a gap in the literature regarding the success rate of nicotine transdermal therapy was noted. This new product entered the market in 1992 and limited research (Transdermal Nicotine Study Group, 1991) has been conducted

to indicate whether or not this prescribed medical adjunctive therapy is significant in predicting adherence to smoking cessation.

Theoretical Framework

The theoretical framework for this study utilized three constructs: perspective transformation, self-efficacy, and self-esteem. Perspective transformation (Mezirow, 1978) describes the changed insight one gains after receiving new information: this personal fresh insight leads to new roles, relationships, and actions. Self-efficacy (Bandura, 1977) is a person's confidence in his or her ability to successfully execute the behaviors that a situation requires to achieve a desired outcome. Self-esteem (Rosenberg, 1979) refers to a positive or negative orientation toward oneself which can influence one's perceptions and behaviors.

The theoretical framework for the study is schematically depicted in Figure 1, and shows a direct relationship between self-efficacy, self-esteem, and perspective transformation regarding one's smoking cessation outcome.

It was predicted that individuals with positive self-efficacy and self-esteem would experience perspective transformation during a smoking cessation program. Persons scoring highly in perspective transformation more likely

identified this phenomenon in his study of adult learners. Mezirow states that a unique dimension of adult development pertains to becoming aware that one is caught in one's own history and is reliving it. This leads to an indepth reassessment of self which progresses to a structural change in the way one views self and one's relationships. Perspective transformation reformulates a person's criteria for valuing and taking action: familiar assumptions are challenged and new directions and commitments are charted.

The type of learning that Mezirow terms "meaning perspectives" refers to the structure of cultural assumptions within which new experience is assimilated to- and transformed by- one's past experience. This becomes a personal framework for understanding oneself and one's relationships. Because there are often challenges, or dilemmas, in adult life that cannot be resolved by former patterns of problem-solving, a person must undergo significant phases of reassessment and seek new avenues for personal growth.

An example of transformation in daily life is that which is experienced by a smoker. A smoker is often unable to give up the habit of smoking without indepth assessment of self, the effects of smoking upon self, and what smoking represents in relationship to others. While culturally acceptable in the 1950's, smoking has become unacceptable in

the 1990's. The smoker may make efforts to give up smoking, but finds that past experience is lacking in providing the tools necessary to overcome this psychological and addictive habit. When new associations are formed and behaviors are learned, the ex-smoker experiences a new perspective and meaning regarding smoking. The ex-smoker may find it necessary to temporarily withdraw from associates who are smokers. As one moves forward to new perspectives, one disards those of the past.

The dynamics of perspective transformation involve a conscious recognition of the difference between one's old and new viewpoints. New perspectives are adopted as more valuable. Because critical self-appraisal can be tension producing and evolve to a crisis or dilemma, special support may be necessary to sustain one's plan for action. Association with others who share the new perspective is essential in sustaining one's new perspective.

In conclusion, Mezirow (1978) identifies three phases of the full transformation cycle. The first is alienation from prescribed social roles. The second is reframing, which is the restructuring of one's conception of reality and one's place in it. Lastly, there is contractual solidarity within which it becomes possible to participate in society on one's own inner-directed terms as defined by one's new meaning perspective.

Self-efficacy

Bandura (1977) defines self-efficacy as the conviction that one can successfully execute the behavior required to produce a desired outcome. Expectations of personal efficacy determine whether coping behavior will be initiated, how much effort will be expended, and how long it will be sustained in the face of obstacles and adversity.

Bandura (1977) defines an outcome expectancy as a person's estimate that a given behavior will lead to certain outcomes. Outcome and efficacy expectations are different. Individuals can believe that a behavior will produce an outcome (outcome expectation), but unless they believe that they can perform the behavior (efficacy expectation), no action will occur.

Using the construct of self-efficacy with smokers who enter a smoking cessation program, the theory suggests that persons with high self-efficacy will be more willing to engage in the behaviors required to achieve the outcome of becoming a non-smoker. Persons with low self-efficacy might evaluate themselves as incapable of performing the actions required to become a non-smoker. They might more easily relapse when facing the aversive nature of a smoking cessation program and encounter difficulties.

Although it is possible to increase one's self-efficacy

during a smoking cessation program, this researcher posited that the smoker's initial level of self-efficacy at the beginning of a smoking cessation program would predict either adherence or relapse in smoking cessation.

Self-Esteem

Rosenberg's (1979) self-concept theory addresses the nature and principles by which persons view themselves. The nature of the self-concept is "the totality of the individual's thoughts and feelings having reference to himself as an object" (Rosenberg, p. 7). Various internal and external factors influence the thoughts and feelings which individuals have about themselves, such as one's disposition and one's social identity.

The self-concept has two facets: self-esteem and self-consistency. Self-esteem refers to a positive or negative orientation toward the self. Positive self-esteem engenders positive feelings about oneself and one's abilities. Self-consistency refers to a person's tendency to act congruently with one's existing self-concept.

An individual entering a smoking cessation program possesses a level of self-esteem which can either hinder or assist the smoking cessation process. The smoker with low global self-esteem must reject the possibility of success because it contradicts his/her concept of self. The smoker

with high global self-esteem will more likely succeed because it correlates with his/her system of self-values. Although self-esteem may be increased or decreased during the smoking cessation program, this researcher believed that subjects' initial existing level of self-esteem would be predictive of success or relapse in smoking cessation.

Theoretical Assumptions

The theoretical assumptions for this study were based on the three constructs of self-esteem, self-efficacy, and perspective transformation.

1. Each individual develops a unique concept of one-self which becomes a consistent way of viewing one-self (Rosenberg, 1979).

2. Self-esteem ranges on a positive-negative continuum (Rosenberg, 1979).

3. An individual's self-esteem positively or negatively affects one's actions (Rosenberg, 1979).

4. Individuals are capable of forming expectations about their abilities (Bandura, 1977).

5. Individuals' expectations about their abilities influence their behavior (Bandura, 1977).

6. Self-assessment and new learning experiences produce a changed way of viewing oneself and one's relationships in the world (Mezirow, 1978).

7. Individuals with transformed perspectives often change their criteria for valuing and taking action (Mezirow, 1978).

Research Assumptions

Research assumptions addressed beliefs and principles regarding the process of the research study. It was assumed that:

1. The purposive sample would be evenly distributed and large enough to be representative of the population and attributes being studied.

2. Subjects' self-reports would be honest and indicative of true values.

3. Self-efficacy, self-esteem, and perspective transformation can be measured.

4. Brod and Hall's Self-efficacy Scale (as adapted by Stanton et al., 1992), is a measure of self-efficacy.

5. The Rosenberg Self-esteem Scale (Rosenburg, 1979) is a measure of self-esteem.

6. The Revised Marsh Revelation Scale (Van Nostrand, 1992) is a measure of perspective transformation.

7. A percentage of systematic and error variance is present in all studies.

Hypotheses

There were five research hypotheses which addressed

the purpose of this study.

1. Smoking cessation adherence in adults who have attended a smoking cessation program is predicted by their self-efficacy and self-esteem measured at the beginning of the program, and their perspective transformation measured at the end of their program.

2. Perspective transformation in adults who have attended a smoking cessation program is predicted by their self-efficacy and self-esteem.

3. Smoking cessation adherence is predicted by use of nicotine therapy in adults who have attended a smoking cessation program.

4. Smoking cessation adherence is predicted by gender, age, ethnicity, marital status, educational level, income level and employment in adults who have attended a smoking cessation program.

5. Smoking cessation adherence in adults who have attended a smoking cessation program is predicted by their living situation and their history of smoking.

Definition of Terms

The definition of terms for this study included conceptual and operational definitions (Kerlinger, 1986). Conceptual definitions provide the variable or concept under study with a theoretical meaning. The operational

definition is developed to facilitate measurement of the variable or concept.

Self-efficacy

Self-efficacy was conceptually defined as: A person's confidence in his or her ability to successfully execute the behaviors that a situation requires to achieve a desired outcome (Bandura, 1977). Self-efficacy was operationally defined as: Scores on Stanton's adapted Self-efficacy Scale.

Self-esteem

Self-esteem was conceptually defined as: The internal image of oneself formed by the interaction of physical experiences and influential environmental factors at a particular stage in life (Rosenberg, 1979). Self-esteem was operationally defined as: Scores on Rosenberg's Self-esteem Scale (1979).

Perspective Transformation

Perspective transformation was conceptually defined as: A redefined perspective of self, of one's roles, relationships and actions based upon a new insight (Mezirow, 1978). Perspective transformation was operationally defined as: Scores on Van Nostrand's "Adapted, Revised Marsh Revelation Scale" (1992).

Smoking Cessation

Smoking cessation was conceptually defined as: The initial relinquishment of the habit of smoking. Smoking cessation was operationally defined as: Self-report of total abstinence from cigarettes at the end of one's smoking cessation program.

Smoking Cessation Adherence

Smoking cessation adherence was conceptually defined as: The maintenance of smoking cessation as a change in lifestyle over a period of time. Smoking cessation adherence was operationally defined as: Self-report of total abstinence from cigarettes three months after completing a smoking cessation program.

Nicotine Therapy

Nicotine therapy was conceptually defined as: An individual's use of a nicotine transdermal system for the purpose of smoking cessation. Nicotine therapy was operationally defined as: The wearing of a nicotine patch for at least three weeks after beginning one's smoking cessation program.

Smoking Cessation Program

A smoking cessation program was conceptually defined as: A structured approach offered for smokers to achieve

smoking cessation through use of group support, education, and behavioral modification techniques. A smoking cessation program was operationally defined as: Three or more structured sessions on smoking cessation principles and techniques presented by a trained facilitator to a group of smokers who meet together for the purpose of giving up smoking.

Limitations of the Study

Limitations of the study are factors over which the researcher has no control. They may affect the validity and reliability of the study. Seven limitations of the present study were identified.

1. A high mortality rate occurred regarding return of the second set of data; possibly subjects failed to return the questionnaire due to treatment failure (not completing the program), or due to embarrassment when unsuccessful in smoking cessation.

2. Subjects self-selected to use, or not to use, nicotine therapy during their smoking cessation process: the dosage and duration of time in wearing the nicotine patch varied.

3. Although honesty in self-reporting was assumed, subjects may have altered their true responses to items on the instruments and the progress reports due to feelings of

discomfort, guilt, or anxiety.

4. During the data collection period of this study, subjects may have been differently influenced by personal happenings in their lives, or by fluctuating time cycles (such as seasons or holidays).

5. There was no physical or observational validation of subjects' responses regarding smoking cessation and adherence.

6. A variety of smoking cessation programs were used: thus, there was variance in the length of treatment, content of treatment, style of treatment facilitators, financial cost of the treatment, external motivating influences for participants receiving the treatment, location of treatment, and time of year when treatment was given.

7. The self-selected subjects who participated in this study may not have been representative of other participants in the same smoking cessation programs.

Delimitations of the Study

The delimitations of the study are factors over which the researcher has control. Two delimitations for the present study were determined.

1. A purposeful sample of English speaking adults participating in a smoking cessation program offered in the state of Texas was used.

2. A time duration of three months was set to measure smoking cessation adherence.

Summary

The problem of this predictive study focused on understanding psychological, therapeutic, and demographic variables which may affect successful adherence to smoking cessation. Specific purposes addressed self-efficacy, self-esteem, perspective transformation, nicotine therapy, and demographics. Major constructs were drawn from the theorists of perspective transformation, self-efficacy, and self-concept to develop the study's conceptual framework. Hypotheses derived from the specific purposes of the study were presented. The assumptions, definitions, limitations, and delimitations of the study were delineated.

CHAPTER II

REVIEW OF LITERATURE

This chapter presents a review of the literature on selected facets of smoking and cessation efforts. Topics discussed are demographics, adherence and relapse in smoking cessation, perspective transformation, self-efficacy, self-esteem, and nicotine therapy.

Demographics

Population demographics of American smokers are most frequently based upon statistics compiled by the U.S. Department of Health and Human Services (USDHHS, 1989). The USDHHS, the Centers for Disease Control (CDC), and The American Cancer Society present smoking demographic findings in a variety of publications, articles, and factsheets. Authors published in numerous professional journals, such as The American Journal of Public Health, commonly refer to these demographics in their research.

The third chapter, entitled "Tobacco", of Healthy People 2000: National Health Promotion and Disease Prevention Objectives (USDHHS, 1991) summarizes the effects of smoking, prevalence of smoking, and rates in decline. Baseline data sources include the National Vital Statistics System (CDC), National Health Interview Survey (CDC), Adult

Use of Tobacco Survey (CDC), Office on Smoking and Health (CDC), and others. The reliability of these demographic statistics have assisted in the setting of sixteen national goals to decrease smoking and its effects on the American population by the year 2000.

Results of cigarette smoking (USDHHS, 1991) account for about 390,000 deaths yearly including 21 percent of all coronary heart disease deaths, 87 percent of lung cancer deaths, 30 percent of all cancer deaths, and 82 percent of all chronic obstructive pulmonary disease deaths. Aside from the death rate, smoking contributes substantially to chronic morbidity and disability as well.

Use of the 1985 Current Population Survey (Shopland, Niemcryk, & Marconi, 1992) indicates that thirty-three percent of adults aged twenty and older used at least one type of tobacco product in 1985 ($N = 105,225$). According to the American Cancer Society (1991) and Healthy People 2000: (USDHHS, 1991) approximately twenty-nine percent of all adults in the United States continue to smoke. The prevalence of smoking among adults decreased from 40 percent in 1965 to 29 percent in 1987. Gender, age, ethnicity, marital status, income and educational level, and type of employment are variables which reflect and influence this trend.

Gender

Although both genders have decreased in smoking over the past twenty years (American Cancer Society, 1991), males have declined more sharply than females. Male smoking has shown a decrease of 19% from 1965 to 1985; from 52% to 33%. The female smoking rate declined only 5% during this period; from 33% in 1965 to 28% in 1985.

Differences between men and women in the declining rate of smoking prevalence have prompted some investigators to predict that cigarette smoking among women is rising and may exceed men. The fact that lung cancer is the leading cause of death among adult women verifies women's increased cigarette use which began 20-30 years ago (USDHHS, 1989). Shopland, Niemcryk, and Marconi's findings (1992) suggest that geographical region and gender differentiate tobacco use. Survey results ($N = 105,225$) indicated that southern women smoke less than women from other regions of the country. Total tobacco use by males still exceeds that among females.

Gender difference in smoking cessation outcome was not reflected in Anderson and Anderson's study (1990) of male and female former smokers or smokers ($N = 31$) ($p > .05$). Subjects were measured for locus of control, stability and globality to which men and women attributed their success or failure to stop smoking. However, due to the small number

of subjects in each category ($n = 13$, $n = 3$, $n = 8$, $n = 7$) the validity of their findings appear unsubstantiated.

Age

Smoking is distributed equally across the age span with two exceptions: a decline occurs at 65 years of age, and an increase of new smokers occurs during adolescence (American Cancer Society, 1991). Statistics regarding adolescent smoking have limitations due to difficulties in differentiating between experimentation and initiation.

Older smokers are more likely to quit than younger smokers. Barnes, Vulcano, and Greaves' (1985) six month followup study of clients ($N = 166$) attending a smoking cessation program revealed that abstainers tended to be older ($p = .01$). Similar results were obtained by Salive, Cormoni-Huntley, LaCroix, Ostfeld, Wallace and Hennekens (1992) in an epidemiologic study of the elderly ($N = 1259$). Smoking cessation was significantly ($p < .05$) associated with older age.

Smoking initiation studies conducted on highschool and gradeschool students indicate that fourteen percent of senior highschool students smoke occasionally ($N = 2,212$) and five percent smoke daily (McDermott, Sarvela, Hoalt, Bajracharya, Marty & Emery, 1992). High school sophomores smoke at a slightly higher rate (16%) than juniors or

seniors. A study of fourth, fifth, and sixth grade students (Don Morris, Vo, Bassin, Savaglio, & Wong, 1993) reported that five percent of males and two percent of females ($N = 453$) had smoked within the week preceding measurement. These rates are low in comparison to those identified in Healthy People: 2000 (USDHHS, 1991): this study uses a proxy baseline which takes into consideration drop-outs from school who frequently are not measured in other studies.

Ethnicity

According to the American Cancer Society (1991) the percentages (rounded) of smoking according to race are African American (33%), Caucasian (29%), and Hispanic (24%). A percentage analysis of race according to gender reflects that only 18% of Hispanic females smoke, whereas the percentage of Hispanic men who smoke is approximately the same as Caucasian men (30%). The highest percentage of male smokers are African American (39%). Twenty-eight percent of both Caucasian and African American females smoke.

Conversely, Healthy People 2000: (USDHHS, 1991) states that reliable data on smoking trends among Hispanics are not available, but current smoking prevalence estimates for Hispanics exceed those for the U.S. population overall. The 1982-84 Hispanic Health and Nutrition Examination Survey estimated smoking prevalence among Hispanics to be 40

percent for men and 26 percent for women.

A trend of ethnic smoking patterns is becoming apparent among adult women and female adolescents (Dusenbury, Kerner, Baker, Botvin, James-Ortiz, & Zauber, 1992; Geronimus, Neidert, & Bound, 1993; Royce, Hymowitz, Corbett, Hartwell & Orlandi, 1993). A study of Latino adolescents ($N = 3129$) by Dusenbury et al. suggests that Puerto Rican female students of all ages tend to have higher smoking prevalence rates than Puerto Rican males students or other Latino female students.

The smoking initiation age for African-American women appears to be significantly later than for Caucasian women (Royce, Hymowitz, Corbett, Hartwell & Orlandi, 1993). In addition, Royce et al.'s study ($N = 1190$) found that African-American women were found to be lighter/moderate smokers, and more likely to be menthol smokers, than other ethnic or gender groups ($p < .001$).

Although Caucasian women begin smoking at an earlier age than African-American women, Geronimus, Neidert, and Bound (1993) indicate that Caucasian women are more likely to quit smoking ($N = 6038$). The proportion of women smoking in these two ethnic groups converges by age 25. After this age, a crossover occurs and the higher proportion of female smokers are African-American.

Smoking prevalence among Asians appears higher than

among the general population. Studies of Southeast Asian refugees in California conducted between 1984 and 1988 reported smoking rates of 55 to 65 percent for Vietnamese men, 71 percent for Cambodian men, and 92 percent for Laotian men (USDHHS, 1991).

Prevalence of smoking varies considerably among Native American groups: fifty-six percent of Alaska Natives smoke, as do 42-70% of Northern Plains Indians (USDHHS, 1991). A study comparing urban American Indians ($N = 419$) to the overall population by Lando, Johnson, Graham-Tamasi, McGovern & Solberg (1992) reported that the urban American Indian quit-ratio is lower (29.7%) than the quit-ratio of the general U.S. population (45%). Subjects reported a median 11 cigarettes a day, indicating they were lighter smokers than the general population identified as smoking 20 cigarettes daily. Lando et al.'s conclusions, citing similarities between American Indians and the U.S. population desire to quit smoking and reasons for relapse, are well documented.

Income Level, Employment and Educational Level

As education and income increase, there is a decrease in smoking (American Cancer Society, 1991). People with less than a high school diploma smoke twice as much as people with a college degree. The 1987 prevalence of

cigarette smoking among people with a high school education or less was 34 percent. In households earning \$10,000 or less, 36% of males and 26% of females smoke. In households earning \$40,000 or more, 24% of males, and 20% of females smoke. Employment figures reflect this trend. Blue collar workers smoke more prevalently (36% of males and 37% of females) than white-collar professionals (26% of males and 27% of females). The close proximity of male and female smoking rates suggests that the work environment influences smoking status (USDHHS, 1991).

Characteristics associated with high smoking rates (low education, income below poverty level, unemployment, and employment in service-level jobs) decrease likelihood of smoking cessation (Manfredi, Lacey, Warnecke, & Buis, 1992; Brownson, Jackson-Thompson, Wikderson, Davis, Owens, & Fisher, 1992). Using survey measurement on large samples ($N = 859$ and $N = 2092$) these studies found that while the majority of blacks from lower-socioeconomic neighborhoods believe that smoking is harmful to health, their cessation rate remains lower than whites. Beliefs were correlated with education level in both studies. When comparing black women from subsidized public housing with black and white women from the metropolitan area, Manfredi et al. found that black women from subsidized housing are the least likely to quit smoking, and that black metropolitan women have a

stronger desire to quit than white metropolitan women. Programs targeting poorly educated black communities must take into consideration the intensified needs and barriers experienced by this population.

Marital Status

Marital status can influence an increase, or a decline, in smoking rates. Two studies discuss the relationship between spouses (or partners) and smokers in the smoking cessation process (Coppotelli & Orleans, 1985; Cohen & Lichtenstein, 1990). Coppotelli and Orleans discovered that partner facilitation was significant in predicting abstiners 6-8 weeks after quitting smoking ($N = 125$). Abstainers significantly more often had ex-smoking partners than did nonabstainers ($p < .01$) and significantly more often had smoking partners who successfully quit with them than did nonabstainers ($p < .05$).

A relationship exists between positive reinforcement received from partners and subject abstinence in the early phases of smoking cessation (Cohen & Lichtenstein, 1985). However, negative reinforcement does not improve partner abstinence ($N = 221$). Implications for smoking cessation programming would include the incorporation of partners into the process, and to emphasize their role of offering positive reinforcement.

Smoking Cessation Adherence and Relapse

The literature suggests that at least 75% of ex-smokers relapse within the first year after completing a smoking cessation program. Studies summarized by Gintner (1988) indicate that most of the incidents of smoking relapse occur during the first 90 days after program completion. Shiffman (1993) identifies that formal smoking cessation efforts have achieved a flattened 30% success rate over the past three decades (aside from an upward trend noted between 1965-69 and 1970-74 from 20% to 30%). Shiffman's analysis is based upon the results of 244 smoking study groups reported in 127 publications between the years of 1965 and 1989.

Positive findings have been learned about smoking cessation over the past decade (Lichtenstein & Glasgow (1992). The addictive qualities of tobacco and its influence on smokers have been recognized, facilitating measures to deal with withdrawal symptoms. Smoking cessation has been articulated as a stages-of-change model: a process involving several identifiable phases. Clinical interventions have targeted the action stage. Public health interventions have directed efforts toward the initial stage of smoking cessation by promoting individual and social awareness. Federal support and research on disease prevention and health promotion has expanded.

Although estimates of smoking cessation programs

account for only 10% of smoking cessation, they remain important (Shiffman, 1993). There remains a segment of hardcore, heavily addicted smokers who may require intensive treatment in order to quit smoking. Also, formal smoking cessation programs have traditionally provided the scientific and clinical content that is disseminated in public health interventions.

Combinations of present therapy, and new channels of intervention are necessary to achieve higher success rates and to reach a broader segment of the smoking population through health care settings, workplaces, and entire communities (Gintner, 1988; Shiffman, 1993; Lichtenstein & Glasgow, 1992). An extensive innovative health promotion effort to decrease smoking is The American Stop Smoking Intervention Study (Shopland, 1993). This five year smoking control plan, presently being implemented, places emphasis on the strategic use of media and the adoption and implementation of tobacco control policies. The total funding for this plan will exceed \$150 million.

Following are topics which influence the action phase of smoking cessation. Relapse is often associated with nicotine dependency, one's perception of health risks, and emotional states. Relapse may be diverted by maintenance sessions, relaxation imagery, or program adherence.

Nicotine Dependence

High levels of nicotine dependency impede smoking cessation efforts (Hall, Munoz, Reus, & Sees, 1993; Hughes, 1992; and Zelman, Brandon, Jorenby, & Baker, 1992). Study findings concur that although most withdrawal symptoms lessen in time, post-cessation depression often remains and is a significant predictor of relapse. Depression is noted at higher levels in smokers than in the general population.

The Sensitivity Model (Pomperleau, Collins, Shiffman, & Pomerleau, 1993) physiologically theorizes why individuals experience differences in sensitivity to nicotine and have different tolerance levels. Implications from this model are: 1) individuals who are relatively drug-insensitive will successfully respond to social support and environmental contingencies in smoking cessation, whereas, 2) individuals who are highly reactive and vulnerable to nicotine drug use will demand intensive treatment programs.

Perceptions of Health Risks

Success or failure in a smoking cessation program affects one's perceptions of the health risks of smoking. Gibbons, McGovern and Lando (1991) found that subjects ($N = 96$) shared the same beliefs at the beginning of their smoking cessation program, but were significantly different six months later ($p = <.01$). This finding indicates that

relapsers practice a defensive reaction called "pathogenic denial". Chapman, Wong, and Smith (1993) found similar results between smokers and ex-smokers ($N = 471$). Fewer smokers than ex-smokers accept that smoking causes disease ($p < .05$), and smokers maintain more self-exempting beliefs than ex-smokers ($p < .01$). Tipton's study (1988) did not find this difference. Tipton measured four types of beliefs regarding smoking in program participants ($N = 33$). Findings indicated no significant differences between the abstainers and the relapsers beliefs at the three month follow-up. Tipton's sample size may have been too small to note the effect reported by other studies.

Relapse Dynamics

Temptations to smoke are commonly experienced by ex-smokers and frequently are associated with relapse to smoking. The Reversal Theory of O'Connell, Cook, Gerkovich, Potocky, and Swan (1990) offers a new approach to understanding ex-smokers ($N = 159$) behaviors during situations which are highly tempting. Individuals in negativistic states (predominated by feelings of anger and rebelliousness against rules) were more likely to relapse ($p < .001$) than individuals in a conformist state (characterized by a preference for rules and conventions without feelings of anger). While this theory indicates how

emotional states can impact response to smoking cessation, it does not explain how negativistic states can be changed to conformist states.

Yielding to one temptation to smoke often predicts complete relapse. Baer, Lichtenstein, Kamarck, and Ransom (1989) interviewed subjects who had achieved ($N = 102$) initial cessation at three months posttreatment. Prospective analyses indicated that any smoking lapse is strongly related to subsequent relapse. A strength of this study is the differentiation between a lapse (a temporary slip with smoking) and relapse (complete return to smoking).

Although lapses are frequently associated with subsequent relapse, event history analysis is a valuable research design in examining the dynamic nature of smoking cessation maintenance (Swan & Denk, 1987). Findings reveal that ex-smokers (who had been abstinent for three months) experience several fluctuating episodes of abstinence and relapse during the following one-year period ($N = 381$). Study results indicate that the rate of relapse per month (3.7%) is roughly half that of the rate of return to abstinence per month (6.9%). The design of this study permitted continuous analysis of the dynamics of the relapse-abstinence cycle, and revealed that more individuals return to abstinence than remain relapsed. Trend analysis revealed that at any time approximately 60% of the subjects

were abstinent. This outcome is different than most studies indicate (Shiffman, 1993).

The theory of relapse prevention in the treatment of addictive behaviors (Marlatt & Gordan, 1985) support the findings of Swan and Denk's study. Relapse (lapses or slips) weakens abstinence resolve, but a cyclical pattern is noted over time. If individuals successfully overcome lapses, their resolve may be strengthened enough to achieve abstinence. However, numerous lapses too closely associated most commonly result in total relapse.

Maintenance Strategies

Inclusion of maintenance strategies during or following smoking cessation programs are thought to improve adherence to smoking cessation. The study of Stevens and Hollis (1989) found that abstinence rates increase by eight percent among subjects who receive follow-up training sessions. Brandon, Zelman, and Baker (1987) found insignificant differences between subjects receiving maintenance sessions and the control group. An implication from these studies is that continual social support and contact is at the heart of effective self-help programs. Although Stevens and Hollis's study reflected a small percentage improvement in abstinence by having subjects actively rehearse coping strategies, there was still a 59% relapse rate among subjects.

Incorporation of coping strategies and weekly self-monitoring devices within a smoking cessation program do not significantly alter abstinence rates (Karmarck & Lichtenstein, 1988). Despite adequate adherence to program strategies, only 34% of subjects ($N = 94$) were abstinent at the end of one year. These findings indicate that maintenance strategies taught during the active phase of smoking cessation are either not implemented by participants, or are ineffective due to other variables.

A promising maintenance strategy for smoking cessation is relaxation imagery (Wynd, 1992). Subjects receiving imagery training were significantly more adherent than subjects not trained in this technique ($p < .05$). Both experimental and control groups met for a three month period after the initial cessation program: perhaps this variable (ongoing contact) contributed to the unusually high abstinence rates of both groups (72% and 51% respectively).

Perspective Transformation

Theoretical studies on perspective transformation have been conducted by Marsh (1989), Hunter (1980), and Nowak (1981). Using synonymous terms, these dissertations discuss aspects of the perspective transformation process described by Mezirow (1978). Van Nostrand (1992) adapted and tested instruments from Marsh's study in her quantitative study of

smokers and ex-smokers.

Marsh (1989), Hunter (1980), and Nowak (1981) envision the process of perspective transformation occurring in progressive stages or phases. Marsh (1989) delineates four: recoiling, readiness, revelation, and sustained change over time. The characteristics of readiness are life dissatisfaction, social support, and critical analysis. Revelation has four dimensions: personal power, knowledge, mystical experience, and redefined perspective.

Hunter (1980) identifies seven phases of perspective transformation: exposure, inoculation, denial, crisis, commitment, life satisfaction, and faith. Hunter describes three categories of change in her perspective transformation process: learning for change, circumstances surrounding change, and critical change.

Nowak (1981) discusses three conditions of perspective transformation which are: a "feeling experience" (contact with original truth), the internalization of six principles, and development of abilities which operationalize these principles. Nowak's six principles are polarity, causality, force, reality, change, and responsibility. The ability to operationalize these principles are faith, courage, and freedom.

Similarity is noted amongst these three theorists, and Mezirow (1979), insofar as perspective transformation

involves personal evaluation, change, internalization of new values, and consistent new behaviors. A spiritual entity is noted by the theorists (whether it is identified as mystical experience, solidarity, faith, or freedom) which transcends cognitive learning. This process occurs over time. For example, Marsh predicts that a timeframe up to five years may be necessary before an individual achieves a sustained change. The process of perspective transformation appears holistic in nature: it's realization is greater than the sum of it's parts which makes it difficult to measure quantitatively.

The samples addressed by Marsh, Hunter, Nowak and Mezirow in their studies were not exclusively smokers. Health-related and adult educational settings were used. It was believed that study findings could be generalized to similar populations of persons who were undergoing changes in personal development and health promoting behaviors. Marsh (1989) noted that among health-risk groups studied, smokers did not significantly demonstrate the phenomenon of readiness-revelation.

Van Nostrand (1992) adapted and tested the Marsh Revelation Readiness Index (MRRI) and the Marsh Revelation Scale (MRS) as instruments to measure phases of perspective transformation in smokers and ex-smokers ($N = 159$). Results indicated that both instruments manifested acceptable total

contrasted ex-smokers' and smokers' groups failed to significantly differ in total responses on either adapted instrument. Content analyses of non-smokers' written accounts of the smoking cessation process offered estimates of the perspective transformation process. The one-measurement survey design of this study may have been insufficient to capture the changes which occur with perspective transformation over time.

Self-Efficacy

Self-efficacy is a reliable indicator of a tendency toward abstinence or relapse in smoking, whether subjects are participants of a smoking cessation program, or are smokers who make self-initiated efforts to stop smoking on their own. Self-efficacy ratings made prior to a smoker's quit date are related to success or failure in smoking cessation (Stanton et al., 1992) and even the number of cigarettes subsequently smoked (Garcia, Schmitz, & Doerfler, 1990). Self-efficacy ratings for high risk situations indicate which individuals will smoke, or not smoke, when confronted with the temptation to smoke (Garcia et al., 1990; Condiotte & Lichtenstein, 1981). Abstinent non-smokers report markedly higher levels of self-efficacy, while relapsed smokers report least confidence in coping with situations that evoke negative emotions (Prochaska et

al., 1982).

Moderate levels of self-efficacy may best predict return to abstinence after one has lapsed, (Haaga & Stewart, 1992). These results are consistent with Bandura's hypothesis (1977) that self-efficacy for recovery of abstinence should ideally be at a moderate level among ex-smokers. If too high, ex-smokers may be tempted to experiment with smoking, and if too low, ex-smokers may become hopeless if a lapse occurs.

Self-efficacy is significantly enhanced as the result of participation in a smoking cessation program (Condiotte & Lichtenstein, 1981). This finding supports the utility and validity of Bandura's (1977) self-efficacy theory. Self-efficacy is strengthened by performance accomplishments. Personal mastery experiences in one area of mastery increases self-efficacy; which in turn increases self-efficacy expectations for other areas.

Cultural differences and level of addiction to nicotine may influence one's self-efficacy and the ability to stop smoking. Sabogal, Otero-Sabogal, Perez-Stable, and Marin (1989) measured self-efficacy, addiction to cigarettes, and acculturation in Hispanics ($N = 263$) and non-Hispanic whites ($N = 150$). There were significant differences between Hispanics with high acculturation, Hispanics with low acculturation, and non-Hispanic whites. Less acculturated

Hispanics have the highest levels of self-efficacy to quit and the lowest addiction levels of any group. Thus, Hispanics may be at greater risk for increased addiction to cigarettes as they acculturate.

Healthy People 2000: (USDHHS, 1991) reports that Hispanic smoking prevalence exceeds that of the general U.S. population, but does not differentiate between Hispanics who have recently become residents and those who have assimilated American culture. Prevalence of smoking is not synonymous with level of addiction. Heavily addicted smokers may have lower levels of self-efficacy due to past experience with withdrawal symptoms. Stronger acculturation may increase level of addiction.

Self-Esteem

There are few recent articles which address the relationship between self-esteem and smoking behavior in adults. Perhaps this is due to the preferred use of self-efficacy as a predictor of outcome.

There is a strong relationship between self-esteem and smoking in adolescents (Murphy & Price, 1988; Emery, McDermott, Holcomb, & Marty, 1993). Twenty percent of 8th grade students from North Carolina identified themselves as current smokers, and over fifty percent stated they had tried smoking ($N = 1,513$). Murphy and Price found that the

lower the self-esteem, the higher the frequency of ever smoking ($p < .001$). The subjects of this study lived in a tobacco production area which was felt to influence the results.

The findings of Emery et al. (1993) concur with the above study. Sixth graders from Florida ($N = 411$) were measured for home self-esteem and school self-esteem. Results indicated that the higher their scores were in home and school self-esteem, the lower their use of tobacco substance.

A study of adult self-esteem and smoking behavior by Baugh (1983) indicated that self-esteem was not a significant predictor of smoking status ($N = 212$). The design of this study was retrospect and compared smokers to non-smokers using one measurement. Step-wise multiple regression was used with the variables of self-esteem, the components of the health belief model, and locus of control. None of the variables were significant in predicting smoking behavior. It would appear that self-esteem would be most valid and reliable in a prospective study, when smokers are measured before and after they make an effort to give up smoking. The non-smoker subjects in Baugh's study were not all former smokers.

Nicotine Therapy

Nicotine therapy, as described in the present study, concerns use of "the nicotine patch". Transdermal nicotine systems entered the commercial market in 1991 as an adjunct to smoking cessation (The John Hopkins Medical Letter, 1992). Currently available by prescription, brand names of the nicotine patch are Nicoderm, Nicotrol, ProStep, and Habitrol. Each brand is dispensed in decreasing doses, facilitating weaning from nicotine during the treatment period. Physicians individualize the dose and length of treatment according to patient need; however, pharmaceutical companies recommend that titrated treatment span a period of anywhere from six weeks to three months. Costing \$3.50 to \$4.00 daily, the patches are designed to be worn either 16 or 24 hours a day. Major side effects are skin irritation, and dream disturbances if worn at night. Use of the patch while smoking is prohibited and dangerous, causing increased vascular constriction possibly leading to myocardial infarction (Consumer Reports on Health, 1992).

Controlled experimental studies have consistently indicated that subjects wearing the nicotine patch initially have significantly higher abstinence rates than control subjects who used either placebos, or no patch (Abelin, Ehlsam & Buhler-Reichert, 1989; Buchkremer & Minneker, 1989; Daughton et al., 1991; Rose, Levin & Behm, 1990; Transdermal

Nicotine Study Group, 1991). Initial abstinence rates for subjects wearing the nicotine patch in five studies ranged between 39% to 61%. Respectively, the initial abstinence rates for the control groups ranged between 13% to 34%. On follow up, the difference between abstinence rates for the two groups lessened: subjects wearing the patches had an average 26% success rate (with a range of 18-36%), whereas control subjects averaged a 15% success rate (ranging between 6-22%). This pattern was consistent in all studies, despite dosages used or the duration of the follow up period (ranging between six weeks to a year). All studies used randomized experimental designs, usually double-blind and placebo controlled. All subjects attended a program for smoking cessation as part of the treatment design.

Findings of these five studies concur with a Mayo Clinic study (Consumer Reports on Health, 1992). Initially, the experimental patch group achieved a 77% abstinence rate, whereas the abstinence rate in the placebo group was 39%. At one year followup, the patch group had a 15% abstinence rate, and the placebo group had a 5% abstinence rate. In this study the initial success rate of the patch users was substantially higher than the other studies; and the follow up abstinence rate was significantly lower than the other patch studies as well as predicted abstinence rates for all smoking cessation programs (Shiffman, 1993). The initial

high success rate may have been correlated with the two-week live-in treatment phase of the Mayo Clinic program.

There is an expected increase in one year smoking cessation adherence rates by individuals who use the nicotine patch and attend a smoking cessation program (D'Epiro, 1993). D'Epiro estimates that abstinence rates achieved by wearing the patch alone are estimated to be approximately 20%, as compared to 30-40% when using the patch in conjunction with group behavioral therapy.

Nicotine therapy is effective in decreasing withdrawal symptoms. It's ability to strongly increase longterm abstinence rates has not been supported by the above studies. Factors which need to be considered in the use of this modality are the individual's motivational level and level of addiction to nicotine.

Synopsis of Literary Findings

A synopsis of the sixty literary sources selected for review reveals that there are concurring and differing findings among the authors. The following two sections highlight these areas of agreement and disagreement.

Areas of Agreement in Review of Literature

The American Cancer Society, the U.S. Department of Health and Human Services, and the Center for Disease Control (Office on Smoking and Health) using the same

statistics concur in publications regarding smoking and gender, age, race, education, and household income.

Barnes, Vulcano, and Greaves (1985) and Salive et al. (1992) concur that smoking cessation is associated with older age. Shopland, Niemcryn, and Marconi's (1992) findings that 33% of adults use one form of tobacco is consistent with USDHHS data. Royce et al, (1993), and Geronimus, Neidert, & Bound, (1993) note a significant trend of female ethnic smoking patterns which differentiates Caucasians from African-Americans. Coppotelli and Orleans (1985) and Cohen and Lichtenstein (1990) agree that a positive relationship of spouse/partner support to smoking cessation outcome exists. Manfredi et al. (1992) and Brownson et al., (1992) find that while lower-socioeconomic African-Americans' believe that smoking is harmful to health, their ability to stop smoking is difficult due to socio-economic barriers.

Gintner (1977) and Shiffman (1993) agree in their estimates of relapse levels (75%) following smoking cessation efforts. Lichtenstein and Glasgow's (1992) summary of what has been learned over the past decade is supportive of these findings. These four authors, plus Shopland (1993), concur that alternate strategies of prevention, action, and maintenance are necessary to assist the population become smoke-free. Hall et al., (1993),

Hughes et al., (1992) and Zelman et al., (1992) find that high levels of nicotine dependency make smoking cessation difficult due to withdrawal effects and associated depression. The Sensitivity Model of Pomperleau et al., (1993) provides rationale which supports the above findings.

Gibbons, McGovern and Lando (1991) and Chapman, Wong, and Smith (1993) agree that ex-smokers become stronger in their beliefs about the health risks of smoking; whereas smokers express decreased beliefs about smoking health risks when they do not achieve abstinence. Stevens and Hollis (1989) and Karmarck and Lichtenstein (1988) studies believe that specific maintenance strategies are important to decrease relapse rate. Although these strategies do not prevent relapse for all subjects, Stevens and Hollis's study showed a small significant improvement in abstinence rates.

The three theorists addressing perspective transformation (Marsh, 1989, Hunter, 1980, and Nowak, 1981) presented it as a process which was not contradictory to Mezirow (1978). Using different but synonymous terminology, similarity in the phases of this process was discernable. Van Nostrand's findings (1992) were unable to support the Readiness-Revelation theory of Marsh.

Self-efficacy study findings were similar regarding the positive relationship between smoking cessation adherence and self-efficacy (Stanton et al., 1992, Garcia et al.,

1990, Condiotte & Lichtenstein, 1981). The self-esteem studies of Murphy & Price (1988) and Emery et al. (1993) concurred that self-esteem is positively related to smoking activity in grade school adolescents.

Findings among the transdermal nicotine system studies agreed that use of the patch is significantly associated with higher levels of abstinence at the end of a smoking cessation program. Findings at followup periods reveal a declining abstinence rate which approaches the norm achieved by persons not using the patch.

Areas of Disagreement in Review of Literature

Disagreement is noted between Healthy People 2000: National Health Promotion and Disease Prevention Objectives (USDHHS, 1991) and the American Cancer Society (1991) in presentation of statistics regarding Hispanics and prevalence of smoking. The source utilized by Healthy People 2000 (the 1982-84 Hispanic Health and Nutrition Examination Survey) may be more accurate (considering it is specific to Hispanics) than rates based on census statistics.

Healthy People 2000's (1991) estimate of adolescent smoking is different from other sources because it is based on the proxy measurement of regular smokers in the 20-24 year old group. Their estimate of adolescent smoking is 30%

whereas McDermott et al. (1992) indicated prevalence rates to be 5-16%, and Morris et al. (1993) indicated grade school smoking rates to be 2-5%.

Anderson and Anderson's study (1990) of male and female smokers indicated no gender difference in smoking cessation outcome when measured for locus of control, stability, and globality. Although other studies did not consider these specific variables, the literature (USDHHS, 1991) documents differences in gender smoking cessation trends. Shopland, Niemcryk, and Marconi (1992) found differences in gender smoking rates according to geographical region.

Dusenbury et al.'s study of Latino students (1992) indicated that Puerto Rican female students smoke at higher levels than Puerto Rican males or other Latino students. Male smoking patterns are reported as higher than female in most studies (USDHHS, 1991).

Lando et al., (1992) reports low quit-ratios for urban American Indians when compared to the general U.S. population. Healthy People: 2000 reports a higher prevalence of smoking among various American Indian groups than among the general U.S. population.

Swan and Denk (1987) present the dynamic nature of abstinence and relapse over a year's period after one has stopped smoking, rather than viewing relapse episodes as a predictor of a subsequent total return to smoking (Baer et

al., 1989).

Haaga and Stewart (1992) reported that moderate levels of self-efficacy best predict return to abstinence after one has lapsed. Other studies (Prochaska et al., 1982, Garcia et al., 1990) find that the higher the level of self-efficacy, the higher the rate of abstinence.

D'Epiro (1993) presents abstinence rates for persons using the nicotine patch and attending behavioral therapy at 30-40% one year followup. These percentages were higher than the means of subjects in controlled experimental studies (Abelin et al., 1989, Buchkremer & Minneker, 1989, Daughton et al., 1991, Rose et al., 1990, Transdermal Nicotine Study Group, 1991).

Areas of agreement and disagreement in the above studies reflect the multi-faceted aspect of smoking and cessation efforts. Achieving abstinence is a complex process involving many variables.

Summary

The review of the literature begins with a summary of smoking demographics which includes studies on age, gender, ethnicity, marital status, income level, employment, and educational level. Smoking cessation adherence and relapse were addressed through analysis of trends and knowledge regarding smoking over the past decades. Specific topics

addressed by research studies were nicotine dependence, perceptions of health risks, relapse dynamics, and maintenance strategies. Three psychological variables were addressed; perspective transformation, self-efficacy, and self-esteem. Progress on use of the nicotine patch was discussed. A synopsis of similarities and differences among the literary sources concluded the review of literature.

CHAPTER III

PROCEDURE FOR COLLECTION AND TREATMENT OF DATA

This chapter discusses the research design, variables, setting, population and sample, selection and protection of human subjects, and instruments pertaining to the study. The collection and treatment of data are described.

A longitudinal research design with treatment partitioning was selected in order to study smoking cessation adherence over a three month period. Treatment partitioning was used to increase the sample size (Burns & Grove, 1993). Data from ten partitioned groups were merged together for analysis and interpretation of meaning. This type of design is appropriate when studying subjects who participate in a "treatment" which is similar yet may contain some differences, such as smoking cessation programs. The "treatment" is uncontrolled by the researcher but is clearly described as the "key event" that is thought to lead to change in the subjects. The subjects in each of the ten partitioned groups of this study were measured at three points in time: 1) at the beginning of their smoking cessation program, 2) at the end of their program, and 3) at three months later.

Variables of this study included self-efficacy, self-

esteem, perspective transformation, nicotine therapy, and smoking cessation adherence. Demographic variables were age, gender, ethnicity, marital status, employment, education level, living environment, and smoking status. All variables are described in detail in the instruments section of this chapter.

Setting

The settings for this research study were ten smoking cessation programs conducted in the state of Texas by various health care agencies and facilities. The programs are described as follows:

Program One was offered at a medical center's wellness promotion center in a metropolitan area, consisting of six individualized one-hour modules presented once a week over six weeks. Participants could enter the program at any time (each week an orientation session preceded the module for new participants). Facilitators used materials prepared by a national smoking cessation program and Parke-Davis (Nicotrol Patient Starter Kit). A fee of either \$140.00 or \$87.50 was charged depending on materials bought by the participants. Six people attended the program and were present for the majority of sessions.

Program Two, offered at the same wellness promotion center, consisted of five one hour sessions held over a two week timeframe. The printed materials and fee were similar

to Program One. Two participants attended all sessions.

Program Three was offered at a medical clinic (located in the country and subsidized by a nearby city's medical center). The program, presented by a pharmaceutical representative, consisted of three one hour sessions offered once a week for three weeks. A physician was available at the first session to meet with participants needing a prescription for the nicotine patch. This program was free, but subjects paid for their prescriptions if obtained. A total of fourteen people attended this program, but only three were present for the last session.

Program Four was offered at a city's medical center. The program consisted of five sessions offered once a week for five weeks. The medical center provided for drug discounts to employees who attended the program and chose to use the nicotine patch (with a doctor's prescription). The program was free to employees, but a fee of \$65.00 was charged to the public. There was a total of 24 persons at the orientation session, with 11 people attending the last session.

Program Five was offered at a large metropolitan medical center, consisting of five one-hour sessions offered over a two week period. Facilitators used materials which they had compiled themselves. A fee of \$85.00 was charged. Eight people attended the majority of sessions from this

program.

Program Six was the same program as Program Four and was offered at the same location. Five persons attended all sessions of this program.

Program Seven was offered at an agency located in a large metropolitan city. A deposit of \$10.00 was requested at the orientation, and was returned to persons attending the last session. Ten people began this program, and two were present as the last session.

Program Eight (the same program and location as Programs Four and Six) had a total of eleven participants, and eight attended the last session.

Program Nine was offered at a large metropolitan veteran's hospital. The program was free to veterans and free nicotine patches were made available to participants. The program was led by two psychologists and consisted of an orientation, and seven sessions offered once a week over eight weeks. Twelve people began the program: six attended the last session.

Program Ten was offered by the health promotion department of a military installation. The program was free to military personnel. Arrangements were made for obtaining prescriptions and receiving nicotine patches without charge. There were a total of sixteen participants in this program, who signed an agreement at the orientation session stating

they would attend all sessions.

Population and Sample

The population of this study were adults who voluntarily participated in smoking cessation programs in the state of Texas. The total sample consisted of 75 subjects ($N = 75$) out of 108 participants attending one of ten different smoking cessation programs. Of the 108 participants who began a program, only 68 were present at the last session of the program. Thus, approximately 62% of the participants completed the entire program.

Although there were 75 subjects in the study, all subjects did not return data requested for the second period of measurement. Completed data was obtained from 41 of the 75 subjects in the study. These 41 subjects ($N = 41$) returned responses at all three points of measurement. The total sample ($N = 75$) consisted of all subjects in the study; but 34 of these subjects did not return the perspective transformation questionnaire. See Figure 2 for illustration of subjects responses at the three measurement periods.

Subjects were adult smokers, who had smoked over 10 cigarettes daily for at least one year, spoke English, and were participants in a smoking cessation program. Although three subjects were two years younger than the adult age

	Time 1 Beginning of Program		Time 2 End of Program		Time 3 At 3 Months	
	Date:	<u>N</u>	Date:	<u>N</u>	Date:	<u>N</u>
Program One	5/3/93	6	6/10/93	4	8/3/93	6
Program Two	8/25/93	2	9/7/93	2	11/25/93	2
Program Three	10/15/93	11	11/7/93	4	1/15/94	3
Program Four	1/10/94	13	2/7/94	7	4/10/94	13
Program Five	1/11/94	5	2/7/94	4	4/11/94	5
Program Six	3/1/94	5	3/20/94	3	6/1/94	5
Program Seven	3/7/94	7	3/28/94	1	6/7/94	7
Program Eight	3/7/94	10	4/4/94	8	6/7/94	10
Program Nine	5/4/94	6	6/1/94	2	8/4/94	6
Program Ten	5/5/94	10	6/1/94	6	8/5/94	10
Merging of Data:		▼ <u>N</u> = 75		▼ <u>N</u> = 41		▼ <u>N</u> = 75

Figure 2. Partitioned treatment data collection timeframe with subject response at Measurements 1, 2, and 3.

criteria, they were included in the sample because they were participants in an adult smoking cessation program, and would possess many of the same characteristics.

Subjects were encouraged to remain in the study whether or not they were successful with smoking cessation, or had completed every session of the program. The purpose of the study was to evaluate predictors of adherence; and not to evaluate effectiveness of the smoking cessation treatment.

The sampling technique used in this study was "purposive" sampling (Kerlinger, 1986). Purposive sampling is characterized by "the use of judgment and a deliberate effort to obtain representative samples by including presumably typical areas or groups in the sample" (Kerlinger, p. 120). Three listings were used to locate smoking cessation programs: 1) The National Center for Health Promotion's listing of Texan hospitals which offer a specific commercially prepared smoking cessation program, 2) The American Cancer Society's listing of Dallas Area Tobacco Cessation Programs, and 3) the Directory of Smoking Resources and Contacts in Texas prepared by the Office of Smoking and Health, Texas Department of Health (1992).

Protection of Human Subjects

Permission to conduct this research study and protect the rights of human subjects involved was obtained from the

Human Subjects Review Committee at Texas Woman's University (see Appendix C). The following actions were observed for protection of human subjects.

Agency Consent

Eighteen agencies (out of 48 contacted between May 1993 and May 1994) were mailed the Explanation of Study, Subject Consent Form, Instruments, and three Agency Consent forms (see Appendices G,H,I, and F). Seven agencies who participated in the study signed the agency consent form. The agency, the researcher, and the TWU Human Subjects Review Committee each maintained a copy.

In addition, one hospital requested the researcher to follow hospital protocol for research studies and submit to their review board: an abstract, subject consent form, and detailed description of the research study. The researcher was then notified of agency consent.

Explanation of Study

A written and verbal explanation of the study was presented to subjects during their orientation session. The "Explanation of Study" identified the researcher, purpose of the research, and potential benefits gained from the study for healthworkers and smokers (see Appendix G). The time frame and documentation required from subjects was delineated. The absence of risks, except for possible

emotional reactions to the questionnaires, was stated. Voluntary participation was emphasized, and subjects were informed that they could withdraw from the study at any time without detriment to the effect of their program.

Confidentiality was clearly described: subjects' responses were coded and information would not be given to any other agency or person. Results of the study would be reported anonymously; only grouped responses would be used. Names, addresses, and phone numbers were secured separately from the questionnaires. Data was filed and will be destroyed at the end of five years. Subjects were informed that the results of this study would be shared with them (debriefing). The researcher's phone number and address was given to subjects for contact, if needed. The phone number for the Texas Woman's University Office of Research and Grants Administration was given to subjects in the event they had any concerns regarding the manner in which the research was conducted.

Subject Consent

Each subject was asked to sign two copies of the consent form to participate in the study. The consent form clearly describes each area of content discussed in the letter of explanation, with emphasis upon voluntary participation and confidentiality (see Appendix H). Both

subject and researcher kept a signed copy. The consent form was co-signed by a witness other than the researcher. The researcher's copies of subject consents were subsequently filed with the TWU Office of Research and Grants Administration.

Instruments

Instruments used in this study included the demographic data form, questionnaires for self-efficacy, self-esteem, and perspective transformation, and the progress report. These three sets of instruments were used to measure subject response.

The Demographic Data Form

The demographic data form (Appendix I) asked for information related to age, gender, ethnicity, marital status, employment, income level, educational level, living environment, smoking status, smoking history, and use/non-use of nicotine therapy. The demographics comprise important variables for the study and are described as follows.

Age. Studies have indicated that the young (adolescents and early 20's) are not as successful in giving up smoking as middle-aged and older adults (JAMA, 1991a). Therefore, age was investigated in this study to determine

if age groups differ in adherence to smoking cessation.

Gender. Even though more men smoke than women, the American Cancer Society states that smoking is declining in a greater proportion among men than women (1991). This study assessed the influence of gender upon smoking cessation.

Ethnicity. In 1988 (JAMA, 1991b) the overall prevalence of smoking was higher among blacks (31.7%) than whites (27.8%), and lowest among persons of other races (23.8%). However, the proportion of whites who stop smoking are higher than blacks (JAMA, 1991b). Ethnicity was addressed in this study as related to smoking cessation adherence.

Marital Status. The prevalence of smoking is significantly higher among separated and divorced persons than among persons in other marital categories (JAMA, 1991b). Influences of marital status were considered in this study.

Employment. Studies have indicated that professional, white collar workers are more successful in giving up smoking than blue collar workers: subject composition of smoking cessation programs tend to have a greater proportion of the former (Stanton et al., 1992). Therefore, employment

was described in this study.

Income Level. As income increases to \$40,000 or more, prevalence of smoking significantly decreases less than persons with lower income levels (American Cancer Society, 1991). Income levels were studied in this research endeavor.

Education Level. People with higher education tend to smoke less than those who have less than a high school education (American Cancer Society, 1991). This factor appears to be correlated with income and job type. The influence of education level to smoking cessation adherence was addressed in this study.

Living Environment. It is important to know if a participant lives in a home where a smoker resides. A smoke-free living environment would appear more supportive and predictive of success than a home with constant reminders of smoking. This researcher was unable to find studies which specifically addressed this variable: therefore, the impact of living with a smoker, a non-smoker, or alone, on smoking cessation success was investigated in this study.

Smoking Status and History. The demographic data form asked for information regarding smoking status: cigarettes

smoked in a 24 hour period, years of smoking, and number of previous efforts to quit. Heavily addicted smokers (designated by high pack/years) have more difficulty quitting than light smokers who have low pack/years (Simon, 1992). These factors were considered in the present study to determine their relationship to smoking cessation adherence.

Use/Non-Use of Nicotine Therapy. It was important to know if the subject used a nicotine patch during the smoking cessation program and process. This information differentiated subjects influenced by the extraneous variable, nicotine therapy.

Smoking cessation adherence. Subjects were asked via the progress reports how many cigarettes they were presently smoking to measure smoking cessation and adherence. Smoking cessation adherence is the goal of all smoking cessation programs. This study described psychological factors of subjects which may be used to predict the success of smoking cessation.

The Self-efficacy Questionnaire

The Self-efficacy questionnaire (Appendix I) is a measure developed by Brod and Hall (1984) and adapted by Stanton et al. (1992). This Self-efficacy questionnaire is

a measure of one's beliefs in his/her ability to succeed in smoking cessation. Reliability measures obtained by Brod and Hall were $\alpha = .73$. The reliability α of Stanton's study was .90 ($N = 31$). Stanton's questionnaire was reviewed by a panel of five community health educators and two smoking-cessation instructors, revised, and then administered to 18 subjects. The instrument was revised again, based on written responses and oral comments.

The instrument consists of 12 positive statements to which the subject circles one of six responses (indicated by a Likert scale of 1 to 6, 1=strongly disagree, 6=strongly agree). Scoring consists of computing the subjects total score, thereby yielding a summative score.

The Self-esteem Questionnaire

The Rosenberg Self-esteem Scale (RSE) (Rosenberg, 1979) is a frequently used instrument (Appendix I). The RSE scale is a measure of global self-esteem. The RSE is a 10-item measure. The items are answered on a four point scale ranging from strongly agree (4) to strongly disagree (1). Five of the items are phrased positively and five are phrased negatively in order to reduce acquiescent responses. Negatively phrased items are reverse scored. Thus, in the present study the five negative items were reverse scored. Although originally scored using the Guttman procedure, the

Likert scoring method is commonly used. Likert scores range between 10-40.

The RSE (originally titled New York State Self-Esteem Scale) has a Coefficient of Reproducibility of 92 percent and a Coefficient of Scalability of 72 percent (Rosenberg, 1979). The New York State adolescent study consisted of 5024 juniors and seniors in ten high schools throughout the state. Sampling occurred initially by stratification of communities by size, from which communities were selected on the basis of their proportion of the total population. High schools were selected from the communities on a random basis. The sample consisted of juniors and seniors present on the day of questionnaire administration. This questionnaire also has been used with adults in numerous studies (i.e., Williams, 1986).

The Perspective Transformation Questionnaire

The Adapted, Revised Marsh Revelation Scale (Van Nostrand, 1992) is a measure of perspective transformation indicated by the sub-scales of knowledge, power, and mystical experience (Appendix I). Van Nostrand reports a standardized reliability Cronbach alpha coefficient of .96 for the overall 62 items. The standardized alphas for the subscales were: Knowledge = .91, Mystical experience = .87, Power = .89 and Redefined perspective = .78. In Van

Nostrand's retrospective study of 159 smokers and ex-smokers, there was no statistical significant difference between the scores of the two groups ($p \geq .01$). This result indicates limited construct validity for the instrument.

The Adapted Marsh Revelation Scale is lengthy, consisting of 62 items, and is answered with a 1-5 point Likert scale (1=strongly disagree, 5=strongly agree). Statements are both positive and negative, therefore reverse scoring is necessary on negative items; thus, the nine negative items were reverse scored in the present study.

The adapted MRS was selected for the present study because it is the only known instrument to measure perspective transformation in smokers. This researcher felt that it's construct validity might be supported by investigating it's relationship to self-efficacy and self-esteem.

Progress Report

The progress report (Appendix I) was used to ascertain if subjects had achieved initial smoking cessation at the end of the program, and if they had remained adherent to smoking cessation at three months. If subjects reported smoking, they were asked to identify the number of cigarettes smoked over the past two weeks. Smoking subjects were then asked to indicate whether this smoking was a

temporary "slip" or a return to the smoking habit. Use of nicotine therapy was also documented at this time.

Data Collection

Inclusive of the three month pilot study, total data collection for the present study occurred over a fifteen month period beginning May 3, 1993 and concluding August 5, 1994. Data was collected from individual subjects at three points over a three month period (refer to previous Figure 2). Smoking cessation programs were staggered throughout the data collection period.

The researcher was present at the orientation, or beginning, session of each smoking cessation program. Participants were invited to become research subjects and were given a packet of information which included:

- 1) A letter of explanation of the study
- 2) Two consent forms
- 3) A sheet requesting name, phone, and address
- 4) The Demographic data form
- 5) The Self-efficacy instrument
- 6) The Self-esteem instrument

Subjects completed the instruments at the end of this session on the premises, except for two programs which requested the subjects take them home and mail them to the researcher. Following the conclusion of the program,

subjects were mailed: 1) the Progress Report, 2) The Perspective Transformation instrument, and 3) a return addressed stamped envelope. At the end of three months from the beginning of the program, each subject was interviewed by phone regarding their smoking cessation status using the Progress Report.

A follow-up postcard was mailed to subjects who did not return the Progress Report and Perspective Transformation Questionnaire after two weeks. The researcher then called the subject two weeks later if a response had not been received, and mailed a second questionnaire if necessary.

Pilot Study

A pilot study was completed using participants from Program One. HSRC approval was obtained from Texas Women's University.

There were a total of four subjects (out of the original six who attended the program) who completed all three questionnaires of the study. Results from the first four subjects at the end of the program revealed that two subjects were smoke-free, one had "slipped" (defined as smoking intermittently, yet maintaining the desire to give up smoking, and still performing behaviors to do so), and one had continued smoking. At the end of three months, only one subject was adherent to smoking cessation, two had

decided to quit trying to give up smoking, and one stated he would try again. The psychological scores for the non-smokers at the end of the program were higher than for the one subject relapsing to smoking, indicating some support of the hypotheses of this study.

The researcher gained important information from the pilot study and subsequently made modifications for the present study. During the pilot study, subjects completed all three questionnaires at the beginning and end of program, and at the end of three months to provide data for trend analysis. However, due to repetition of test measurement and difficulty obtaining the three sets of questionnaires back from the subjects, the researcher decided to omit trend analysis and use only one measurement of each psychological variable in the present study.

The number of available subjects, mortality rate, and percentage of subjects using nicotine therapy during the pilot study assisted the researcher to realize that a variety of locations and programs was needed to ensure an adequate sample size for this study.

Treatment of Data

The following section describes reliability testing, exploratory data analysis, and treatment of demographic data. Inferential statistics used to address the five

hypotheses of the study are discussed with rationale.

Reliability Testing

Coefficient alphas were computed for each of the three study instruments in order to determine internal consistency. As a measure of reliability, the coefficient alpha is based on both the average correlation among items (the internal consistency) and the number of items (Nunnally, 1978). Nunnally states that coefficient alpha provides a good estimate of reliability in most situations. Whereas .70 reflects an acceptable level of reliability, alpha coefficients of .80-.90 indicate strong reliability. A higher number of items usually increases reliability.

Exploratory Data Analysis

Exploratory Data Analysis was used to observe the data for distribution, homogeneity, skewness, and outliers. Analysis of residuals, frequency histograms, scatterplots, and a matrix of correlation coefficients (Pearson r) were computed as appropriate to observe patterns in the data and relationships between the variables.

Demographic Data

The sample is described according to gender, age, marital status, ethnicity, educational level, income, employment, smoking history, and living environment. The

narrative account of the sample summarizes frequencies for each demographic, including numerical and percentage findings. Range and measures of central tendency are included as applicable.

Greater detail is accorded the descriptive data through use of summary tables. Demographics were summarized according to measurement level presenting frequencies, percentages, mean, median, mode, and range when applicable.

Descriptive Findings

Use of the nicotine patch and smoking cessation adherence results are summarized by numerical frequency and percentage. Self-efficacy, self-esteem, and perspective transformation scores are described using frequencies and percentage, measures of central tendency including standard deviation, and range of scores. A table accompanies the narrative account of the instrument frequencies.

Following the presentation of descriptive findings, each hypothesis is addressed. Inferential statistics were used in testing the five hypotheses of the study.

Data Analysis of Hypothesis One

The first hypothesis was tested using discriminant function analysis. Hypothesis #1 reads: Smoking cessation adherence in adults who have attended a smoking cessation

program is predicted by their self-efficacy and self-esteem measured at the beginning of the program, and their perspective transformation measured at the end of their program.

Discriminant function analysis is a test used to predict group membership from a set of predictors measured by interval level data. The independent variables (self-efficacy, self-esteem, and perspective transformation) were used to predict membership in either the smoking group, or the adherent non-smoking group.

Assumptions were met for use of discriminant function analysis. The sample size of the smallest group exceeded the number of variables. Regarding the assumptions of multivariate normality, "no tests are currently feasible for testing the normality of all linear combinations of sampling distributions of means of predictors" (Tabachnick and Fidell, 1989, p. 511). Scatterplots of the variables displayed that homogeneity and linearity assumptions were met.

The use of t-tests were employed to identify whether subjects who were adherent to smoking cessation were different from subjects who were smoking in regard to their self-efficacy, self-esteem, and perspective transformation scores. Assumptions for this test were met: 1) the data was interval level, 2) each subject contributed independent

scores, and 3) the distribution of scores was normal.

Data Analysis of Hypothesis Two

The second hypothesis was tested using standard multiple regression. Hypothesis #2 reads: Perspective transformation in adults who have attended a smoking cessation program is predicted by their self-efficacy and self-esteem.

Standard multiple regression (Tabachnick & Fidel, 1989) allows one to assess the relationship between one DV (perspective transformation) and several IV's (self-efficacy and self-esteem). Regression is used when the intent of the analysis is prediction. The assumptions of multiple regression were met. The data was at the interval level. The cases-to-IVs ratio was substantial (a base requirement is to have at least five times more cases than independent variables). Assumptions of normality, linearity, homoscedasticity and independence were met. Visual analysis of the histograms, plots, and scatterplots of residuals indicated that distributions were acceptable, although not perfect. Data was squared and taken to Log10 to investigate whether transformation would improve the distributions.

In standard multiple regression, all IV's enter into the regression equation at once; each is assessed as if it had entered the regression after all other IV's had entered.

Each IV is evaluated in terms of what it adds to the prediction of the DV that is different from the predictability afforded by all the other IV's. In hierarchical multiple regression, the researcher assigns priority for entry of variables into equations. Both methods were employed in this study.

Data Analysis of Hypothesis Three

The third hypothesis was tested using the Chi-Square Test. Hypothesis #3 reads: Smoking cessation adherence is predicted by use of nicotine therapy in adults who have attended a smoking cessation program.

The Chi-Square Test (Two Dimensional Table) was used to show relationship between the IV and DV which are both at the nominal level of measurement. The smoking and adherent non-smoking groups (the dependent variable) were grouped in two categories, with the opposite groups categorized as nicotine patch users or non-nicotine patch users (the independent variable).

All assumptions for the Chi-Square test were met except for random selection of the sample. Frequency data was used with an adequate sample size (at least five subjects in each cell). The measures were independent of each other, and there was a theoretical basis for the categorization of the variables (Munro & Page, 1993).

Data Analysis of Hypotheses Four and Five

Logistic regression was used in testing the fourth and fifth hypotheses. Hypothesis #4 reads: Smoking cessation adherence is predicted by gender, age, ethnicity, marital status, educational level, income level, and employment in adults who have attended a smoking cessation program.

Hypothesis #5 reads: Smoking cessation adherence in adults who have attended a smoking cessation program is predicted by their living situation and their history of smoking.

Logistic regression allows the use of independent variables that are both dichotomous and continuous when predicting a dichotomous dependent variable (Tabachnick & Fidell, 1989). Norusis, as quoted by Munro and Page (1993, p. 233) states "Logistic regression requires far fewer assumptions than discriminant analysis, and even when the assumptions required for discriminant analysis are satisfied, logistic regression still performs well".

Additional Analysis of Data

Chi-Square tests and frequencies were performed on the smoking cessation programs to detect whether significant differences existed among groups in smoking cessation outcome. However, the Chi-Square assumption of adequate size was violated as most cells did not show an expected frequency of five subjects.

Due to the high number of women subjects in the study, additional analysis was conducted to evaluate the effect of gender upon success in smoking cessation adherence. Frequencies on age and smoking outcome were computed; t-tests were conducted using the variables of self-esteem, self-efficacy, perspective transformation, years smoked, packs smoked, and previous quit attempts.

The number of subjects was a concern to the researcher. Post priori power analysis was computed regarding the sample size. A moderate effect size was expected (0.5), using a probability level of .05, and a power of .80 was desired. According to Cohen (1987), for a two-tailed t-test of the above specifications, 64 subjects would be required in each group for a total sample of 128. A power of .57 was attained when using the total 75 subjects; power decreased to .33 when using the sub-sample of 41 subjects.

Summary

This chapter presented the longitudinal research design with treatment partitioning used in studying predictors of success in smoking cessation adherence. The settings, comprised of smoking cessation programs, were individually described. Discussion of the population, sample, and sampling technique followed. Measures taken to protect the rights of human subjects were delineated. The variables of

the study and the instruments used to measure them were explored in light of validity and reliability. The data collection method was recounted in detail. Treatment of demographic data was presented. Rationale and assumptions for inferential statistics used in addressing the five research hypotheses were discussed. Analyses of additional study findings concluded the chapter.

CHAPTER IV

ANALYSIS OF DATA

This chapter describes the sample, states reliabilities of the instruments, and discusses findings from exploratory data analysis. Statistics used in testing the five research hypotheses are analyzed and other study findings are presented. A summary of all findings concludes the chapter.

Description of Sample

The sample consisted of seventy-five subjects. Sixty-seven percent of the subjects (51) were female, and thirty-three percent (24) were male. The mean and median age was 42. Seventy of the subjects were White/Caucasian, four were Black/Afro-American, and one was Hispanic. The majority of subjects were either married (60%) or single (20%). Table 1 presents the demographic frequencies of gender, age, ethnicity, and marital status.

Thirty of the subjects had not attended college, 30 had some college education but no degree, and fourteen had completed a degree. Seventy-five percent of the subjects (56) were employed and twenty-four percent (18) were either retired or unemployed. Tables 2 and 3 present type of employment, education, income, living environment, and smoking data frequencies.

Table 1

Frequencies of Gender, Age, Ethnicity, and Marital Status

Variable Category	Frequency	Valid %	Central Tendency	Range
<u>Gender</u>				
Female	51	68.0	Mode: Female	
Male	24	32.0		
Total	75	100.0		
<u>Age</u>				
20 years or less	4	5.3		16-68 Years
21-25 years	8	10.7		
26-30 years	3	4.0		
31-35 years	9	11.9	Mean:	
36-40 years	10	13.3	42 yrs.	
41-45 years	11	14.7		
46-50 years	7	9.3	Median:	
51-55 years	12	12.0	42 yrs.	
56-60 years	5	6.9		
61-65 years	2	2.6	Mode:	
66-70 years	4	5.3	55 yrs.	
Total	75	100.0		
<u>Ethnicity</u>				
Caucasian	70	93.3	Mode: Caucasian	
Afro-American	4	5.3		
Hispanic	1	1.3		
Total	75	100.0		
<u>Marital Status</u>				
Single	15	20.0	Mode: Married	
Married	45	60.0		
Divorced	9	12.0		
Partner	1	1.3		
Separated	3	4.0		
Widowed	2	2.7		
Total	75	100.0		

Note: Measures of central tendency and range are based on raw data.

Table 2

Frequencies of Education, Employment Status, Type of
Employment, Income, and Living Environment

Variable Category	Frequency	Valid %	Central Tendency
<u>Education</u>			
Less than High School	8	10.8	Mode: College, no degree
High School Diploma	11	14.9	
Training	11	14.9	
College, no degree	30	40.5	Median: College, no degree
College degree	11	14.9	
Graduate School	3	4.1	
Total	74	100.0	
<u>Employed</u>			
Yes	56	74.7	Mode: Employed
No	19	25.3	
Total	75	100.0	
<u>Job Type</u>			
Profession/Managerial	15	20.3	Mode: Service/ Manual Work
Clerical/Technical	19	25.7	
Service/Manual Work	22	29.7	
Retired/Non-employed	18	24.3	
Total	74	100.0	
<u>Income</u>			
Less than \$10,000	5	7.4	Mode: \$40,001 or more
\$10,001-\$20,000	11	16.2	
\$20,001-\$30,000	16	23.5	
\$30,001-\$40,000	5	7.4	Median: \$30,001- \$40,000
\$40,001 or more	31	45.6	
Total	68	100.0	
<u>Living Environment</u>			
Live with Smoker	36	48.0	Mode: Live with a Smoker
Live with Non-Smoker	28	37.3	
Live alone	11	14.7	
Total	75	100.0	

Table 3

Frequencies of Relationship to Persons Lived With, Years
of Smoking, Packs Smoked, and Prior Quit Attempts

Variable Category	Frequency	Valid %	Central Tendency	Range
<u>Relationship</u>				
Spouse	46	61.3	Mode: Live with Spouse	
Significant Other	6	8.0		
Other	12	16.0		
Self	11	14.7		
Total	75	100.0		
<u>Years Smoked</u>				
1-5 years	6	7.9		3-51 yrs.
6-10 years	12	15.9		
11-15 years	8	10.6	Mean:	
16-20 years	15	20.0	22 yrs.	
21-25 years	8	10.5		
26-30 years	11	14.6	Median:	
31-35 years	3	4.0	20 yrs.	
36-40 years	5	6.6		
41-45 years	3	4.0	Mode:	
46-50 years	3	3.9	20 yrs.	
51-55 years	1	1.3		
Total	75	100.0		
<u>Packs Smoked</u>				
Less than one pack	10	13.3	Median:	
One pack	35	46.7	One pack	
One and a half pack	17	22.7		
Two packs	10	13.3	Mode:	
Two and a half packs	3	4.0	One pack	
Total	75	100.0		
<u>Prior Quit Attempts</u>				
Zero	7	9.5		0-35 Attempts
One	16	21.6		
Two	12	16.2	Bi-Mode:	
Three	10	13.5	1 and 4	
Four	16	21.6	attempts	
Five	4	5.4		
Six or more	10	12.4	Median:	
Total	74	100.0	3 attempts	

Note: Central tendencies and range are based on raw data.

Type of employment for subjects was evenly distributed. Job status was categorized as: Professional/Managerial (20%), Clerical/Technical (26%), Service/Manual (30%) and Retired/Unemployed (24%).

Forty-six percent of the subjects had an income of \$40,000 or more, while seven percent of the subjects had incomes of less than \$10,000. The median income was between \$30,000 and \$40,000.

In regard to living situation, 48% of the subjects lived with a smoker, 37% lived with a non-smoker, and 15% lived alone. Subjects most frequently reported the relationship of the person they lived with as spouse (46%), or other (12%). The average years smoked was twenty-two, with a range of three years to fifty-one years of smoking. Approximately half of the subjects smoked one pack of cigarettes per day (47%). Forty percent smoked more than a pack a day, and 13% smoked less than a pack a day. The majority of subjects (83%) had tried to quit smoking one to four times previously.

Reliability Analysis

As a measure of reliability, coefficient alphas were computed for each of the three instruments. Measures for the present study are compared with reliabilities found in other studies as presented in Table 4.

Table 4

Coefficient Alpha Values of Instruments

<u>Rosenberg Self-Esteem Scale</u>	<u>Alpha</u>	<u>Sample Size (N)</u>
Present Study	.85	75
Murphy & Price (1988)	.81	1,513
Rosenberg (1979)	.92	5,024
<u>Brod & Hall's Adapted Self-Efficacy Scale</u>		
Present Study	.84	75
Stanton et al. (1992)	.90	31
<u>Adapted Marsh Revelation Scale</u>		
Present Study	.97	41
Van Nostrand (1992)	.96	159

The coefficient alpha obtained for the Rosenberg Self-Esteem Scale used in this study was .85 ($N = 75$). As the shortest test (10 items), this indicated positive reliability. Reliability analysis of this scale by Murphy and Price (1988) resulted in a coefficient alpha of .81 when used with 1,513 highschool students.

Using data from this study ($N = 75$), a coefficient alpha of .84 was obtained for Brod and Hall's Self-Efficacy Scale as adapted by Stanton. This 12 item scale when used in Stanton et al.'s study (1992) produced a coefficient alpha of .90 ($N = 31$) when used with participants of a smoking cessation program.

The Adapted Marsh Revelation Scale (Van Nostrand, 1992)

consisted of 62 items, thus, a higher coefficient alpha was expected. The coefficient alpha finding of the present study was .97 ($N = 41$). Van Nostrand reported a .96 alpha when it was used with 159 smokers and ex-smokers.

As a measure of reliability, the coefficient alpha is based upon the average correlation among items and the number of items in the instrument. All three instruments demonstrated strong levels of reliability.

Exploratory Data Analysis

Exploratory data analysis was conducted prior to conducting the statistical tests in order to examine the data for relationships and distributions. Correlation coefficients with all variables, scatterplots of the psychological variables, and residual analysis of the psychological variables, were conducted.

Correlation Matrix

Tables 5 and 6 present the findings of the Pearson Product Correlation Coefficient Matrix. Strong correlation coefficients ($p = <.01$, 2-tailed) were found between: Years Smoked with Age (.85), Smoking History with Age (.64), Years Smoked with Smoking History (.83), and Smoking History with Packs Smoked (.75). Thus, age, years of smoking, packs smoked and history of smoking were significantly correlated.

Table 5

Pearson Product Correlation Matrix of All Variables and Gender, Age, Ethnicity, Marital Status, Education, Employment, Income, Living Situation and Relationship

Variable	Gender	Age	Ethnic	MarStat	Ed	Employ	Income	LivWth	Relate
Gender	1.00								
Age	.25**	1.00**							
Ethnic	-.17	-.21	1.00						
MarStat	-.09	.26*	.08	1.00					
Education	.04	.18	.07	.15	1.00				
Employment	.06	.13	-.05	.08	-.20	1.00			
Income	.11	.12	-.32**	-.18	.11	-.16	1.00		
Live With	.04	.19	-.06	.18	.19	.06	-.09	1.00	
Relationship	.00	-.19	.06	-.07	-.17	.04	-.50**	.03	1.00
Yrs Smoked	.38**	.85**	-.14	.24*	.08	.12	.04	.09	-.16
Packs Smoked	.40**	.24*	-.16	-.02	-.20	-.06	.30*	-.15	-.12
Quits	.31**	.19	.03	.03	.00	.18	-.11	.17	-.05
Smoking	.00	.25*	.00	-.04	.01	.10	.07	-.02	-.25*
Patch	-.15	.04	-.14	.13	-.09	.10	.10	.11	.01
Program	-.03	-.04	.27*	-.08	-.20	.14	-.28*	-.04	.11
JobType	.10	.10	-.05	-.02	-.42	.72	-.25	-.19	.07
SmHistory	.41**	.65**	-.17	.10	-.07	.03	.18	-.08	-.14
Efficacy	-.11	.18	-.12	.08	.08	.14	.03	.01	.03
Esteem	.19	.10	-.14	.08	.16	.04	.12	.13	-.19
P. Trans	-.13	-.16	-.09	-.21	-.15	.07	-.27	-.05	.23

Note: * $p < .05$, ** $p < .01$ (2-tailed)

Table 6

Pearson Product Correlation Matrix of Years Smoked, Packs, Quits, Smoking, Patch, Program, Job Type, Smoking History, Efficacy, Esteem, and P. Transformation

Variable	Yrs.Sm.	Packs	Quits	Smoking	Patch	Program
Yrs Sm.	1.00					
Packs	.36**	1.00				
Quits	.29	.14	1.00			
Smoking	.08	-.05	-.10	1.00		
Patch	.01	-.02	.00	.05	1.00	
Program	.06	.06	.10	-.02	-.34**	1.00
JobType	.15	.11	.02	.06	.06	.09
SmHx	.83**	.74**	.21	.00	.02	.05
Efficacy	.04	-.23*	-.15	.24*	-.20	-.04
Esteem	-.02	.01	.08	.36**	-.07	.00
P. Trans	-.13	-.14	.13	-.05	-.14	.15

Variable	JobType	SmHx	Efficacy	Estm	Trans
JobType	1.00				
SmHx	.18	1.00			
Efficacy	-.01	-.09	1.00		
Esteem	-.05	-.05	.28*	1.00	
P. Trans	.04	-.18	.34*	.03	1.00

Note: *p < .05, ** p < .01 (2 tailed)

Gender was weakly correlated ($p < .01$) with age (.25), number of packs smoked (.40), years smoked (.38), and number of previous quit attempts (.30). These correlations were further investigated through analysis of gender frequencies and use of t-tests as other findings of the study.

Significant, but weak, relationships were noted among the psychological variables. The correlation coefficient of Self-Efficacy to Perspective Transformation was .34 ($p < .05$, 2-tailed). A .36 correlation coefficient was found between Self-Esteem and Smoking, and a .28 correlation existed between Self-Esteem and Self-Efficacy ($p = < .01$, 2-tailed). A negative correlation was found between self-efficacy and the number of packs smoked (-.23).

Several other weak correlation coefficients existed between the variables as indicated in Tables 5 and 6. Income was negatively correlated with ethnicity (.32), and relationship (living with spouse, other, or alone) (.50), and to program (.28). Income was positively related to the number of packs smoked (.30).

Analysis of the correlation matrix reveals that variables are not highly correlated. Therefore, multicollinearity and singularity are not problems. With multicollinearity, the variables would be very highly correlated (.90 and above); and with singularity, the variables are perfectly correlated (Tabachnick & Fidell,

1989). Smoking history was computed by multiplying the years of smoking by the number of packs smoked daily: therefore, one of the variables is a combination of two other variables. This computation was done to accommodate the testing of Hypothesis Five.

Scatterplots

Scatterplots were computed by using the raw scores of the psychological variables. The purpose of computing scatterplots was to analyze the data for linearity and homoscedasticity; these are assumptions of some multivariate procedures and most statistical tests. The third assumption, normality, was achieved by viewing the raw score frequency distributions of the data for signs of normal distribution or skewness.

The assumption of homoscedasticity states that the variability in scores for one variable is roughly the same at all values of the other variable (Tabachnick & Fidell, 1989). See Appendix J [Figures 5, 6, and 7] for computer printouts of self-efficacy, self-esteem, and perspective transformation scatterplots. Analysis of these bivariate scatterplots reveal that Self-Efficacy and Self-Esteem display the strongest homoscedasticity. Less homoscedasticity is noted between Self-Efficacy and Perspective Transformation. The least homoscedasticity is

noted between Self-Esteem and Perspective Transformation.

The assumption of linearity states that there is a straight line relationship between two variables; linearity is fundamental to multivariate statistics because the solutions are based on the general linear model (Tabachnick & Fidell, 1989). The three scatterplots of self-esteem, self-efficacy, and perspective transformation do not reveal a strong straight line relationship. Further examination of the assumptions of normality, homoscedasticity, and linearity was continued through use of residual analysis.

Residual Analysis

Residuals are the difference between actual scores and the predicted scores. If data fits a predicted model perfectly there are no residuals; raw scores will be identical to the predicted scores. The model of this study projected that self-efficacy and self-esteem scores would predict perspective transformation scores. The casewise plot of standardized residuals shown in Appendix J [Figures 8 and 9] illustrate that a large number of residuals exist regarding the prediction of perspective transformation by self-efficacy and self-esteem. However, as shown in Figure 10 of Appendix J, the ten residual scores with greatest deviation from the mean were not outliers (scores extending beyond three standard deviations from the mean).

A histogram of the standardized residuals (Figure 10 of Appendix J) reveals that the assumption of normal distribution was met. The assumption of linearity was examined through the plot of residuals as illustrated in Figure 11 of Appendix J. The plot of linear relationship illustrates that there are deviations from the line of prediction. A scatterplot of the residuals (Figure 12 in Appendix J) reveals an upward scattering of residuals for self-efficacy and perspective transformation; and a downward scattering of residuals for self-esteem and perspective transformation. If the assumption of homoscedasticity is met, a rectangular band of the scores would be evident.

Although there were no outliers, the data was transformed by squaring it and taking it to Log 10 to see if such transformations would improve the normality of the distribution. Figures 13-18 in Appendix J present the results. A slight improvement was achieved by squaring the scores of self-esteem. Actual scores of self-efficacy were negatively skewed, but neither of the transformations improved the distribution. Therefore, data transformation was not used in this study.

Findings

Descriptive outcomes of the study based on frequencies revealed that thirty-three percent of the subjects (25) were

reported as non-smoking at the end of three months, and sixty-six percent of the subjects (50) were smoking. Fifty-six percent of the subjects (42) had used the nicotine patch during their smoking cessation effort, while forty-four percent of the subjects (33) did not.

Table 7 presents descriptive findings of the self-efficacy, self-esteem and perspective transformation scores.

Table 7

Descriptive Statistics of Psychological Variables

Variable	Mean	S.D.	Range	df	Highest Score Possible
Efficacy	60	8.85	25-71	74	72
Esteem	31	4.84	20-40	74	40
P. Trans.	193	42.95	88-268	40	310

Subjects scored most highly on self-efficacy, second highest on self-esteem, and lowest on perspective transformation. The greatest amount of variance (42.95) was noted for perspective transformation; self-esteem had the least amount of variance (4.84), and a variance of 8.85 was noted for self-efficacy. Thus, the self-esteem scores were most closely clustered around the mean, representing less error. There were 75 subjects measured for self-efficacy and self-esteem (total sample), and 41 subjects (sub-sample) measured for perspective transformation.

Prediction of Adherence by Self-Efficacy, Self-Esteem, and Perspective Transformation: Hypothesis One

The first hypothesis was "Smoking cessation adherence in adults who have attended a smoking cessation program is predicted by their self-efficacy and self-esteem measured at the beginning of the program, and their perspective transformation measured at the end of the program". The first hypothesis was rejected. Discriminant function analysis was used to investigate if the psychological variables predicted group membership. Table 8 illustrates the results of classification using self-efficacy and self-esteem as predictors of smoking cessation adherence.

Table 8

Actual and Predicted Group Membership for Smoking Status using Self-Efficacy and Self-Esteem

<u>Actual Group</u>	<u>Number of Cases</u>	<u>Predicted Group Membership</u>	
		1	2
Group 1 Smoking	50	44 88.0%	6 12.0%
Group 2 Non-Smoking	25	13 52.0%	12 48.0%

The percent of "grouped" cases correctly classified was 75%, using self-efficacy and self-esteem to predict smoking cessation adherence at the end of three months ($N = 75$), ($p = .0025$). Group 1 consisted of 50 subjects who were smoking, and Group 2 consisted of 25 subjects not smoking.

Self-esteem and self-efficacy were significant predictors of subjects who would be smoking or non-smoking. All 75 subjects were included for analysis of these two predictors.

When perspective transformation was added as a possible predictor of smoking cessation adherence, the percent of correct prediction decreased and was non-significant. The classification results are illustrated in Table 9.

Table 9

Actual & Predicted Group Membership for Smoking Status using Perspective Transformation, Self-Efficacy & Self-Esteem

Actual Group	Number of Cases	Predicted Group Membership	
		1	2
Group 1	24	18	6
Smoking		75.0%	25.0%
Group 2	17	10	7
Non-Smoking		58.8%	41.2%

The percent of "grouped" cases correctly classified using perspective transformation, self-efficacy, and self-esteem was 61% ($p = .2969$). Perspective transformation, coupled with self-efficacy and self-esteem, is nonsignificant as a predictor of smoking cessation adherence. The sub-sample ($N = 41$) used in this analysis consisted of the forty-one subjects who returned the perspective transformation questionnaire.

Based on findings of discriminant function analysis the first hypothesis was rejected. Although the level of

significance was $p = .0025$ for the total sample ($N = 75$) using self-efficacy and self-esteem as predictors of adherence to smoking cessation, the level of significance decreased to $p = .2969$ when perspective transformation was added as a predictor of smoking outcome ($N = 41$).

Mean Scores. Mean scores of the total sample ($N = 75$) illustrate that the non-smokers ($n_2 = 25$) have higher mean scores on self-efficacy and self-esteem than the smokers ($n_1 = 50$) as shown in Table 10.

Table 10

Self-Efficacy & Self-Esteem Mean Scores of Groups

Group	Self-Efficacy	Self-Esteem
Smokers	58.5	30.2
Non-Smokers	62.9	33.9
Total	59.9	31.5

As indicated in the above table, the means of the non-smokers were higher than the means of the smokers in self-efficacy and self-esteem when using the total sample ($N = 75$). The non-smokers had a higher self-efficacy mean (rounded) of six points more than the smokers. In regard to self-esteem, the non-smokers had a mean (rounded) of four points greater than the smokers.

Table 11 illustrates the difference in means for the sub-sample ($N = 41$) for all three psychological variables.

Table 11

Perspective Transformation, Self-Efficacy, and Self-Esteem
Mean Scores for Groups

Group	P. Trans.	Efficacy	Esteem
Smokers	195.3	60.3	30.8
Non-Smokers	190.8	62.5	33.7
Total	193.5	61.2	32.0

The sub-sample consisted of the 41 subjects who completed the perspective transformation questionnaire. The self-efficacy and self-esteem mean scores for the sub-sample ($N = 41$) remained higher for the non-smokers (17 subjects) than for the smokers (24 subjects). However, the mean score for perspective transformation was reversed; the smokers (17 subjects) had a higher perspective transformation mean than the non-smokers (24 subjects). The perspective transformation mean for smokers was 4.5 points higher than for the non-smokers. The self-esteem and self-efficacy means remained higher for the non-smokers than for the smokers; however, the self-efficacy mean (60.3) for the smokers was higher in the sub-sample ($N = 41$) than in the total sample (58.5) ($N = 75$).

Variance. Findings of the total sample ($N = 75$) indicated that smokers ($n_1 = 50$) had more variance in their self-efficacy scores than non-smokers ($n_2 = 25$). The

variance in self-esteem scores for smokers and non-smokers was similar as presented in Table 12.

Table 12

Group Standard Deviations of Self-Efficacy and Self-Esteem

Group	Self-Efficacy	Self-Esteem
Smokers	9.2	4.6
Non-Smokers	7.3	4.4
Total	8.8	4.8

The sub-sample was also analyzed for variance regarding perspective transformation, self-efficacy, and self-esteem. These results are illustrated in Table 13.

Table 13

Group Standard Deviations of Perspective Transformation, Self-Efficacy, and Self-Esteem

Group	Pers. Trans.	Self-Efficacy	Self-Estimate
Smokers	46.5	6.2	4.8
Non-Smokers	38.7	8.3	4.6
Total	42.9	7.1	4.9

Results of variance in self-efficacy and perspective transformation of the sub-sample ($N = 41$) was higher for non-smokers ($n_2 = 17$) than smokers ($n_1 = 24$). There was a .2 difference noted in the self-esteem variance, which was higher for the smokers.

Findings of t-test. Analysis of differences between the smokers and non-smokers was continued with a t-test. Table 14 illustrates the findings of the t-test.

Table 14

t-Test Results of Smokers and Non-Smokers

Variable	Number of Cases		Mean	Std. Dev.	Std. Error
Efficacy	Smokers	50	58.4	9.2	1.3
	Non-Smokers	25	62.9	7.2	1.5
Esteem	Smokers	50	30.2	4.6	.7
	Non-Smokers	25	33.9	4.4	.9
P. Trans	Smokers	24	195.2	46.5	9.4
	Non-Smokers	17	190.9	38.7	9.4

	F Value	2-tail Prob.	t value	df	2-tail Prob.
Efficacy	1.62	.20	-2.13	73	.037*
Esteem	1.08	.85	-3.33	73	.001**
P. Trans.	1.44	.45	.32	39	.751

* significance at .05

** significance at .001

Results of the t-test indicate that perspective transformation scores were not significantly different for the smokers and non-smokers ($N = 75$) ($p = .751$). Self-efficacy ($p = .037$) and self-esteem (.001) scores were significantly different between the smoking and non-smoking groups ($N = 75$).

Hypothesis one was rejected. Although self-efficacy and self-esteem predict smoking cessation adherence by 75% ($p = .0025$) ($N = 75$), the addition of perspective transformation negates significance ($p = .2969$) ($N = 41$).

The findings of the t-test ($N = 75$) indicate a significant difference between subjects based on self-esteem ($p = .001$) and self-efficacy ($p = .037$) scores, but no significant difference between smokers and non-smokers based on their perspective transformation scores ($N = 41$) ($p = .751$).

Prediction of Perspective Transformation by Self-Efficacy and Self-Esteem: Hypothesis Two

Hypothesis Two was "Perspective transformation in adults who have attended a smoking cessation program will be predicted by their self-efficacy and self-esteem".

Hypothesis Two was rejected. The second hypothesis was tested using multiple regression ($N = 41$) with self-efficacy and self-esteem as the predictor variables, and perspective transformation as the criterion variable. Table 15 presents the findings of stepwise multiple regression.

Table 15

Stepwise Multiple Regression Analysis of Self-Efficacy and Perspective Transformation

Variable	B	Beta	t
Self-Efficacy $R^2 = .11$, $F = 5.029$	2.022	.3380	.0307*

* $p = .100$

Using the stepwise method ($PIN = .1000$, $POUT = .1100$), self-efficacy entered the equation. The R^2 indicates that 11% of the variance in perspective transformation can be

explained by self-efficacy.

When using the enter method, (PIN = .1000, POUT = .1100) self-efficacy again was the only variable to enter the equation. The R^2 increased to .13, indicating that 13% of the variance in perspective transformation can be explained by self-efficacy. When PIN was changed to .2000 and POUT to .2200 using both stepwise and enter methods, self-efficacy entered, but self-esteem did not. Therefore, as predictors, self-esteem was non-significant, and self-efficacy was only a weak indicator.

Pearson Product Coefficient Correlation Matrix.

A correlation matrix of self-efficacy, self-esteem, and perspective transformation is illustrated in Table 16.

Table 16

Correlation Matrix of Self-Efficacy, Self-Esteem, and Perspective Transformation

	Efficacy	Transformation	Esteem
Efficacy	1.000	.3380*	.2816*
Transformation		1.0000	.0319
Esteem			1.0000

* $p = <.05$

The findings indicate a weak significant relationship between self-efficacy and the other two variables. However, self-esteem is not related to perspective transformation. The highest correlation coefficient exists between self-

efficacy and perspective transformation (.3380).

Based on the findings of multiple regression and correlation coefficients, hypothesis two is rejected. Stepwise multiple regression indicates that self-efficacy explains an insignificant 11% of the variance in perspective transformation ($R^2 = .11$) ($p = .1000$). Self-esteem does not enter the equation. Pearson Product Correlation Coefficients do not support a strong relationship between the variables.

Relationship of Nicotine Patch to Adherence: Hypothesis Three

The third hypothesis was "Smoking cessation adherence is predicted by use of nicotine therapy in adults who have attended a smoking cessation program". The third hypothesis was rejected. The Chi-Square test was used with the total sample ($N = 75$). Findings are presented in Table 17.

Table 17

Chi-Square Test of Nicotine Patch to Smoking Relationship

	Smoking	Non-Smoking	Row Total
Patch	29	13	42
No Patch	21	12	33
Column Total	50	25	75
	66.7	33.3	100.0

Forty-two subjects used the patch: 29 (69%) were

smoking and 13 (31%) were non-smoking. Of subjects not using the patch, 21 (64%) were smoking and 12 (36%) were non-smoking. The Pearson Chi-Square was .2435, with a .6216 level of significance. Based on these findings, hypothesis three was rejected. There was no significant difference between subjects who used the patch, and subjects who did not. Use of the nicotine patch does not significantly predict whether subjects will be adherent to smoking cessation at the three month measurement period.

Relationship of Demographics to Adherence

Two hypotheses address the relationship of demographics to smoking cessation adherence. Both hypotheses were tested with logistic regression. The results of logistic regression are presented in three tables. These are the logistic regression classification table, the goodness of fit logistic regression table, and the table of logistic regression parameter estimates.

Hypothesis Four. Hypothesis four was "Smoking cessation adherence is predicted by gender, age, ethnicity, marital status, educational level, income level, and employment in adults who have attended a smoking cessation program". This hypothesis was rejected. Table 18 presents the classification table results of logistic regression.

Table 18

Logistic Regression Classification Table: Smoking with Gender, Age, Ethnicity, Marital Status, Education, Income and Employment

<u>Observed</u>	<u>Predicted</u>		Percent Correct
	Yes	No	
Yes	40	4	90.91%
No	18	5	21.74%
			Overall 67.16%

Note: Eight cases were rejected in the analysis due to missing data, therefore 67 cases were used.

Findings indicate that the demographic variables were able to predict 91% of subjects who were smoking, and 22% of subjects who were non-smoking. Overall, smoking status was predicted by 67%.

Table 19 shows the goodness-of-fit statistics for smoking outcome with the independent variables of the fourth hypothesis.

Table 19

Goodness of Fit Logistic Regression: Smoking with Gender, Age, Ethnicity, Marital Status, Education, Income & Employment

	Chi-Square	df	Significance
-2 Log Likelihood	78.6	59	.05
Model Chi-Square Improvement	7.6	7	.37
Goodness of Fit	7.6	7	.37
	66.4	59	.24

The first row of the table compares the present model to a "perfect model" which would perfectly predict smokers from non-smokers. The small observed significance level (.05) indicates that this model significantly differs from the "perfect" model. Therefore, the demographic variables were insignificant in predicting smoking or non-smoking outcome.

Table 20 presents logistic regression parameter estimates.

Table 20

Logistic Regression Parameter Estimates: Smoking with Gender, Age, Ethnicity, Marital Status, Education, Income, and Employment

Variable	B	S.E.	R	Wald	Sig.
Gender	-.71	.64	.00	1.21	.27
Age	.05	.02	.14	3.88	.04
Ethnicity	.53	.99	.00	.28	.59
Marital Status	-.61	.41	-.04	2.17	.14
Education	.06	.25	.00	.06	.80
Income	.10	.23	.00	.21	.65
Job Type	.16	.29	.00	.34	.56

Estimated coefficients for the logistic model (B) are indicators of whether or not the predicted event will occur. All demographic variables had insignificant B values (less than 0.5) except for ethnicity which was .53. (Descriptive statistics revealed that 70 subjects were Caucasian, 4 were Afro-American, and one was Hispanic).

Since none of the coefficients were significantly

different from 0, the Wald statistic (which is the square of the ratio of the coefficient to its standard error) was not used in interpretation. The R values, which represent partial correlation between smoking and each of the independent demographic variables, were insignificant (none approached -1 or +1).

Hypothesis four was rejected based on findings of logistic regression. The demographic variables of gender, age, ethnicity, marital status, education, income and employment predict only 22% of those who are non-smoking, have a small observed significance level (.05), and insignificant B values.

Hypothesis Five. Hypothesis five was "Smoking cessation adherence in adults who have attended a smoking cessation program is predicted by their living situation and their history of smoking". The fifth hypothesis was rejected. Table 21 presents classification results.

Table 21

Logistic Regression Classification Table: Smoking with Smoking History and Living Environment

<u>Observed</u>	<u>Predicted</u>		Percent Correct
	Yes	No	
Yes	43	0	100%
No	21	0	0%
			Overall 67.19%

Sixty-four cases were used in the analysis, as 11 were rejected for missing data. Results of the logistic regression classification table indicate that smoking history and living situation were able to predict 100% of subjects who were smoking, and none of those who were non-smoking. There were 43 subjects who were observed as smoking, and 21 subjects observed as non-smoking. The overall predictive ability was 67.1% (which is the same predictive ability as the demographic variables had in hypothesis four).

The goodness-of-fit statistics which are presented in Table 22 indicate that this model approaches significance in comparison to the "perfect" model.

Table 22

Goodness of Fit Logistic Regression: Smoking with Smoking History and Living Environment

	Chi-Square	df	Significance
-2 Log Likelihood	76.3	60	.07
Model Chi-Square	4.7	3	.19
Improvement	4.7	3	.19
Goodness of Fit	62.4	60	.38

The .07 significance level indicates that smoking history and living situation approach significance in predicting smoking cessation adherence. The higher the significance level, the more the data fit the predicted

model. The .07 is slightly significant in comparison to .05 which would be insignificant. Because it is only slightly significant, this indicates that the data almost differed from the model.

Estimated coefficients for smoking history and living environment are presented in Table 23.

Table 23

Logistic Regression Parameter Estimates: Smoking with Smoking History and Living Environment

Variable	B	S.E.	R	Wald	Sig.
Smoking History	-.00	.00	.00	.00	.94
Live With	-.32	.56	.00	.32	.57
Relationship	-.83	.45	-.13	3.34	.06

These estimated coefficients indicate insignificant B values and insignificant R values for these demographic variables as predictors of smoking outcome. The B values of Smoking History (-.00), Live With (-.32) and Relationship (-.83) do not approach .5 which would be significant. The R values of .00 and -.13 also are insignificant as they do not approach +1 or -1. The Wald statistic was not used in analysis because none of the B values were significant.

Hypothesis five is rejected. Although smoking history and living environment can 100% correctly predict which subjects will be in the smoking group, they were unable to predict any of the subjects who were non-smoking.

Other Findings

Smoking cessation programs were compared to analyze their differences in successful outcome. Table 24 presents these outcomes according to program.

Table 24

Frequencies of Smoking Cessation Adherence at Three Months According to Program

Program	Smoking	Non-Smoking
One	4	2
Two	1	1
Three	10	1
Four	6	7
Five	3	2
Six	4	1
Seven	4	3
Eight	6	4
Nine	4	2
Ten	8	2

To further examine the relationship of programs to smoking outcome, a Chi-Square test ($N = 75$) was performed. Results of the Chi-Square test are shown in Table 25.

Findings of the Chi-Square test indicate that there were no significant differences among the ten programs regarding their ability to predict which subjects would be smoking and which subjects would be non-smoking. The Pearson Chi-Square was 7.40634 at a level of .59489 significance. When interpreting these test findings, it

must be noted that assumptions of the Chi-Square test were violated as most cells did not show an expected frequency of five subjects. All subjects of the total sample were used in this test ($N = 75$).

Table 25

Chi-Square Test of Smoking Programs and Smoking Status

Program	Smoking	Non-Smoking	Row Total
One	4	2	6
Two	1	1	2
Three	10	1	11
Four	6	7	13
Five	3	2	5
Six	4	1	5
Seven	4	3	7
Eight	6	4	10
Nine	4	2	6
Ten	8	2	10
Column Total	50	25	75
	66.7	33.3	100.0

Note: The $df = 9$.

Another finding of this study was the high percentage of female subjects (51) in comparison to the number of male subjects (24). It was found that both groups achieved

identical smoking cessation outcomes: thirty-three percent of the women (17), and 33% of the men (8), were non-smoking at the end of three months. Sixty-seven percent of both women (34) and men (16) continued to smoke. Two-thirds of the men (16) used the nicotine patch, whereas only one-half of the women (26) used the nicotine patch.

The greatest differences noted between gender were age, number of years smoking, number of packs smoked, and previous quit attempts. Means on these variables were consistently higher for men. The mean age for females was 40 years old, which was seven years younger than the males, whose mean age was 47. This difference was reflected in the differences in years smoked: a mean of 19 years for females, and 29 years for males. The men tended to be heavier smokers, smoking one pack to two and a half packs a day. Women smoked less than a pack to no more than two packs (only 9% smoked two packs). Women on the average had made two previous quit attempts, whereas the men had made between four to five prior attempts to quit smoking.

Other gender differences which did not appear as pronounced were education, employment, and living relationship. Type of employment was evenly distributed among females, while 41% of the males were employed in service or manual jobs. Tables 26 and 27 present gender findings of demographics as discussed above.

Table 26

Demographic Differences by Gender

Variable	Women		Men	
<u>Gender</u>				
Frequency	51		24	
Valid Percent	67%		33%	
<u>Age</u>				
Mean	40 years		47 years	
Median	40 years		50 years	
Mode	44 years		55 years	
Range	17-68 years		17-68 years	
<u>Education</u>				
Less than HS	10%	5	13%	3
HS diploma	14%	7	17%	4
Training	20%	10	4%	10
College, no deg.	38%	19	46%	11
College degree	16%	8	13%	3
Graduate sch.	2%	1	8%	2
<u>Employment</u>				
Prof/Mgm	22%	11	11%	4
Tech/Clerical	30%	15	17%	4
Service/Manual	24%	12	41%	10
Retired/Unemp	24%	12	25%	6
<u>Living With</u>				
Smoker	51%	26	42%	10
Non-Smoker	33%	17	46%	11
Alone	16%	8	12%	3
<u>Years Smoked</u>				
Mean	19 years		29 years	
Median	20 years		20 years	
Mode	20 years		20 years	
Range	3-48 years		5-50 years	
<u>Packs Smoked</u>				
Less 1 pack	20%	10		
One pack	51%	26	38%	9
One and half	20%	10	29%	7
Two packs	9%	5	21%	5
Two and half			12%	3

Table 27

Gender Differences in Quit Attempts, Nicotine Patch, and Smoking Outcome at Three Months

Variable	Women		Men	
<u>Quit Attempts</u>				
Mean	2.686		5.913	
Median	2.000		4.000	
Mode	4.000		1.000	
Range	0-10		0-35	
<u>Nicotine Patch</u>				
Yes	51%	26	67%	16
No	49%	25	33%	8
<u>Smoking Outcome</u>				
Smoking	67%	34	67%	16
Non-Smoking	33%	17	33%	8

To evaluate whether smoking demographics were significantly different by gender, t-tests were conducted. Possible gender differences regarding the psychological variables were also investigated through the use of t-tests.

The results of t-tests are presented in Table 28. Significant gender differences were noted in age, the number of years smoked, and the number of packs smoked. The difference in quit attempts between males and females was insignificant. There were no significant differences between males and females in their scores of self-efficacy, self-esteem, and perspective transformation. Results of the F test determined use of either the pooled or separate t-test.

Table 28

Findings of t-tests for Gender-related Differences

Variable	F value	2-tailed prob	Variance Estimate		
			t-value	df	2-tail prob
Self-Efficacy	1.45	.270	<u>Pooled</u>		
			.94	73	.316
Self-Esteem	1.28	.533	<u>Pooled</u>		
			-1.66	73	.100
Perspect. Transform.	1.34	.650	<u>Pooled</u>		
			.88	39	.386
Age	1.26	.491	<u>Pooled</u>		
			-2.28	73	.026*
Years Smoked	1.98	.044	<u>Separate</u>		
			-3.16	34.34	.003**
Packs Smoked	1.48	.249	<u>Pooled</u>		
			-3.83	73	.000***
Quit Attempts	14.65	.000	<u>Separate</u>		
			-1.92	23.37	.067

* significant at .05

** significant at .005

*** significant at .001

The first t-test indicated that there was not a significant difference (.94) ($p = .316$) between female and male self-efficacy scores. The F test (1.45) ($p = .270$) indicated that the standard deviations for the two groups

were equivalent: therefore, the pooled variance estimate was used. Self-esteem scores were not significantly different between the two groups (t-value -1.66) ($p = .100$). The groups also were not significantly different in their perspective transformation scores, which yielded a t-value of .88 ($p = .386$). There were significant differences between gender for age, years smoked, and packs smoked. The pooled variance for age was significant ($t = -2.28$, $p = .026$). The separate variance estimate was used for years smoked (-3.16) ($p = .003$) because of differences in standard deviations of the two groups ($F = 1.98$, $p = .044$). The t-value for packs smoked was -3.83 ($p = .000$) using the pooled variance estimate. The difference in male and female quit attempts approached significance: using the separate variance estimate the t-value obtained was -1.92 ($p = .067$).

Summary of Findings

The description of the sample ($N = 75$) revealed that the majority of subjects were white, middle-aged, married, had attended college, were employed, and had an income over \$40,000. Two thirds of the sample were women (51), whose mean age was 40: the men of the sample (24) had a mean age of 47 years. Most subjects had smoked at least a pack of cigarettes daily for 22 years, had made three or more attempts to quit smoking, and lived with a smoker. Thirty-

three percent of the subjects were non-smoking three months after attending a smoking cessation program.

Exploratory data analysis was performed using Pearson Product correlation coefficients, scatterplots, and analysis of residuals. Variables most strongly correlated were age, years of smoking, packs smoked, and smoking history. The psychological variables in general had weak correlations with each other and smoking cessation. Gender was weakly correlated with with years smoked and packs smoked.

The first hypothesis was rejected. The predictive value of self-efficacy, self-esteem, and perspective transformation for smoking cessation adherence was tested using discriminant function analysis. Although self-efficacy and self-esteem were able to predict group membership significantly by 75% ($N = 75$) ($p = .0025$), the addition of perspective transformation ($N = 41$) decreased predictability of group membership to 61%, which was insignificant ($p = .2969$). The mean scores for self-efficacy and self-esteem were higher for non-smokers than smokers, but perspective transformation scores were reversed. The use of a t-test ($N = 41$) revealed that smokers and non-smokers were significantly different in their self-efficacy scores ($p = .037$) and self-esteem scores ($p = .001$), but their perspective transformation scores ($N = 41$) did not differ significantly ($p = .751$).

The second hypothesis was rejected. Self-efficacy and self-esteem did not predict perspective transformation. Using stepwise and enter method multiple regression, self-efficacy alone entered the equation and accounted for 11% of the variance in perspective transformation ($p = .100$). Pearson product correlation coefficients were .3380 for self-efficacy and perspective transformation ($p = .05$); and .0319 for self-esteem and perspective transformation ($p = .05$).

The third hypothesis was rejected. The relationship between the use of the nicotine patch and smoking cessation adherence was not significant. The Chi-Square test ($N = 75$) resulted in a Pearson Chi-Square coefficient of .2435 between the observed and predicted groups of smokers and non-smokers ($p = .6216$).

Hypotheses Four and Five were rejected. The findings of logistic regression ($N = 67$ and $N = 64$ respectively) in testing these hypotheses revealed that the sets of demographic variables had insignificant predictive ability.

The logistic regression classification table of observed and predicted groups using the independent variables of gender, age, ethnicity, marital status, education, income and employment indicated that 91% of the smokers were predicted by the variables, and 22% of the non-smokers were predicted. The -2 Log Likelihood was a high

Chi-Square score (78.6) with a significance level of .05 indicating that the variables differ significantly from the "perfect model"; thus they were insignificant. These variables had insignificant B values, and insignificant R values. Their overall predictive ability was 67.16%.

When smoking history and living environment were used as predictors of the smoking or non-smoking groups, the logistic regression classification table revealed that 100% of the smokers were predicted, and none of the non-smokers were predicted, resulting in a 67.16% overall predictive ability. Insignificant B values and insignificant R values were obtained.

Other findings of the study investigated differences in smoking cessation programs, and differences in gender as possible predictors of smoking cessation outcome. The Chi-Square test, which was performed on the ten programs and subjects' smoking status, revealed no significant relationships between programs and success rates in smoking cessation outcome ($\chi^2=7.40634$, $p = .59489$). Percentages of success among the programs ranged between 9% and 53%. Due to insufficient number of subjects in all cells, an assumption of this test was violated.

Because of the high percentage of women in this study, gender differences were analyzed. Significant differences

were noted between men and women in the number of years they had smoked ($p = .003$), and in the number of packs smoked ($p = .000$). Findings of t-tests for self-efficacy, self-esteem, perspective transformation according to gender were found to be insignificant.

The mean age for women was 40 years, which was seven years younger than the mean age of the men in the sample (47 years). Descriptive findings revealed that smoking outcome for the two groups was identical: 67% were smoking, and only 33% in both groups were non-smoking at the three month measurement. One-half of the women used the nicotine patch, in comparison to two-thirds of the men who used it.

CHAPTER V

SUMMARY OF THE STUDY

This study explored whether self-efficacy, self-esteem, and perspective transformation would predict success in smoking cessation adherence. In addition, the relationship of nicotine therapy and demographics to smoking cessation efforts were examined to ascertain their predictive ability.

Subjects were seventy-five participants who had attended smoking cessation programs in the state of Texas. Subjects were measured at the beginning and end of their programs, and at the conclusion of three months. Use of the nicotine patch was decided by the individual subject.

Findings indicated that self-esteem and self-efficacy were predictors of smoking cessation adherence; but were unable to predict perspective transformation. Perspective transformation, nicotine therapy, and demographics were not predictors of smoking cessation adherence.

Summary

The purpose of this longitudinal study was to investigate elements which influence the ability of a smoker to attain success in smoking cessation efforts. Specifically, three questions were investigated regarding this purpose. Do self-efficacy, self-esteem, and

perspective transformation act as predictors of smoking cessation adherence? Does the use of the nicotine transdermal system make a difference? And lastly, do demographic factors influence the ability of a person to stop smoking on a long-term basis?

Rationale for this study was based on the fact that twenty-nine percent of Americans continue to smoke despite extensive media exposure on smoking's health hazards. If smoking is to be decreased to no more than 15% of the population by the end of the decade, a goal projected by Healthy People 2000: National health promotion and disease prevention Objectives (USDHHS, 1991), further research is necessary to identify barriers and interventions which impact failure or success.

The conceptual framework of this study was based on the constructs of perspective transformation, self-esteem, and self-efficacy which were conceptualized as having a direct relationship to smoking cessation adherence. This researcher believed that the smoker must change his/her perspective of self and reality to remain adherent to smoking cessation. Self-efficacy and self-esteem were believed to influence the smoker's ability to initially give up smoking and achieve perspective transformation.

The study was limited by three major factors. A forty-six percent mortality rate (34 subjects out of 75) was

realized in the return of the perspective transformation questionnaire. Although subjects did not drop out of the study (they did respond to the third measurement which was a phone interview) their lack of response during the second measurement period decreased representation of the sample. Therefore, generalization to the population is limited.

A second limitation was variation in use of the nicotine patch: dosages, compliance, and time duration differed for subjects who wore the transdermal systems. The third limitation was the difference noted in the ten smoking cessation programs; although similar in content, they varied in style, length, and cost.

A longitudinal research design with treatment partitioning was used. Subjects were seventy-five adults in the state of Texas who were participants of ten different smoking cessation programs. All subjects ($N = 75$) completed the demographic form, the Rosenberg Self-Esteem Scale (Rosenburg, 1979), and the revised Self-Efficacy Scale of Brod and Hall (Stanton et al., 1992) at the beginning of their program. The Adapted Marsh Revelation Scale (Van Nostrand, 1992) and a progress report was mailed to the subjects at the conclusion of their program to which 41 subjects responded ($N = 41$). All subjects were contacted by phone at the end of three months for the final progress report ($N = 75$). Data collection occurred over a fifteen

month period, inclusive of a three month pilot study.

Agency and subject consent were obtained through signed consent forms. Agencies were contacted through lists made available by The American Cancer Society, the Office of Smoking and Health (Texas Department of Health) and The National Center for Health Promotion.

The sample was primarily white, middle-aged, married, employed with an income over \$40,000, and had attended college. Two thirds of the subjects were female ($N = 51$) and one third were male ($N = 24$). The majority of subjects lived with a smoker and had smoked a pack of cigarettes daily for a mean duration of 22 years. The median quit-attempt was three. Fifty-six percent of the subjects used the nicotine patch ($N = 42$) during their smoking cessation effort. One third of the subjects ($N = 25$) were adherent to non-smoking at the conclusion of three months, while two-thirds were reported as smoking ($N = 50$).

The first hypothesis (Smoking cessation adherence in adults who have attended a smoking cessation program is predicted by their self-efficacy and self-esteem measured at the beginning of the program, and their perspective transformation measured at the end of the program) was rejected using discriminant function analysis. Self-efficacy and self-esteem significantly predicted smoking cessation adherence ($N = 75$) ($p = .0025$), but perspective

transformation did not ($N = 41$) ($p = .2969$).

The second hypothesis (Perspective transformation in adults who have attended a smoking cessation program is predicted by their self-efficacy and self-esteem) was not supported. Multiple regression ($N = 41$) indicated a weak but insignificant correlation coefficient ($R^2 = .11$) for self-efficacy in predicting perspective transformation ($p = .1000$). Self-esteem did not enter the equation and was therefore insignificant.

The third hypothesis (Smoking cessation adherence is predicted by use of nicotine therapy in adults who have attended a smoking cessation program) was rejected. The Chi-Square test ($N = 75$) indicated a non-significant relationship (.2435) ($p = .6216$) between patch-users and non-patch-users in smoking cessation adherence. Use of the nicotine patch did not predict smoking cessation outcome.

The fourth hypothesis (Smoking cessation adherence is related to gender, age, ethnicity, marital status, educational level, income level and job type in adults who have attended a smoking cessation program) was rejected. Logistic regression ($N = 67$) was used to test the hypothesis and revealed that these demographics had an insignificant overall predictive ability of 67%.

The fifth hypothesis (Smoking cessation adherence in adults who have attended a smoking cessation program is

related to their living situation and their history of smoking) was also rejected. Logistic regression ($N = 64$) indicated that living situation and history of smoking had an overall insignificant predictive ability of 67%. Although these demographic variables were able to 100% correctly predict subjects who would be smoking, the variables did not predict which subjects who would be non-smoking.

Other findings of the study revealed that there was not a significant difference in smoking outcome according to program attended ($N = 75$). Although differences were noted in the percentages of subjects who were non-smoking according to program at the three month follow-up (which ranged from 9% to 53%), the Pearson Chi-Square (7.40634) was insignificant ($p = .59489$). Type of program attended did not predict smoking cessation outcome.

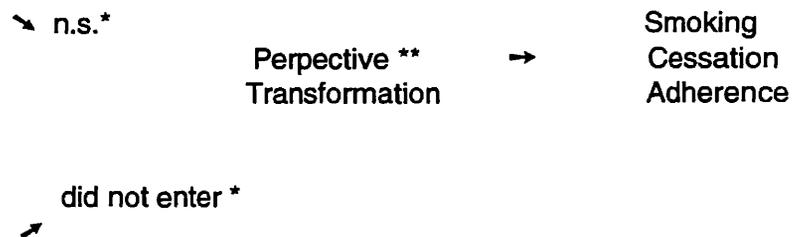
Significant gender differences were found with t-tests in number of years smoking ($N = 75$) ($t = -3.57$, $p = .001$), and number of packs smoked ($N = 75$) ($t = -3.83$, $p = .000$). Men had higher scores on both these variables. The results of t-tests on self-efficacy, self-esteem, perspective transformation and previous quit attempts according to gender were insignificant. The most important finding of gender analysis revealed that there was no difference in smoking outcome for the groups: thirty-three percent of both

males and females were non-smoking at the three month follow-up.

Findings Applied to Theoretical Framework

Theoretically, the study's statistical findings did not support the conceptual framework. Figure 3 presents the original conceptual framework with notations regarding critical values.

Self-Efficacy



Self-Esteem

- * Self-efficacy R^2 was .11, Self-esteem did not enter equation using multiple regression for prediction of perspective transformation
- ** Perspective transformation, self-efficacy and self-esteem together had an overall non-significant predictive ability of 61% ($p = .2969$) regarding smoking cessation adherence

Figure 3.

Original Conceptual framework with statistical values.

The concepts of self-efficacy and self-esteem did not predict perspective transformation as indicated by multiple regression values; the insignificant R^2 for self-efficacy

was .11, and self-esteem did not enter the equation. Indirect support of the conceptual framework was found in the significant values of self-efficacy and self-esteem, which did predict smoking cessation adherence. Using discriminant function analysis, their overall value for predictability of smoking cessation adherence was 75% ($p = .0025$). However, when perspective transformation was added, discriminant function values decreased to an overall predictive ability of 61% which was insignificant ($p = .2969$). Therefore, perspective transformation did not predict smoking cessation adherence. The model was not supported.

Discussion of Findings

The discussion of findings involves identification of strengths and weaknesses found in the study, and rationale for factors affecting the findings. Findings regarding mortality rate, smoking cessation outcome, the hypotheses, the ten study programs, and gender differences are discussed. A revised theoretical framework is included.

Mortality Rate and Sample Size

The 45% mortality rate for this study was high (34 subjects out of 75) regarding the return of the second set of data. This mortality rate could have significantly

affected the findings regarding perspective transformation, as only 41 cases were used out of the total 75 subjects when testing hypotheses one and two.

Post priori power analysis revealed that at least 64 subjects would be necessary in each group (requiring a total sample of 128) for t-tests, which were used in conjunction with discriminant function analysis to test hypothesis one. A sample size must be large enough to attain a .80 power level, which would prevent a Type II error. The power level of this study for t-tests was .33 using the sub-sample ($N = 41$) and .57 when using the total sample ($N = 75$). Thus, research assumptions were violated in regard to sample size.

Treatment mortality has been studied in smoking cessation programs (Stanton et al., 1992) and attendance at program sessions has been significantly related to success in smoking cessation. There was a high treatment mortality rate reflected for participants attending the ten smoking cessation programs. Of the 108 participants who began these programs, only 68 were present at their last session; reflecting a possible 38% program treatment mortality rate.

The researcher was unable to identify the treatment mortality rate for the 75 study subjects. This was due to not being present at sessions (except for the first), and because of neglecting to include this variable on the progress report. The researcher was able to obtain the

number of participants completing the programs, but not their names.

In conclusion, limitations of this study were the small sample size, the treatment mortality of participants, and the mortality rate of subjects who did not return the second set of data. These limitations diminish the generalizations which can be inferred to the population.

Smoking Cessation Outcome

The most reliable finding of this study was the thirty-three percent success rate of subjects in smoking abstinence at the three month follow-up (25 subjects out of 75). This success rate is consistent with other smoking studies (Gentner, 1988) and trends in smoking cessation success rates over the past three decades (Shiffman, 1993). Gentner's summary of smoking studies indicates that most incidents of smoking relapse occur during the first 90 days after program completion. Shiffman's trend analysis of 244 smoking cessation groups from 1965 to 1989 explicates that a thirty percent abstinent rate is the expected mean at six months and twelve months after completing a program.

What does this imply? If all programs result in a 70% relapse rate despite different approaches, and combinations of therapy or modalities, can anything make a difference? There are several factors to consider. Persons who attend

smoking cessation programs are individuals who are externally motivated and feel externally controlled; whereas those who achieve abstinence usually attribute their successful quitting behaviors to more internal, stable, and controllable factors, including self-efficacy (Schmitz, Rosenfarb, & Payne, 1993). Ninety percent of ex-smokers give up smoking on their own; therefore, personality and psychological attributes of program participants must be considered.

General principles of smoking cessation include that it occurs gradually for most people, and is characterized by relapse and recycling (Marlatt & Gordon, 1985; Fisher, Lichtenstein, Haire-Joshu, & Morgan, 1993). Thus, program post-measurements may label participants as relapsed, when in fact they have temporarily lapsed and subsequently achieve abstinence.

Social support and social pressure for non-smoking have intensified through numerous prevention media campaigns (Shopland, 1993). A combination of these factors may assist smokers to repeat smoking cessation programs, attend more sessions, and implement skills learned. An example of key methods for successful smoking cessation include: extinguishing conditioned responses, practicing aversive conditioning, avoiding temptations, self-monitoring, social support, follow-up, and multiple program contacts (Fisher et

al., 1993). Due to readiness and motivation, participants may be more successful when repeating a smoking cessation program the second time.

The short time duration of many programs may be insufficient to support participants through the various phases of cessation which are: initiation/preparation, quitting, maintenance of short-term abstinence, relapse prevention, and maintenance of long-term abstinence (Hatsukami & Lando, 1993). Longer programs with intensive follow-up may better assist participants to enhance their commitment to abstinence: maintenance sessions would provide the group support needed to strengthen coping skills and manage difficult situations and periods. The addictive nature of tobacco necessitates intense intervention often lasting from one to three years. The development of Smokers Anonymous groups are promising systems for offering the on-going support which many addictive smokers may need to remain smoke-free.

Self-Efficacy

Self-efficacy has been a reliable indicator of a smoker's ability to stop smoking and remain abstinent after completion of a formal program (Condiotte & Lichtenstein, 1981; Garcia et al., 1990; Prochaska et al., 1982; Stanton et al., 1992). The results of this study also support the

influence of self-efficacy upon successful smoking cessation. As presented in Bandura's theory (1977), self-efficacy reflects a person's belief that it is possible to relinquish smoking. This belief influences the level of motivation, power, and commitment which is necessary for a smoker to overcome the smoking habit. The belief of self-efficacy is action oriented. Because it is objectively focused toward a specific task, it's effect size is notable and sensitive even when used with small samples. Smokers themselves realize the importance of self-efficacy, and several reliable valid instruments are available to measure this attribute. This finding supports the conceptual framework.

Self-esteem

In contrast to self-efficacy, self-esteem is less focused toward an action-orientated task and smokers may be unaware of it's impact on their decision to stop smoking. This study found self-esteem to be significant in predicting one's ability to become a non-smoker. Although few recent studies have been conducted with adults regarding self-esteem and smoking cessation, this study's finding is collaborated with studies on adolescents (Murphy & Price, 1988, Emery et al., 1993) in which a strong relationship between self-esteem and smoking status was supported in both

studies. This researcher believes that self-esteem is basically consistent (with minor fluctuations) as described by Rosenberg (1979). Low self-esteem often generates feelings of fear and trepidation regarding new tasks. A positive regard for self can generate motivation and anticipation for change. As substantiated in this study, persons with higher self-esteem appeared more capable of accomplishing the task of smoking cessation than persons with lower self-esteem. Thus, the conceptual framework was supported.

Perspective Transformation

Perspective transformation did not predict smoking cessation adherence as theorized in the conceptual framework. This finding collaborated with that of Van Nostrand (1992) whose study indicated there were no significant differences between groups of smokers and non-smokers regarding perspective transformation scores.

Marsh (1989) concluded that it is more difficult to measure the perspective transformation process in smokers than in other groups making efforts toward health promotion. As Mezirow (1978) and Marsh theorize, the process of perspective change is thought to occur in phases. Measurement of subjects at one point does not delineate the changes which occur in subjects over time. However, the

results of Marsh's and Van Nostrand's instruments have not validly supported the existence of perspective transformation as occurring in smokers.

A limitation of this study was that only 54% of the subjects (41 out of 75) returned their perspective transformation questionnaire. This high mortality rate may have significantly influenced the results. The Adapted Marsh Revelation Scale used in measuring perspective transformation contained 62 items. It was noted on the raw data that some respondents circled columns of the same Likert score on the last two pages of the instrument, perhaps indicating fatigue with the repetition of items. Because of the questionable validity of the instrument and the high mortality rate realized, the findings of this study are inconclusive at best, or insignificant.

Interaction of Self-efficacy, Self-esteem, and Perspective Transformation

In light of the questionable validity of the perspective transformation results for this sample, the relationship of perspective transformation to self-efficacy and self-esteem is inconclusive. Since self-esteem and self-efficacy were successful indicators of smoking cessation adherence, it follows that they would not predict an unsuccessful indicator.

Marsh (1989) identifies low self-esteem as a factor of readiness (identified as Stage II of her Revelation Readiness Model of Lifestyle Change). This researcher agrees with Marsh that low self-esteem may influence a smoker to join a smoking cessation program as a sign of readiness for change. However, as the findings of this study indicate, success in a smoking cessation program is related to higher levels of self-esteem.

Nicotine Transdermal Therapy

Although over half of the subjects in this study ($N = 42$) self-reported using the nicotine patch, results indicated no significant difference in their smoking abstinence at three months from the non-users ($N = 33$). Controlled experimental studies (Abelin et al., 1989; Buchkremer & Minneker, 1989; Daughton et al., 1991; Rose et al., 1990; Transdermal Nicotine Study Group, 1991) indicated that high success rates initially ranged from 61% to 39%, but at follow-up abstinence rates fell to 26%. Of the 42 patch-users in this study, 29 were smoking and 13 were non-smoking at the three month follow-up; this indicates a 30% abstinence rate. Thus, results of this study were similar to other studies even though use of the nicotine patch was uncontrolled and subject compliance was unknown. This limitation did not appear to influence the findings.

Speculation on why the nicotine patch does not assist smokers to achieve higher smoking cessation rates may be related to non-compliance, misconceptions, or the lack of inner-directed motivation. Smokers may have the misconception that wearing the patch alleviates any psychological or physical discomfort in the withdrawal of nicotine, and that the patch will externally provide the means and motivation whereby one can give up smoking without personal effort. Although the patch does alleviate nicotine withdrawal symptoms, it does not immediately and permanently remove the urge to smoke. The patches are titrated to emit lower levels of nicotine which the subject physiologically experiences. Unless subjects are internally motivated and consistent in using coping responses, they may be unprepared when experiencing temptations to smoke and relapse. Subjects reported smoking while wearing the nicotine patch even though advised of the associated risks.

Demographics

The failure of demographics to predict smoking cessation adherence in this study was not supported by the literature. This researcher believes that although demographic influences on smoking behavior is realized in the population, the influence of demographics may be undetectable in small samples.

The insignificant findings of this study may be due to statistical differences noted by effect size of the demographic variables (small, medium, and large), size and distribution of the sample, the dynamics of the central limit theorem, and resulting power. The smaller the effect size, the larger the sample needed to detect it. The larger the sample, the more the distribution approaches the normal curve. The larger the number of the samples, the closer their overall mean is to the population mean. The larger the sample, the greater is its power in preventing a Type II error in hypothesis testing.

Demographic results reported by the U.S. Department of Health and Human Services (1989) are based on population statistics. Studies conducted by Salive et al. (1992), and McDermott et al. (1992) and Geronimus et al. (1993) used samples numbering over a thousand subjects each. The survey sample of Shopland, Niemcryk, and Marconi (1992) consisted of 105,225 subjects. Sample sizes of this magnitude support the fact that differences in smoking cessation rates occur according to gender, age, income, ethnicity, occupation, and education; whereas this study's findings did not.

The ethnicity distribution of the sample was similar to that found in other studies (Stanton et al., 1992). Caucasians (94%) were more strongly represented in this study than Afro-Americans (5%) or Hispanics (1%).

The majority of subjects in this study were married and lived with smokers. However, living environment in this study was not predictive of success in smoking cessation adherence. Coppotelli and Orleans (1985) found partner support to be the primary predictor of smoking cessation maintenance. Perhaps this finding was related to the high number of ex-smoking partners which the abstainers had in their study. In this study, over 48% (36) of the subjects lived with smokers. Cohen and Lichtenstein's study (1990) indicated that only ten percent of their sample were abstinent at one month: but results indicated positive reinforcement measures from spouses or partners were more strongly related to abstinence than negative reinforcement measures.

This researcher believes that direct relationships between living environment and success in smoking cessation adherence do occur, but were not realized in this study possibly due to small sample size, and not controlling for it in the study design.

Revised Conceptual Framework

Since the findings of the study did not support the original conceptual framework, the researcher offers a revised model based on study results. Findings of discriminant function analysis, and support from the

literature, indicate that self-efficacy and self-esteem are significant predictors of smoking cessation adherence as diagrammed in Figure 4.

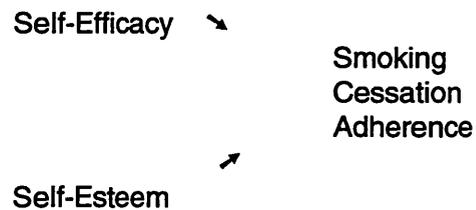


Figure 4. Revised conceptual model for prediction of smoking cessation adherence.

Levels of self-efficacy and self-esteem would predict individuals at a state of readiness to enter a smoking cessation program, and who would subsequently be most likely to succeed in remaining adherent to smoking cessation.

The Ten Study Programs

Although many programs for smoking cessation are listed in resource listings, the researcher found it difficult to locate programs offered during the data collection period. Many health care agencies offer programs only once or twice a year. Several programs were cancelled due to insufficient participants. This infrequency and unavailability of local programs could hinder the smoker at a point of readiness to stop smoking. Conversely, perhaps fewer smoking cessation

programs are offered due to a lower demand from the public.

Although success rate percentages varied for the ten programs, their pooled results indicated the average norm of success in smoking cessation adherence. The two most poorly attended programs were free to the public. Other programs which charged the public, or were offered to those affiliated with the institution, had higher attendance rates but did not have significantly higher success rates.

Gender

Composition of the sample was 67% female (51) and 33% male (24). Three of the smoking cessation programs were offered to hospital employees, who were predominantly female which may have affected the ratio found in the sample. This study's findings revealed that both genders achieved the identical abstinence rate of 33%. These findings concur with other studies and reject the myth that men are more successful in giving up smoking than women (Jarvis, 1991; Toneatto, Sobell, & Sobell, 1992). However, gender and age together were considered to be factors which influence relapse according to the study findings of Brigham, Henningfield, & Stitzer (1991). Another study (Killen, Fortmann, Newman, & Varady, 1990) found that men and women showed a differential treatment response: men who received nicotine gum were more likely to be abstinent at each

follow-up (2,6, and 12 months).

Because the mean age of men in this study was higher (29 years) than the mean age of women (19 years), it follows that their years of smoking would be significantly higher than the females. The men were also heavier smokers than the women as noted by the significant difference in packs smoked, which could have made it more difficult for them to give up smoking.

No significant differences were found by gender in scores of self-efficacy, self-esteem, or perspective transformation. Studies have documented that psychosocial differences are apparent between men and women. Women have shown more stress and less confidence in their ability to cope with smoking cessation than men (Abrams, Monti, Pinto, Elder et al., 1987). In regard to motivation for smoking, women reported smoking more in emotional and social situations in order to reduce negative affect and for pleasure; whereas men reported smoking more in situations requiring close attention to a task (Zuckerman, Ball, & Black, 1990; Livson & Leino, 1988).

Conclusions and Implications

Five conclusions have been generated from the discussion of findings. These are presented as follows with their associated implications for nurses and health care

professionals. Because of the small sample size, however, generalizations about these findings must be undertaken with caution.

First Conclusion

Self-efficacy and self-esteem may be predictors of smoking cessation adherence at the three month period. The explanation may be that persons with high levels of these attributes succeed: success stimulates stronger self-esteem and self-efficacy over time which re-enforces adherence.

Nurses and health care practitioners should assess these characteristics, and assist clients in increasing self-esteem and self-efficacy whenever possible. If participants fail to stop smoking after attendance in a smoking cessation program, their initial self-esteem and self-efficacy will probably be decreased as a result of the failure. Such clients could be counseled to attend other programs which enhance positive self-regard before making a further attempt at smoking cessation. Such programs as "Stress Management", "Assertiveness Training", and "Self-Esteem" are commonly available through community or adult educational facilities at a reasonable cost. Such courses might offer a greater sense of control over one's life, and increase self-esteem. Participation in such programs might also enhance self-efficacy. Subsequently, the individual

may successfully accomplish smoking cessation through a behaviorally structured program.

Second Conclusion

Perspective transformation measured at the conclusion of a smoking cessation program was not an indicator of smoking cessation adherence. Participants initially can be successful in smoking cessation without experiencing this phenomenon. Implications from this conclusion may be that 1) perspective transformation does not occur in smokers, 2) the Adapted Marsh Revelation Scale does not measure it, 3) it can't be measured quantitatively, 4) longer periods of time are needed for perspective transformation to occur before it can be measured, or 5) a larger sample size is needed to detect the effect of perspective transformation.

Third Conclusion

Use of the nicotine patch in combination with a smoking cessation program does not predict a successful outcome at the three month follow-up period. This conclusion implies that the psychological and habitual aspects of smoking are more important than the physical addiction. The essence of smoking cessation lies in the internalization of new attitudes and practices as a "non-smoker". These positive values and behaviors must replace dependency on smoking.

Smokers desiring to quit must be helped to realize that

the patch will not externally remove their smoking habit. The patch should be recognized as a measure which will ease the physical discomfort of nicotine withdrawal. Nurses in the primary and acute care settings often have opportunity to assess which clients may possibly benefit from the patch, and to teach clients about proper use of the patch if prescribed by the physician. The nicotine patch is sometimes ordered for patients during hospitalization for management of withdrawal symptoms. This situation provides an excellent opportunity for nurses to encourage patients toward smoking cessation, to provide further information regarding use of the patch, and to emphasize the necessity of adding behavioral therapy to nicotine therapy after discharge.

Fourth Conclusion

Demographic differences were unrelated to success in smoking cessation adherence. Demographics describe the sample, and are usually non-manipulated. Population studies do reflect the influence of demographics on trends in smoking. Therefore, larger-sized samples may be necessary to study this effect.

Fifth Conclusion

Over sixty percent of participants from a smoking cessation program will be smoking at the three month follow-

up period. In view of these high relapse rates, smoking cessation programs might be more successful if clearly delineated to address the phases of smoking cessation: 1) initiation and preparation, 2) quitting, 3) maintenance of short-term abstinence, 4) relapse prevention, and 5) maintenance of long-term abstinence. Programs of longer duration may be necessary to assist smokers with the lapse-relapse-abstinence cycle that individuals who are heavily addicted to tobacco experience. Presently, most programs are too short to provide the long-term support necessary during the entire smoking cessation process.

An implication for nursing is to educate other professionals and clients regarding the process and phases of smoking cessation. When possible, nurses could assist in the planning of programs which would accommodate all phases of smoking cessation. As a professional group, nurses might be able to exert influence on health insurance programs to provide funding for such programs, as is done for other drug and alcohol-related conditions. Lastly, nurses in their practice settings can initiate interventions which assist clients to attend smoking cessation programs and refer them to sources where long-term support may be found. However, if clients feel capable to stop smoking on their own, nurses could provide the information and assistance which would enable clients to reach their goal.

Recommendations for Further Study

The findings, conclusions and implications of the study support the following recommendations for further research. The dynamics involved in the smoking cessation process are numerous and multi-faceted. Research addressing barriers to smoking cessation, types of interventions, and prevention of smoking relapse is necessary to continue the national decrease in smoking prevalence. The following recommendations for research offer suggestions for further study.

1. Conduct a quasi-experimental study of subjects who complete a course designed to increase self-esteem prior to taking a smoking cessation course, and compare outcome result with members of a control group.
2. Conduct a case study of subjects who participate in an experimental two-phase smoking cessation and maintenance program. The acute smoking cessation phase would consist of a controlled three day experience within which participants live at the facility where the program is being offered. The maintenance phase would consist of weekly sessions for three months, followed by bi-monthly sessions for a year.
3. Charge a costly fee for a smoking cessation program (most of which would be returned to the participant at the

end of the program if all sessions were attended) and compare results of program mortality and smoking outcome with other groups charging a standard fee at 3,6, and 12 month follow-up.

4. Measure motivational factors, personality characteristics, and personal support systems of successful abstainers and compare with the same variables in unsuccessful relapsers six months following a smoking cessation program.

5. Conduct a phenomenological study of ex-smokers who are members of a Smokers Anonymous group.

6. Conduct an experimental study of hospitalized (medical-surgical) smokers who receive nurse-administered written information on smoking cessation and resources to contact after their discharge. Contact patients six months afterward to see if they tried to stop smoking on their own, or attended a smoking cessation program, as a result of the information. Measure smoking prevalence at this time and compare with pre-admission numbers.

7. Replicate Wynd's study (1992) on relaxation imagery to test this method for reliability (this study reported a high 72% abstinence rate three months after the program).

8. Conduct a large survey of smokers who have stopped on their own, and do factor analysis to determine what variables are associated with their success.

10. With funding, design and administer a six-week controlled program which is similar to the type of intensive therapy that other drug-addicted persons receive. Emphasis would be on "cold turkey" cessation which has been proven successful, and restructuring of life-style. Measure abstinence rates at 3, 6, 9, and 12 months follow-up.

11. Conduct an exploratory descriptive study of the relationship between a health threat crisis and subsequent actions in regard to smoking cessation.

These recommendations for research have addressed a few of the many variables associated with smoking cessation adherence. Such studies might assist in understanding and assisting those who strive to relinquish this habit.

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APPENDIX A

Approval from Dissertation Committee for Prospectus

PROSPECTUS FOR THE DISSERTATION

This prospectus proposed by: Susan Kowalski, RN, MSN, MBA

Social Security Number: 212-46-1764

Titled: Predictors of Adherence to Smoking Cessation: Self-Efficacy,
Self-Esteem, Perspective Transformation & Nicotine Therapy

Has been read and approved by the members of his/her research committee.

This research (check one):

involves human subjects (Student submits application materials to Human Subjects Review Committee);

involves use of animals (Student submits application materials to Animal Care and Use Committee);

does not involve either human subjects or animals.

Research Committee (Original Signatures Required):

Type name

Signature

Dr. Maisie Kashka (Chair)

Dr. Maisie Kashka

Dr. Peggy Drapo

Dr. Peggy J. Drapo

Dr. Susan Ward

Dr. Susan Ward

Dr. Barbara Lease

Dr. Barbara Lease

Dean, College of Nursing

Carolyn S. Dunaj 10/11/93

Signature

Date

APPENDIX B

Approval Letter from the Graduate School for Prospectus

TEXAS WOMAN'S UNIVERSITY
DENTON DALLAS HOUSTON

THE GRADUATE SCHOOL

P.O. Box 22479, Denton, Texas 76204-0479 817/898-3400 FAX 817/898-3412



November 30, 1993

Ms. Susan Kowalski
411 Grande Blvd.
Tyler, TX 75703

Dear Ms. Kowalski:

I have received and approved the Prospectus for
your research project. Best wishes to you in the
research and writing of your project.

Sincerely yours,

Leslie M. Thompson

Leslie M. Thompson
Associate Vice President for Research
and Dean of the Graduate School

dl

cc Dr. Maisie Kashka
Dr. Carolyn Gunning

APPENDIX C

Letters from Human Subjects Review Committee



HUMAN SUBJECTS REVIEW COMMITTEE

April 22, 1993

Susan Kowalski
411 Grande Blvd.
Tyler, TX 75703

Social Security #: 212-46-1764

Dear Susan Kowalski:

Your study entitled "Predictors of Adherence to Smoking Cessation: Self-Efficacy, Self-Esteem, Perspective Transformation & Nicotine Therapy" has been reviewed by a committee of the Human Subjects Review Committee and appears to meet our requirements in regard to protection of individuals' rights.

Be reminded that both the University and the Department of Health and Human Services (HHS) regulations typically require that signatures indicating informed consent be obtained from all human subjects in your study. These are to be filed with the Human Subjects Review Committee. Any exception to this requirement is noted below. Furthermore, according to HHS regulations, another review by the Committee is required if your project changes.

Special provisions pertaining to your study are noted below:

- The filing of signatures of subjects with the Human Subjects Review Committee is not required.
- Your study is exempt from further TWU Human Subjects Review.
- No special provisions apply.

Sincerely,

A handwritten signature in cursive script, appearing to read "Jean Taylor".

Chairman
Human Subjects Review Committee

cc: Graduate School
Dr. Maisie Kashka, Nursing
Dr. Carolyn Gunning, Nursing

████████████████████
TEXAS WOMAN'S
UNIVERSITY
DENTON/DALLAS/HOUSTON

HUMAN SUBJECTS REVIEW COMMITTEE

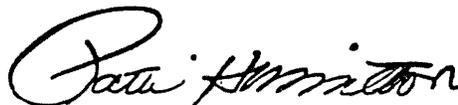
OFFICE OF
RESEARCH AND
GRANTS ADMINISTRATION
P.O. Box 22939
Denton, TX 76204-0939
Phone: 817/898-3375

August 4, 1994

To: Dr. Maisie Kashka, Nursing
Dr. Carolyn Gunning, Nursing
Graduate School

This is to inform you that, as of this date, Susan Kowalski, Social Security #212-46-1764, has placed on file with the Human Subjects Review Committee the agency approval letters and signatures of the subjects who participated in his/her research project "Predictors of Adherence to Smoking Cessation: Self-Efficacy, Self-Esteem, Perspective Transformation & Nicotine Therapy." The signatures constitute evidence of informed consent of each subject.

Sincerely,



Chair
Human Subjects Review Committee

cc: Susan Kowalski
411 Grande Blvd.
Tyler, TX 75703

APPENDIX D

Permission to use Scale to Measure Self-efficacy



UNIVERSITY AT BUFFALO
STATE UNIVERSITY OF NEW YORK

Program of Continuing Education
School of Nursing
124 Kimball Tower
Buffalo, New York 14214
(716) 831-3291

164

March 4, 1993

Susan Kowalski, M.S., R.N.
411 Grande Boulevard
Tyler, Texas 75703

Dear Susan:

Thank you for your phone call and letter. I really enjoyed our conversation and hope I was helpful to you. I will also pass your letter along to my co-investigators. Dr. Wooldridge might be especially helpful to you in terms of evaluating and modifying the instrument.

As I told you on the phone, I have modified the Brod and Hall instrument. I have enclosed a copy of our self-efficacy scale. The reliability and scoring for our tool is described in the article you've reviewed. I have also enclosed a copy of the letter I received from Dr. Brod with a copy of her instrument and the information that she had provided to me in terms of how she weighted and scored her tool. This way you can review instruments, scoring mechanisms and if you need to contact her you will have her address. As I also told you on the phone, I had initially used the attached tool as well as Condiotte's self-efficacy scale in our pilot. However, because it made the instrument so lengthy, we decided not to include it in the study and went with the shorter version adapted from the Brod instrument. I personally would like to do further research using Condiotte's tool plus the adapted Brod instrument.

I hope you will find this information helpful. Good luck to you as you pursue your doctoral work. Please feel free to contact me if you require further assistance.

Sincerely yours,

Marietta P. Stanton, Ph.D., RN, C-
Associate Professor/Director
Continuing Education
UNIVERSITY AT BUFFALO SCHOOL OF NURSING

attachments

APPENDIX E

Approval to use Scale to Measure Perspective Transformation

AGREEMENT

I agree to give Susan Kowalski permission to use the: Demographic Profile; Self Report of Smoking Behavior; and the Adapted, Revised Marsh Revelation Scale. I hold the copyright for these instruments. The latter instrument contains adaptations and revisions made by me to the original and revised instrument developed and copyrighted by Gene W. Marsh, PhD.

Permission for use is given for the purpose of conducting research toward Ms. Kowalski's doctorate in nursing from Texas Woman's University. Permission is also granted for these instruments to be revised for research purposes.

In return, Ms. Kowalski agrees to make available to me a copy of her completed dissertation and a copy of relevant raw data files and coding. The latter would be utilized for further estimates of the item analyses, reliabilities, and validities for the above noted adapted instruments.

September 1, 1993
Date

September 10, 1993
Date

Joyce A. Van Nostrand
Joyce A. Van Nostrand, RN, Ph.D.

Susan Kowalski
Susan Kowalski, RN, MSN

AGREEMENT

I agree to give Susan Kowalski permission to use the: Demographic Profile; Self Report of Smoking Behavior; Adapted, Revised Marsh Revelation Readiness Index; and the Adapted, Revised Marsh Revelation Scale. All three instruments contain adaptations and revisions made by me to the original and revised instruments developed and copyrighted by Gene W. Marsh, PhD. Permission must also be obtained from Dr. Marsh.

Permission for use is given for the following: evaluation of the instruments and conducting a pilot study as a partial requirement for a doctorate in nursing from Texas Woman's University. Permission is also granted for these instruments to be revised for research purposes.

In return, Ms. Kowalski agrees to make available to me a copy of the instruments' evaluation, summary of pertinent research findings and use, and copy of the raw data file and coding for potential addition to the initial data file (Van Nostrand, 1992). The latter would be utilized for further estimates of the item analyses and construct validity for the above noted adapted instruments.

April 1, 1992
Date

May 3, 1992
Date

Joyce A. Van Nostrand
Joyce A. Van Nostrand, RN, MSN

Susan Kowalski
Susan Kowalski, RN, MSN

APPENDIX F

Agency Permissions for Conducting Study

TEXAS WOMAN'S UNIVERSITY
COLLEGE OF NURSING

AGENCY PERMISSION FOR CONDUCTING STUDY*

THE _____

GRANTS TO Susan Kowalski, RN, MSN
a student enrolled in a program of nursing leading to a Master's/Doctoral Degree at Texas Woman's University, the privilege of its facilities in order to study the following problem.

Predictors of Adherence to Smoking Cessation: Self-efficacy, Self-esteem, Perspective Transformation, and Nicotine Therapy

The conditions mutually agreed upon are as follows:

1. The agency (may) (may not) be identified in the final report.
2. The names of consultative or administrative personnel in the agency (may) (may not) be identified in the final report.
3. The agency (wants) (does not want) a conference with the student when the report is completed.
4. The agency is (willing) (unwilling) to allow the completed report to be circulated through interlibrary loan.
5. Other _____

Date: April 9, 1993

Joni Kaubman
Signature of Agency Personnel

Susan Kowalski
Signature of Student

Mailee Kashka
Signature of Faculty Advisor

*Fill out and sign three copies to be distributed as follows: Original - Student; First copy - Agency; Second copy - TWU College of Nursing.

AGENCY PERMISSION FOR CONDUCTING STUDY

THE _____
GRANTS TO Susan Kowalski, RN, MSN

a student enrolled in a program of nursing leading to a Doctoral Degree at Texas Woman's University, the privilege of its facilities in order to study the following problem:

Predictors of Adherence to Smoking Cessation:
Self-Efficacy, Self-Esteem, Perspective Transformation
and Nicotine Therapy

The conditions mutually agreed upon are as follows:

1. The agency (may) may not be identified in the final report.
2. The names of consultative or administrative personnel in the agency (may) may not be identified in the final report.
3. The agency (wants) does not want a conference with the student when the report is completed.
4. The agency is willing (unwilling) to allow the complete report to be circulated through interlibrary loan.
5. Other _____

Date: 21 Dec 93

Dorothy D. Bell M.D.
Signature of Agency Personnel

Susan Kowalski
Signature of Student

Marilyn Kascha
Signature of Faculty Advisor

* Fill out and sign three copies to be distributed as follows:
Original - Student; First Copy - Agency; Third Copy - TWU College
of Nursing.

TEXAS WOMAN'S UNIVERSITY
COLLEGE OF NURSING

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AGENCY PERMISSION FOR CONDUCTING STUDY

THE Hugley Memorial Medical Center
GRANTS TO Susan Kowalski, RN, MSN

a student enrolled in a program of nursing leading to a Doctoral Degree at Texas Woman's University, the privilege of its facilities in order to study the following problem:

Predictors of Adherence to Smoking Cessation:
Self-Efficacy, Self-Esteem, Perspective Transformation
and Nicotine Therapy

The conditions mutually agreed upon are as follows:

1. The agency (may) (may not) be identified in the final report.
2. The names of consultative or administrative personnel in the agency (may) (may not) be identified in the final report.
3. The agency (wants) (does not want) a conference with the student when the report is completed.
4. The agency is (willing) (unwilling) to allow the complete report to be circulated through interlibrary loan.
5. Other _____

Date: 1/6/94

Melike G. Wascomb
Signature of Agency Personnel

Susan Kowalski
Signature of Student

Marilyn Kasler
Signature of Faculty Advisor

* Fill out and sign three copies to be distributed as follows:
Original - Student; First Copy - Agency; Third Copy - TWU College
of Nursing.

TEXAS WOMAN'S UNIVERSITY
COLLEGE OF NURSING

172

AGENCY PERMISSION FOR CONDUCTING STUDY

THE _____

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4. The agency is (willing) (unwilling) to allow the complete report to be circulated through interlibrary loan.
5. Other _____

Date: 3/5/94

Marnie H. Manay
Signature of Agency Personnel

Susan Kowalski
Signature of Student

Maisie Kuska
Signature of Faculty Advisor

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TEXAS WOMAN'S UNIVERSITY
COLLEGE OF NURSING

173

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3. The agency (wants) (does not want) a conference with the student when the report is completed.
4. The agency is (willing) (unwilling) to allow the complete report to be circulated through interlibrary loan.
5. Other _____

Date: 03/07/94

Karen Parker Gilgore
Signature of Agency Personnel

Susan Kowalski
Signature of Student

Mavis Kaska
Signature of Faculty Advisor

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of Nursing.

TEXAS WOMAN'S UNIVERSITY
COLLEGE OF NURSING

AGENCY PERMISSION FOR CONDUCTING STUDY

THE _____

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and Nicotine Therapy

The conditions mutually agreed upon are as follows:

1. The agency (may) (may not) be identified in the final report.
2. The names of consultative or administrative personnel in the agency (may) (may not) be identified in the final report.
3. The agency (wants) (does not want) a conference with the student when the report is completed.
4. The agency is (willing) (unwilling) to allow the complete report to be circulated through interlibrary loan.
5. Other _____

Date: 5/11/94 _____
Signature of Agency Personnel

Susan Kowalski _____
Signature of Student Marilyn Kasbek
Signature of Faculty Advisor

* Fill out and sign three copies to be distributed as follows:
Original - Student; First Copy - Agency; Third Copy - TWU College of Nursing.

AGENCY PERMISSION FOR CONDUCTING STUDY

THE Sheppard AFB - Health Promotions Center

GRANTS TO Susan Kowalski, RN, MSN

a student enrolled in a program of nursing leading to a Doctoral Degree at Texas Woman's University, the privilege of its facilities in order to study the following problem:

Predictors of Adherence to Smoking Cessation:
Self-Efficacy, Self-Esteem, Perspective Transformation
and Nicotine Therapy

The conditions mutually agreed upon are as follows:

1. The agency (may) (~~must~~) be identified in the final report.
2. The names of consultative or administrative personnel in the agency (may) (~~must~~) be identified in the final report.
3. The agency (wants) (~~desires~~) a conference with the student when the report is completed.
4. The agency is (willing) (~~able~~) to allow the complete report to be circulated through interlibrary loan.
5. Other _____

Date: 5 May 94

JOSELYN H. THOMPSON, Ph.D.
Health Promotion Manager
Signature of Agency Personnel
920 B Avenue Suite 1
Sheppard AFB, TX 76311-3331

Susan Kowalski
Signature of Student

Marilyn Kashka
Signature of Faculty Advisor

* Fill out and sign three copies to be distributed as follows:
Original - Student; First Copy - Agency; Third Copy - TWU College
of Nursing.

APPENDIX G

Explanation of Study for Participants

EXPLANATION OF STUDY

I am a doctoral student at Texas Woman's University studying why some people are able to give up smoking and stay "smoke-free". The purpose of this research is to study the attitudes which people have about themselves as they quit smoking. The result of this research is important to health care workers in helping others to successfully give up smoking.

This research is a three month study of persons who complete a smoking cessation program. If you choose to participate in this study, you will be asked to complete the following:

At the end of this session:

- 1) a consent form (giving your consent to participate)
- 2) an initial information sheet about yourself
- 3) two short questionnaires
- 4) your name, address, and phone number

At the end of the program:

- 1) one questionnaire
- 2) a progress report on your smoking and whether or not you have been using the nicotine "patch"

At three months after the program is complete:

- 1) I will phone you to ask you about your progress

There is no actual risk to you if you participate in this research study. However, you may become more aware of your attitudes and feelings. This may be very satisfying, or raise slight feelings of anxiety.

Participation in this study is entirely voluntary. If you decide not to participate in this study, it will not affect any of the benefits of your smoking cessation program. You do not need to use the nicotine patch to participate in this study. If you return to smoking I hope you will continue in this study.

Your responses will be kept confidential and seen only by myself. Questionnaires will be coded and the results of the study will be reported anonymously; only grouped responses will be used. Names, addresses, and phone numbers will be locked up separately from the questionnaires and not given to any other person or agency. All data will be filed and destroyed at the end of five years. If you decide to stop participating in the study, your data will be destroyed when you leave the study.

I will be happy to share the results of this study with you, and answer any questions that you may have. Please feel free to contact me at (903) 534-1600. If you have any concerns about the way this research has been conducted, contact the Texas Woman's University Office of Research and Grants Administration at (817) 898-3375. Thank you!

Susan Kowalski
411 Grande Blvd.
Tyler, TX 75703

APPENDIX H

Consent Form Given to Participants

Texas Woman's University
Human Subjects Review Committee

Consent to Act as a Subject for Research and Investigation:

The following information is to be read by the participant. One copy of the form, signed and witnessed, is given to each subject. A second copy is retained by the investigator.

1. I understand that the purpose of this research is to study the attitudes of persons who have made the decision to give up smoking and have attended a smoking cessation program.
2. I hereby authorize Susan Kowalski to perform the following investigation:

I will fill out an information sheet about myself which includes my age, gender, marital status, ethnicity, educational level, income, living environment, smoking history, and if I plan to use the nicotine patch. I will be asked to give my name, address and phone number so that the investigator may contact me. I will complete two questionnaires after my first smoking cessation class. I will complete another questionnaire after I have completed the smoking cessation course. I will be contacted by phone three months after I have completed my course. I will be asked to report my progress with smoking cessation and whether I am using the nicotine patch.

3. The investigation listed above has been explained to me by Susan Kowalski.
4. I understand that the only risks associated with this study is that I may feel a slight anxiety or discomfort while completing the questionnaires. In reporting my progress while giving up smoking, I may feel uncomfortable or guilty if I have not been successful.
5. I understand that a potential personal benefit of this study is that I may become more aware of change in myself as I become a non-smoker. Increased awareness of my attitudes and beliefs about myself may act as further motivation not to smoke.
6. I understand that a potential benefit from this study is that health care workers will gain information about attitudes of smokers as they give up smoking and the effect of the nicotine patch: this will be beneficial in assisting other smokers.

7. The investigator has described to me how my records will be kept confidential, that my responses will be grouped and reported anonymously, and that all records will be destroyed at the end of five years.
8. I understand that participation in this study is voluntary and that I may stop at any time. If I do stop participating in the study my records will be destroyed at that time. I understand that I do not need to use the nicotine patch to participate in this study. If I return to smoking I can still continue in this study.
9. I understand that Texas Woman's University does not provide any medical service or compensation as a result of any injury resulting from participation in research.
10. If I have any questions regarding the study I understand that I may contact the investigator, Susan Kowalski, at (903) 534-1600. If I have any concerns about the way this research has been conducted, I may contact the Texas Woman's University Office of Research and Grants Administration at (817) 898-3375.

Signatures:

(Participant's Signature)

(Date)

(Witness's Signature)

(Date)

APPENDIX I

Instruments Given to Subjects

DEMOGRAPHIC PROFILE

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1. Gender: Female Male
2. Birthdate: / /
3. Ethnicity: Causasian/White Afro-American/Black
 Hispanic American Indian Asian Other
4. Marital Status: single single with partner
 married separated
 divorced widowed
5. Highest Level of Education: (Check highest, only one)
 Less than high school diploma
 High school diploma
 Certification or Technical Training
after high school graduation
 Some college, but no degree
 College Degree
 Graduate School
6. Job Type: Are you employed? yes no
If yes, state job _____
7. Annual gross family income:
 Less than \$10,000
 \$10,001 - \$20,000
 \$20,001 - \$30,000
 \$30,001 - \$40,000
 \$40,001 or more
8. Living Environment:
I live with a smoker: spouse
 significant other
 other household member
I live with a non-smoker: spouse
 significant other
 other household member
I live alone:
9. Number of years that I have smoked:
10. Average packs of cigarettes I smoked per day:
 Less than one pack Two packs
 One pack Two and a half packs
 One and a half packs Three or more packs
11. How many times have you tried to quit before:
12. Do you plan to use the nicotine "patch" during this program?
 yes no undecided

Rosenberg Self-Esteem Scale

Read each statement below and circle the answer that most indicates how you feel about the item. SA = strongly agree. A = agree. D = Disagree. SD = strongly disagree.

- | | | | | |
|---|----|---|---|----|
| (1) On the whole, I am satisfied with myself. | SA | A | D | SD |
| (2) At times I think I am no good at all. | SA | A | D | SD |
| (3) I feel that I have a number of good qualities. | SA | A | D | SD |
| (4) I am able to do things as well as most other people. | SA | A | D | SD |
| (5) I feel I do not have much to be proud of. | SA | A | D | SD |
| (6) I certainly feel useless at times. | SA | A | D | SD |
| (7) I feel that I am a person of worth, at least on an equal plane with others. | SA | A | D | SD |
| (8) I wish I could have more respect for myself. | SA | A | D | SD |
| (9) All in all, I am inclined to feel that I am a failure. | SA | A | D | SD |
| (10) I take a positive attitude toward myself. | SA | A | D | SD |

Self-Efficacy Scale

Please read the following statements. Circle one number next to each statement that shows how much you agree or disagree with that statement.

Answer Code: 1 = Strongly disagree
 2 = Moderately disagree
 3 = Slightly disagree
 4 = Slightly Agree
 5 = Moderately Agree
 6 = Strongly Agree

1. My confidence in myself to quit smoking is based on my past performance in changing other behaviors. 1 2 3 4 5 6
2. Quitting smoking will boost confidence in myself 1 2 3 4 5 6
3. I am confident that I can learn techniques that will help me avoid smoking 1 2 3 4 5 6
4. I am enthusiastic about this program and believe I will be able to quit smoking. 1 2 3 4 5 6
5. When I think I need a cigarette, I believe I'll be able to talk myself out of it 1 2 3 4 5 6
6. I expect that I will be able to stay away from cigarettes for the rest of my life after this program has ended. 1 2 3 4 5 6
7. I expect to gain many positive rewards if I quit smoking. 1 2 3 4 5 6
8. My failed attempts to quit smoking in the past will not affect or influence my ability to quit this time. 1 2 3 4 5 6
9. I am confident that I will not start smoking in the future. 1 2 3 4 5 6
10. I can look forward to the time when I won't even want a cigarette. 1 2 3 4 5 6
11. I am capable of quitting smoking. 1 2 3 4 5 6
12. I am confident I can quit smoking this time. 1 2 3 4 5 6

Code # _____

ADAPTED, REVISED MARSH REVELATION SCALE

DIRECTIONS: Please indicate how much you agree or disagree with each of the items below by circling the number that best describes your feelings or experience. The numbers 1 - 5 refer to the following answers:

- 1 strongly disagree
- 2 disagree
- 3 unsure
- 4 agree
- 5 strongly agree

Only circle "3" if you absolutely cannot choose between agree or disagree.

Example: **WHILE I STOPPED SMOKING**, life became more meaningful to me:

1 2 3 4 ⑤

If life became much more meaningful to you as you stopped smoking, you would circle "5" for strongly agree. Please continue with the following items. Always precede the statement with the stem, "WHILE I STOPPED SMOKING _ "

Answer Code:

- 1 strongly disagree
- 2 disagree
- 3 unsure
- 4 agree
- 5 strongly agree

WHILE I STOPPED SMOKING:

- | | | | | | |
|--|---|---|---|---|---|
| 1. I remained exactly the same person that I used to be: | 1 | 2 | 3 | 4 | 5 |
| 2. I liked myself more: | 1 | 2 | 3 | 4 | 5 |
| 3. I had no experience which changed my view of life: | 1 | 2 | 3 | 4 | 5 |
| 4. I felt unchained and free: | 1 | 2 | 3 | 4 | 5 |
| 5. I found my goals and values changing: | 1 | 2 | 3 | 4 | 5 |
| 6. I realized that I didn't have to feel anguish: | 1 | 2 | 3 | 4 | 5 |
| 7. I had a spiritual awakening: | 1 | 2 | 3 | 4 | 5 |
| 8. I made personally satisfying decisions: | 1 | 2 | 3 | 4 | 5 |
| 9. I had no special religious or spiritual experience: | 1 | 2 | 3 | 4 | 5 |

WHILE I STOPPED SMOKING:

- | | | | | | |
|---|---|---|---|---|---|
| 10. I found my behavior matching my thoughts & values: | 1 | 2 | 3 | 4 | 5 |
| 11. I had an experience of significant internal personal growth: | 1 | 2 | 3 | 4 | 5 |
| 12. I was in control of my behavior: | 1 | 2 | 3 | 4 | 5 |
| 13. I had no experience which filled me with awe: | 1 | 2 | 3 | 4 | 5 |
| 14. I had an experience which left me feeling optimistic about my future: | 1 | 2 | 3 | 4 | 5 |
| 15. I felt a need to move on with my life: | 1 | 2 | 3 | 4 | 5 |

Answer Code: 1 strongly disagree
 2 disagree
 3 unsure
 4 agree
 5 strongly agree

WHILE I STOPPED SMOKING:

- | | | | | | |
|--|---|---|---|---|---|
| 16. I experienced a new way of knowing: | 1 | 2 | 3 | 4 | 5 |
| 17. I realized I was part of a larger plan: | 1 | 2 | 3 | 4 | 5 |
| 18. I experienced all the pieces falling into place: | 1 | 2 | 3 | 4 | 5 |
| 19. I maintained a heightened awareness of my behavior for some time: | 1 | 2 | 3 | 4 | 5 |
| 20. I felt comfortable with myself and my behavior: | 1 | 2 | 3 | 4 | 5 |
| 21. I made a decision that immediately gave me a sense of tranquility: | 1 | 2 | 3 | 4 | 5 |
| 22. I wanted to run away from conflict with others people: | 1 | 2 | 3 | 4 | 5 |
| 23. I saw a new angle to everything: | 1 | 2 | 3 | 4 | 5 |

WHILE I STOPPED SMOKING:

- | | | | | | |
|--|---|---|---|---|---|
| 24. I had an experience from which I emerged as a new person: | 1 | 2 | 3 | 4 | 5 |
| 25. I had kept my same priorities: | 1 | 2 | 3 | 4 | 5 |
| 26. I realized that my habits were like an illness,
and therefore I could do little to change them: | 1 | 2 | 3 | 4 | 5 |
| 27. I experienced becoming a different person: | 1 | 2 | 3 | 4 | 5 |
| 28. I had a sense of impending discovery: | 1 | 2 | 3 | 4 | 5 |
| 29. I had an experience in which I had no fear about anything: | 1 | 2 | 3 | 4 | 5 |
| 30. I practiced the lifestyle I wanted to have: | 1 | 2 | 3 | 4 | 5 |
| 31. I had a great insight: | 1 | 2 | 3 | 4 | 5 |

WHILE I STOPPED SMOKING:

- | | | | | | |
|---|---|---|---|---|---|
| 32. I had an experience that left an afterglow of peacefulness
and calmness: | 1 | 2 | 3 | 4 | 5 |
| 33. I led others toward change: | 1 | 2 | 3 | 4 | 5 |
| 34. I felt challenged and excited, despite a degree of sadness and loss: | 1 | 2 | 3 | 4 | 5 |
| 35. I remember this experience as if it happened yesterday: | 1 | 2 | 3 | 4 | 5 |
| 36. I had a new sense of personal identity: | 1 | 2 | 3 | 4 | 5 |
| 37. I suddenly "saw the light": | 1 | 2 | 3 | 4 | 5 |
| 38. I wanted to tell everyone about my special experience: | 1 | 2 | 3 | 4 | 5 |
| 39. I had an experience in which time seemed to expand: | 1 | 2 | 3 | 4 | 5 |
| 40. I formed new more personally satisfying relationships: | 1 | 2 | 3 | 4 | 5 |

Answer Code: 1 strongly disagree
 2 disagree
 3 unsure
 4 agree
 5 strongly agree

WHILE I STOPPED SMOKING:

41. I experienced a new view of reality:	1	2	3	4	5
42. I gained inner strength:	1	2	3	4	5
43. I had an intensely positive experience:	1	2	3	4	5
44. I felt related to the world around me:	1	2	3	4	5
45. I had an insight about myself which words cannot express:	1	2	3	4	5
46. I felt revitalized and strong:	1	2	3	4	5
47. I experienced myself in a new way:	1	2	3	4	5

WHILE I STOPPED SMOKING:

48. I experienced a oneness of myself and all things:	1	2	3	4	5
49. I gained a new sense of self-responsibility:	1	2	3	4	5
50. I felt more assured and confident:	1	2	3	4	5
51. I knew I would succeed at my goals:	1	2	3	4	5
52. I became more receptive to life:	1	2	3	4	5
53. I experienced nothing suddenly changed within myself:	1	2	3	4	5
54. I had an experience of suddenly "leaping ahead":	1	2	3	4	5
55. I realized that I would never change:	1	2	3	4	5

WHILE I STOPPED SMOKING:

56. I began to view myself in a new way:	1	2	3	4	5
57. I had an experience of being apart yet very together with life:	1	2	3	4	5
58. I had an "ah, ha!" experience:	1	2	3	4	5
59. Life became more meaningful to me:	1	2	3	4	5
60. I suddenly understood things about myself that were previously unclear:	1	2	3	4	5
61. I had an experience in which time seemed nonexistent:	1	2	3	4	5
62. I discovered more alternatives and opportunities for choices:	1	2	3	4	5

Please double check that you circled an answer for each question.

Code Number _____

PROGRESS REPORT

SMOKING/NON-SMOKING

1. Are you smoking now?
_____ no (zero cigarettes)
_____ yes

Answer questions #2, #3, and #4 only if answered "Yes".

2. How many cigarettes approximately have you smoked in
last two weeks? _____
3. Do you feel that this is a temporary "slip"?
_____ yes _____ no
4. Have you decided to quit trying to give up smoking?
_____ yes _____ no

USE/NON-USE OF NICOTINE PATCH

5. Have you been wearing the nicotine patch?
_____ no _____ yes

If "yes" please describe the dosage(s) and length of time
for each dosage:

APPENDIX J

Results of Exploratory Data Analysis

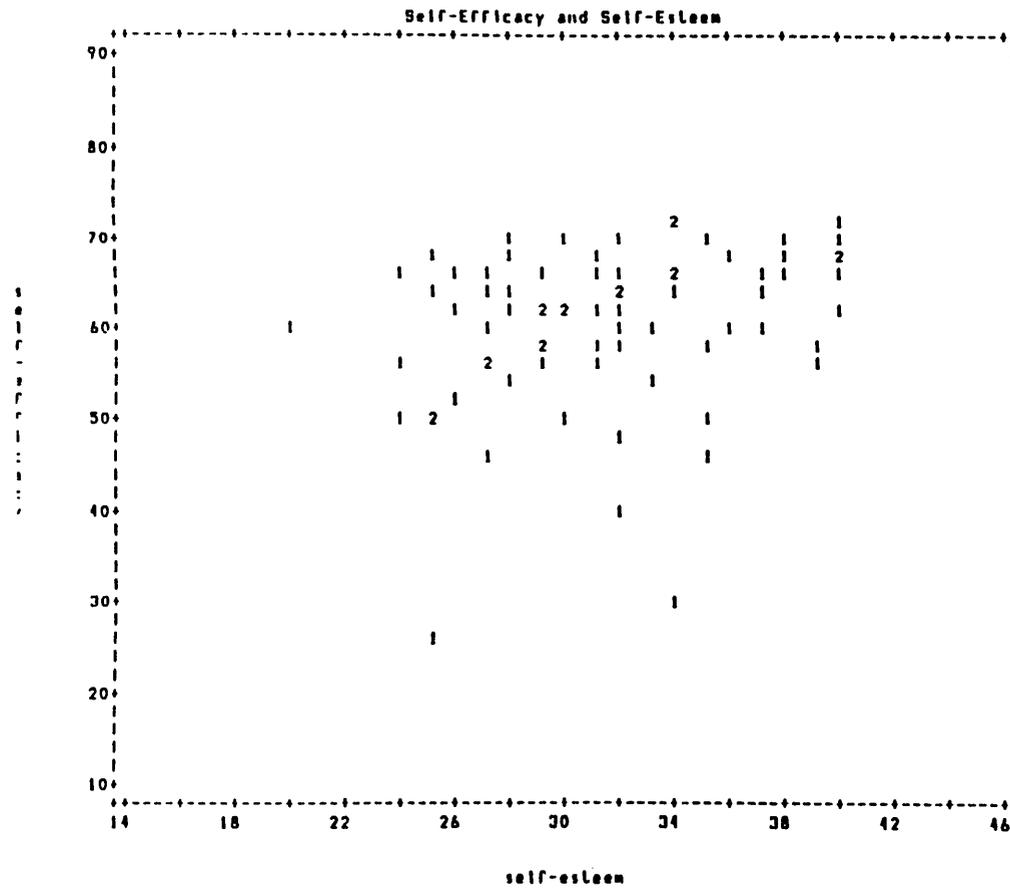


Figure 5.
Scatterplot of self-efficacy (vertical) with self-esteem (horizontal).

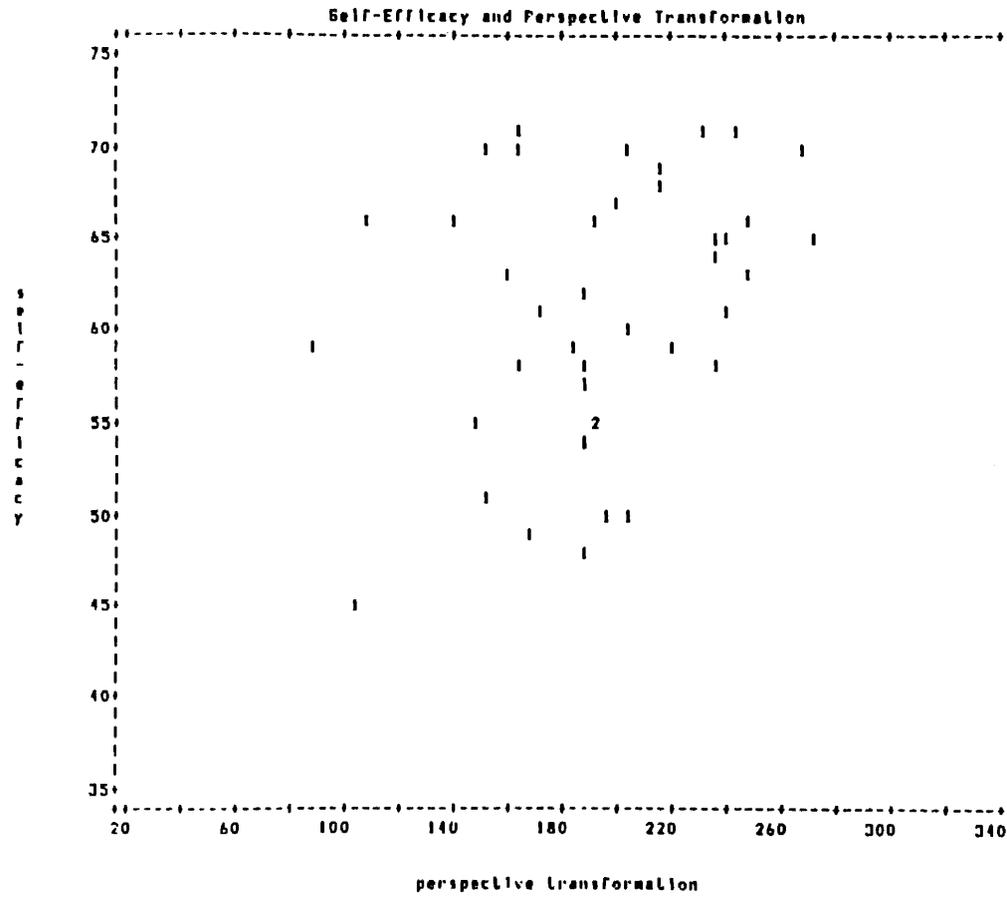


Figure 6.

Scatterplot of self-efficacy (vertical) plotted with perspective transformation (horizontal).

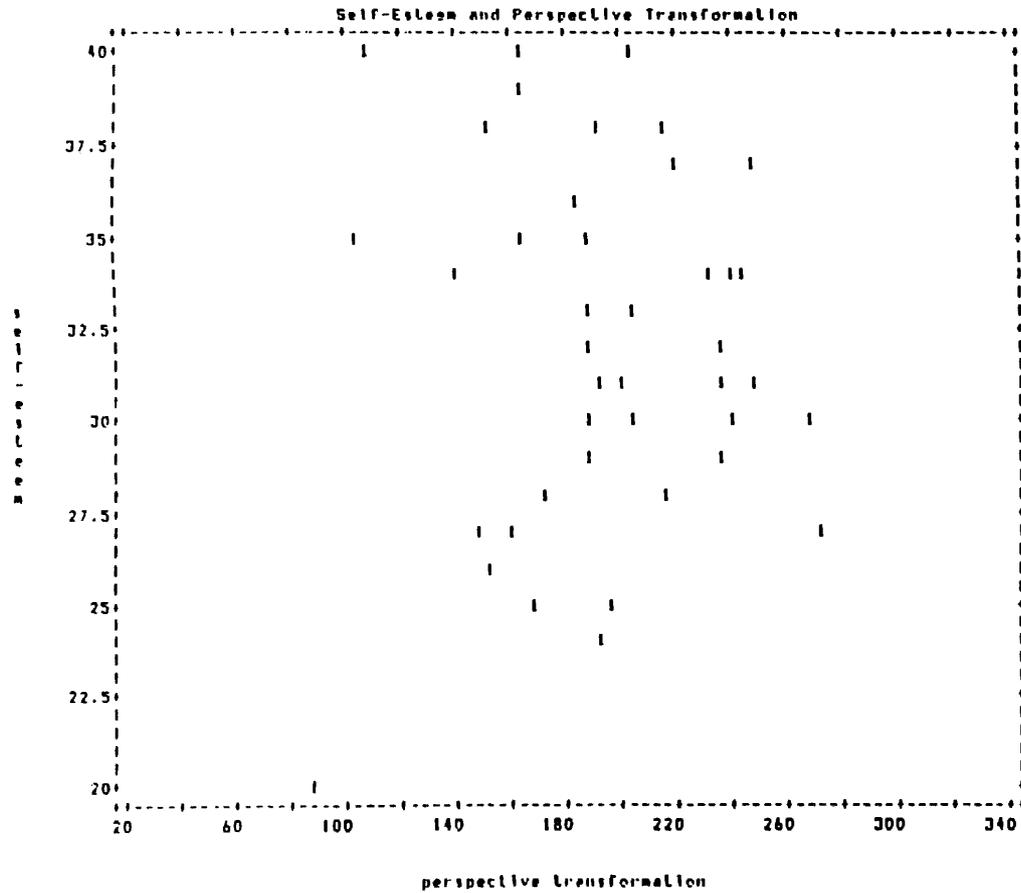


Figure 7.
 Scatterplot of self-esteem (vertical) with perspective transformation
 (horizontal).

Casewise Plot of Standardized Residual

*: Selected M: Missing

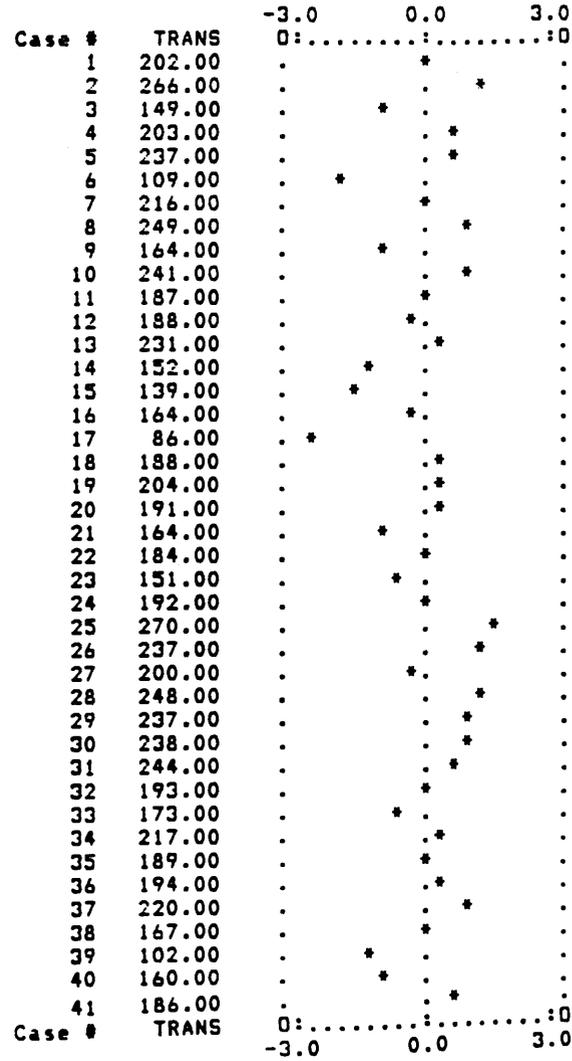


Figure 8.

Standardized Residuals: Prediction of perspective transformation by self-efficacy and self-esteem.

TRANS	*PRED	*RESID	*SRESID	*SDRESID
202.00	205.0776	-3.0776	-.0788	-.0778
266.00	216.0967	49.9033	1.2684	1.2789
149.00	184.5480	-35.5480	-.8893	-.8868
203.00	169.6241	33.3759	.8484	.8453
237.00	205.5805	31.4195	.7839	.7799
109.00	195.7831	-86.7831	-2.2118	-2.3382
216.00	215.9769	.0231	.0006	.0006
249.00	205.7003	43.2997	1.0748	1.0771
164.00	207.4013	-43.4013	-1.1152	-1.1189
241.00	200.0709	40.9291	1.0108	1.0111
187.00	180.3800	6.6200	.1654	.1633
188.00	197.5077	-9.5077	-.2346	-.2317
231.00	214.0127	16.9873	.4282	.4236
152.00	207.2815	-55.2815	-1.3985	-1.4169
139.00	202.3946	-63.3946	-1.5685	-1.6004
164.00	178.2959	-14.2959	-.3676	-.3633
86.00	201.5559	-115.5559	-3.1213	-3.5717
188.00	175.6129	12.3871	.3105	.3067
204.00	189.5547	14.4453	.3558	.3517
191.00	180.1403	10.8597	.2698	.2665
164.00	210.5872	-46.5872	-1.1686	-1.1745
184.00	183.9253	.0747	.0019	.0018
151.00	176.3554	-25.3554	-.6450	-.6400
192.00	187.8537	4.1463	.1058	.1044
270.00	207.7843	62.2157	1.5737	1.6060
237.00	187.1112	49.8888	1.2301	1.2388
200.00	208.0239	-8.0239	-.1999	-.1974
248.00	192.1179	55.8821	1.3937	1.4118
237.00	199.9511	37.0489	.9133	.9113
238.00	195.1840	42.8160	1.0557	1.0573
244.00	214.0127	29.9873	.7559	.7516
193.00	197.9869	-4.9869	-.1251	-.1235
173.00	197.3879	-24.3879	-.6060	-.6009
217.00	202.6342	14.3658	.3615	.3573
189.00	189.3151	-.3151	-.0078	-.0077
194.00	175.1336	18.8664	.4845	.4796
220.00	182.8234	37.1766	.9345	.9329
167.00	172.8100	-5.8100	-.1499	-.1480
102.00	152.4964	-50.4964	-1.3901	-1.4080
160.00	203.1370	-43.1370	-1.0833	-1.0858
186.00	162.7730	23.2270	.6033	.5982
TRANS	*PRED	*RESID	*SRESID	*SDRESID

Figure 9.

Predicted values, residuals, and standarized residuals of perspective transformation by self-efficacy and self-esteem.

Outliers - Standardized Residual

Case #	TRANS	*ZRESID
17	86.00	-2.80709
6	109.00	-2.10814
15	139.00	-1.53998
25	270.00	1.51135
28	248.00	1.35749
14	152.00	-1.34290
39	102.00	-1.22666
2	266.00	1.21225
26	237.00	1.21190
21	164.00	-1.13170

Histogram - Standardized Residual

NExp N (* = 1 Cases, . : = Normal Curve)

0	.03	Out	
0	.06	3.00	
0	.16	2.67	
0	.37	2.33	
0	.75	2.00	.
1	1.37	1.67	:
3	2.25	1.33	***
5	3.31	1.00	***:**
4	4.35	.67	***:
6	5.14	.33	****:**
8	5.43	.00	****:***
3	5.14	-.33	*** .
2	4.35	-.67	** .
4	3.31	-1.00	**:**
2	2.25	-1.33	**:
1	1.37	-1.67	:
1	.75	-2.00	:
0	.37	-2.33	
1	.16	-2.67	*
0	.06	-3.00	
0	.03	Out	

Figure 10.

Outliers and histogram of standardized residuals:

Prediction of perspective transformation by self-efficacy and self-esteem.

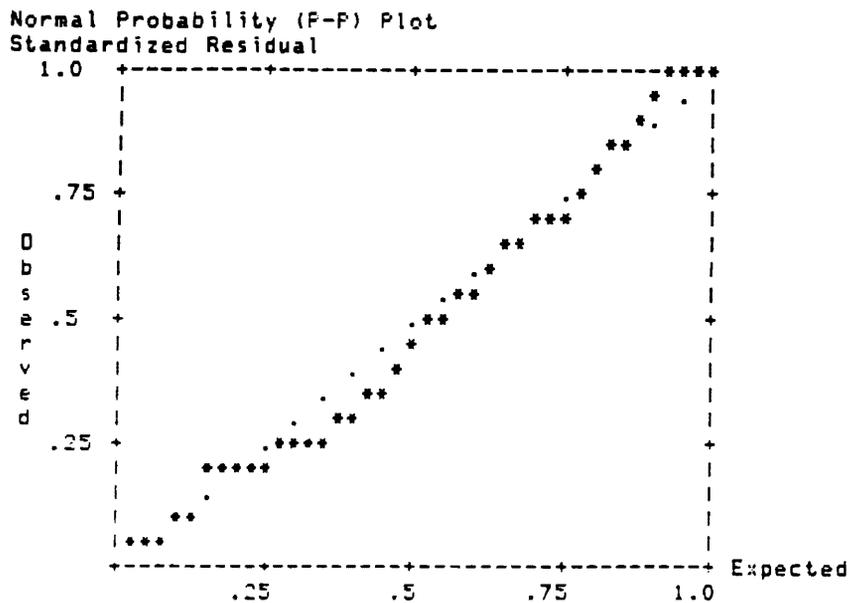
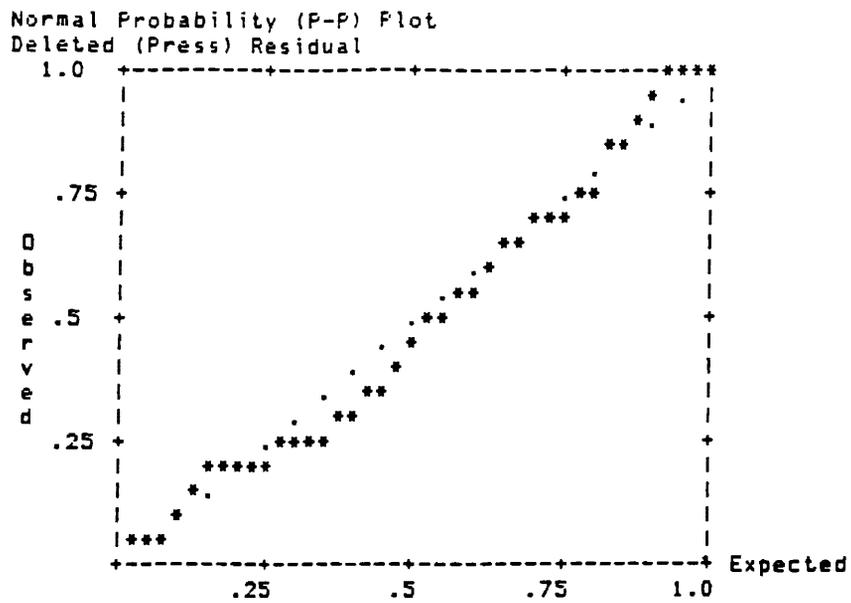


Figure 11.

Plot: Residuals (top) and standardized residuals (bottom) from predicted values of perspective transformation by self-efficacy and self-esteem.

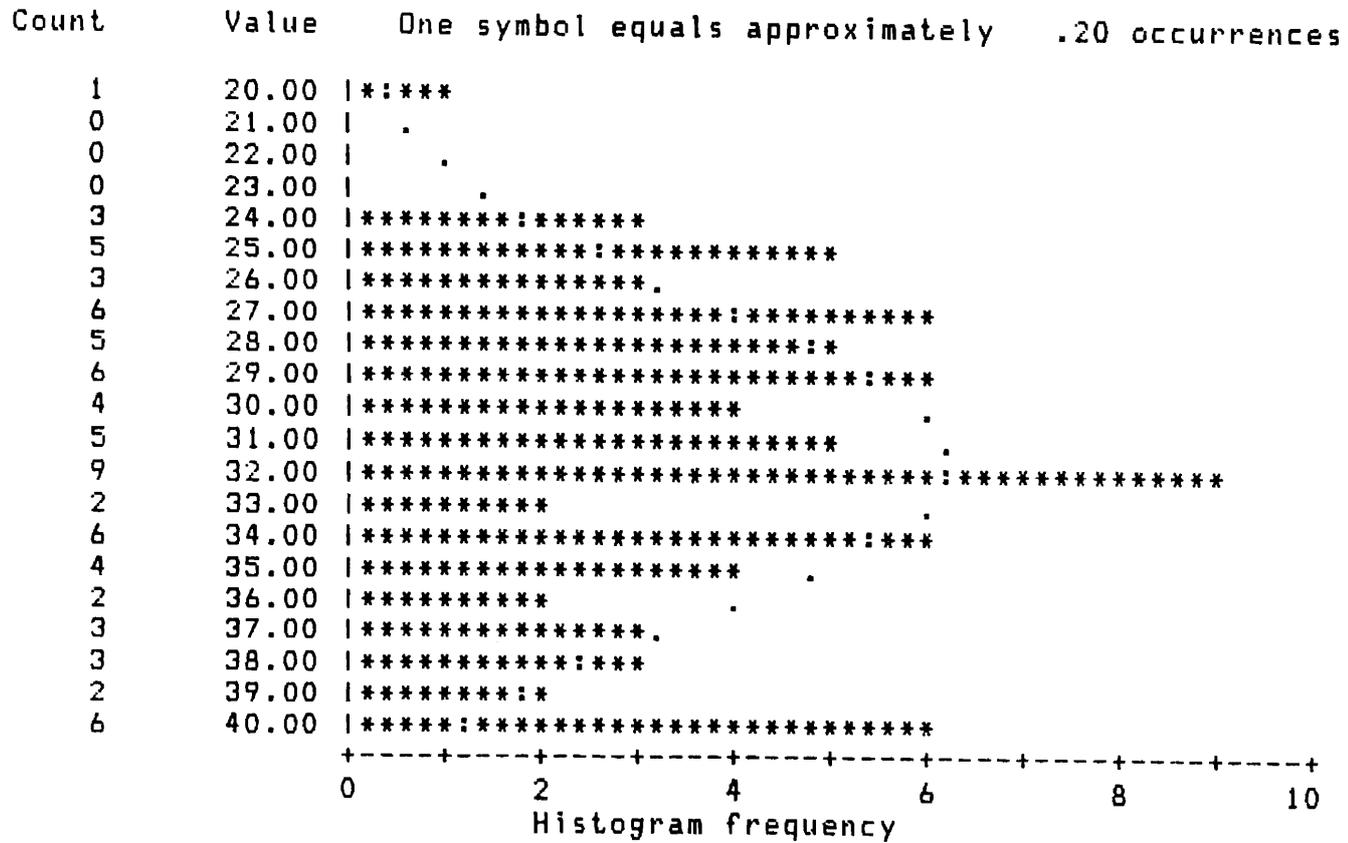


Figure 13.

Histogram of actual self-esteem values.

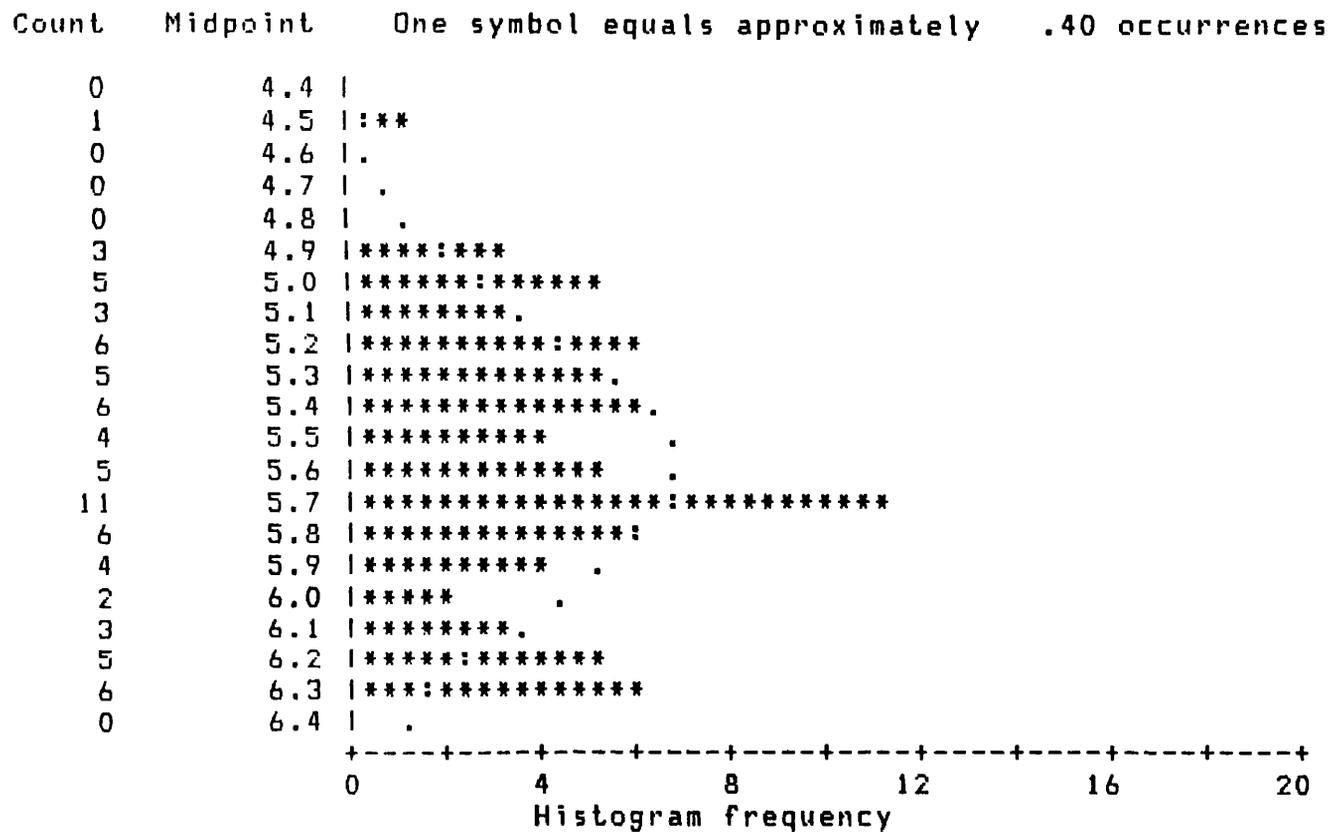


Figure 14.

Histogram of squared self-esteem values.

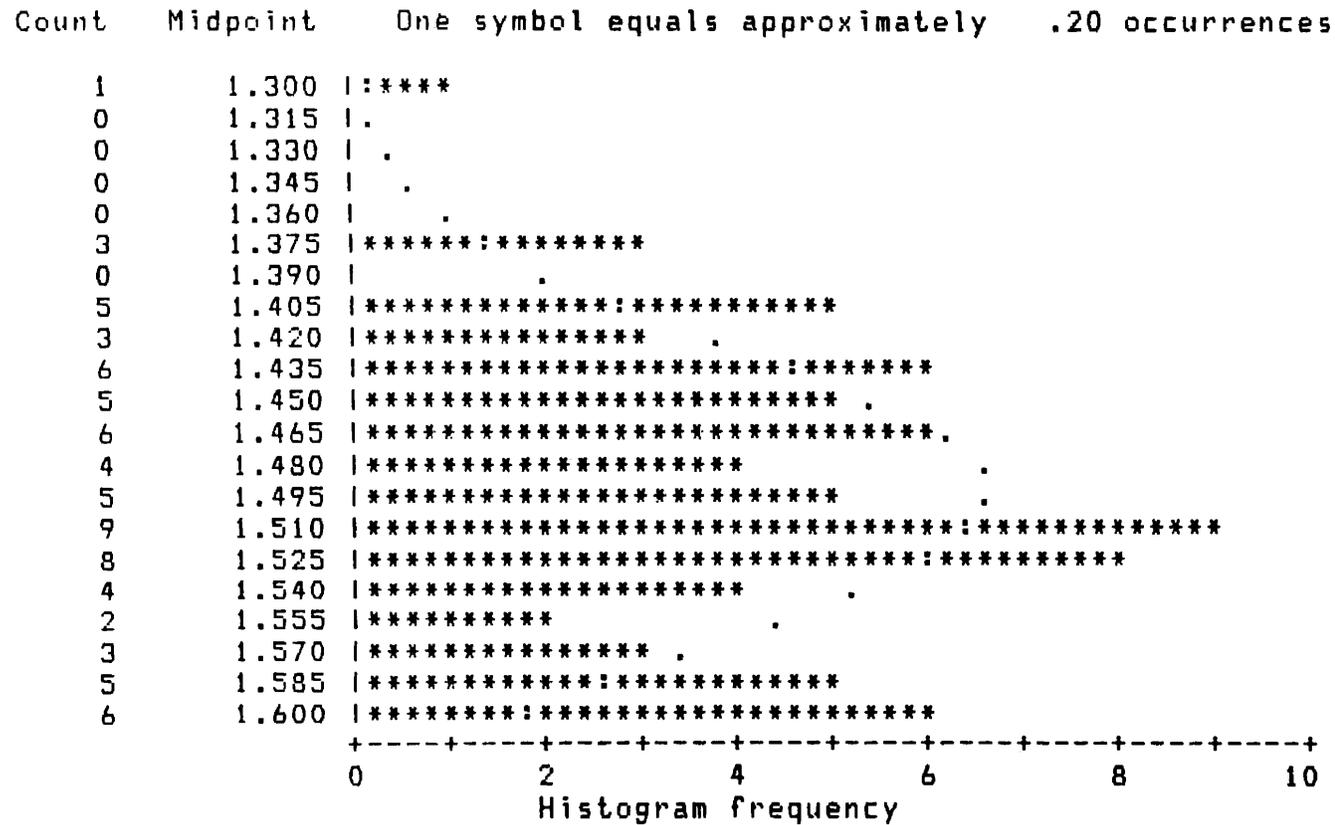


Figure 15.

Histogram of self-esteem values taken to Log¹⁰.

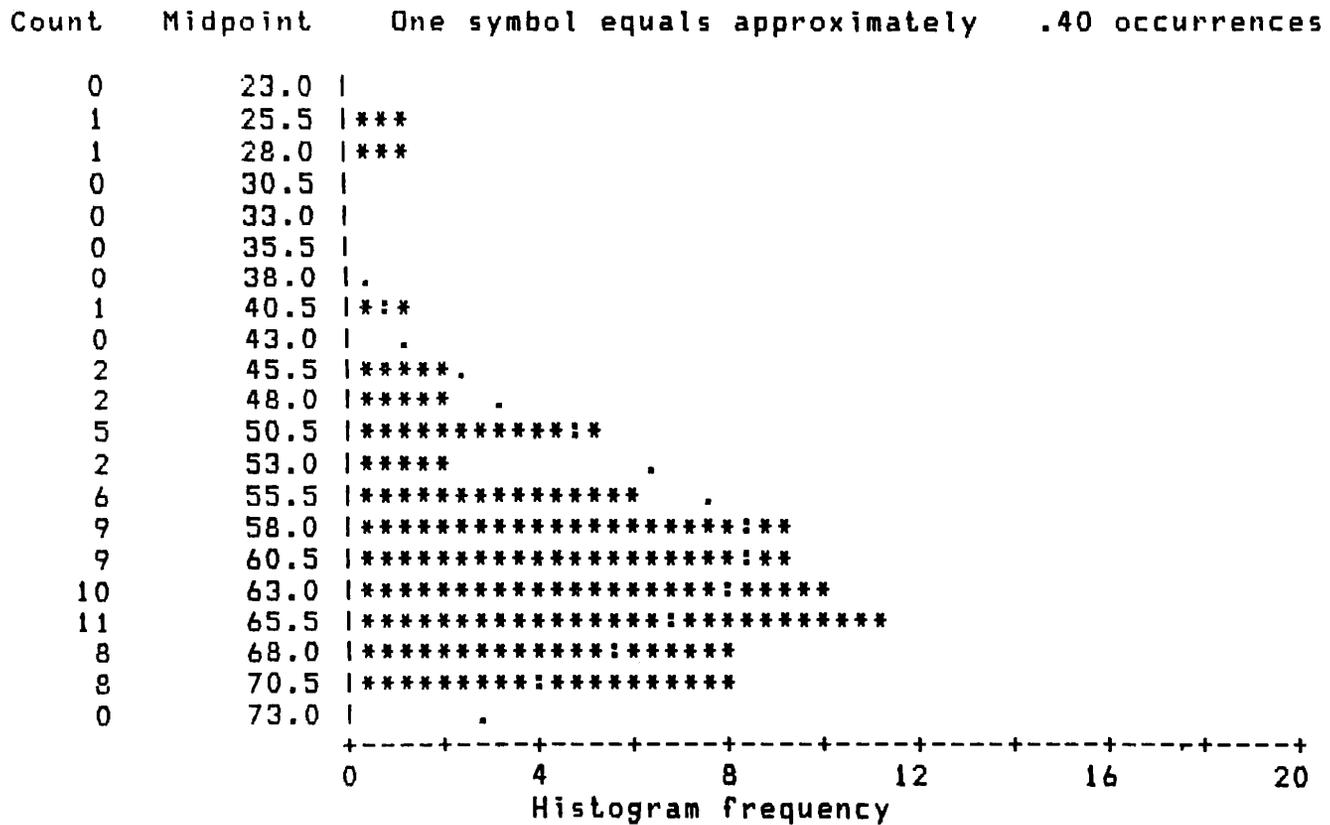


Figure 16.

Histogram of actual self-efficacy values.

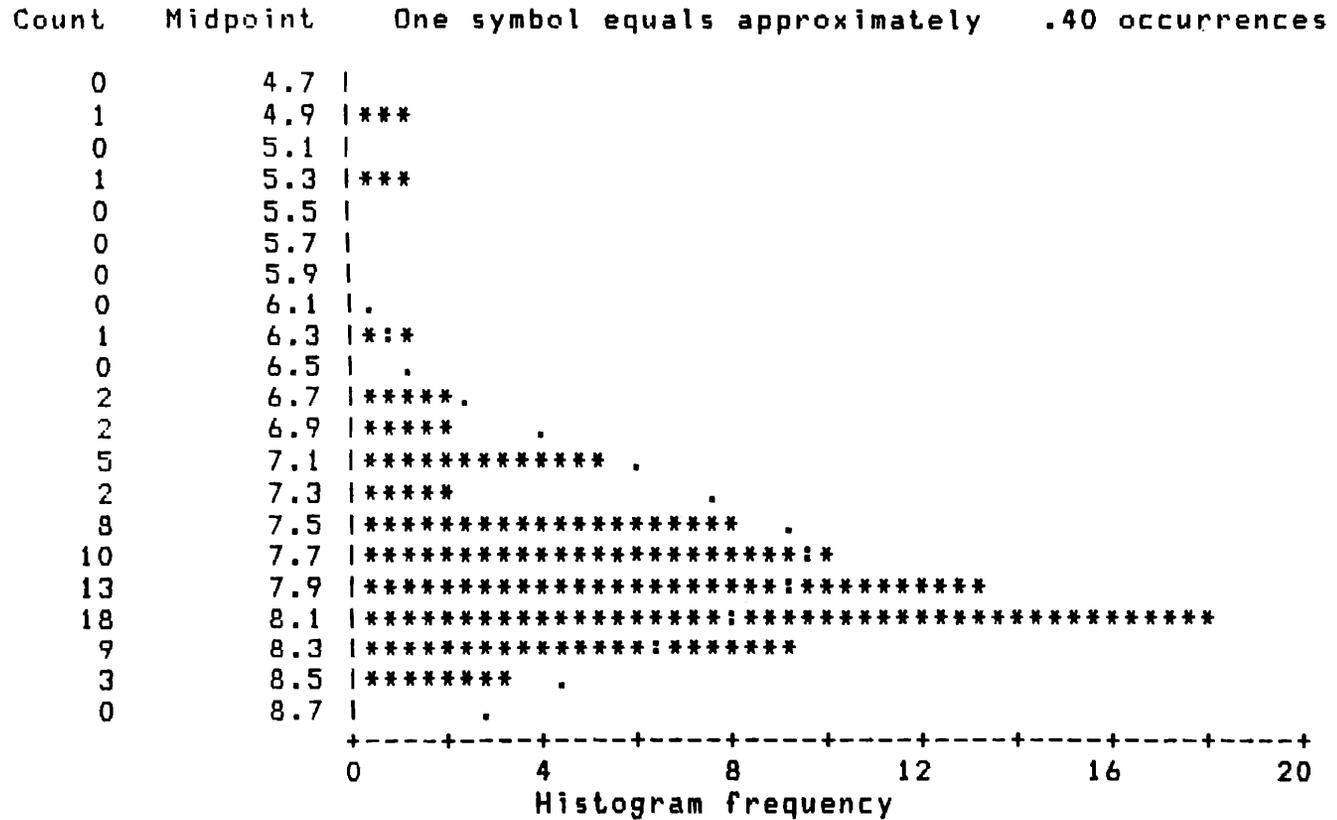


Figure 17.

Histogram of squared self-efficacy values.

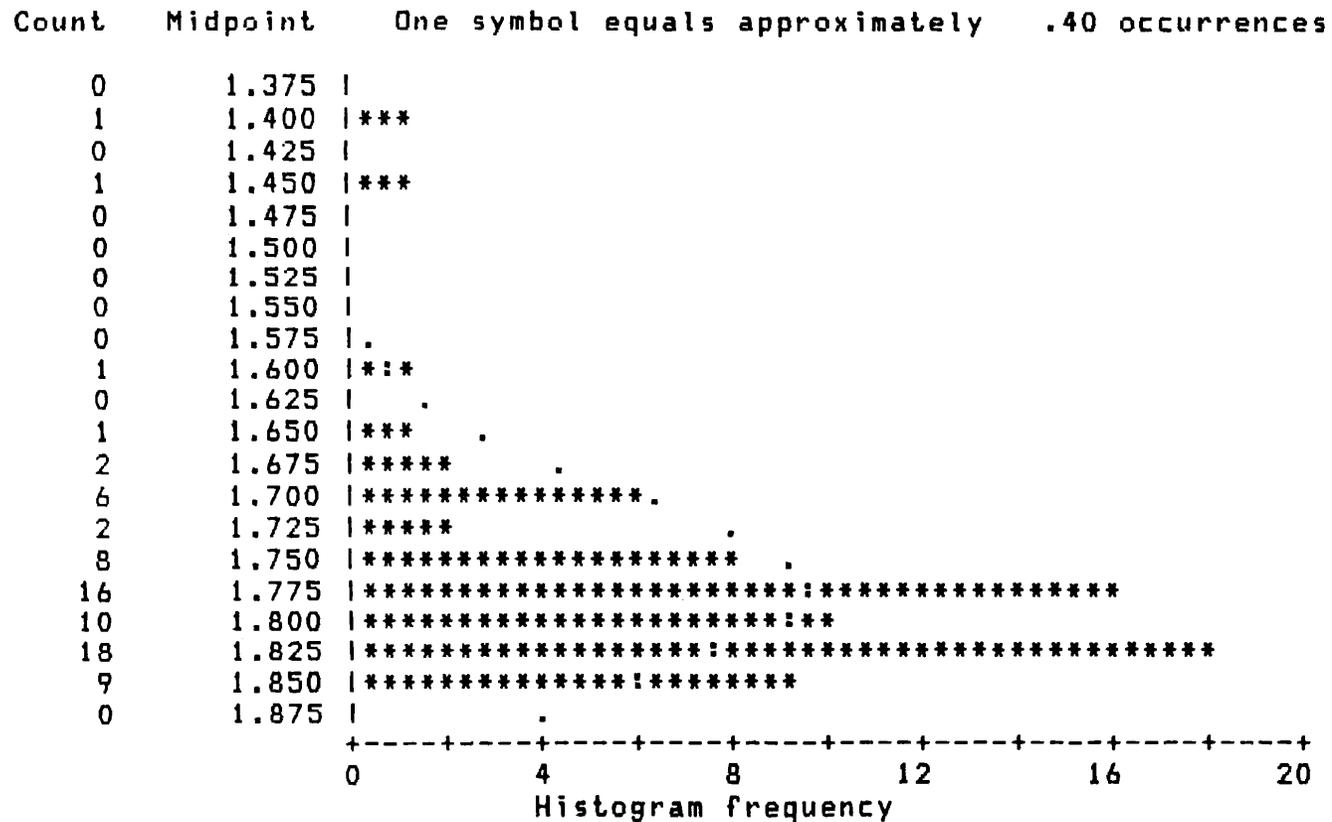


Figure 18.

Histogram of self-efficacy values taken to Log¹⁰