AN ABSTRACT OF THE THESIS OF


Abstract Approved: Redacted for Privacy

Rebecca J. Donatelle

Cigarette smoking continues to be one of the country's major health concerns. It has been defined as the single largest preventable cause of disease and death in the United States. Although research has indicated that overall cigarette consumption has decreased in the nation over the past decades, cigarette smoking remains a significant problem among young people in the United States. This fact, coupled with studies indicating that cigarette smoking increases with age into the early twenties suggests that research should be conducted to determine those variables that encourage smoking behavior of late adolescents and young adults.

The purpose of the study was to compare the relationship between selected predisposing factors and subsequent smoking behaviors exhibited in 1963 and 1987 respectively. Assessments of smoking behaviors of college students in Oregon in 1963-64 and 1986-87 were conducted to determine relationships between students smoking behaviors and selected socio-demographic variables. Comparisons were made between the resulting data for students in the 1963-64 and 1986-87 studies.

A questionnaire relating to smoking behavior was developed and administered to 3,786 college students attending introductory personal
health classes during the 1963-64 school year at four selected colleges in
the state of Oregon. During the 1986-87 school year a modified version of
the questionnaire was developed and administered to college students
attending introductory personal health classes at three of the same four
universities that were utilized in the 1963-64 study. Stepwise logistic
regression, chi square and descriptive statistics were used to analyze the
data.

Results indicated that there were significantly more smokers in
1963-64 and their daily consumption rates were significantly higher when
compared to 1986-87 data. Although a larger percentage of females were
smokers in the total population surveyed in 1963-64, there were more
female smokers in the population of smokers in 1986-87. Whereas males
consumed significantly more cigarettes per day than did females in
1963-64, there was no significant difference between male and female
consumption rates in 1986-87. Significant numbers of smokers in 1986-87
started smoking at an earlier age than did smokers in 1963-64. When
separating by gender, this was significant for females but not for males.

Peer smoking was listed as the number one reason for starting to
smoke by more than half of the respondents in 1986-87 as compared to 40%
who listed curiosity in 1963-64. Physical reasons were indicated as the
main reason for quitting by ex-smokers in 1963-64 and in 1986-87, over
one half of the respondents indicated that they quit because of a concern for
their physical health.

Stepwise logistic regression equations were used to determine the set
of variables that best accounted for smoking status in 1963-64 and
1986-87. Results indicated that the variables which predisposed
individuals toward subsequent smoking behavior did differ when comparing the two studies. In 1963-64, an individual with the highest probability of smoking was one who had one or more older sisters who smoked, both parents smoked, father was a high school non-graduate and was from an urban setting. The individual with the lowest probability of smoking in 1963-64 had no older sisters who smoked, mother and father did not smoke, father was a high school graduate and lived in a rural setting. In 1986-87, the only variable to significantly increase the probability of an individual smoking was one or more older brothers who smoked.

The following data were collected only for the 1986-87 population of students because questions relating to these issues were not included on the 1963-64 questionnaire.

Use of alcohol, marijuana and smokeless tobacco by cigarette smokers was not significantly different when compared to non-smokers. Illicit substance use (cocaine, crack, heroin, quaaludes, etc) was significantly different for cigarette smokers and non-smokers. Smokers were more likely to use illicit substances than were non-smokers.

The largest number of smokeless tobacco users were males in the 18-19 age category. Use of alcohol, marijuana and other illicit substances were significantly different for smokeless tobacco users than for non-users. Smokeless tobacco users were more likely to consume more alcohol on a weekly basis and use marijuana and illicit substances on an occasional and regular basis than were non-users of smokeless tobacco.
A COMPARATIVE ANALYSIS OF FACTORS INFLUENCING SMOKING BEHAVIORS OF COLLEGE STUDENTS: 1963 - 1987

by

Nancy L. Gray

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Date thesis is presented  April 28, 1987
Typed by researcher for  Nancy L. Gray
DEDICATION

I dedicate this thesis to my mother, for it is from her that I learned that no matter the circumstances that surround the day, it is ours to mold - we make the best of what we have, and yet, not merely settle for anything less than what we know to be within our reach.

I also dedicate this thesis to the memories of my father and step-father; one gave me life and the other provided me with a special appreciation for life and the way in which it can be lived.
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I would like to thank Dr. Tom Grigsby, for whom I have a great deal of respect. His guidance and genuine concern for students was refreshing, as was his sense of humor. Dr. Roberta Hall's interest in my research was sincerely appreciated. Her suggestions and contributions definitely assisted in the successful completion of the project. I would also like to thank Dr. Jake Nice. His time, efforts and thought-provoking input proved to be very helpful and constructive. A heartfelt thank you is extended to Dr. Robert Houston for agreeing to serve on my committee at the last minute. His time and willingness to assist in the process were gratefully acknowledged. Last, but not least, I would like to thank Dr. Gordon Anderson. This study would not have been possible if it were not for Dr. Anderson's 1960's study and his suggestion that I use the data that had been in storage for more than 20 years.

I am grateful to Susie Maresh and Telly Adera for their generously given time and remarkable patience with my seemingly never-ending questions. I no doubt owe them a year's worth of lunches or dinners....or both!
On a more personal note, I would like to thank my family for their encouragement and support that only a family can provide. I would especially like to thank my mother. I consider myself very blessed to have the woman for a mother. I thank her for instilling in me a feeling of responsibility to myself and to others and for encouraging me to have a desire to learn. My sister, who is one of my best friends, also deserves a sincere thank you. Her support is very important to me. My respect for her as a person and her accomplishments have served as a primary motivator for me over the years..........(now can I borrow your clothes?).

I also want to thank my good friends for their support during the past several years. Thanks to Bruce and Candy for their "affordable" personalized computer service at all hours of the day and night and to Denise and Wendy for nights out that proved to be a welcome change of scenery. My roommate, Carla, deserves many thanks for her patience and understanding when I was no doubt difficult to tolerate. I am thankful that she was an expert proof-reader and grateful that she did not throw my computer printer out the window when it was running noisily at 5:00 A.M. Seriously - thank you, you made it a great deal easier for me than it might have been.
TABLE OF CONTENTS

CHAPTER I: INTRODUCTION 1

Statement of the Problem 2
Purpose of the Study 3
Objectives of the Study 4
Hypotheses 5
Definition of Terms 5

CHAPTER II: REVIEW OF THE LITERATURE 9

Introduction 9
Cigarettes and Their Major Risk Factors 11
Physical Costs to Others 17
Consumption Patterns: 1960's vs 1980's 20
Psychosocial Characteristics of Smokers: 1960's 23
Psychosocial Influences on Smoking Behavior: 1980's 27
Smoking Prevention/Cessation Programs for Adolescents & Young Adults 34

CHAPTER III: METHODS AND PROCEDURES 38

Subjects 38
1963-64 Questionnaire 39
1986-87 Questionnaire 40
Data Collection 41
Analysis of Data 42
Summary 43

CHAPTER IV: RESULTS AND DISCUSSION 44

Description of the Subjects: 1963-64/1986-87 44
Smoking Behaviors of the Subjects: 1963-64/1986-87 45
Smoking Cessation: 1963-64/1986-87 52
Findings Related to Major Hypotheses 54
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discussion of the Predictor Variables</td>
<td>62</td>
</tr>
<tr>
<td>Additional Descriptive Characteristics of Smokers: 1986-87</td>
<td>68</td>
</tr>
<tr>
<td>Smokeless Tobacco Use</td>
<td>74</td>
</tr>
<tr>
<td>Smokeless Tobacco and Other Substance Use</td>
<td>76</td>
</tr>
<tr>
<td>CHAPTER V: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS</td>
<td>81</td>
</tr>
<tr>
<td>Summary of the Study</td>
<td>81</td>
</tr>
<tr>
<td>Hypotheses of the Study</td>
<td>83</td>
</tr>
<tr>
<td>Conclusions</td>
<td>84</td>
</tr>
<tr>
<td>Recommendations</td>
<td>87</td>
</tr>
<tr>
<td>BIBLIOGRAPHY</td>
<td>90</td>
</tr>
<tr>
<td>APPENDIX A: 1963-64 Smoking Behavior Questionnaire</td>
<td>99</td>
</tr>
<tr>
<td>APPENDIX B: 1986-87 Smoking Behavior Questionnaire</td>
<td>104</td>
</tr>
<tr>
<td>APPENDIX C: INSTRUCTIONS READ PRIOR TO ADMINISTRATION OF 1986-87</td>
<td>112</td>
</tr>
<tr>
<td>QUESTIONNAIRE</td>
<td></td>
</tr>
</tbody>
</table>
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-1</td>
<td>Sex and Age of Regular Smokers: 1963-64/1986-87</td>
<td>46</td>
</tr>
<tr>
<td>4-2</td>
<td>Smoking Status of the Respondents: 1963-64/1986-87</td>
<td>47</td>
</tr>
<tr>
<td>4-3</td>
<td>Grade Level in School When Started to Smoke: 1963-64/1986-87</td>
<td>48</td>
</tr>
<tr>
<td>4-4</td>
<td>Chi Square Comparison of Grade in School When Started Smoking by Males and Females: 1963-64/1986-87</td>
<td>49</td>
</tr>
<tr>
<td>4-5</td>
<td>Reasons for Starting to Smoke: 1963-64</td>
<td>49</td>
</tr>
<tr>
<td>4-6</td>
<td>Reasons for Starting to Smoke: 1986-87</td>
<td>50</td>
</tr>
<tr>
<td>4-7</td>
<td>Average Daily Cigarette Consumption: 1963-64/1986-87</td>
<td>51</td>
</tr>
<tr>
<td>4-8</td>
<td>Chi Square Comparison of Average Daily Cigarette Consumption by Smokers: 1963-64/1986-87</td>
<td>52</td>
</tr>
<tr>
<td>4-9</td>
<td>Reasons Given for Quitting Smoking by Ex-Smokers: 1963-64</td>
<td>53</td>
</tr>
<tr>
<td>4-10</td>
<td>Reasons Given for Quitting Smoking by Ex-Smokers: 1986-87</td>
<td>53</td>
</tr>
<tr>
<td>Table</td>
<td>Title</td>
<td>Page</td>
</tr>
<tr>
<td>---------</td>
<td>-----------------------------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>4-11</td>
<td>Proportion of Regular Cigarette Smoking of Males &amp; Females Combined: 1963-64/1986-87</td>
<td>55</td>
</tr>
<tr>
<td>4-12</td>
<td>Proportion of Regular Cigarette Smoking of Adolescent and Young Adult Females: 1963-64/1986-87</td>
<td>56</td>
</tr>
<tr>
<td>4-13</td>
<td>Proportion of Regular Cigarette Smoking of Adolescent and Young Adult Males: 1963-64/1986-87</td>
<td>57</td>
</tr>
<tr>
<td>4-14</td>
<td>Demographic Characteristics as Predictors of a Predisposition of Smoking for Males &amp; Females Combined: 1963-64</td>
<td>58</td>
</tr>
<tr>
<td>4-15</td>
<td>Demographic Characteristics as Predictors of a Predisposition of Smoking for Females: 1963-64</td>
<td>59</td>
</tr>
<tr>
<td>4-16</td>
<td>Demographic Characteristics as Predictors of a Predisposition of Smoking for Males: 1963-64</td>
<td>60</td>
</tr>
<tr>
<td>4-17</td>
<td>Summary of Stepwise Logistic Regression Analysis: 1963-64/1986-87</td>
<td>61</td>
</tr>
<tr>
<td>4-18</td>
<td>Percentage of Regular Smokers by Number of Older Sisters Who Smoke: 1963-64/1986-87</td>
<td>62</td>
</tr>
<tr>
<td>4-19</td>
<td>Percentage of Regular Smokers by Number of Older Brothers Who Smoke: 1963-64/1986-87</td>
<td>63</td>
</tr>
<tr>
<td>4-20</td>
<td>Percentage of Regular Smokers by Hometown Size: 1963-64</td>
<td>64</td>
</tr>
<tr>
<td>Table</td>
<td>Description</td>
<td>Page</td>
</tr>
<tr>
<td>---------</td>
<td>--------------------------------------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>4-21</td>
<td>Percentage of Regular Smokers by Hometown Size: 1986-87</td>
<td>64</td>
</tr>
<tr>
<td>4-22</td>
<td>Smoking Status of Males and Females by Mother and Father Smoking Smoking Behavior: 1963-64/1986-87</td>
<td>65</td>
</tr>
<tr>
<td>4-23</td>
<td>Percentage of Regular Smokers by Mother's Educational Level: 1963-64/1986-87</td>
<td>67</td>
</tr>
<tr>
<td>4-24</td>
<td>Percentage of Regular Smokers by Father's Educational Level: 1963-64/1986-87</td>
<td>67</td>
</tr>
<tr>
<td>4-25</td>
<td>Regular Smokers by Ethnic Identification: 1986-87</td>
<td>68</td>
</tr>
<tr>
<td>4-26</td>
<td>Regular Smokers by Grade Point Average: 1986-87</td>
<td>69</td>
</tr>
<tr>
<td>4-27</td>
<td>Percentage of Male and Female Smokers by Parents Annual Household Income: 1986-87</td>
<td>70</td>
</tr>
<tr>
<td>4-28</td>
<td>Percentage of Cigarette Smokers and Non-Smokers by Weekly Alcohol Consumption: 1986-87</td>
<td>71</td>
</tr>
<tr>
<td>4-29</td>
<td>Chi Square Comparison of Smoking Status by Weekly Alcohol Consumption: 1986-87</td>
<td>71</td>
</tr>
<tr>
<td>4-30</td>
<td>Percentage of Cigarette Smokers and Non-Smokers by Use of Other Substances: 1986-87</td>
<td>72</td>
</tr>
<tr>
<td>4-31</td>
<td>Chi Square Comparison of Smokers and Non-Smokers by Marijuana Use: 1986-87</td>
<td>73</td>
</tr>
<tr>
<td>Table</td>
<td>Description</td>
<td>Page</td>
</tr>
<tr>
<td>-------</td>
<td>-----------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>4-32</td>
<td>Chi Square Comparison of Smokers and Non-Smokers by Illicit Substance Abuse: 1986-87</td>
<td>73</td>
</tr>
<tr>
<td>4-33</td>
<td>Percentage of Cigarette Smokers and Non-Smokers by Use of Smokeless Tobacco: 1986-87</td>
<td>74</td>
</tr>
<tr>
<td>4-34</td>
<td>Chi Square Comparison of Smokers and Non-Smokers by Use of Smokeless Tobacco: 1986-87</td>
<td>75</td>
</tr>
<tr>
<td>4-35</td>
<td>Age and Sex of Smokeless Tobacco Users by Smoking Status: 1986-87</td>
<td>76</td>
</tr>
<tr>
<td>4-36</td>
<td>Percentage of Users and Non-Users of Smokeless Tobacco by Weekly Alcohol Consumption: 1986-87</td>
<td>77</td>
</tr>
<tr>
<td>4-37</td>
<td>Chi Square Comparison of Users and Non-Users of Smokeless Tobacco by Weekly Alcohol Consumption: 1986-87</td>
<td>77</td>
</tr>
<tr>
<td>4-38</td>
<td>Patterns of Substance Abuse Among Smokeless and Non-Smokeless Tobacco Users: 1986-87</td>
<td>78</td>
</tr>
<tr>
<td>4-39</td>
<td>Chi Square Comparison of Smokeless and Non-Smokeless Tobacco Users by Use of Marijuana: 1986-87</td>
<td>79</td>
</tr>
<tr>
<td>4-40</td>
<td>Chi Square Comparison of Smokeless Tobacco Users and Non-Users by Their Use of Illicit Substances</td>
<td>80</td>
</tr>
</tbody>
</table>
A COMPARATIVE ANALYSIS OF FACTORS INFLUENCING SMOKING BEHAVIORS OF COLLEGE STUDENTS: 1963 - 1987

CHAPTER 1

INTRODUCTION

Research has confirmed that cigarette smoking is the single largest preventable cause of disease and death in the country (Department of Health and Human Services [DHHS], 1984). The American Medical Association has reported that, "Today, smoking is associated with some 340,000 premature deaths a year, including 30% of all cancer deaths. Millions suffer from debilitating chronic disease caused by smoking. It is a major risk factor in cardiovascular disease, chronic bronchitis and emphysema, and cancer of the lung, throat, mouth, esophagus, pancreas and bladder. It can also cause problems ranging from minor respiratory infections to stomach ulcers" (The Health Letter, 1985).

Decades of studies have led to an increased focus on tobacco use, particularly cigarette smoking. Beginning in the 1930's a number of retrospective studies by organizations worldwide established a relationship between smoking and disease.

One of the most comprehensive and widely recognized accumulation of research on the deleterious health aspects of smoking that had ever been conducted was the 1964 Surgeon General Report entitled, "Smoking and Health: Report of the Advisory Committee to the Surgeon General of the Public Health Service. Information presented in the document was
recognized worldwide because the report established a relationship between cigarette smoking, morbidity and mortality. Emergence of this Report as well as other epidemiological studies demonstrating the link between smoking and disease evidenced the need for additional information about the risks of smoking and the populations affected. As a result, researchers placed emphasis on gathering and providing information regarding such variables as age, sex, occupation, residence, race, type of smoking and degree of smoking (Schuman, 1972).

The major purpose of this research was to analyze and compare data from the early 1960's with current data relating to smoking behavior. Those variables that were significantly associated with smoking behavior were determined. Trends in consumption patterns, quit rates, and other factors associated with cigarette smoking were also investigated.

**Statement of the Problem**

A great deal of research has been conducted to identify factors that influence individual smoking behaviors. Very few studies, however have compared data collected prior to the 1964 Surgeon General Report with current data relating to psychosocial factors and their relationship to smoking behaviors of those in late adolescence or young adulthood.

Based on the results of previous research, an investigation of the factors that result in subsequent smoking behavior of late adolescence and young adults appears to be warranted. This segment of the population has generally been overlooked even though several studies have found that cigarette smoking increases with age up to the early years of the twenties (Schneider & Vanmastrigt, 1974; Alexander, et. al, 1983). Research should be directed at this population as it has been indicated that cigarette
smoking remains a significant problem among young people in the United States (O'Malley, Bachman & Johnston, 1984; Brown, Cherry & Forbes, 1980; Lambert, 1982). Continued research is also indicated because cigarette smoking has been associated with numerous health risks to the smoker and more recently, to non-smokers. Harmful effects of sidestream smoke have been well documented in current literature.

Cigarette use has been highly correlated with the use of other drugs. D. B. Kandel (1980) defined alcohol, cigarettes and marijuana as "gateway" drugs. When an individual uses a gateway drug, there appears to be a progression from one drug to another. Kandel suggested that the use of beer or wine led to the use of cigarettes. Cigarette use progresses to marijuana and finally to other illicit drugs. Kandel stated that these four distinct, culturally determined, developmental stages in drug involvement establish a direct relationship between the use of cigarettes and subsequent drug use and/or abuse.

Cigarette smoking among adolescents and young adults is a major health concern. Studies that determine the differences and/or similarities in the variables relating to cigarette use of adolescents and young adults will assist in minimizing the health problems associated with cigarette smoking. Additional information will also aid in planning, implementing and evaluating more effective smoking prevention and smoking cessation programs.

**Purpose of the Study**

The purpose of this study is to compare the relationship between selected predisposing factors and subsequent smoking behaviors exhibited in 1963 and 1987 respectively. Specifically, this study will determine the
relationship between selected socio-demographic variables and smoking behaviors for a population of college students (n = 3,786) during the 1963-64 school year and compare these with results obtained from college students during the 1986-87 school year (n = 863).

A modified version of a questionnaire developed and administered by Anderson in 1963-64 will be administered to students enrolled in Introductory Health classes at three institutions of Higher Education in the state of Oregon during winter term, 1987. The data collected from three of the same four institutions in 1963-64 will be analyzed with the 1987 data to determine the differences and similarities in variables that are strongly associated with cigarette smoking. Data will not be collected from the University of Oregon Health Science Center because the curriculum no longer includes a Personal Health class as it did in the early 1960's.

Objectives of the Study

The study addressed the following research objectives:

1. Obtain information regarding cigarette consumption patterns of students attending selected colleges in the state of Oregon in 1963-64 and 1986-87.

2. Compare the proportion of cigarette smokers in 1963-64 with the proportion of cigarette smokers in 1986-87.

3. Identify predisposing factors apparent in 1963-64 and 1986-87 relating to cigarette use and determine their relationship to smoking behaviors.

4. Determine whether those factors that contributed to smoking behavior in 1963-64 were different than those factors that contributed to smoking in 1986-87.
Hypotheses

Based on analysis of previous research, the following null and alternative hypotheses were developed:

1. Ho: There will be no significant difference between the proportion of adolescents and young adults who are regular cigarette smokers when comparing the 1963-64 study to the 1986-87 study.

   Ha: There will be a significant difference between the proportion of adolescents and young adults who are regular cigarette smokers when comparing the 1963-64 study to the 1986-87 study.

2. Ho: There will be no significant difference between the proportion of females who are regular cigarette smokers when comparing the 1963-64 study to the 1986-87 study.

   Ha: There will be a significant difference between the proportion of females who are regular cigarette smokers when comparing the 1963-64 study to the 1986-87 study.

3. Ho: There will be no significant difference between the proportion of males who are regular cigarette smokers when comparing the 1963-64 study to the 1986-87 study.

   Ha: There will be a significant difference between the proportion of males who are regular cigarette smokers when comparing the 1963-64 study to the 1986-87 study.

Definition of Terms

The following terms have been defined to clarify their use in the study:

(1) Adolescent: An individual aged 12-18 years of age

(2) Asphyxia: A condition caused by an insufficient intake of oxygen. (a) Asphyxia, fetal: Asphyxia occurring in a fetus. It results from interference in placental circulation or from premature separation
of placenta, as in abruptio placentae.

(b) **Asphyxia, neonatorum:** Respiratory failure in the newborn.

(3) **Chewing Tobacco:** A preparation of tobacco leaves mixed with molasses. As the tobacco is chewed, the nicotine is absorbed through the mucous membranes of the mouth. Neither the tobacco nor its juice is swallowed.

(4) **Epinephrine:** A hormone secreted by the adrenal medulla. It is produced by tissues other than the adrenal and has been synthesized. It is employed therapeutically as a vasoconstrictor, cardiac stimulant, and to relax bronchioles.

(5) **Experimenter:** Smoked a few times but no longer smoke cigarettes

(6) **Ex-Smoker:** Used to smoke but no longer smokes cigarettes

(7) **Gateway Drug:** When the use of one drug leads to the use of another drug. The drug used initially in the progression is referred to as the "gateway" drug

(8) **Heavy Smoker:** A smoker who smokes 25 or more cigarettes per day

(9) **Late Adolescence:** An individual aged 16-18 years of age

(10) **Occasional Smoker:** Smoke once in a while but not every day

(11) **Mainstream Smoke:** Smoke inhaled by the smoker while smoking a cigarette

(12) **Never Smoker:** Never smoked cigarettes

(13) **Promotor:** A substance that assists a catalyst to act

(14) **Regular Smoker:** Usually smoke cigarettes every day

(15) **Respiratory Distress Syndrome:** A condition formerly known as hyaline membrane disease. It accounts for more than 25,000 infant deaths per year in the U.S.A. Clinical signs, including
delayed onset of respiration and low Apgar score, are usually present at birth.

(16) **Sidestream Smoke**: Smoke that is emitted by the burning tip of a cigarette, cigar or pipe.

(17) **Smokeless Tobacco**: Tobacco that is not smoked but is in the form of chew or snuff.

(18) **Sudden Infant Death Syndrome (SIDS)**: The completely unexpected and unexplained death of an apparently well infant. The most common cause of death between the second week and first year of life. This worldwide syndrome has been of a constant rate over the years. Occurs more frequently in the third and fourth months of life, in premature infants, in males, and in infants living in poverty. The deaths usually occur during sleep and are more likely to happen in winter than in summer.

(19) **Young Adult**: An individual aged 18-24 years of age.

This study was conducted to compare the smoking behavior of students attending selected colleges in Oregon in 1963-64 with smoking behavior of college students in Oregon in 1987. Students attending introductory health classes at Oregon State University, Portland State University and the University of Oregon were questioned regarding their smoking behavior in an attempt to define possible factors relating to their choosing to smoke or not to smoke. Variables that resulted in being strong predictors of subsequent smoking behavior were determined and compared.

Smoking behavior of an often neglected population of older adolescents and younger adults over a span of 24 years was addressed in this study. A significant factor of the study was that the initial study was conducted prior to the release of the Surgeon General Report on the health consequences of smoking. This research provided an understanding to the
reasons why individuals choose to smoke or not to smoke and indicated whether or not those reasons have remained constant over time. The resulting information will assist in planning and implementing more effective smoking prevention and cessation programs.
CHAPTER II

REVIEW OF LITERATURE

Introduction

The United States Public Health Service first became officially involved in an appraisal of the available data on smoking and health in June, 1956. A scientific Study Group on the subject was established jointly by the National Cancer Institute, the National Heart Institute, the American Cancer Society, and the American Heart Association at that time (United States Department of Health, Education, and Welfare [USDHEW], 1964). This group appraised 16 independent studies conducted in five countries over a period of 18 years and concluded that there was a causal relationship between excessive smoking of cigarettes and lung cancer. Following the conclusion of this study, the Surgeon General Leroy E. Burney issued a statement in July of 1957 declaring that, "The Public Health Service feels the weight of the evidence is increasingly pointing in one direction; that excessive smoking is one of the causative factors in lung cancer" (USDHEW, 1964).

In 1962, the Surgeon General, Luther L. Terry, called for a re-evaluation of the Public Health Service position taken by Dr. Burney. Dr. Terry felt that the findings from recent studies necessitated further evaluation of the factors in the relationship between tobacco smoking and health. An Advisory Committee was established to investigate a variety of topics relating to tobacco use, including consumption rates and patterns, and the psycho-social aspects of tobacco use.

The result of the Advisory Committee's efforts was the most
comprehensive and widely recognized accumulation of research that had ever been conducted. The document was published in 1964 and entitled, "Smoking and Health: Report of the Advisory Committee to the Surgeon General of the Public Health Service". The information presented in the document gained worldwide attention. For the first time, a report established a definite relationship between cigarette smoking, morbidity and mortality. This was the first of many comprehensive studies relating to cigarette smoking in the United States.

Researchers have gathered information for the past several decades relating to cigarette consumption. Research conducted since the late 1950's and early 1960's has shown an overall decrease in cigarette smoking by the American population with few exceptions. Adolescents and young adults demonstrated a steady increase in tobacco use until the mid-1970's when a decrease was noted, followed by an apparent plateau. Although consumption rates plateaued overall, the number of cigarette smokers among teenage females increased. That increase was offset by a stable or declining rate for adolescent males (Green, 1968, 1970, 1972, 1974; Steele, 1982; National Cancer Institute, 1977).

Many reasons have been cited for the changing cigarette consumption patterns of adolescents and young adults. Several of these reasons relate specifically to the psychosocial factors that influence an individual's choice to smoke or not to smoke. Factors such as peer, parental and sibling smoking, socioeconomic and educational level of parents, urban vs rural dwelling, school performance, personality variables, and attitudes and beliefs toward smoking have appeared to be significantly associated with an individual starting to smoke and continuing to smoke. The 1964 Surgeon General's Report stated that a number of demographic, social and
environmental factors were associated with subsequent smoking behavior. Similar research in the 1970's and 1980's regarding adolescents and young adults smoking behavior support those findings.

The 1964 Surgeon General Report addressed the issue of why individuals chose to smoke and more specifically, indicated the health consequences of smoking. Until recently, smoking had been addressed as a health concern for the individual smoker. There is now evidence that links cigarette smoking with negative health effects on the nonsmoker (Collishaw, et. al, 1984). Adolescents and young adults are no doubt affected by this at the present. They will continue to be affected by the smoking issue as they become adults and enter the workforce.

This chapter will address cigarette smoking and its relationship to the physical health of smokers and nonsmokers. Literature relating to the variables that are significantly associated with smoking will be reviewed. The behavioral aspects of cigarette smoking relating to specific populations will also be discussed in this chapter. A better understanding of these issues will assist health professionals in planning more effective smoking prevention and cessation programs for adolescents and young adults. Information will also increase awareness and lend support for the provision of such programs in the community.

Cigarettes and Their Major Risk Factors

When a smoker lights a cigarette, he/she is exposing his/her body to over 2,000 chemical agents. Many of these chemicals initiate and promote cancer (Taylor, 1984). The main chemicals and particulates include carbon monoxide, nicotine, and tar. Carbon monoxide is a gas that makes it difficult for the red blood cells to absorb oxygen (Whaley, 1982). Carbon
monoxide is picked up by the red blood cells where it binds to the hemoglobin molecules and forms carboxyhemoglobin. Up to 10% of all the hemoglobin in smokers may be in the carboxyhemoglobin form. This form of hemoglobin cannot carry oxygen, so up to 10% of their blood is effectively out of circulation in the normal oxygen-carbon dioxide exchange (Witters & Witters, 1983). It can contribute to debilitating lung diseases and is a factor in heart attacks (Cox, Jacobs, Leblanc, Marshman, 1983). It also contributes to the lower birth weight and survival rate of infants born to women who smoke during pregnancy (Witters & Witters, 1983).

Nicotine is a particulate. It is a liquid substance and is the major cause of physical dependence. Nicotine is a powerfully addictive drug. (Pollin, 1983). It is found in the tobacco plant and, when inhaled, acts through specialized subcellular formations located on the Central Nervous System (CNS) and peripheral neurons. These specialized receptors are for the major drugs of dependence - nicotine, the opium derivatives, and the benzodiazepines (Pollin, 1984).

The nicotine-receptor interactions cause the body to experience numerous reactions. Nicotine first stimulates and then depresses the nervous system. Nicotine will actually increase the respiration rate at low dose levels because it stimulates the receptors in the carotid artery that monitor the brain's need for oxygen. At the same time, nicotine stimulates the cardiovascular system by release of epinephrine, causing increases in coronary blood flow, heart rate, and blood pressure. The effect is to increase the oxygen requirements of the heart muscle but not the oxygen supply. This may trigger heart attacks in susceptible persons (Witters & Witters, 1983). Other effects include changes in brain waves and a release of a variety of endogenous psychoactive hormones and neuropeptides (Pollin,
These changes cause the smoker to experience psychic effects that may be pleasurable and have the potential to lead to dependency. Cigarette smoking demonstrates a typical substance abuse pattern. A substance abuse pattern involves experimentation leading to regular use. Regular use then leads to an increased dependence and an increase in the number of cigarettes smoked daily.

Another major particulate in tobacco smoke is tar. Tar contains all the particulate matter plus the material condensed from the gases. It is formed by the burning of tobacco dust as the cigarette is smoked. Tar is rich in hydrocarbons and is the primary carcinogenic agent when the cigarette is smoked (Whaley, 1982).

The dangers of smoking have been well documented in the literature. Cigarette smoking can be a serious addiction and the above factors clearly demonstrate the risks associated with smoking. Survey data have indicated that 85% of smokers believe the scientific reports stating that smoking is dangerous to their health and nine of every 10 smokers would like to quit, recently tried to quit, or say they would quit if they felt they could or if there was an easy way (Hansen, 1984). Knowledge of the hazards of smoking and a desire to quit does not imply that the smokers will quit smoking. A 1984 Gallup Poll showed that one third of the people who attempted to quit, started smoking again after one week, and only one fourth of those who did quit, did not smoke for six months (Hansen, 1984). Russell (1979) found that cigarette smoking was rated by opium addicts as being more desirable than use of heroin, barbiturates, alcohol or other drugs.

The possibility of developing psychological and physical dependencies on cigarettes emphasizes the importance of smoking prevention programs. It is evident that intervention has to occur "before the fact" because
chronic, addicted smokers are much more likely to incur deleterious health effects, specifically cardiovascular disease, respiratory disease and cancer.

Cigarette smokers have total cancer death rates two times greater than do nonsmokers. Heavy smokers (25+ cigarettes/day) have a three to four times greater risk of cancer mortality (DHHS, 1982). There are different forms of cancer that are related to cigarette smoking. They are as follows:

1. Lung Cancer - The single largest contributor to the total cancer death rate. Twenty-five percent of all cancer deaths are due to lung cancer. It is estimated that 85% of lung cancer cases are due to cigarette smoking. The lung cancer death rate for women is increasing, surpassing breast cancer as the number one cancer in women.

2. Larynx and Oral Cavity Cancer - In 1982, it affected 40,000 individuals and was responsible for approximately 13,000 deaths in the United States. It is estimated that 50-70% of these cancer deaths are strongly associated with smoking cigars, pipes and cigarettes.

3. Esophageal Cancer - In 1982, 8,300 deaths were due to cancer of the esophagus. Cigarette smoking is estimated to be a factor in over half of esophageal cancer deaths.

4. Bladder and Kidney Cancer - In 1982, there were 50,000 cases responsible for 20,000 deaths. It is estimated that between 30-40% of bladder cancers are smoking related.

5. Pancreatic Cancer - In 1982, there were 24,000 cases responsible for 22,000 deaths. It is estimated that 30% of this cancer is due to cigarettes.

In addition to cancer, the most widely investigated risk factors associated with smoking relate to the cardiovascular system. Cigarette smoking ranks as the largest preventable cause of Coronary Heart Disease (CHD) in the United States. The 1983 Report of the Surgeon General
investigated the relationship between smoking and cardiovascular disease. The report indicated that, "In 1980, diseases of the circulatory system were responsible for approximately one-half of the total U.S. mortality. CHD was the single most important cause of death, accounting for approximately 30% of all U.S. deaths (USDHHS, 1983).

Arteriosclerosis is the major underlying cause of cardiovascular disease and atherosclerosis is the form of arteriosclerosis that most frequently causes the following: CHD, atherothrombotic brain infarction, atherosclerotic aortic disease, and atherosclerotic peripheral vascular disease (USDHHS, 1983). Cigarette smoking contributes both to the development of atherosclerotic lesions and to atherosclerotic vascular disease. Cigarette smoking is also a major factor in fatal and non-fatal myocardial infarctions. Statistical studies have indicated that the concentration of carbon monoxide is the one factor most responsible for linking smoking and diseases of the cardiovascular system (Dusek & Girdano, 1987; Corry & Cimbolic, 1985).

Cigarette smoking also contributes to respiratory tract problems. Corry & Cimbolic (1985) have reported that emphysema occurs four times more often in smokers than in nonsmokers. The damage from emphysema, including shortness of breath, difficulty in breathing, and strain on the heart, is irreversible. Two-pack-a-day smokers are four times more likely to develop bronchitis. All respiratory infections occur more often in smokers and the cases are more severe (Corry & Cimbolic, 1985).

The gastrointestinal tract is affected negatively by smoking. Cigarettes appear to produce an increase in gastric secretions causing an increased number of ulcers in smokers. Peptic ulcers are twice as common in smokers (Corry & Cimbolic, 1985). Research has indicated that symptoms
of duodenal ulcers were worse when a higher daily consumption of cigarettes was reported (Piper, McIntosh & Hudson, 1985).

Dr. Elizabeth Whelan summarizes the overall risks to the smoker (Whelan, 1984):

1. Cigarette smoking is the greatest single cause of preventable death in the United States today. Well over 350,000 deaths annually are smoking-related. Four of the five leading causes of death are related to cigarette smoking.

2. Regular smokers lose about five minutes of life expectancy for each cigarette they smoke.

3. More than one out of every seven deaths in this country is related to smoking. Each year six times as many people in this country die from smoking-related causes as die from automobile accidents.

4. Overall, a smoker is 70% more likely to die at a given age than is a comparable nonsmoker. Heavy smokers are 200% more likely to die prematurely than are nonsmokers.

5. Smoking two or more packs a day decreases life expectancy more than eight years. One pack a day decreases life expectancy six years.

6. The earlier one starts smoking, the more likely one is to die from it.

7. Male cigarette smokers report 33% more days lost from work and 14% more days of bed disability. Female smokers have an absentee rate 45% greater than that of nonsmokers and report 17% more days of bed disability.

Although effects on individuals who smoke have been clearly documented, research demonstrating harmful effects to the nonsmoker are now surfacing. Sidestream smoke is now considered a major health risk.
Physical Costs to Others

Tobacco smoke is a complex mixture of particles and gases that contain at least 3800 different chemical compounds (Hoffman, Haley & Brunnemann, 1983), of which over 50 are known to be carcinogenic in animals or humans, or both (Collishaw, Kirkbride & Wigle, 1984). When nonsmokers inhale the tobacco smoke of a smoker it is termed sidestream smoke. Sidestream smoke is emitted from the burning tip of a cigarette, cigar or pipe and it contains much higher concentrations of many toxic and cancer-causing chemicals than does mainstream smoke (Collishaw, et.al., 1984). Mainstream smoke is that which is inhaled by the smoker.

Certain carcinogens are more potent in sidestream smoke than they are in mainstream smoke. Nitrosamines, which are primary carcinogens, exist at a level that is 50 times greater in sidestream than mainstream smoke (USDHHS, 1982). Another example is Quinoline. Quinoline is a nitrogen-containing organic compound that is derived from coal tar. It is a known liver carcinogen in animals. It is found in concentrations of 11 times that which is contained in mainstream smoke. Promoters are also more potent in sidestream smoke than in mainstream smoke. A promoter is a substance that assists a catalyst to act. The promoter alone is not harmful. When it acts with a co-carcinogen, the cell may develop into a malignancy. Benzopyrene is one of the most potent promtors known. It is found in concentrations three times more in sidestream than in mainstream smoke. Several other toxic agents found at greater levels in sidestream than in mainstream are formaldehyde, hydrogen cyanide, hydrogen sulfide, and arsenic (USDHHS, 1982).

The concentrations of these agents demonstrate that the effects of passive smoke can go beyond the common symptoms of burning eyes, nasal
congestion, and sore throat. The effects of long-term contact can be very serious. Studies of non-smokers in smoking environments have been conducted both in the workplace and in the home.

The presence of tobacco smoke in the workplace is estimated to effect 63% of the labor force in the United States (Repace & Lowrey, 1983). A study of 2100 adults revealed impairment of small airways function in non-smokers who were employed for at least 20 years in enclosed areas where smoking was permitted (White & Froeb, 1980). The non-smokers had a loss of function equivalent to that in persons who smoke up to 10 cigarettes per day (Cuddeback, Donovan & Burg, 1976).

The deleterious effects of cigarette smoke is not unique to the workplace. G. H. Miller (1984) found support for the hypothesis that long-term passive smoking leads to excess cancer deaths in exposed non-smokers. His conclusions were based on an almost twofold increase in the mortality due to cancer among non-employed wives who had long-term exposure to passive smoking compared with non-employed wives with little or no exposure.

A different study in support of these findings was done measuring continine levels of non-smokers. Continine is the major metabolite of nicotine found in the urine. It was found that the urinary continine levels of non-smokers who lived with smokers were higher than those of non-smokers who did not. The levels of continine increased with the combined daily cigarette consumption of smokers in the family. The level was highest with family members who smoked more than 40 cigarettes per day - it was almost identical to the level of smokers who smoked less than three cigarettes per day (Matsukura, Taminato & Kitano, 1984).

Sandler, Everson & Wilcox (1985) compared the cancer risks among
nonsmoking individuals who were married to smokers to those who had never been married to a smoker. They found that the cancer risk among individuals ever married to smokers was 1.6 times that of individuals never married to smokers. Elevated risks were seen for several specific cancer sites and were not limited to lung cancer or other "smoking-related" tumors. The risks from passive smoking appeared greater among groups generally at lower cancer risks (females, nonsmokers and individuals under age 50) but were not limited to these groups. A recent study at the University of California, San Francisco found that nonsmoking wives of cigarette smokers were at significantly greater risk of suffering a heart attack than nonsmoking wives of nonsmokers (Martin, 1987). The researchers studied over 7,000 nonsmoking women between the ages of 30 and 59. The results indicated that the women married to smokers had over three times the risk of having a heart attack. This risk was apparent after adjusting for other known risk factors, such as family history of heart disease, hypertension, diabetes, weight, alcohol intake and amount of exercise.

The children of smokers are also affected by passive smoke. This is true for both the fetus of a smoking mother and after birth in an environment with parents who smoke. Cigarette smoking during pregnancy has been clearly associated with a lower birth weight (American Medical Association, 1985), an increase in spontaneous abortions, a greater incidence of bleeding during pregnancy, premature and prolonged rupture of amniotic membranes, abruptio placentae and placenta previa (USDHHS, 1980).

It has also been found that women who smoke cigarettes during pregnancy have more fetal and neonatal deaths than nonsmoking women. The child is more likely to develop respiratory problems if the mother
smokes during pregnancy. There is an increased risk of developing respiratory distress syndrome. Respiratory distress syndrome is the leading cause of death among premature infants. Asphyxia is the leading cause of death among newborns. It is associated with smoking during pregnancy (Reed & Lang, 1987). A relationship between maternal smoking and Sudden Infant Death Syndrome (SIDS) has now been established (USDHHS, 1980). Sudden Infant Death Syndrome is responsible for one third of infant deaths occurring between ages one month and one year (Reed & Lang, 1987).

The effects to the child are believed to be due to a significant concentration of toxins - nicotine and continine - being present in fetal blood, amniotic fluid, and placental fluid (Luck & Nau, 1984). A study by Greenburg, Haley & Loda indicated that measurable concentrations of these toxins were transferred by passive smoking or in breast milk and could be detected in the infant's serum, saliva and urine (Greenburg, et. al., 1984).

**Consumption Patterns: 1960's vs 1980's**

Cigarette consumption was reported to have increased markedly since the turn of the Century, when per capita consumption was less than 50 cigarettes per year. Since 1910, when cigarette consumption per person (15 years and older) was 138, it rose to 1,265 in 1930, 1,828 in 1940, to 3,322 in 1950 and to 3,986 in 1961. The 1955 Current Population Survey showed that 68% of the male population and 32.4% of the female population 18 years of age and over were regular smokers of cigarettes. All other forms of tobacco use had decreased. Chewing tobacco declined from approximately four pounds per person in 1900 to half a pound in 1962 (USDHEW, 1964).

The survey data from the mid-1960's to the late 1970's and early
1980's show that overall cigarette consumption in this country is declining (USDHHS, 1980). Annual per capita consumption has decreased from 4,258 in 1965 to an estimated 3,900 in 1979. From 1965 to 1979, the proportion of adult male cigarette smokers declined from 51% to 37%. The proportion of adult women cigarette smokers remained virtually unchanged at 32% to 33% during that same time period. Since 1976 however, the proportion of adult women cigarette smokers appears to have declined to 28% (USDHHS, 1980).

In 1965 nearly 70% of the male population in the U.S. and 40% of the female population had smoked regularly at one time or another (Hedrick, 1969). More than half of males in the United States, 20 years of age and over were smoking regularly compared with approximately one-third of adult females. However, since 1965 this sex differential has decreased substantially because the proportion of male smokers has declined at a much greater rate than the proportion of female smokers.

In 1983, about 35% of adult males were cigarette smokers, a slight decrease from 1980. Between 1980 and 1983 the percent of adult females smoking cigarettes remained stable at about 30%. This lack of decline in recent years among women is primarily attributable to an increase in smoking women 20-24 years of age. Smoking rates of women in that age group increased from 33-36% (USDHHS, 1984). This increase can also be attributed to the movement into this group of women who were teenagers in the 1970's, when smoking rates were increasing (National Center for Health Statistics, 1984).

Heavy smokers are increasing among both sexes. The percentage of women who smoke 25 or more cigarettes per day has risen from 13.0% in 1965 to 20.6% in 1983. Data from 1965 to 1983 show that the number of
males who smoke 25 cigarettes of more per day has increased from 24.1% to 33.6% (USDHHS, 1984).

There have been several national surveys conducted in the United States that compare cigarette consumption patterns of adolescents and young adults. The results of the surveys indicate that the increase of smoking in this population was largely due to the steady increases among females for every age group.

In the mid-1960's, 17.0% of males 12-18 years of age were current smokers as compared to 11.1% in 1979. For 12-18 year old females during those same years, there was an increase from 10.0% to 13.1% (Green, 1979). In the 20-24 year old age group, 59.2% of males were current smokers in the mid-1960's as compared to 37.5% in 1983. The percentage of females in the same age group was 41.9% in the mid-1960's and 36.1% in 1983 (USDHHS, 1984).

According to a 1979 survey by the National Institute of Education, cigarette smoking among adolescent girls exceeded that among adolescent boys. In the 17-19 year age group, there were almost five female cigarette smokers for every four male cigarette smokers (National Institute of Education, 1979).

The decline in numbers of adolescent males who smoke does not imply that there is a decrease in their use of all types of tobacco. They are choosing to use smokeless tobacco rather than cigarettes. Recent surveys have reported that smokeless tobacco rates are ranging from 13% (Offenbacher & Weathers, 1985) to 22% (Greer & Poulson, 1983) as compared to 4% in 1975 (U.S. Public Health Service, 1979) and 10% in 1980 (Harper, 1980).

Males and females are beginning to smoke at an earlier age than in the
past. Research has shown that the average age of onset of regular smoking among women has continuously declined during the last decades and continues to decline. It has been reported that among women the average age of onset of regular smoking has progressively declined with each successive birth cohort. Onset has declined from 35 years of age for those born before 1900 to 16 years of age among those born 1951 to 1960 (USDHHS, 1980). Males are also starting to smoke at an earlier age. For example, of the age group of smokers who were born in the 1950's (and are now 26 to 36 years old) 88% of males started smoking regularly before the age of 20. Seventy four percent of the males born in the 1920's started smoking regularly before the age of 20. (USDHHS, 1987). Although the decreasing age of initiation is evident, the reasons for this phenomenon are not clear.

A recent survey by the National Institute on Drug Abuse (NIDA) reported that high school seniors were much more likely to smoke than college students. According to NIDA, only 14% of college students smoked cigarettes regularly in 1985. About 18% of college women smoked cigarettes daily in 1985, compared with 10% for college men. About 19% of high school seniors, and 24% of all 18-23 year olds were daily smokers in 1985.

**Psychosocial Characteristics of Smokers: 1960's**

The relationships between psycho-social characteristics and smoking behavior discussed in the 1964 Surgeon General's Report were based on results of a limited number of studies that preceded the report. The Report stated:
The overwhelming evidence points to the conclusion that smoking - its beginning, habituation, and occasional discontinuation - is to a large extent psychologically and socially determined. This does not rule out physiological factors, especially in respect to habituation, nor the existence of predisposing constitutional or hereditary factors (USDHEW, 1964).

Several of the studies that were published prior to the release of the Surgeon General report were reviewed to provide a better understanding of the basis of the 1964 Report. There have been numerous studies since 1964 that have analyzed the reasons individuals smoke and how cigarette smoking related to a number of demographic and social variables. The factors that appeared to be most likely to predispose an individual toward smoking cigarettes in the late 1950's and early 1960's are reviewed in the following discussion.

In 1958, Horn and colleagues conducted a study involving all of the public and parochial high schools in Portland, Oregon and some of the schools in the surrounding urbanized area. Parental smoking behavior was significantly related to the smoking behavior of the high school students. Cigarette smoking rose with each successive school year and was more frequent among boys than girls. Smoking was highest among the children of families in which both parents smoked cigarettes. Smoking was lowest in families in which neither parent had ever been a smoker. The smoking behavior of boys tended to conform more closely to that of the father whereas the smoking behavior of the girls followed more closely that of the mother.

There was an inverse relationship between parents' education and children's smoking behavior. Smoking was significantly higher for students
in families where neither parent had graduated from high school than in families where both parents had attended college. It was determined that this relationship diminished with each grade, becoming nonexistent in the senior year of high school. This suggested that smoking was initiated at an earlier age in families of parents with a low educational level. This did not indicate that educational level affected whether or not the student would eventually smoke during the high school years.

The students who were smokers were characterized as being non-participative in extracurricular activities, tended to be scholastically unsuccessful due to the fact that they were older than their classmates and they had lower academic goals. (Horn, Courts, Taylor & Solomon, 1959).

It appeared that the years from the early teens to the ages of 18-20 were significant in exposing people to their first smoking experiences. Horn (1963) estimated that 10% of later smokers "develop the habit with some degree of regularity" before their teens and 65% during their high school years.

There was a similar study conducted by Salber and MacMahon in 1959 in a high school in Newton, Massachusetts. The researchers gathered information on students' smoking patterns, parental smoking habits, and parental occupations. This study also showed that the highest proportion of student smokers were in families in which both parents smoked. A finding contrary to Horn, et.al., was that Salber and MacMahon found an independent effect of each parent, regardless of the sex of the student. They did not see evidence of fathers having more influence on sons smoking or mothers having more influence on daughters smoking.

Salber and MacMahon also found that the highest percentage of smokers were in the lower socioeconomic groups. The largest number of students
who smoked more than one pack of cigarettes per week were in the lowest socioeconomic category and they outnumbered students in the highest socioeconomic category by two to one. The lower categories also contained more earlier starters. This trend was seen for both male and female students (Salber & MacMahon, 1961).

In 1965, the Health Interview Survey was conducted in the United States. It was based on household interviews of a sample of the civilian noninstitutionalized population. It showed that cigarette smoking was more prevalent in the cities and metropolitan areas than on farms. This difference was more pronounced with the female population, in which 36% of those residing in metropolitan areas smoked compared with 16% of those residing on farms. Fifty-one percent of males residing in metropolitan areas smoked versus 45% of those living on farms. The 1964 Surgeon General Report had supported these more recent findings. It stated that there were proportionally fewer smokers in rural than in urban areas. It was reported that the smallest percentage of smokers was found within the rural farm population (DHEW, 1964).

Smoking was inversely associated with income level and years of education for males. As income increased, the number of male cigarette smokers decreased from 55% to 44%. This was also true for educational level. As education increased, the percentage of male smokers decreased from 53% to 41%. This was not true for females. Increases in income and education indicated an increase in smoking for females. As family income increased, the number of female smokers rose from 31% to 36% and, as education increased, the percentage of female smokers increased from 24% to 34%.

At the time the survey was conducted, the average daily consumption of
cigarettes ranged from 11 to 20 for both males and females. Forty seven percent of male smokers and 44% of female smokers smoked between 11 and 20 cigarettes per day. Twenty four percent of the male smokers consumed more than a pack a day and 14% of the females smoked more than a pack per day (Public Health Service, 1967).

**Psychosocial Influences on Smoking Behavior: 1980's**

A five year study conducted by the United States Department of Health and Human Services stated that cigarette smoking remained a significant problem among young people and that the prevalence of smoking escalated with increasing age up to the early years of the twenties (Johnston, Bachman, and O'Malley, 1980). More than half of all young people who are currently smoking daily adopted the habit before or during their ninth grade school year (Johnston, et.al., 1980). Results of current smoking studies indicate that young people started smoking because of a variety of psychosocial influences.

Flay, Hansen, Johnson and Sobel (1983), defined five categories of variables that they found to be highly correlated with smoking. They are as follows:

1. Social factors including both peer and parental smoking.
2. Sociodemographic variables such as sex, socioeconomic status and school performance.
3. Personality variables such as rebelliousness, nonconformity, locus of control and self-esteem.
4. Psychosocial factors including inner needs, beliefs and attitudes.
5. Biological factors including the physiological and pharmacological
effects of smoking.

Although all of the above factors have been shown to be important predictors of subsequent smoking behavior, research indicates that the major predictors are parental and peer smoking behavior. Both have been found to be highly associated with adolescent smoking. These social factors are often given as the major predictors of an individual starting to smoke (Chasin, Presson, Bensenberg, Corty, Olshavsky, & Sherman, 1981; Gritz & Brunswick, 1980). Both factors appear to be important in the child's decision to smoke or not to smoke, however there is controversy as to which factor is a better predictor.

Parental influence does play a major role in whether or not a child will choose to smoke cigarettes. If the parents smoke, the child is more likely to smoke (Bloom & Greenwald, 1984; Eiser & Van Der Pligt, 1984). Flay, et al. (1983) found that family influences were important to early preparation stages of smoking although peer factors were important to later stages.

There are researchers who contend that cigarette smoking is more of a peer oriented behavior rather than a family oriented behavior (Banks, Bewley, Bland, Pollard, & Dean, 1978; Rudolph & Borland, 1976; Pederson & Lefcoe, 1985). Over 50% of adolescents reported smoking their first cigarette with a friend (Bewley, Bland, & HArris, 1974; Palmer, 1970). Sixteen percent of boys and 9% of girls reported smoking their first cigarette alone. Only five percent of boys and 2% of girls reported having their first cigarette with a parent (Palmer, 1970).

Other researchers also support the contention that peer influences are the major factor in the onset of experimentation and that the influence is a direct one; adolescents smoked when they were with other adolescents who
were smoking. It has been found that in initial experimentation the same sex peers are generally the ones who influenced the adolescents to smoke and adults are rarely present (Biglan & Lichtenstein, 1984; Mittelmark, Murray, Luepker, Pechacek, Pirie, & Pallonen, 1983; Sherman, Presson, Chassin, & Olshavsky, 1983).

Pederson & Lefcoe conducted a longitudinal study of adolescents and young adults to determine variables related to cigarette smoking. The researchers compared correlates of smoking in a cohort of 4,641 young people when they were in grades 4 to 6 to when they were aged 16-21. Peer smoking was the most important variable when the students were in grades 4 and 6, however as the group aged, attitude toward smoking had the strongest relationship to current smoking in late adolescence (Pederson, et.al., 1985).

Another important factor in predicting subsequent smoking behavior is related specifically to sociodemographic variables. The sociodemographic variables that are most discussed in literature are sex, socioeconomic status and school performance.

Differences appear to exist in the research relating to smoking and the sexes. These differences are evident in the numbers of cigarette smokers and the reasons for choosing to smoke. Pederson and Lefcoe's (1985) study indicated that there were more female than male smokers. The underlying associations for smoking differed for males and females. Attitude toward smoking was a better predictor for females who chose to smoke. Peer pressure was found to be the second best predictor. For males, peer smoking was the most significant predictor. Attitude was given as the second best predictor of subsequent smoking behavior for males. The first national survey of college student drug use was conducted by the National
Institute on Drug Abuse (NIDA) in 1986. The researchers reported that college women were almost twice as likely to smoke cigarettes as their male counterparts. Related survey data on adolescent smoking habits revealed that smoking prevalence among women exceeded that of men by the time they were 17 to 19 years of age (USDHHS, 1980).

Socioeconomic status has also been strongly associated with smoking behavior. Numerous studies have indicated that there was a relationship between smoking and lower parental income. Lower educational status of the parents was also associated with smoking. The increase in smoking was true for both the parents and their children (Borland & Rudolph, 1975; National Institute of Education, 1979; Reeder, 1977; Pederson & Lefcoe, 1985). There appeared to be a negative association between socioeconomic status and smoking in male adolescents. An increase in socioeconomic status resulted in a decrease in the numbers of males who smoked. This trend was opposite for females. An increase in socioeconomic status resulted in an increase in the numbers of females who smoked (Borland, 1975; Kozlowski, 1979). Adolescents from lower income families may also begin to smoke earlier than others (National Institute of Education, 1979).

Research has reported a relationship between scholastic performance and smoking behavior. Studies have indicated an association between poor school grades, reduced motivation, lower aspiration and smoking behavior (Borland & Rudolph, 1975; Johnston, et.al., 1977; National Institute of Education, 1979; Pederson & Lefcoe, 1985).

A third major factor in predicting subsequent smoking behavior is personality. A number of personality variables have been found to be significantly associated with adolescent and young adults smoking behavior. It was noted by McAlister, Perry, & Maccoby (1978) that many of these
factors have been studied in relative isolation and in a "static rather than longitudinal fashion". It is also true that the majority of studies relating to smoking personalities have researched adult populations in the past (Flay, d'Avernas, Best, Kersell, & Ryan, 1983). The studies that are available regarding adolescents have not shown consistent results associating personality variables to smoking behavior. There are factors that do occur in the literature more often than others showing that there appear to be certain personality factors that may influence the onset of smoking.

Rebelliousness has been associated with smoking behavior (Mcalister, Krosnick & Milburn, 1984; Jessor & Jessor, 1977). Obedient adolescents are less influenced by peers and rebellious children are more influenced by peers. The researchers suggest that a combination of peer influence and a resistance to authority increase the likelihood of smoking behavior. McAlister, et.al, (1978) discuss Erikson's theory of development and the stage at adolescence when they are trying to achieve identity. The authors suggest that the youth are smoking in an attempt to conform with smoking peers and rebel against parents.

Cherry & Kiernan (1976) conducted a large, longitudinal study involving adolescents. The results showed that extroversion and neuroticism each were associated positively with becoming a smoker for both males and females.

Tucker (1984) attempted to determine the extent to which multiple measures of personality discriminated between adolescent males who reported intention to smoke cigarettes as adults and those who indicated that they had no intention to smoke as adults. He found that the adolescent males who reported intention to smoke as adults differed significantly in personality from those who were nonintenders. Results indicated that a
lower self-concept was the most powerful predictor in smoking intenders. Intenders were also significantly less stable, intelligent, moralistic, self-confident, and controlled. They were also significantly more apprehensive, liberal, self-sufficient, and tense than were nonintenders. Smoking nonintenders were significantly more moralistic, intelligent, conservative, tender-minded, group-oriented, and reserved than were smoking intenders. It was also reported that smoking intenders were significantly more anxious or neurotic than were nonintenders. The groups did not differ on extraversion.

Another major factor in predicting subsequent smoking behavior involves beliefs and attitudes as they relate to smoking behavior. According to Ajzen and Fishbein, behavior is a function of behavioral intentions. Behavioral intentions are a function of attitudes toward the act in question and beliefs about the expectations of significant people in the social world (normative beliefs) (Ajzen and Fishbein, 1970). This would suggest that adolescents' intentions to smoke cigarettes can be predicted from their attitudes toward smoking in combination with their beliefs about significant others' expectations and evaluations of their smoking. Chassin, Presson, Bensenberg, Corty & Sherman reported that attitudes and normative beliefs were excellent predictors of nonsmoking adolescents' intentions to smoke in the future. An important finding in their study was that intentions were better predictors of the transition from experimental to regular smoker than for the transition to initial smoking. Intentions were generally better predictors for high school than middle school subjects (Chassin, et al., 1981).

Jessor and Jessor's problem behavior theory (predicting smoking transitions from general "deviance prone" personality characteristics and
perceived environment) is an alternative concept of adolescent smoking initiation. Jessor & Jessor defined deviance prone adolescents as being relatively nonconventional, having a higher attitudinal tolerance for deviance, being more external in locus of control and having lower expectations for attaining academic success. Deviance prone adolescents have family and peer environments with more smoking models and they tend to overestimate the extent of smoking by adults and teenagers. They also have stronger intentions to smoke and more positive attitudes towards smoking (Jessor and Jessor, 1977). This theory has proven successful in predicting subsequent smoking initiation. It suggests that adolescents' initial experience with cigarette smoking is more dependent on the immediate environmental context (combined with a "deviance prone" vulnerable adolescent) than on long-term attitudes and beliefs about smoking (Chassin et.al, 1981).

When researching variables related to cigarette smoking among late adolescents and young adults, Pederson and Lefcoe found that attitude toward smoking has become a more important determinant of smoking than it was in the past. They found this to be true, particularly in females (Pederson and Lefcoe, 1985).

Other factors that correlate highly with smoking include the physiological and pharmacological effects of smoking. These factors relate to the continuation of smoking once the individual has started to smoke. The addictive process in combination with the factors discussed in the previous paragraphs emphasize the importance of addressing the issue of cigarette smoking before smoking is initiated.
Smoking Prevention/Cessation Programs for Adolescents & Young Adults

The more we understand the stages of cigarette smoking and the sociodemographic variables that appear to be predictors of subsequent smoking behavior, the better we will be able to plan effective prevention and cessation programs. At present, research has focused mainly on prevention rather than cessation programs for adolescents.

It is suggested that smoking prevention programs should be provided prior to, and during, the sixth grade in order to catch high-risk individuals (Flay, et al., 1983; Grady, Gersick, Snow & Kessen, 1986). Most researchers believe that cigarette smoking is best conceptualized as a series of stages, with initiation and maintenance having very different determinants (Leventhal & Cleary, 1980). The developmental nature of the process of becoming a smoker suggests that preventive efforts should be spread throughout the developmental sequence. The developmental sequence could range from 5 to 10 years.

It is important that programs address the issue of how to counteract the strong modeling influence of smoking parents, siblings, and friends (Flay, et al., 1983). A program that involves families, friends, schools, the medical profession, media events, and community action is more likely to be effective than a program that focuses entirely on children in the classroom (Flay, Hansen, Johnson, Alvarez, Sobal, Simmons, Kaufman & Ulene, 1982).

Prevention programs should be aimed at teaching nonsmoking adolescents to "say no" to environmental pressures to smoke. Adolescents need to be prepared with behavioral responses to high-risk social situations (Evans, Smith & Raines, 1985). Biglan and Lichtenstein (1984) state that peer influence is a direct one and that adolescents smoke when they are with other adolescents who are smoking. They recommend teaching skills
for refusing cigarettes in smoking situations. The researchers believe that this will be helpful in the initiation as well as the maintenance stage. Other studies have stressed the importance of enhancing the adolescents' abilities to cope with peer pressure (McAlister, et al., 1979; Evans, Rozelle, Mittelmark, Hansen, Bane, & Havis, 1978). The importance of older siblings' smoking in the current data suggests that the prevention programs should also include techniques for coping with sibling modeling along with their current emphasis on resisting parental, peer and media models (Chassin, Presson, Sherman, Corty, & Olshavsky, 1984).

McCaul, Glasgow, O’Neill, Freeborn & Rump (1982) suggest that it would be beneficial if designers of programs to prevent adolescent smoking focused on the following: teaching adolescents to cope with peer pressure, modifying future intentions to smoke, teaching adolescents the harmful short-term effects of smoking, emphasizing the difficulty of quitting smoking, and modifying the norms governing smoking behavior.

The traditional educational programs have shown to be less than adequate. School information campaigns, discussions, lectures, demonstrations, assemblies, posters, pamphlets, films, articles in the school paper, and resource people to provide information on the dangers of smoking have been utilized. These approaches appear to have had a less than significant impact on smoking habits (Thompson, 1978). Evans (1979) stated that the evaluation of such educational programs was nearly impossible due to methodological problems. Teachers themselves often expressed a lack of confidence in their ability to implement smoking education programs effectively.

Flay, et al. (1983) conducted a rather extensive review of smoking prevention programs for adolescents and young adults and found that the
most promising programs involved social inoculation, peer leaders and coping-skills development techniques in smoking prevention. The authors define social inoculation as being analogous to biological inoculation. Biological inoculation occurs when a person is exposed to a small dose of an infectious agent in order to develop antibodies, thereby reducing susceptibility to subsequent exposure. This model, applied to smoking, assumes that social factors exert the major influence on the initial decision to experiment with cigarettes. It also assumes that resistance to persuasion to smoke will be greater if one has developed, then refuted, arguments for smoking cigarettes in specific situations. According to this theory, such experience with counter-arguments inoculates the individual against pressures in similar real-life situations. The individual develops a resistance to these pressures in advance. Peer-led programming may also be used. It involves junior or senior high school students planning and carrying out education activities for their peers or for students in an earlier grade.

At this time, there have been a limited number of controlled studies employing objective measures of smoking cessation programs specifically designed for adolescents who smoke (Seffrin & Bailey, 1985). The focus of most prevention programs is on deterring the initiation of smoking experimentation. The student who is already smoking has not been given a great deal of attention although 13.5% of high school seniors smoke a half pack or more daily (Johnston, et al., 1984). Longitudinal studies are currently investigating predictors of cessation among adolescent smokers (Ary & Biglan, 1985; Chassin, et al., 1984).

Smoking prevention programs are important for adolescents and young adults who have not yet started to smoke. Smoking cessation programs are
a valuable option for those individuals who are already smoking. Neither of these programs can be planned or implemented effectively without knowledge of the factors that influence smoking behavior. Researchers should look carefully at those predictive factors and utilize that knowledge in planning and implementing prevention and cessation programs.
CHAPTER III

METHODS AND PROCEDURES

A discussion of the methods and materials used for the study is provided in this chapter. The first section includes the procedures involved in obtaining the sample population. Construction and revision of the 1963-64 and 1986-87 questionnaires are discussed in the second section. Procedures used in data collection and analysis of the data are discussed in the third and fourth sections of the chapter, respectively.

Subjects

The subjects in the 1963-64 study consisted of 3,786 college students from four different universities in the state of Oregon. The universities included Oregon State University, Portland State University, the University of Oregon, and the University of Oregon Medical School. A questionnaire on smoking behavior was administered to all students enrolled in introductory personal health classes during the 1963-64 school year. At that time, the personal health class was a requirement at Oregon State, Portland State and the University of Oregon. The University of Oregon Medical School offered the personal health class as an elective course.

In the 1986-87 study, 863 college students from three of the same four universities in Oregon participated in completing a modified version of the 1963-64 questionnaire. Subjects included all students attending introductory personal health classes during winter term at Oregon State University, Portland State University and the University of Oregon. The personal health class was a required course at the University of Oregon and
an elective course at Oregon State and Portland State Universities in the 1986-87 study. The target groups for generalization were the student populations of selected public universities in 1963-64 and 1986-87.

1963-64 Questionnaire

The questionnaire used in the 1963-64 study was developed by G. Anderson and administered to all students attending introductory personal health classes at four universities in the state of Oregon (Appendix A). The questionnaire consisted of 39 forced response items and was divided into three sections. The first section was to be completed by all respondents and included questions pertaining to the following:

1. Sociodemographic information including age, sex, home state, college class level, college residence, home town size, home classification, parents' education, university attended, major field - if in medical school, and year (Items 1-9, 37 - 39).

2. Smoking status of parents and siblings (Items 10-23).

3. Current smoking status (Item 24).

The second section was to be completed only by those who were previous smokers or were smoking regularly at that time. It contained five questions including smoking history, type of tobacco preferred, and attempts at quitting smoking.

The third section was to be filled out by current smokers. It contained seven questions on amount smoked, type of cigarettes smoked, and attempts and failures at quitting smoking.

Directions for completing the questionnaire were clearly printed in each section of the questionnaire. The specific directions were highlighted
in an attempt to encourage the respondents to answer only the questions in
the appropriate sections of the questionnaire.

1986-87 Questionnaire

The questionnaire used in the 1986-87 study was a modified version of
the questionnaire used during the 1963-64 school year (Appendix B). Key
items from the 1963-64 questionnaire were included in the revised
questionnaire in order to make comparisons between past and current data.
New items were added to reflect current trends relating to smoking
behavior and present day philosophy on questionnaire construction.

The revised questionnaire consisted of 33 forced responses and was
divided into five sections. The first section was to be answered by
everyone and included questions regarding the following: Current smoking
status of participant, smoking status of parents and siblings, use of
smokeless tobacco, parent and sibling use of smokeless tobacco and
personal use of alcohol, marijuana and other illicit drugs (Items 1 - 15).

The second section was to be completed only by those who were
regular, occasional and ex-cigarette smokers. It contained two questions
relating to the age of the individuals when they started to smoke and the
major factor that influenced the participants in starting to smoke (Items 16
& 17).

Section three was to be completed by regular (smoke every day)
smokers. The first of three questions pertained to consumption patterns.
The other two questions related to the smoker's desire to quit and attempts
to quit smoking (Items 18 - 20).

The fourth section consisted of two questions and was to be completed
by ex-smokers (those who previously smoked but no longer smoked). The
questions asked the participants to indicate the factors that had the greatest influence on their decision to quit and the methods used in quitting (Items 21 & 22).

Section five contained questions pertaining to sociodemographic information including age, sex, home state, estimated family income, college residence, current grade point average, home town size, and parents' educational level (Items 23 - 32). An additional question was provided at the beginning of the questionnaire for participants to indicate the school that they were currently attending.

The modified questionnaire was tested for reliability using the test-retest procedure. In this procedure the same test was administered on two occasions, one week apart, to the same 25 individuals. The stability-reliability for the questionnaire was found to be .98.

Data Collection

The questionnaires were hand-carried to three institutions of higher education in the state of Oregon and administered to a total of 863 college students. The participants were enrolled in introductory health classes during winter term, 1987, at Oregon State University, Portland State University, and the University of Oregon. The universities were chosen to retain consistency between universities surveyed in 1963-64 and 1986-87 studies. The University of Oregon Health Science Center (previously the University of Oregon Medical School) was deleted from the study as there was no longer a personal health class offered at the institution.

Oregon State had six personal health sections with responses from 145 students and Portland State had one section of an introductory personal health class with 32 students. The University of Oregon respondents
consisted of 686 students enrolled in 26 sections of personal health classes.

Prior arrangements were made with the course instructors or administrators in the respective departments of health, enabling the students to complete the questionnaire during class time. The questionnaire was administered by the researcher. Written instructions were read to each class before administration of the questionnaire (Appendix C).

Analysis of Data

It was the purpose of this study to determine those variables that appeared to be the strongest predictors of subsequent smoking behavior in adolescents and young adults when comparing data from 1963-64 with data gathered in 1986-87. Data were analyzed with assistance from a statistical consultant at the Oregon State University Computer Center. The SPSS-X and BMDP programs were used in the analysis of data.

The 1960's data cards were first entered into the computer for frequencies and specified cross tabulations. The data were then entered to determine which variables were most likely to predict subsequent smoking behavior. A stepwise logistic regression was chosen to select predictor variables in a stepwise manner because the data involved categorical independent variables and a dichotomous dependent variable (smoke vs. no smoke). Predictors of subsequent smoking behavior were chosen from previous research. The following variables were used as predictors: sex, mother's education, father's education, mother's smoking, father's smoking, sibling's smoking and hometown classification.

Similar data analyses procedures were utilized for the 1980's data. The questionnaires were op-scanned and transferred to tape. The tape was
then converted to a CYBER system for data analysis. Chi square statistics were used to compare the 1963-64 data with the data compiled in 1986-87 and to test the stated hypotheses. Separate stepwise logistic regression equations were used for the 1963-64 data and the 1986-87 data. The results of the 1963-64 analysis were compared with the results of the 1986-87 analysis. Descriptive statistics were used in the study to further examine the survey populations.

Summary

Chapter III describes the materials and methods used in this study. Discussion relates to the participants in the study, the initial and modified questionnaires, the methods involved in the collection of data, and the statistical procedures used to analyze the data.
CHAPTER IV

RESULTS AND DISCUSSION

This study was conducted to compare the relationship between selected predisposing factors and subsequent smoking behaviors exhibited in 1963 and 1987 respectively. Assessments of smoking behaviors of college students in Oregon in 1963-64 and 1986-87 were conducted to determine relationships between students smoking behaviors and selected socio-demographic variables. Comparisons were made between the resulting data for students in the 1963-64 and 1986-87 studies.

Description of the Subjects: 1963-64 and 1986-87

During the 1963-64 school year, a questionnaire developed by Anderson was administered to 3,786 college students at selected colleges in the state of Oregon. Of those students, 1593 (42.1%) were from Oregon State University, 942 (24.8%) were from the University of Oregon Medical School, 885 (23.4%) attended the University of Oregon and 313 (8.3%) were from Portland State College.

There were 2,200 (58.1%) males and 1,586 (41.9%) females surveyed in the 1963-64 study. Their ages ranged from 16 to 24+, with the largest number, 2560 (67.6%) in the 18-19 age group.

The largest number of respondents were from the state of Oregon. Two thousand and fifty-three (75.4%) of the students were from Oregon, 338 (8.9%) were from California, 140 (3.7%) from Washington, 78 (2.1%) from Idaho, and 377 (9.9%) were from other states in the country.

The 1986 - 87 questionnaire was administered to 863 college students
in attendance at selected colleges in the state of Oregon. Of those students, 686 (79.5%) were from the University of Oregon, 145 (16.8%) were from Oregon State, and 32 (3.7%) attended Portland State University.

There were 420 (48.7%) males who responded to the questionnaire and 443 (51.3%) females. The ages ranged from 16 to 24+, with the largest percentage (55.9%) in the 18-19 age group.

The majority of respondents answering the questionnaire were from the state of Oregon. Results indicated that 587 (68.0%) of the students were from Oregon, 69 (8.0%) were from California, 33 (3.8%) from Washington and 16 (1.9%) from Idaho. The remaining 158 (18.3%) of the respondents were from other states in the country.

There were 690 (80.0%) Caucasians who responded to the questionnaire and 88 (10.2%) Asians. Results indicated that there were 37 (4.3%) Native Americans, 15 (1.7%) Blacks, and 14 (1.6%) Hispanics.

With the expected exception that the median age of the respondents in the study was younger than the general population of college students, the results were comparable to the Oregon state system undergraduate enrollment statistics for sex and ethnicity. The median age of the respondents was younger because the population of students were enrolled in an introductory level course.

**Smoking Behaviors of the Subjects: 1963-1964/1986-87**

Of the students responding to the questionnaire in 1963-64, 1189 (31.4%) reported that they were current or former regular smokers. Seven hundred and forty-two (62.4%) of those regular smokers were males and 447 (37.6%) were females. In 1986-87, 78 (9.0%) of the respondents indicated that they smoked regularly. Thirty eight (48.7%) of the regular smokers
were males and 40 (51.3%) were females.

The majority of the regular smokers in 1963-64 and 1986-87 were in the 18-19 year old age category. There were 723 (60.8%) 18-19 year old regular smokers in 1963-64 and 33 (42.3%) 18-19 year olds who indicated that they were regular smokers (Table 4-1).

The results indicated that 399 (10.5%) of the students in 1963-64 smoked occasionally as compared to 79 (9.2%) in 1986-87. In 1963-64, 447 (11.8%) had experimented with cigarettes and 288 (33.4%) indicated that they had experimented with cigarette smoking in 1986-87. There were 1525 (40.2%) students in 1963-64 who responded that they had never smoked cigarettes and 357 (41.4%) who had never smoked in 1986-87 (Table 4-2).

Table 4-1. Sex and Age of Regular Smokers: 1963-64/1986-87

<table>
<thead>
<tr>
<th>Year/Sex</th>
<th>16-17</th>
<th>18-19</th>
<th>20-21</th>
<th>22-23</th>
<th>24+</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1963-64</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>7 (0.9%)</td>
<td>412 (55.5%)</td>
<td>66 (8.9%)</td>
<td>94 (12.7%)</td>
<td>163 (22.0%)</td>
</tr>
<tr>
<td>Females</td>
<td>13 (2.9%)</td>
<td>311 (69.6%)</td>
<td>67 (14.9%)</td>
<td>15 (3.4%)</td>
<td>41 (9.2%)</td>
</tr>
<tr>
<td>Total</td>
<td>20 (1.7%)</td>
<td>723 (60.8%)</td>
<td>133 (11.2%)</td>
<td>109 (9.2%)</td>
<td>204 (17.2%)</td>
</tr>
<tr>
<td><strong>1986-87</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>0 (0.0%)</td>
<td>18 (47.7%)</td>
<td>6 (15.8%)</td>
<td>5 (13.2%)</td>
<td>9 (23.7%)</td>
</tr>
<tr>
<td>Females</td>
<td>0 (0.0%)</td>
<td>15 (27.5%)</td>
<td>15 (37.5%)</td>
<td>3 (7.5%)</td>
<td>7 (10.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>0 (0.0%)</td>
<td>33 (42.3%)</td>
<td>21 (26.9%)</td>
<td>8 (10.3%)</td>
<td>16 (20.5%)</td>
</tr>
</tbody>
</table>
Table 4-2. Smoking Status of the Respondents: 1963-64/1986-87

<table>
<thead>
<tr>
<th>Year/Sex</th>
<th>Regular</th>
<th>Occasional</th>
<th>Experimenter</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1963-64</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>742 (33.7%)</td>
<td>270 (23.3%)</td>
<td>268 (12.2%)</td>
<td>768 (34.9%)</td>
</tr>
<tr>
<td>Females</td>
<td>447 (28.2%)</td>
<td>129 (8.1%)</td>
<td>179 (11.3%)</td>
<td>757 (47.7%)</td>
</tr>
<tr>
<td>Total</td>
<td>1189 (31.4%)</td>
<td>399 (10.5%)</td>
<td>447 (11.8%)</td>
<td>1525 (40.2%)</td>
</tr>
<tr>
<td><strong>1986-87</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>38 (9.0%)</td>
<td>34 (8.1%)</td>
<td>128 (30.5%)</td>
<td>195 (46.4%)</td>
</tr>
<tr>
<td>Females</td>
<td>40 (9.0%)</td>
<td>45 (10.2%)</td>
<td>160 (36.1%)</td>
<td>162 (36.6%)</td>
</tr>
<tr>
<td>Total</td>
<td>78 (9.0%)</td>
<td>79 (9.2%)</td>
<td>288 (33.4%)</td>
<td>357 (41.4%)</td>
</tr>
</tbody>
</table>

Six hundred and sixty seven (49.2%) students who smoked regularly, occasionally, or were ex-smokers in 1963-64, reported they had started smoking in senior high school. This was also the age at which the largest number of smokers in the 1986-87 study started to smoke. There were 103 (47.2%) who started to smoke in grades 10-12. This was true for 37 (38.1%) of the males and 66 (54.5%) of the females in 1986-87. Of those who started smoking in high school in 1963-64, 390 (58.5%) were males and 277 (41.5%) were females (Table 4-3).
Table 4-3. Grade Level in School When Started To Smoke:
1963-64/1986-87

<table>
<thead>
<tr>
<th>Year/Sex</th>
<th>Elementary</th>
<th>7-8-9</th>
<th>Sr. High</th>
<th>College</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>1963-64</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>62 (7.2%)</td>
<td>156 (18.2%)</td>
<td>390 (45.6%)</td>
<td>248 (29.0%)</td>
</tr>
<tr>
<td>Females</td>
<td>9 (1.8%)</td>
<td>36 (7.2%)</td>
<td>277 (55.3%)</td>
<td>179 (35.7%)</td>
</tr>
<tr>
<td>Total</td>
<td>71 (5.2%)</td>
<td>192 (14.1%)</td>
<td>667 (49.2%)</td>
<td>427 (31.5%)</td>
</tr>
<tr>
<td><strong>1986-87</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>11 (11.3%)</td>
<td>21 (21.7%)</td>
<td>37 (38.1%)</td>
<td>28 (28.9%)</td>
</tr>
<tr>
<td>Females</td>
<td>13 (10.7%)</td>
<td>22 (18.2%)</td>
<td>66 (54.5%)</td>
<td>20 (16.5%)</td>
</tr>
<tr>
<td>Total</td>
<td>24 (11.0%)</td>
<td>43 (19.7%)</td>
<td>103 (47.2%)</td>
<td>48 (22.0%)</td>
</tr>
</tbody>
</table>

A chi square value of 14.57 with one degree of freedom indicated a significant difference when comparing the age at which adolescents and young adults started smoking in 1963-64 and 1986-87. Smokers in 1986-87 started smoking earlier than smokers in 1963-64 (Table 4-4).

When separating by sex, a chi square value of 2.58 with one degree of freedom did not indicate a significant difference between the age at which males started to smoke in 1963-64 and 1986-87. A chi square comparison of the age at which females started to smoke in 1963-64 and 1986-87 resulted with a significant value of 34.4 with one degree of freedom. This data suggests that females in 1986-87 began smoking at an earlier age than did females in 1963-64.
Table 4-4. Chi Square Comparison of Grade in School When Started Smoking by Males and Females: 1963-64/1986-87

<table>
<thead>
<tr>
<th>Year/Grade</th>
<th>Observed</th>
<th>Expected</th>
<th>X2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1963-64 K-9</td>
<td>263</td>
<td>284.3</td>
<td>1.59</td>
</tr>
<tr>
<td>1986-87 k-9</td>
<td>67</td>
<td>45.7</td>
<td>9.93</td>
</tr>
<tr>
<td>1963-64 High School/College</td>
<td>1094</td>
<td>1072.7</td>
<td>.42</td>
</tr>
<tr>
<td>1986-87 High School/College</td>
<td>151</td>
<td>172.3</td>
<td>2.63</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>X2 = 14.57</td>
</tr>
</tbody>
</table>

Curiosity was listed as the number one reason for starting to smoke by 520 (38.3%) of the respondents in 1963-64. Three hundred and fourteen (36.8%) of the males and 206 (40.7%) of the females indicated that curiosity was the number one reason that they started to smoke (Table 4-5).

Table 4-5. Reasons for Starting to Smoke: 1963-64

<table>
<thead>
<tr>
<th>Reason</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curiosity</td>
<td>314 (36.7%)</td>
<td>206 (41.1%)</td>
<td>520 (38.3%)</td>
</tr>
<tr>
<td>Other</td>
<td>300 (35.0%)</td>
<td>191 (38.1%)</td>
<td>491 (36.2%)</td>
</tr>
<tr>
<td>Group Pressure</td>
<td>93 (10.9%)</td>
<td>55 (11.0%)</td>
<td>148 (10.9%)</td>
</tr>
<tr>
<td>Thought It Was 'Smart'</td>
<td>73 (8.5%)</td>
<td>27 (5.4%)</td>
<td>100 (7.4%)</td>
</tr>
<tr>
<td>To Appear 'Grown Up'</td>
<td>76 (8.9%)</td>
<td>22 (4.4%)</td>
<td>98 (7.2%)</td>
</tr>
<tr>
<td>Total</td>
<td>856 (63.1%)</td>
<td>501 (36.9%)</td>
<td>1357</td>
</tr>
</tbody>
</table>

In 1986-87, 120 (55.0%) of the regular, occasional and ex-smokers indicated that peer smoking was the number one influence in starting to smoke. This was true for both 58 (60.0%) males and 62 (51.2%) females. Stress was listed as the number two influence for 10 (10.3%) of the males.
and 18 (14.9%) of the females who were regular, occasional or ex-smokers (Table 4-6).

Table 4-6. Reasons for Starting to Smoke: 1986-87

<table>
<thead>
<tr>
<th>Reason</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peers</td>
<td>58 (60.0%)</td>
<td>62 (51.2%)</td>
<td>120 (55.0%)</td>
</tr>
<tr>
<td>Stress</td>
<td>10 (10.3%)</td>
<td>18 (14.9%)</td>
<td>28 (12.8%)</td>
</tr>
<tr>
<td>Nonconformity</td>
<td>4 (4.1%)</td>
<td>12 (9.9%)</td>
<td>16 (7.4%)</td>
</tr>
<tr>
<td>Self Esteem</td>
<td>5 (5.1%)</td>
<td>10 (8.3%)</td>
<td>15 (6.9%)</td>
</tr>
<tr>
<td>Use of Other Drugs</td>
<td>8 (8.2%)</td>
<td>7 (5.7%)</td>
<td>15 (6.9%)</td>
</tr>
<tr>
<td>Role Models Smoked</td>
<td>9 (9.3%)</td>
<td>3 (2.5%)</td>
<td>12 (5.5%)</td>
</tr>
<tr>
<td>Parents Smoked</td>
<td>3 (3.1%)</td>
<td>6 (5.0%)</td>
<td>9 (4.1%)</td>
</tr>
<tr>
<td>Media/Advertisements</td>
<td>0 (0.0%)</td>
<td>3 (2.5%)</td>
<td>3 (1.4%)</td>
</tr>
<tr>
<td>Total</td>
<td>97</td>
<td>121</td>
<td>218</td>
</tr>
</tbody>
</table>

The largest number of respondents in the 1963-64 survey indicated that they smoked an average of one-half to one pack of cigarettes per day. Five hundred and twenty four (44.1%) students smoked one-half to one pack per day. This was the average amount smoked by 334 (28.1%) males and 190 (16.0%) females. In 1986-87, the most common amount of cigarettes smoked per day was one half pack or less. Twenty three (57.5%) of the females and 28 (73.7%) of the males indicated that they smoked one half pack or less in an average day (Table 4-7).
### Table 4-7. Average Daily Cigarette Consumption: 1963-64/1986-87

<table>
<thead>
<tr>
<th>Year/Sex</th>
<th>0-1/2 Pack</th>
<th>1/2-1 Pack</th>
<th>1-2 Packs</th>
<th>2+ Packs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1963-64</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>232 (31.3%)</td>
<td>334 (45.0%)</td>
<td>147 (19.8%)</td>
<td>29 (3.9%)</td>
</tr>
<tr>
<td>Females</td>
<td>185 (41.4%)</td>
<td>190 (42.5%)</td>
<td>58 (13.0%)</td>
<td>14 (3.1%)</td>
</tr>
<tr>
<td>Total</td>
<td>417 (35.1%)</td>
<td>524 (44.0%)</td>
<td>205 (17.3%)</td>
<td>43 (3.6%)</td>
</tr>
<tr>
<td><strong>1986-87</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>28 (73.7%)</td>
<td>8 (21.0%)</td>
<td>2 (5.3%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Females</td>
<td>23 (57.5%)</td>
<td>13 (32.5%)</td>
<td>2 (5.0%)</td>
<td>2 (5.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>51 (65.4%)</td>
<td>21 (26.9%)</td>
<td>4 (5.1%)</td>
<td>2 (2.6%)</td>
</tr>
</tbody>
</table>

A chi square value of 28.87 with one degree of freedom indicated there was a significant difference in the amount of cigarettes smoked by adolescents and young adults when comparing 1963-64 with 1986-87. Consumption rates for the total population of smokers were higher in 1963-64 than they were in 1986-87 (Table 4-8).

When comparing the amount of cigarettes smoked by males in 1963-64 and 1986-87, a significant chi square value of 29.1 with one degree of freedom resulted. Males in 1986-87 smoked less than did males in 1963-64. A chi square comparison of females in 1963-64 and 1986-87 indicated that there was a significant difference in consumption patterns of females between the two populations of smokers. The chi square value was 3.89 with one degree of freedom. The data suggests that female smokers in 1963-64 smoked more cigarettes in an average day than did female smokers in 1986-87.

Consumption rates were also compared between males and females in
1963-64 and males and females in 1986-87. A chi square value of 12.52 with one degree of freedom indicated that there was a significant difference between male and female consumption rates in 1963-64. Males smoked more cigarettes per day than did females in 1963-64. A chi square value of 1.49 with one degree of freedom did not indicate a significant difference between the consumption rates of males and females in 1986-87.

Table 4-8. Chi Square Comparison of Average Daily Cigarette Consumption by Smokers in 1963-64 and 1986-87

<table>
<thead>
<tr>
<th>Year/Daily Average</th>
<th>Observed</th>
<th>Expected</th>
<th>X2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1963-64 0 to 1/2 Pack</td>
<td>417</td>
<td>439.19</td>
<td>1.12</td>
</tr>
<tr>
<td>1986-87 0 to 1/2 Pack</td>
<td>51</td>
<td>28.81</td>
<td>17.08</td>
</tr>
<tr>
<td>1963-64 &gt; 1/2 Pack</td>
<td>772</td>
<td>749.81</td>
<td>.66</td>
</tr>
<tr>
<td>1986-87 &gt; 1/2 Pack</td>
<td>27</td>
<td>49.19</td>
<td>10.01</td>
</tr>
</tbody>
</table>

X2 = 28.87

Smoking Cessation: 1963-64/1986-87

Of the 1189 regular smokers in 1963-64, 452 (38.0%) responded that they would like to quit as compared to 31 (39.7%) of the 78 regular smokers in 1986-87. Those attempting to quit smoking numbered 564 (47.4%) in 1963-64 and 30 (38.5%) in 1986-87.

Physical reasons were listed by 187 (40.6%) ex-smokers as the major reason for quitting smoking in 1963-64 (Table 4-9). Forty eight (78.7%) ex-smokers in 1986-87 indicated that concern for their own physical health was the major reason for quitting smoking (Table 4-10).
Table 4-9. Reasons Given For Quitting Smoking By Ex-Smokers: 1963-64

<table>
<thead>
<tr>
<th>Reason For Quitting</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>140 (44.5%)</td>
<td>47 (32.2%)</td>
<td>187 (40.6%)</td>
</tr>
<tr>
<td>Social</td>
<td>59 (18.7%)</td>
<td>47 (32.2%)</td>
<td>107 (23.2%)</td>
</tr>
<tr>
<td>Medical</td>
<td>57 (18.1%)</td>
<td>25 (17.1%)</td>
<td>80 (17.4%)</td>
</tr>
<tr>
<td>Economic</td>
<td>36 (11.4%)</td>
<td>13 (8.9%)</td>
<td>48 (10.4%)</td>
</tr>
<tr>
<td>Religious</td>
<td>23 (7.3%)</td>
<td>14 (9.6%)</td>
<td>39 (8.4%)</td>
</tr>
<tr>
<td>Total</td>
<td>315</td>
<td>146</td>
<td>461</td>
</tr>
</tbody>
</table>

Table 4-10. Reasons Given For Quitting Smoking By Ex-Smokers: 1986-87

<table>
<thead>
<tr>
<th>Reason For Quitting</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concern for Qwn Health</td>
<td>20 (80.0%)</td>
<td>28 (77.8%)</td>
<td>48 (78.7%)</td>
</tr>
<tr>
<td>Friends Wanted You To Quit</td>
<td>1 (4.0%)</td>
<td>4 (11.0%)</td>
<td>5 (8.2%)</td>
</tr>
<tr>
<td>Negative Societal View</td>
<td>2 (8.0%)</td>
<td>1 (2.8%)</td>
<td>3 (4.9%)</td>
</tr>
<tr>
<td>Aesthetics</td>
<td>1 (4.0%)</td>
<td>1 (2.8%)</td>
<td>2 (3.3%)</td>
</tr>
<tr>
<td>Family Wanted You To Quit</td>
<td>1 (4.0%)</td>
<td>1 (2.8%)</td>
<td>2 (3.3%)</td>
</tr>
<tr>
<td>Smoking Cost Too Much</td>
<td>0 (0.0%)</td>
<td>1 (2.8%)</td>
<td>1 (1.6%)</td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td>36</td>
<td>61</td>
</tr>
</tbody>
</table>

In 1963-64, the largest number of male and female ex-smokers reported that they quit smoking all at once. Two hundred and sixty five (57.5%) males and 380 (82.4%) females chose to quit smoking cigarettes all at once. Thirty two (10.2%) males and 23 (15.8%) females quit smoking by
cutting down gradually. In 1986-87, both males and females responded that
the greatest number of them quit smoking on their own. Twenty three
(92.0%) males and 35 (97.2%) females indicated that they succeeded in
quitting smoking on their own.

Findings Related to Major Hypotheses

1. Ho: There will be no significant difference between the proportion
   of adolescents and young adults who are regular cigarette smokers when
   comparing the 1963-64 study to the 1986-87 study.

   Results indicated that there were 1189 (31.4%) adolescent and young
   adults who responded positively to smoking regularly in the 1963-64 study.
   In the 1986-87 study 78 (9.0%) responded to smoking regularly.

   A significant chi square value of 177.34 with one degree of freedom
   indicated that there was a significant difference in the proportion of
   adolescents and young adults who were regular cigarette smokers in the
   1963-64 study when compared to the 1986-87 study. The null hypothesis
   was rejected and it was concluded that adolescents and young adults in
   1963-64 were more likely to smoke than adolescents and young adults in
   1986-87 (Table 4-11).
Table 4-11. Proportion of Regular Cigarette Smoking of Males & Females Combined: 1963-64 vs 1986-87

<table>
<thead>
<tr>
<th>Regular Smokers</th>
<th>Observed</th>
<th>Expected</th>
<th>X2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1963-64 Smokers</td>
<td>1189</td>
<td>1031.8</td>
<td>23.9</td>
</tr>
<tr>
<td>1986-87 Smokers</td>
<td>78</td>
<td>235.2</td>
<td>105.1</td>
</tr>
<tr>
<td>1963-64 Non-smokers</td>
<td>2597</td>
<td>2754.2</td>
<td>9.0</td>
</tr>
<tr>
<td>1986-87 Non-smokers</td>
<td>785</td>
<td>627.8</td>
<td>39.8</td>
</tr>
</tbody>
</table>

X2 = 177.4

2. Ho: There will be no significant difference between the proportion of adolescent and young adult females who are regular cigarette smokers when comparing the 1963-64 study to the 1986-87 study.

Of the total population surveyed in 1963-64, 447 (11.8%) of the females smoked regularly. In the 1986-87 study, 40 (4.6%) of the total population surveyed were females who smoked regularly. Of the 1189 regular smokers in the 1963-64 study, 447 (37.6%) of those were females. Of the 78 regular smokers in 1986-87, 40 (51.3%) were females.

The calculated Chi Square value was significant at 69.65 with one degree of freedom. The Null Hypothesis was rejected and it was concluded that there was a significant difference in the proportion of females who were regular cigarette smokers when comparing the female populations of the 1963-64 study and the 1986-87 study. There were more adolescent and young adult females who were regular smokers in 1963-64 than there were in 1986-87 (Table 4-12).
Table 4-12. Proportion of Regular Cigarette Smoking of Adolescent and Young Adult Females: 1963-64 vs 1986-87

<table>
<thead>
<tr>
<th>Female Smokers</th>
<th>Observed</th>
<th>Expected</th>
<th>X2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1963 Smokers</td>
<td>447</td>
<td>380.7</td>
<td>11.5</td>
</tr>
<tr>
<td>1987 Smokers</td>
<td>40</td>
<td>106.3</td>
<td>41.4</td>
</tr>
<tr>
<td>1963 Non-smokers</td>
<td>1139</td>
<td>1205.3</td>
<td>3.7</td>
</tr>
<tr>
<td>1987 Non-smokers</td>
<td>403</td>
<td>336.7</td>
<td>13.1</td>
</tr>
</tbody>
</table>

X2 = 69.7

3. Ho: There will be no significant difference between the proportion of adolescent and young adult males who are regular cigarette smokers when comparing the 1963-64 study to the 1986-87 study.

There were 742 (19.6%) males who responded to smoking regularly in 1963-64 as compared to 38 (4.4%) male smokers in 1986-87. Of the 1189 regular smokers in 1963-64, 742 (62.4%) were males. Thirty eight (48.7%) of the 78 regular smokers in the 1986-87 survey were males.

To determine if differences existed in the proportion of male smokers, a Chi Square test was conducted with a 0.05 level of significance. A significant Chi Square of 102.74 resulted, with one degree of freedom. The Null Hypothesis was rejected and it was concluded that there was a difference in the proportion of males who were regular cigarette smokers in the 1963-64 study when compared to the 1986-87 study. Adolescent and young adult males in 1963-64 were much more likely to smoke regularly than were adolescent and young adult males in 1986-87 (Table 4-13).
Table 4-13. Proportion of Regular Cigarette Smoking of Adolescent and Young Adult Males: 1963-64 vs 1986-87

<table>
<thead>
<tr>
<th>Male Smokers</th>
<th>Observed</th>
<th>Expected</th>
<th>$X^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1963 Smokers</td>
<td>742</td>
<td>655.0</td>
<td>11.6</td>
</tr>
<tr>
<td>1987 Smokers</td>
<td>38</td>
<td>125.0</td>
<td>60.5</td>
</tr>
<tr>
<td>1963 Non-smokers</td>
<td>1458</td>
<td>1545.0</td>
<td>4.9</td>
</tr>
<tr>
<td>1987 Non-smokers</td>
<td>382</td>
<td>295.0</td>
<td>25.7</td>
</tr>
</tbody>
</table>

$X^2 = 102.7$

Stepwise logistic regression equations were used to determine the set of variables that best accounted for smoking status in 1963-64 and 1986-87. All of the predictor variables that were included in both the 1963-64 and the 1986-87 survey were entered into the initial equations to determine if the model (of variables) provided a statistical fit. The predictor variables included father's smoking status, mother's smoking status, older brother's smoking status, older sister's smoking status, sex, hometown classification (urban, suburban or rural), mother's education and father's education.

The stepwise logistic regression was first conducted for the 1963-64 males and females combined. The results for the combined population indicated that older sister(s) smoking was the strongest predictor for smoking in 1963-64. With older sister(s) smoking controlled, mother smoking cigarettes entered the model. The third variable to enter was home classification (urban, suburban, or rural). The next variable to enter the model was father smoking cigarettes and the final variable was father's educational level (Table 4-14).
Table 4-14. Demographic Characteristics as Predictors of a Predisposition of Smoking for Males & Females Combined: 1963-64

<table>
<thead>
<tr>
<th>Step Number</th>
<th>Variable</th>
<th>Degrees of Freedom</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Older Sister Smoke</td>
<td>1</td>
<td>.0000</td>
</tr>
<tr>
<td>2</td>
<td>Mother Smoke</td>
<td>1</td>
<td>.0042</td>
</tr>
<tr>
<td>3</td>
<td>Home Classification</td>
<td>2</td>
<td>.0000</td>
</tr>
<tr>
<td>4</td>
<td>Father Smoke</td>
<td>1</td>
<td>.0004</td>
</tr>
<tr>
<td>5</td>
<td>Father Education</td>
<td>4</td>
<td>.0229</td>
</tr>
</tbody>
</table>

Goodness of Fit Chi-Square (2*0*LN (O/E) P-Value = .031
Goodness of Fit Chi-Square (D. Hosmer) P-Value = .925

A summary of the variables that were used in the stepwise logistic regression for 1963-64 indicated the lowest and highest probabilities of an individual smoking. The summary resulted from all combinations of the variables included in the fitted model. The individual with the lowest probability of smoking (.1158) was one who had no older sisters who smoked, mother did not smoke, father did not smoke, the father was a high school graduate and the individual lived in a rural setting. The individual with the highest probability of smoking (.8930) was an individual with five older sisters who smoked, mother smoked, father smoked, the father was a high school non-graduate and the individual was from an urban setting.

The variables that were entered for the 1963-64 data were also entered for the 1986-87 data. The only variable to enter the model for males and females combined was older brother(s) smoking with a P-Value of .0060.

The summary of all combinations of values of the variables in the fitted model indicated the predicted probability of a person smoking if they
had an older brother or brothers who smoked. The predicted probability was .174.

Stepwise logistic regression was also conducted for males and females separately for 1963-64 and 1986-87. The results indicated that the strongest predictor for females smoking in 1963-64 was older sister(s) smoking. The next variable to enter the model was father smoking. With all other variables constant, the third strongest predictor was home classification (urban, suburban, or rural). The fourth and final variable to enter as being significant for females smoking was mother smoking (Table 4-15).

Table 4-15. Demographic Characteristics as Predictors of a Predisposition of Smoking for Females: 1963-64

<table>
<thead>
<tr>
<th>Step Number</th>
<th>Variable</th>
<th>Degrees of Freedom</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Older Sister Smoke</td>
<td>5</td>
<td>.0000</td>
</tr>
<tr>
<td>2</td>
<td>Father Smoke</td>
<td>1</td>
<td>.0022</td>
</tr>
<tr>
<td>3</td>
<td>Home Classification</td>
<td>2</td>
<td>.0003</td>
</tr>
<tr>
<td>4</td>
<td>Mother Smoke</td>
<td>1</td>
<td>.0176</td>
</tr>
</tbody>
</table>

Goodness of Fit Chi-Square (2*0*LN (O/E) P-Value = .824
Goodness of Fit Chi-Square (D. Hosmer) P-Value = .773

The summary of all combinations of values of the variables in the model indicated the lowest and highest probability of a female smoking in 1963-64. The lowest probability was .1540 and included the combination of no older sisters smoking, mother and father not smoking, and living in a rural environment. The highest probability was .6000 and combined two older sisters smoking, mother and father smoking and living in a suburban
environment.

Results for females in the 1986-87 study indicated that only one variable entered the model. Older brother smoking was the only significant variable with a P-Value of .0068. There was a summary of all combinations of values of the variables in the fitted model. The summary indicated that if a person had an older brother or brothers who smoked, the likelihood of their smoking was increased. The predicted probability of this was .164.

Results indicated that the first variable to enter for males smoking in the 1963-64 study was older sister smoking. The second most significant predictor to enter was home classification (urban, suburban, or rural). The third variable to enter was father's education and the final variable to enter was mother smoking (Table 4-16).

Table 4-16. Demographic Characteristics as Predictors of Predisposition of Smoking for Males: 1963-64 Fitted Model

<table>
<thead>
<tr>
<th>Step Number</th>
<th>Variable</th>
<th>Degrees of Freedom</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Older Sister Smoke</td>
<td>5</td>
<td>.0003</td>
</tr>
<tr>
<td>2</td>
<td>Home Classification</td>
<td>2</td>
<td>.0056</td>
</tr>
<tr>
<td>3</td>
<td>Father Education</td>
<td>4</td>
<td>.0049</td>
</tr>
<tr>
<td>4</td>
<td>Mother Smoke</td>
<td>1</td>
<td>.0117</td>
</tr>
</tbody>
</table>

Goodness of Fit Chi-Square (2*0*LN (O/E) P-Value = .257
Goodness of Fit Chi-Square (D. Hosmer) P-Value = .850.

A summary of all combinations of values of the variables in the fitted model indicated combinations with the highest and lowest probability of a
male smoking in 1963-64. The lowest probability of .1057 resulted from a combination of no older sisters smoking, living in a rural environment, father was a high school non-graduate and the mother did not smoke. The highest probability of smoking (.5752) resulted from a combination of one older sister smoked, living in an urban setting, father was a college non-graduate and the mother smoked.

The same variables were entered for males in the 1986-87 study as they were for the 1963-64 males. None of those variables entered the model as being significant in 1986-87.

A summary of the stepwise logistic regression analysis indicated those variables that were significant in increasing the probability of an individual smoking. The P-Values were calculated for 1963-64 and 1986-87 with a 0.05 level of significance (Table 4-17).

Table 4-17. Summary of Stepwise Logistic Regression Analysis: 1963-64/1986-87

<table>
<thead>
<tr>
<th>Variable</th>
<th>1963-64</th>
<th>1986-87</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother Smoke</td>
<td>.0028*</td>
<td>.0968</td>
</tr>
<tr>
<td>Father Smoke</td>
<td>.0006*</td>
<td>.6487</td>
</tr>
<tr>
<td>Older Brother Smoke</td>
<td>.0612</td>
<td>.0013*</td>
</tr>
<tr>
<td>Older Sister Smoke</td>
<td>.0000*</td>
<td>.1855</td>
</tr>
<tr>
<td>Mother Education</td>
<td>.8138</td>
<td>.3950</td>
</tr>
<tr>
<td>Father Education</td>
<td>.0302*</td>
<td>.4362</td>
</tr>
<tr>
<td>Home Classification</td>
<td>.0000*</td>
<td>.7904</td>
</tr>
</tbody>
</table>

* Significant at alpha level 0.05
Discussion of the Predictor Variables

The predictor variables that were included in the Stepwise Logistic Regression will be discussed separately to further support the results of the statistical analyses. Those variables include older sister's smoking status, older brother's smoking status, home classification, mother's smoking status, father's smoking status, mother's education and father's education.

In 1963-64, there were 620 (16.4%) students who indicated that they had one or more older sisters who smoked. Of the 620 responding, 260 (41.9%) were regular smokers consisting of 153 (39.9%) males and 107 (45.1%) females. Results of the 1986-87 data indicated that 5 (12.5%) of the males and 6 (15.0%) females who smoked regularly had one or more older sisters who smoked cigarettes (Table 4-18).

<table>
<thead>
<tr>
<th>No. of Older Sisters Who Smoke</th>
<th>1963-64 Regular Smokers</th>
<th>1986-87 Regular Smokers</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 Older Sisters*</td>
<td>--</td>
<td>44 (56.4%)</td>
</tr>
<tr>
<td>0 Older Sisters Smoke*</td>
<td>--</td>
<td>23 (29.5%)</td>
</tr>
<tr>
<td>1-2 Older Sisters Smoke</td>
<td>249 (95.8%)</td>
<td>10 (12.8%)</td>
</tr>
<tr>
<td>&gt; 2 Older Sisters Smoke</td>
<td>11 ( 4.2%)</td>
<td>1 ( 1.3%)</td>
</tr>
</tbody>
</table>

*The responses of 0 older sisters and 0 older sisters who smoked were not included in the 1963-64 questionnaire.
In 1963-64, 694 (18.3%) of the students indicated that they had one or more older brothers who smoked cigarettes. Of those students, 269 (38.8%) of them were regular smokers. One hundred and fifty three (56.9%) of the regular smokers were males and 116 (43.1%) were females. In 1986-87, 15 (19.2%) of the regular smokers had one or more older brothers who smoked. Those who indicated that they had one or more older brothers who smoked consisted of 5 (12.5%) males and 10 (25.0%) females (Table 4-19).

Table 4-19. Percentage of Regular Smokers By Number of Older Brothers Who Smoke: 1963-64/1986-87

<table>
<thead>
<tr>
<th>No. of Older Brothers Who Smoke</th>
<th>1963-64 Regular Smokers</th>
<th>1986-87 Regular Smokers</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 Older Brothers*</td>
<td>--</td>
<td>46 (59.0%)</td>
</tr>
<tr>
<td>0 Older Brothers Smoke*</td>
<td>--</td>
<td>16 (20.5%)</td>
</tr>
<tr>
<td>1-2 Older Brothers Smoke</td>
<td>260 (96.7%)</td>
<td>15 (19.2%)</td>
</tr>
<tr>
<td>&gt; 2 Older Brothers Smoke</td>
<td>9 ( 3.3%)</td>
<td>1 ( 1.3%)</td>
</tr>
</tbody>
</table>

* The responses of 0 older brothers and 0 older brothers who smoked were not included in the 1963-64 questionnaire.

The largest number of regular smokers in 1963-64 were from urban areas. There were 629 (59.4%) students who indicated that they smoked regularly and were from an urban area. The smallest number of regular smokers for 1963-64 were from rural areas (Table 4-20). In 1986-87, the largest number of smokers were from cities with the largest populations and the smallest number of smokers were from hometowns with the smallest population. Thirty eight (48.7%) responded that they were from cities with more than 80,000 people and 18 (23.1%) smokers were from populations of less than 10,000 (Table 4-21).
Table 4-20. Percentage of Regular Smokers By Hometown Size: 1963-64

<table>
<thead>
<tr>
<th>Hometown Classification</th>
<th>1963-64 Regular Smokers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>629 (59.4%)</td>
</tr>
<tr>
<td>Suburban</td>
<td>246 (20.7%)</td>
</tr>
<tr>
<td>Rural</td>
<td>237 (19.9%)</td>
</tr>
</tbody>
</table>

Table 4-21. Percentage of Regular Smokers By Hometown Size: 1986-87

<table>
<thead>
<tr>
<th>Hometown Population</th>
<th>1986-87 Regular Smokers</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 10,000</td>
<td>18 (23.1%)</td>
</tr>
<tr>
<td>10,000 to 50,000</td>
<td>22 (28.2%)</td>
</tr>
<tr>
<td>&gt; 50,000</td>
<td>38 (48.7%)</td>
</tr>
</tbody>
</table>

Results indicated that 1620 (43%) of the respondents in 1963-64 had fathers who smoked cigarettes. Of those students, 581 (35.7%) of them smoked cigarettes regularly. In 1986-87, there were 21 (26.9%) students who smoked and indicated that their fathers smoked cigarettes (Table 4-22). The largest number of smokers responded that their fathers had never smoked or that their fathers had smoked but quit. There were 29 (37.3%) students who smoked regularly whose fathers had smoked at one time but quit. Twenty eight (35.9%) regular smokers had fathers who had never smoked.

In 1963-64, 1,248 (33.0%) of the students' mothers smoked cigarettes. Of those respondents whose mothers smoked, 467 (37.4%) were regular cigarette smokers. There were 18 (23.1%) students in 1986-87 who were
regular smokers and indicated that their mother smoked cigarettes (Table 4-21). There were 35 (44.9%) regular smokers whose mothers had never smoked and 28 (35.0%) whose mothers had smoked but quit.

<table>
<thead>
<tr>
<th></th>
<th>1963-64</th>
<th></th>
<th>1986-87</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Father</td>
<td>Mother</td>
<td>Father</td>
</tr>
<tr>
<td>Sex of Smoker</td>
<td>Smoked</td>
<td>Smoked</td>
<td>Smoked</td>
</tr>
<tr>
<td>Male</td>
<td>354 (47.7%)</td>
<td>266 (59.5%)</td>
<td>8 (21.1%)</td>
</tr>
<tr>
<td>Female</td>
<td>227 (50.8%)</td>
<td>201 (45.0%)</td>
<td>13 (32.5%)</td>
</tr>
</tbody>
</table>

In 1963-64, the largest number of regular smokers had mothers who were high school graduates. Four hundred and ninety five (41.6%) of the mothers of regular smokers were high school graduates. This was true for 318 (42.9%) of the males and 177 (39.6%) of the females who were regular smokers. In 1986-87, the largest number of male smokers had mothers who were high school graduates or who had a graduate or professional degree. There were 11 (28.9%) male smokers in both categories. Female smokers in 1986-87 were most likely to have mothers who were high school graduates. There were 13 (32.5%) whose mothers were graduates of high school and 10 (25.0%) whose mothers were four-year college graduates (Table 4-23).

When males and females were combined in 1963-64, results indicated that more of the fathers of regular smokers were college graduates than were in any other educational level. Four hundred and sixteen (35.0%) of the regular smokers had fathers with a college degree. The largest number of
females, 175, (39.1%) also had fathers with a college degree. The largest number of regular smoking males responded equally to having fathers who were college graduates and fathers who were high school graduates. There were 241 (32.5%) whose fathers were college graduates and 242 (32.6%) whose fathers were high school graduates. The majority of males in 1986-87 who smoked had fathers who were at the highest educational level. There were 19 (50.0%) male smokers whose fathers had a graduate or professional degree. Eleven (27.5%) of the female smokers had fathers who had a graduate or professional degree. Ten (25.0%) of the female smokers had fathers who were technical or community college graduates. The lowest number of smokers in 1963-64 and 1986-87 were those whose fathers had the least amount of formal education. In 1963-64 there were 184 (15.5%) smokers who had fathers who were high school non-graduates and in 1986-87 there were four (5.1%) smokers whose fathers were high school non-graduates (Table 4-24).
Table 4-23. Percentage of Regular Smokers By Mother's Educational Level: 1963-64/1986-87

<table>
<thead>
<tr>
<th>Year/Sex</th>
<th>Graduate/Professional Degree*</th>
<th>College Graduate</th>
<th>Technical/Community College Grad.*</th>
<th>High School Graduate</th>
<th>High School Non-Grad.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1963-64</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>--</td>
<td>180 (24.2%)</td>
<td>--</td>
<td>318 (42.9%)</td>
<td>79 (10.6%)</td>
</tr>
<tr>
<td>Females</td>
<td>--</td>
<td>114 (25.5%)</td>
<td>--</td>
<td>177 (39.6%)</td>
<td>51 (11.4%)</td>
</tr>
<tr>
<td><strong>1986-87</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>11 (28.9%)</td>
<td>7 (18.4%)</td>
<td>8 (21.1%)</td>
<td>11 (28.9%)</td>
<td>1 (2.6%)</td>
</tr>
<tr>
<td>Females</td>
<td>2 (5.0%)</td>
<td>10 (25.0%)</td>
<td>9 (22.5%)</td>
<td>13 (32.5%)</td>
<td>6 (15.0%)</td>
</tr>
</tbody>
</table>

* Graduate/Professional Degree and Technical/Community College Graduate were not included on the 1963-64 questionnaire.

Table 4-24. Percentage of Regular Smokers By Father's Educational Level: 1963-64/1986-87

<table>
<thead>
<tr>
<th>Year/Sex</th>
<th>Graduate/Professional Degree*</th>
<th>College Graduate</th>
<th>Technical/Community College Grad.*</th>
<th>High School Graduate</th>
<th>High School Non-Grad.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1963-64</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>--</td>
<td>241 (32.5%)</td>
<td>--</td>
<td>242 (32.6%)</td>
<td>119 (16.0%)</td>
</tr>
<tr>
<td>Females</td>
<td>--</td>
<td>175 (39.1%)</td>
<td>--</td>
<td>121 (27.1%)</td>
<td>65 (14.5%)</td>
</tr>
<tr>
<td><strong>1986-87</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>19 (50.0%)</td>
<td>11 (28.9%)</td>
<td>3 (7.9%)</td>
<td>4 (10.5%)</td>
<td>1 (2.6%)</td>
</tr>
<tr>
<td>Females</td>
<td>11 (27.5%)</td>
<td>8 (20.0%)</td>
<td>10 (25.0%)</td>
<td>8 (20.0%)</td>
<td>3 (7.5%)</td>
</tr>
</tbody>
</table>

* Graduate/Professional Degree and Technical/Community College Graduate were not included on the 1963-64 questionnaire.
Additional Descriptive Characteristics of Smokers: 1986-87

Several questions were included on the 1986-87 questionnaire that were not on the 1963-64 questionnaire. The questions were added to the 1986-87 questionnaire to collect descriptive data relating to smoking behavior of the students. The questions related to ethnicity, grade point average, family income, alcohol consumption, marijuana and other illicit substance use and smokeless tobacco use.

Results indicated that the largest number of regular smokers consisted of Caucasians. There were 59 (75.6%) Caucasians, 11 (14.1%) Asians, 4 (5.1%) Blacks and 2 (2.6%) Native Americans who were regular smokers (Table 4-25).

<table>
<thead>
<tr>
<th>Ethnic Identification</th>
<th>Total Regular Smokers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asian</td>
<td>11 (14.1%)</td>
</tr>
<tr>
<td>Black</td>
<td>4 (5.1%)</td>
</tr>
<tr>
<td>Caucasian</td>
<td>59 (75.6%)</td>
</tr>
<tr>
<td>Native American</td>
<td>2 (2.6%)</td>
</tr>
<tr>
<td>Other</td>
<td>2 (2.6%)</td>
</tr>
</tbody>
</table>

Fourteen (36.8%) of the males who smoked regularly had a Grade Point Average (GPA) of 3.0-3.49, 13 (34.2%) had a 2.5-2.9 GPA and 12 (31.6%) had a GPA of 3.5-4.0. Of the females who smoked regularly, the largest number, 8 (20%), indicated that they had a GPA of 2.5-2.9 (Table 4-26).
Table 4-26. Regular Smokers By Grade Point Average:
1986-87

<table>
<thead>
<tr>
<th>Grade Point Average</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 2.0</td>
<td>0 (0.0%)</td>
<td>2 (5.0%)</td>
<td>2 (2.6%)</td>
</tr>
<tr>
<td>2.0-2.49</td>
<td>0 (0.0%)</td>
<td>4 (10.0%)</td>
<td>4 (5.1%)</td>
</tr>
<tr>
<td>2.5-2.9</td>
<td>13 (34.2%)</td>
<td>17 (42.5%)</td>
<td>30 (38.5%)</td>
</tr>
<tr>
<td>3.0-3.49</td>
<td>15 (39.5%)</td>
<td>6 (15.0%)</td>
<td>21 (26.9%)</td>
</tr>
<tr>
<td>3.5-4.0</td>
<td>10 (26.3%)</td>
<td>11 (27.5%)</td>
<td>21 (26.9%)</td>
</tr>
</tbody>
</table>

The number of smokers was greatest when the annual income of parents ranged from $31,000 to $45,000. Eleven (29.0%) males and 12 (30.0%) females were included in that category. The income category that ranked next for the highest percentage of smokers was the more than $60,000 per year. This was true for both nine (23.7%) of the males and 10 (25.0%) of the females. The lowest number of smokers were from households where the parents annual income was either less than $10,000 or $10,000 to $20,000. There was one (2.6%) male from less than $10,000 category and 2 (5.0%) females who indicated that their parents annual household income was less than $10,000 (Table 4-27).
Table 4-27. Percentage of Male and Female Smokers By Parents Annual Household Income: 1986-87

<table>
<thead>
<tr>
<th>Annual Income</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;$10,000</td>
<td>1 (2.6%)</td>
<td>2 (5.0%)</td>
<td>3 (3.8%)</td>
</tr>
<tr>
<td>$10,000-$20,000</td>
<td>3 (7.9%)</td>
<td>2 (5.0%)</td>
<td>5 (6.4%)</td>
</tr>
<tr>
<td>$21,000-$30,000</td>
<td>7 (18.4%)</td>
<td>5 (12.5%)</td>
<td>12 (15.4%)</td>
</tr>
<tr>
<td>$31,000-$45,000</td>
<td>11 (29.0%)</td>
<td>12 (30.0%)</td>
<td>23 (29.5%)</td>
</tr>
<tr>
<td>$46,000-$60,000</td>
<td>7 (18.4%)</td>
<td>9 (22.5%)</td>
<td>16 (20.5%)</td>
</tr>
<tr>
<td>&gt;$60,000</td>
<td>9 (23.7%)</td>
<td>10 (25.0%)</td>
<td>19 (24.4%)</td>
</tr>
</tbody>
</table>

Total 38 40 78

The largest number of smokers indicated that they had an average of one to five drinks per week. Twenty seven (33.8%) of regular and occasional smokers responded that one to five drinks was their weekly average. Four hundred and eleven (52.6%) non-smokers also indicated that one to five drinks was their weekly average (Table 4-28). A chi square value of 1.08 with one degree of freedom did not indicate a significant difference for the weekly alcohol consumption by smokers when compared to non-smokers (Table 4-29).
Table 4-28. Percentage of Cigarette Smokers & Non-Smokers by Weekly Alcohol Consumption: 1986-87

<table>
<thead>
<tr>
<th>Weekly Alcohol Consumption</th>
<th>Cigarette Smokers</th>
<th>Cigarette Non-Smokers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never Drink</td>
<td>19 (24.4%)</td>
<td>153 (19.5%)</td>
<td>172 (19.9%)</td>
</tr>
<tr>
<td>1-5 Drinks</td>
<td>26 (33.3%)</td>
<td>412 (52.5%)</td>
<td>438 (50.8%)</td>
</tr>
<tr>
<td>6-10 Drinks</td>
<td>18 (23.1%)</td>
<td>132 (16.8%)</td>
<td>150 (17.4%)</td>
</tr>
<tr>
<td>11-15 Drinks</td>
<td>9 (11.5%)</td>
<td>53 (6.7%)</td>
<td>62 (7.2%)</td>
</tr>
<tr>
<td>16-25 Drinks</td>
<td>4 (5.1%)</td>
<td>24 (3.1%)</td>
<td>28 (3.2%)</td>
</tr>
<tr>
<td>&gt; 25 Drinks</td>
<td>2 (2.6%)</td>
<td>11 (1.4%)</td>
<td>13 (1.5%)</td>
</tr>
</tbody>
</table>

Table 4-29. Chi Square Comparison of Smoking Status by Weekly Alcohol Consumption: 1986-87

<table>
<thead>
<tr>
<th>Smoking &amp; Drinking Status</th>
<th>Observed</th>
<th>Expected</th>
<th>X2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoker</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never Drinks</td>
<td>19</td>
<td>15.5</td>
<td>.79</td>
</tr>
<tr>
<td>Drinks</td>
<td>59</td>
<td>62.4</td>
<td>.19</td>
</tr>
<tr>
<td>Non-Smoker</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never Drinks</td>
<td>153</td>
<td>156.5</td>
<td>.08</td>
</tr>
<tr>
<td>Drinks</td>
<td>632</td>
<td>628.5</td>
<td>.02</td>
</tr>
</tbody>
</table>

| X2 = 1.08 |

Twenty six (33.3%) of the regular smokers responded that they had never smoked marijuana. There were 342 (39.6%) of the total respondents who indicated that they had never smoked marijuana and 254 (29.4%) who
had experimented with marijuana. Of 29 (3.3%) regular daily marijuana smokers, eight (27.5%) of them also smoked cigarettes (Table 4-30). A chi square value of 2.27 with one degree of freedom did not indicate a significant difference between smokers and non-smokers use or non-use of marijuana (Table 4-31).

Results indicated that 43 (4.9%) individuals used illegal substances on an occasional and regular basis. Eleven (25.6%) of those individuals also smoked cigarettes regularly (Table 4-30).

<table>
<thead>
<tr>
<th>Substance Use Status</th>
<th>Regular Cigarette Smoker</th>
<th>Non-Smoker</th>
<th>Marijuana Regular Cigarette Smoker</th>
<th>Non-Smoker</th>
<th>Illicit Substances Regular Cigarette Smoker</th>
<th>Non-Smoker</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never Used</td>
<td>26 (33.3%)</td>
<td>316 (40.3%)</td>
<td>48 (61.5%)</td>
<td>591 (75.3%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experiment</td>
<td>14 (17.9%)</td>
<td>240 (30.6%)</td>
<td>15 (19.2%)</td>
<td>139 (17.7%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ex-User</td>
<td>15 (19.2%)</td>
<td>51 (6.5%)</td>
<td>4 (5.1%)</td>
<td>23 (2.9%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occasional</td>
<td>15 (19.2%)</td>
<td>157 (20.0%)</td>
<td>10 (12.8%)</td>
<td>32 (4.1%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regular</td>
<td>8 (10.3%)</td>
<td>21 (2.7%)</td>
<td>1 (1.3%)</td>
<td>0 (0.0%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>78</td>
<td>785</td>
<td>78</td>
<td>785</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A chi square value of 16.65 with one degree of freedom was found significant at the 0.05 level indicating that there was a significant difference in use of illicit substances by cigarette smokers and non-smokers. (Table 4-32). Data suggests that use of illicit substances by smokers was greater than use of illicit drugs by non-smokers.
Table 4-31. Chi Square Comparison of Smokers and Non-Smokers by Marijuana Use: 1986-87

<table>
<thead>
<tr>
<th>Smoking Status &amp; Marijuana Use</th>
<th>Observed</th>
<th>Expected</th>
<th>X2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Smoker</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never Used</td>
<td>26</td>
<td>30.86</td>
<td>.77</td>
</tr>
<tr>
<td>Occasional/Regular</td>
<td>23</td>
<td>18.13</td>
<td>1.30</td>
</tr>
<tr>
<td><strong>Non-Smoker</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never Used</td>
<td>316</td>
<td>311.13</td>
<td>.07</td>
</tr>
<tr>
<td>Occasional/Regular</td>
<td>178</td>
<td>182.86</td>
<td>.13</td>
</tr>
</tbody>
</table>

X2 = 2.27

Table 4-32. Chi Square Comparison of Smokers and Non-Smokers by Illicit Substance Abuse: 1986-87

<table>
<thead>
<tr>
<th>Smoking Status &amp; Illicit Substance Abuse</th>
<th>Observed</th>
<th>Expected</th>
<th>X2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Smoker</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never Used</td>
<td>48</td>
<td>55.28</td>
<td>.96</td>
</tr>
<tr>
<td>Occasional/Regular</td>
<td>11</td>
<td>3.72</td>
<td>14.25</td>
</tr>
<tr>
<td><strong>Non-Smoker</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never Used</td>
<td>591</td>
<td>583.72</td>
<td>.09</td>
</tr>
<tr>
<td>Occasional/Regular</td>
<td>32</td>
<td>39.28</td>
<td>1.35</td>
</tr>
</tbody>
</table>

X2 = 16.65
Smokeless Tobacco Use

Forty students (4.6%) indicated that they used smokeless tobacco daily. Data relating to the status of the respondents' smokeless tobacco use indicated that 40 (4.6%) were regular daily users and 28 (3.2%) were occasional users but did not use daily. Twenty-five (2.9%) indicated that they were ex-users of smokeless tobacco and 158 (18.3%) had experimented with it a few times. The largest number of respondents, 612 (70.9%), had never used smokeless tobacco. Of the 40 (4.6%) who used smokeless tobacco daily, four (10.0%) of them also smoked cigarettes regularly (Table 4-33). A chi square value of .72 with one degree of freedom was not significant at the 0.05 level (Table 4-34). The resulting chi square value indicated no significant difference in use by smokers and non-smokers of smokeless tobacco.

<table>
<thead>
<tr>
<th>Smokeless Tobacco Status</th>
<th>Regular Cigarette Smokers</th>
<th>Cigarette Non-Smokers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never Used</td>
<td>53 (67.9%)</td>
<td>559 (71.2%)</td>
<td>612 (70.9%)</td>
</tr>
<tr>
<td>Experimented</td>
<td>16 (20.6%)</td>
<td>142 (18.0%)</td>
<td>158 (18.3%)</td>
</tr>
<tr>
<td>Ex-User</td>
<td>1 (1.3%)</td>
<td>24 (3.1%)</td>
<td>25 (2.9%)</td>
</tr>
<tr>
<td>Occasional</td>
<td>4 (5.1%)</td>
<td>24 (3.1%)</td>
<td>28 (3.3%)</td>
</tr>
<tr>
<td>Regular</td>
<td>4 (5.1%)</td>
<td>36 (4.6%)</td>
<td>40 (4.6%)</td>
</tr>
<tr>
<td>Total</td>
<td>78</td>
<td>785</td>
<td>863</td>
</tr>
</tbody>
</table>
Table 4-34. Chi Square Comparison of Smokers and Non-Smokers by Use of Smokeless Tobacco: 1986-87

<table>
<thead>
<tr>
<th>Smoking Status &amp; Use of Smokeless Tobacco</th>
<th>Observed</th>
<th>Expected</th>
<th>X2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoker</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never Used Smokeless</td>
<td>53</td>
<td>54.9</td>
<td>.06</td>
</tr>
<tr>
<td>Occasional/Regular</td>
<td>8</td>
<td>6.1</td>
<td>.59</td>
</tr>
<tr>
<td>Non-Smoker</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never Used Smokeless</td>
<td>559</td>
<td>557.1</td>
<td>.01</td>
</tr>
<tr>
<td>Occasional/Regular</td>
<td>60</td>
<td>61.9</td>
<td>.06</td>
</tr>
</tbody>
</table>

\[ X^2 = .72 \]

The largest number of smokeless tobacco users were males in the 18-19 age category. Regular users of smokeless tobacco consisted of 38 (95.0%) males and 2 (5.0%) females (Table 4-35).

Of the 38 males who used smokeless tobacco regularly, one (2.6%) of their fathers used smokeless tobacco. One (50%) of the female users had a father who used smokeless tobacco. Eleven (28.9%) of the males who used smokeless tobacco had brothers who also used smokeless tobacco. One of the females had a brother who used smokeless tobacco.
Smokeless Tobacco and Other Substance Use

The largest number of males who used smokeless tobacco indicated that they consumed one to five alcoholic drinks per week. Thirteen (32.5%) responded to drinking a weekly average of one to five drinks. Of the two females who used smokeless tobacco, one indicated that she drank an average of one to five drinks per week and the other female reported that she drank an average of 25 or more drinks per week (Table 4-36). A chi square value of 7.66 with one degree of freedom was found significant at the 0.05 probability level indicating a significant difference in the weekly consumption of alcohol between smokeless tobacco users and non-users. A chi square test was also conducted to compare specific amounts of alcohol consumption by users and non-users of smokeless tobacco. A chi square value of 88.48 with one degree of freedom indicated that there was a significant difference when comparing consumption of 10 drinks or less to more than 10 drinks per week. (Table 4-37). Smokeless tobacco users were
much more likely to consume more than 10 drinks per week than were non-smokeless tobacco users.

Table 4-36. Percentage of Users and Non-Users of Smokeless Tobacco by Weekly Alcohol Consumption: 1986-87

<table>
<thead>
<tr>
<th>Weekly Alcohol Consumption</th>
<th>Smokeless Tobacco Users</th>
<th>Smokeless Tobacco Non-Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>1 (2.5%)</td>
<td>168 (20.4%)</td>
</tr>
<tr>
<td>1-5 Drinks</td>
<td>14 (35.0%)</td>
<td>425 (51.6%)</td>
</tr>
<tr>
<td>6-10 Drinks</td>
<td>9 (22.5%)</td>
<td>140 (17.0%)</td>
</tr>
<tr>
<td>11-15 Drinks</td>
<td>9 (22.5%)</td>
<td>53 (6.4%)</td>
</tr>
<tr>
<td>16-25 Drinks</td>
<td>4 (10.0%)</td>
<td>26 (3.3%)</td>
</tr>
<tr>
<td>&gt; 25 Drinks</td>
<td>3 (7.5%)</td>
<td>11 (1.3%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
<td><strong>823</strong></td>
</tr>
</tbody>
</table>

Table 4-37. Chi Square Comparison of Users & Non-Users of Smokeless Tobacco by Weekly Alcohol Consumption: 1986-87

<table>
<thead>
<tr>
<th>Smokeless Tobacco Status &amp; Alcohol Consumption</th>
<th>Observed</th>
<th>Expected</th>
<th>X2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Smokeless Tobacco User</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-10 Drinks/Week</td>
<td>15</td>
<td>34.7</td>
<td>11.18</td>
</tr>
<tr>
<td>&gt;10 Drinks/Week</td>
<td>25</td>
<td>5.3</td>
<td>73.22</td>
</tr>
<tr>
<td><strong>Smokeless Non-User</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-10 Drinks/Week</td>
<td>733</td>
<td>713.3</td>
<td>.54</td>
</tr>
<tr>
<td>&gt;10 Drinks/Week</td>
<td>90</td>
<td>109.7</td>
<td>3.54</td>
</tr>
</tbody>
</table>

\[X2 = 88.48\]
There were 201 (23.3%) students who indicated that they used marijuana on an occasional and regular basis. Fifteen (7.5%) of those respondents also used smokeless tobacco (Table 4-38).

Of the 38 (9.0%) males who responded that they used other illicit substances on an occasional basis, five (18.5%) used smokeless tobacco daily. One (50%) of the two females who used smokeless tobacco daily never used illegal substances and one (50%) used them on a daily basis (Table 4-36).

<table>
<thead>
<tr>
<th>Substance Use Status</th>
<th>Marijuana Daily User Smokeless</th>
<th>Non-User Smokeless</th>
<th>Illicit Substances Daily User Smokeless</th>
<th>Non-User Smokeless</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never Used</td>
<td>5 (12.5%)</td>
<td>332 (40.3%)</td>
<td>26 (65.0%)</td>
<td>608 (73.9%)</td>
</tr>
<tr>
<td>Experimented</td>
<td>15 (37.5%)</td>
<td>239 (29.0%)</td>
<td>7 (17.5%)</td>
<td>148 (18.0%)</td>
</tr>
<tr>
<td>Ex-User</td>
<td>5 (12.5%)</td>
<td>63 ( 7.7%)</td>
<td>1 ( 2.5%)</td>
<td>29 ( 3.5%)</td>
</tr>
<tr>
<td>Occasional</td>
<td>13 (32.5%)</td>
<td>159 (19.4%)</td>
<td>5 (12.5%)</td>
<td>38 ( 4.6%)</td>
</tr>
<tr>
<td>Regular</td>
<td>2 ( 5.0%)</td>
<td>30 ( 3.6%)</td>
<td>1 ( 2.5%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>823</td>
<td>40</td>
<td>823</td>
</tr>
</tbody>
</table>

A chi square value of 12.30 with one degree of freedom indicated that smokeless tobacco users differed significantly from smokeless tobacco non-users with respect to marijuana use (Table 4-39). The data suggested that users of smokeless tobacco were more likely to use marijuana on an occasional or regular basis than were smokeless non-users.
Table 4-39. Chi Square Comparison of Smokeless and Non-Smokeless Tobacco Users by Use of Marijuana: 1986-87

<table>
<thead>
<tr>
<th>Smokeless Tobacco Status &amp; Marijuana Use</th>
<th>Observed</th>
<th>Expected</th>
<th>X2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Smokeless Tobacco User</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never Used Marijuana</td>
<td>5</td>
<td>12.46</td>
<td>4.47</td>
</tr>
<tr>
<td>Occasional/Regular Use</td>
<td>15</td>
<td>7.54</td>
<td>7.38</td>
</tr>
<tr>
<td><strong>Non-User of Smokeless</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never Used Marijuana</td>
<td>332</td>
<td>324.54</td>
<td>.17</td>
</tr>
<tr>
<td>Occasional/Regular Use</td>
<td>189</td>
<td>196.46</td>
<td><strong>28</strong></td>
</tr>
</tbody>
</table>

X2 = 12.30

A chi square test was conducted for users and non-users of smokeless tobacco and their use of illicit substances. The resulting value, 8.32 with one degree of freedom indicated that users of smokeless tobacco differed significantly from smokeless tobacco non-users on the variable of illicit substance use. Smokeless tobacco users were more likely to use illicit substances on an occasional and regular basis than were non-smokeless tobacco users (Table 4-40).
Table 4-40. Chi Square Comparison of Smokeless Tobacco Users and Non-User by Their Use of Illicit Substances: 1986-87

<table>
<thead>
<tr>
<th>Smokeless Tobacco Status &amp; Illicit Substance Use</th>
<th>Observed</th>
<th>Expected</th>
<th>X2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smokeless Tobacco User</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never Used Illicit Substances</td>
<td>26</td>
<td>29.92</td>
<td>.51</td>
</tr>
<tr>
<td>Occasional/Regular Use</td>
<td>6</td>
<td>2.08</td>
<td>7.41</td>
</tr>
<tr>
<td>Non-User of Smokeless</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never Used Illicit Substances</td>
<td>608</td>
<td>604.08</td>
<td>.03</td>
</tr>
<tr>
<td>Occasional/Regular Use</td>
<td>38</td>
<td>41.92</td>
<td>.37</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>X2 = 8.32</td>
</tr>
</tbody>
</table>
The study was designed to analyze and compare data that related to smoking behavior of students at selected colleges in the state of Oregon in 1963-64 and 1986-87. The data that were collected during the 1963-64 school year were compared to results of a similar study conducted at the same colleges in Oregon during the 1986-87 school year. The analysis was conducted to determine those variables that were significant predictors of smoking behavior in 1963-64 and 1986-87. There were three research hypotheses developed to examine the nature of the relationship between smoking behavior in 1963-64 and smoking behavior in 1986-87. Descriptive variables were also compared between the two sets of data. Based on the findings of the study, Chapter 5 will present (1) a summary of the study, (2) conclusions of the data analysis and (3) recommendations.

**Summary of the Study**

A questionnaire relating to smoking behavior was developed and administered to 3,786 college students during the 1963-64 school year at selected colleges in the state of Oregon. The respondents were attending introductory personal health classes at Oregon State University, Portland State University, the University of Oregon and the University of Oregon Medical School. The resulting data were not analyzed at that time. Analysis of the data was not completed until 1986 (23 years later) at which time the data cards were discovered in storage.

During the 1986-87 school year a modified questionnaire was
developed and administered to college students attending introductory personal health classes at three of the same four universities that were utilized in the 1963-64 study. The University of Oregon Health Science Center (previously University of Oregon Medical School) was deleted from the study because the curriculum no longer included an introductory personal health class.

This study addressed the smoking behavior of an often neglected population of older adolescents and younger adults over a time period of 24 years. A significant factor of the study was that it provided a comparative analysis of data that were collected before and after the 1964 Surgeon General Report on the health consequences of smoking was published. The results of this study provided an understanding to the reasons why individuals choose to smoke or not to smoke and indicated whether or not those reasons remained constant over time.

Results indicated that the family influence evidenced in the 1963-64 data was not significant in the 1986-87 study. The current data indicated that the major factor in starting to smoke is peer smoking. As health educators, we need to address the issue of peer influence when developing smoking prevention and cessation programs for adolescents and young adults. Information and methods that will assist students in refusing cigarettes and other substances in practical situations should be emphasized.

The age of starting to smoke is decreasing, making it necessary to implement prevention programs during the elementary school years. It is also important that smoking cessation programs be available to the students who are already smoking.
Hypotheses of the Study

Based on analysis of previous research, the following null and alternative hypotheses were developed:

1. **Ho:** There will be no significant difference between the proportion of adolescents and young adults who are regular cigarette smokers when comparing the 1963-64 study to the 1986-87 study.

2. **Ho:** There will be no significant difference between the proportion of females who are regular cigarette smokers when comparing the 1963-64 study to the 1986-87 study.

3. **Ho:** There will be no significant difference between the proportion of males who are regular cigarette smokers when comparing the 1963-64 study to the 1986-87 study.

1. **Ha:** There will be a significant difference between the proportion of adolescents and young adults who are regular cigarette smokers when comparing the 1963-64 study to the 1986-87 study.

2. **Ha:** There will be a significant difference between the proportion of females who are regular cigarette smokers when comparing the 1963-64 study to the 1986-87 study.

3. **Ha:** There will be a significant difference between the proportion of males who are regular cigarette smokers when comparing the 1963-64 study to the 1986-87 study.

The findings of this study do not support the null hypotheses. Significant differences were identified when comparing the proportion of smokers in 1963-64 to the proportion of smokers in 1986-87. The differences were significant for the total population as well as when
separated by gender. Adolescents and young adults were more likely to smoke in 1963-64 than they were in 1986-87.

Conclusions

Based on the results of this study, the following conclusions were made for the population that was specific to this study. Generalizations based on the findings of this study are made in reference to the population of students at the selected colleges in the state of Oregon.

1. Stepwise logistic regression equations were used to determine the set of variables that best accounted for smoking status in 1963-64 and 1986-87. The resulting data indicated that the variables that increased the probability of an individual smoking in 1963-64 did not increase the probability of an individual smoking in 1986-87.

The variables that were significant predictors for subsequent smoking behavior in 1963-64 were mother smoking, father smoking, older sister smoking, father education and home classification. In 1986-87, the only significant variable contributing to an increased probability of a student smoking was having an older brother or brothers who smoked. The predicted probability for a person smoking who had one or more older brothers who smoked was .174. It may have been significant, however it does not appear to be a strong predictor.

It would appear that the characteristics of family members and their behaviors have less influence on the smoking behavior of adolescents and young adults today when compared to adolescents and young adults in 1963-64. It should be noted that the major response listed for starting to smoke was peer smoking for more than one half of the smokers in 1986-87. This variable and several others could not be used in the stepwise logistic
regression due to the differences in terminology or lack of the question in the 1963-64 questionnaire.

2. When separating by gender, the stepwise logistic regression indicated that the strongest predictor for females smoking in 1963-64 was having one or more older sisters who smoked. The other significant predictors were father smoking, home classification and mother smoking. The only significant variable for a female smoking in the 1986-87 study was having one or more older brothers who smoked. There were no common predictors when comparing the two studies. These findings support the previously made assumption that students smoking behavior in 1963-64 was more influenced by family characteristics and behaviors than it was in 1986-87. Although having an older brother or brothers who smoked was significant in 1986-87, the predicted probability of a female smoking who had one or more older brothers who smoked was only .164. Fifty one percent of the females indicated that they started to smoke because their peers smoked.

The analysis indicated that the strongest predictor of males smoking in the 1963-64 study was having one or more older sisters who smoked. The other significant variables that increased the probability of smoking were living in an urban setting, having a father who was a college non-graduate and a mother who smoked. There were no significant predictors for males smoking in the 1986-87 study. Sixty percent of the male smokers in 1986-87 did indicate that peer smoking was a factor in starting to smoke. Again, the influencing factors appear to have changed over the past few decades. In the early 1960's students smoking behavior was influenced more by family characteristics than it was in 1986-87.

3. Although the overall number of smokers decreased from 1963-64 to
1986-87, the number of adolescent and young adult female smokers increased significantly within the smoking population. In 1963-64, 37.6% of the population of smokers were females as compared to 51.3% in 1986-87. Research indicates that the increase of smoking in the adolescent and young adult population is largely due to the steady increases among females who smoke. There are no longer significant differences in the percentages of male and female smokers. The 1963-64 data indicated that there were significant differences between the percentages of male and female smokers. The difference was not significant in 1986-87. A direct result of this finding has been evidenced in recent research. Lung cancer, the most common cancer related to cigarette smoking, has surpassed breast cancer as the number one cancer killer for women (DHHS, 1985).

4. A significant number of smokers were beginning to smoke at an earlier age in 1986-87 when compared to 1963-64. This was especially true for the 1986-87 female population.

5. Cigarette consumption rates differed significantly when comparing 1963-64 data with 1986-87 data. Consumption rates were significantly higher in 1963-64 than they were in 1986-87. When separating by gender, males and females both smoked less in 1986-87 than did smokers in 1963-64. A significant difference is noted when comparing males and females within the separate years. Males smoked significantly more cigarettes per day than did females in 1963-64. There was no significant difference between male and female daily consumption rates in 1986-87.

6. The largest number of smokers in 1963-64 and 1986-87 were from hometowns with large populations. Hometown classification was a significant predictor for smokers in 1963-64. An individual was more likely to smoke if their hometown was an urban area. It was not a
significant predictor in 1986-87, however 48.7% of the smokers were from hometowns with populations of more than 50,000 people as compared to 23.1% of the smokers from hometowns with less than 10,000 people.

7. The major reason for quitting smoking in 1963-64 was listed as physical and in 1986-76 it was a concern for physical health. The majority of smokers quit on their own in 1986-87 and the smokers in 1963-64 responded that they succeeded in quitting by quitting all at once rather than gradually.

8. There was not a significant difference between cigarette smokers and non-smokers with regard to use of smokeless tobacco, alcohol consumption or marijuana use. There was, however a significant difference in the use of other illicit substances (cocaine, crack, heroin, quaaludes, etc.) when comparing cigarette smokers and non-smokers. Cigarette smokers were much more likely to use illicit substances on an occasional or regular basis than were non-smokers.

9. Smokeless tobacco users who indicated that they consumed alcohol, used marijuana and other illicit substances were significantly different than non-users of smokeless tobacco. Smokeless tobacco users were more likely to consume more alcohol on a weekly basis than non-users. They were also more likely to use marijuana and other illicit substances on an occasional and regular basis.

**Recommendations**

Based on the conclusions of the study, the following recommendations are suggested:

(1) Results indicated that the age at which males and females are starting to smoke is decreasing. Emphasis should be placed on smoking
education and prevention programs beginning in elementary school. The programs should also target the college age students because starting age may continue into the twenties. Information regarding the deleterious health effects of smoking should be made available beginning at the elementary level because a concern for physical health was listed as a major reason for quitting smoking.

Prevention efforts should also be directed at the number one reason that adolescents and young adults give for starting to smoke - peer pressure. It is necessary that emphasis be placed on preparing adolescents and young adults to deal successfully with peer pressure.

(2) Smoking cessation programs should be provided to adolescents and young adults. Smoking cessation programs for adolescents and young adults have not received adequate attention. Concentrated efforts have been directed at the adult population and adolescents and young adults have been overlooked. The smoking cessation programs should be designed with the idea that the majority of smokers quit on their own but also offer group support if desired.

(3) Additional efforts need to be focused on the female population of adolescents and young adults. Smoking programs and anti-smoking campaigns should be developed with attention directed toward adolescent females.

(4) Smoking prevention programs should be emphasized in urban settings because of the larger number of smokers living in that environment.

(5) Tobacco education should be included in the substance use/abuse curriculum. There appears to be a significant correlation with tobacco use and illicit substance use/abuse.

(6) Results indicated that adolescent and young adult males were at a
high risk for smokeless tobacco use. Educational programs relating to
smokeless tobacco should be included in the curriculum with other form of
tobacco use with adolescent and young adult males as the target population.

(7) Further research should be conducted relating to adolescents and
young adults smoking behavior to determine other variables that are
significantly related to choosing to smoke or not to smoke.
BIBLIOGRAPHY


APPENDICES
Appendix A

1963-64 SMOKING BEHAVIOR QUESTIONNAIRE
INTER-AGENCY COMMITTEE ON SMOKING AND HEALTH
Smoking Status of College Students

Respondent: DO NOT put your name or any identifying mark on survey form or answer sheet. This survey is strictly confidential and anonymous. MARK ONLY ON THE ANSWER SHEET. Make your mark heavy and black.

GENERAL INFORMATION SECTION:

1. Your age is
   a. 16-17
   b. 18-19
   c. 20-21
   d. 22-23
   e. 24 or older

2. Your home state is
   a. Oregon
   b. Washington
   c. California
   d. Idaho
   e. Other

3. Your sex is
   a. Male
   b. Female

4. College class level
   a. Freshman
   b. Sophomore
   c. Junior
   d. Senior
   e. Graduate

5. College residence
   a. Fraternity
   b. Sorority
   c. Dormitory
   d. Home
   e. Other

6. Home town size
   a. 50,000 or more
   b. 50,000 - 10,000
   c. 10,000 - 5,000
   d. 5,000 - 2,000
   e. 2,000 or less

7. Home classification
   a. Urban
   b. Suburban
   c. Rural

8. Mother's formal education
   a. College grad.
   b. College non-grad.
   c. High school grad.
   d. High school non-grad
   e. Elementary grad.

9. Father's formal education
   a. College grad.
   b. College non-grad.
   c. High school grad.
   d. High school non-grad
   e. Elementary grad.

10. Does father smoke cigarettes?
    a. Yes
    b. No
11. Does father smoke pipe or cigar?
   a. Yes
   b. No

12. Does mother smoke cigarettes?
   a. Yes
   b. No

13. Does mother smoke pipe or cigar?
   a. Yes
   b. No

14. If father does not smoke, did he quit smoking in last 5 yrs.?
   a. Yes
   b. No

15. If mother does not smoke, did she quit smoking in last 5 yrs.?
   a. Yes
   b. No

16. Number of older brothers who smoke
   a. 1  d. 4
   b. 2  e. 5 or more
   c. 3

17. Number of older sisters who smoke
   a. 1  d. 4
   b. 2  e. 5 or more
   c. 3

18. Number of younger brothers who smoke
   a. 1  d. 4
   b. 2  e. 5 or more
   c. 3

19. Number of younger sisters who smoke
   a. 1  d. 4
   b. 2  e. 5 or more
   c. 3

20. Number of older brothers who do not smoke
   a. 1  d. 4
   b. 2  e. 5 or more
   c. 3

21. Number of older sisters who do not smoke
   a. 1  d. 4
   b. 2  e. 5 or more
   c. 3

22. Number of younger brothers who do not smoke
   a. 1  d. 4
   b. 2  e. 5 or more
   c. 3

23. Number of younger sisters who do not smoke
   a. 1  d. 4
   b. 2  e. 5 or more
   c. 3
24. Do you or have you smoked
   a. Regularly at some time
   b. Only on special occasions
   c. Infrequently
   d. Only a few times
   e. Never at all

   ONLY THOSE WHO HAVE OR DO NOW SMOKE REGULARLY CONTINUE WITH
   REMAINING QUESTIONS

25. When did you start smoking?
   a. Elementary school
   b. 7-8-9 grades
   c. Sr. high
   d. College

26. Why did you start smoking?
   a. Group pressure
   b. Desire to appear 'grown up'
   c. Though it was smart
   d. Curiosity
   e. Other reasons

27. If you have quit smoking why did you quit?
   a. Social reasons
   b. Religious reasons
   c. Economic reasons
   d. Medical reasons
   e. Physical reasons

28. If you have quit smoking what method did you use?
   a. Gradual cutting down
   b. All at once
   c. Substitution
   d. With medical aid
   e. With psychological aid

29. Do you regularly smoke?
   a. Cigarettes
   b. Filter cigarettes
   c. Cigars
   d. Pipe
   e. Others
ONLY THOSE WHO NOW SMOKE COMPLETE THE REMAINDER OF THE QUESTIONS

30. How many cigarettes do you smoke in an average day?
   a. 2 or more packs
   b. 1 to 2 packs
   c. 1/2 to 1 pack
   d. 1/2 pack or less

31. Do you smoke filter tip cigarettes?
   a. Yes
   b. No

32. If you smoke filter tip is it because
   a. More sanitary
   b. Get less nicotine & tars
   c. Cooler smoke
   d. Better taste
   e. Status symbol

33. Would you like to quit smoking?
   a. Yes
   b. No

34. If you want to quit smoking is it because
   a. Economic reasons
   b. Medical reasons
   c. Social reasons
   d. Religious reasons
   e. Physical reasons

35. Have you ever tried to quit smoking?
   a. Yes
   b. No

36. If you have tried to quit smoking and failed, do you attribute your lack of success to
   a. Lack of personal discipline
   b. People you associated with
   c. Physical dependency
   d. Psychological dependency
   e. Other reasons
APPENDIX B

1986-87 SMOKING BEHAVIOR QUESTIONNAIRE
DIRECTIONS: PLEASE FOLLOW THE INSTRUCTIONS AT THE BEGINNING OF EACH SECTION OF THE QUESTIONNAIRE. USE A #2 PENCIL. DO NOT PUT YOUR NAME ON THE QUESTIONNAIRE. YOUR ANSWERS WILL REMAIN ANONYMOUS. THANK YOU.

SECTION 1: EVERYONE ANSWER THE FOLLOWING QUESTIONS IN SECTION 1.

1. DO YOU CURRENTLY SMOKE CIGARETTES DAILY?
   1) No
   2) Yes

2. DESCRIBE YOUR CIGARETTE SMOKING STATUS:
   1) Never smoked cigarettes
   2) Experimenter - smoked a few times
   3) Ex-smoker - used to smoke but no longer smoke
   4) Occasional - once in awhile - not every day
   5) Regular - smoke every day

3. DOES YOUR FATHER SMOKE CIGARETTES?
   1) He never has
   2) He used to, but he quit
   3) He smokes less than a pack a day
   4) He smokes about a pack a day
   5) He smokes more than a pack a day

4. DOES YOUR MOTHER SMOKE CIGARETTES?
   1) She never has
   2) She used to, but she quit
   3) She smokes less than a pack a day
   4) She smokes about a pack a day
   5) She smokes more than a pack a day
5. DO YOU HAVE ANY OLDER BROTHER BROTHERS WHO SMOKE?
   1) No older brothers
   2) Have older brothers but none smoke
   3) 1 or 2 older brothers who smoke
   4) More than 2 older brothers who smoke

6. DO YOU HAVE ANY YOUNGER BROTHERS WHO SMOKE?
   1) No younger brothers
   2) Have younger brothers but none smoke
   3) 1 or 2 younger brothers who smoke
   4) More than 2 younger brothers who smoke

7. DO YOU HAVE ANY OLDER SISTERS WHO SMOKE?
   1) No older sisters
   2) Have older sisters but none smoke
   3) 1 or 2 older sisters who smoke
   4) More than 2 older sisters who smoke

8. DO YOU HAVE ANY YOUNGER SISTERS WHO SMOKE?
   1) No younger sisters
   2) Have younger sisters but none smoke
   3) 1 or 2 younger sisters who smoke
   4) More than 2 younger sisters who smoke

9. ARE YOU A DAILY USER OF SMOKELESS TOBACCO
    (CHEW OR SNUFF)?
   1) No
   2) Yes

10. DESCRIBE YOUR USE OF SMOKELESS TOBACCO:
    1) Never used
    2) Experimenter - used a few times
    3) Ex-user - used to use but no longer use
    4) Occasional - use once in awhile - not every day
    5) Regular - use every day

11. DOES YOUR FATHER USE SMOKELESS TOBACCO?
    1) No
    2) Yes
12. DO YOU HAVE ANY BROTHERS WHO USE SMOKELESS TOBACCO?
   1) No
   2) Yes

13. DESCRIBE YOUR USE OF ALCOHOL
    (1 DRINK = 12 OZ. BEER = 4 OZ. WINE = 1 SHOT OF LIQUOR):
    1) I never drink alcohol
    2) 1-5 drinks per week
    3) 6-10 drinks per week
    4) 11-15 drinks per week
    5) 16-25 drinks per week
    6) More than 25 drinks per week

14. DESCRIBE YOUR USE OF MARIJUANA:
    1) Never smoked marijuana
    2) Experimenter - used a few times
    3) Ex-smoker - used to smoke but no longer smoke
    4) Occasional - once in awhile - not every day
    5) Regular - smoke marijuana every day

15. DESCRIBE YOUR USE OF THE FOLLOWING SUBSTANCES
    (COCAINE, CRACK, HEROIN, QUAALUDES, ETC.):
    1) Never used
    2) Experimenter - used a few times
    3) Ex-user - used in the past but no longer use
    4) Occasional - once in awhile - not every day
    5) Regular - use every day

SECTION II: ONLY REGULAR (SMOKE EVERY DAY), OCCASIONAL
             (SMOKE ONCE IN AWHILE BUT NOT EVERY DAY) AND EX- CIGARETTE
             SMOKERS (USED TO SMOKE BUT NO LONGER SMOKE) ANSWER THE
             QUESTIONS IN SECTION II - OTHERS PROCEED TO SECTION III.

16. WHEN DID YOU START SMOKING CIGARETTES?
    1) Elementary school (Grades K-4)
    2) Middle school (Grades 5-6)
    3) Junior high school (Grades 7-8-9)
    4) Senior high school (Grades 10-12)
    5) College
17. WHICH ONE FACTOR DO YOU FEEL WAS THE MAJOR INFLUENCE IN YOU STARTING TO SMOKE?
   1) Peers smoked
   2) One or both parents smoked
   3) Use of other drugs
   4) Stress
   5) Feeling of nonconformity
   6) Media/Advertisements
   7) Role models smoked
   8) Increase self-esteem

SECTION III: ONLY THOSE WHO ARE REGULAR SMOKERS (SMOKE EVERY DAY) ANSWER THE QUESTIONS IN SECTION III - OTHERS PROCEED TO SECTION IV.

18. HOW MANY CIGARETTES DO YOU SMOKE IN AN AVERAGE DAY?
   1) 1/2 pack or less
   2) 1 pack
   3) 1 - 2 packs
   4) More than 2 packs

19. WOULD YOU LIKE TO QUIT SMOKING?
   1) No
   2) Yes

20. HAVE YOU EVER TRIED TO QUIT SMOKING?
   1) No
   2) Yes, 1 or 2 times
   3) Yes, 3 or more times
SECTION IV: THIS SECTION IS TO BE COMPLETED ONLY BY THOSE WHO ARE EX-SMOKERS (USED TO SMOKE CIGARETTES BUT NO LONGER SMOKE). OTHERS PROCEED TO SECTION V.

21. WHICH ONE FACTOR DO YOU FEEL MOST INFLUENCED YOU TO QUIT SMOKING?
   1) Concern for your own health
   2) Family wanted you to quit
   3) Friends wanted you to quit
   4) Smoking cost too much
   5) Current legislation
   6) Warning on cigarette pack
   7) Bad breath/yellow teeth
   8) Negative societal view

22. HOW DID YOU SUCCEED IN QUITTING SMOKING?
   1) On your own without professional assistance
   2) Smoking cessation clinic/workshop
   3) Other

SECTION VI: FINALLY, WE WOULD LIKE TO ASK SOME QUESTIONS ABOUT YOURSELF TO HELP INTERPRET THE RESULTS. EVERYONE IS TO RESPOND TO THIS SECTION.

23. YOUR SEX IS:
   1) Male
   2) Female

24. YOUR AGE IS:
   1) 16-17
   2) 18-19
   3) 20-21
   4) 22-23
   5) 24+
25. YOUR HOME STATE IS:
   1) Oregon
   2) Washington
   3) California
   4) Idaho
   5) Other

26. WHICH OF THE FOLLOWING BEST DESCRIBES YOUR RACIAL OR ETHNIC IDENTIFICATION?
   1) Asian
   2) Black
   3) Caucasian
   4) Hispanic
   5) Native American
   6) Other

27. ESTIMATED ANNUAL INCOME OF YOUR PARENTS HOUSEHOLD?
   1) Less than $10,000
   2) $10,000 - $20,000
   3) $21,000 - $30,000
   4) $31,000 - $45,000
   5) $46,000 - $60,000
   6) More than $60,000

28. YOUR COLLEGE RESIDENCE IS:
   1) Fraternity
   2) Sorority
   3) Dormitory
   4) Home with parents
   5) Apartment
   6) Other

29. WHAT IS YOUR CURRENT GRADE POINT AVERAGE?
   1) Less than 2.0
   2) 2.0 to 2.49
   3) 2.5 to 2.9
   4) 3.0 to 3.49
   5) 3.5 to 4.0
30. HOME TOWN SIZE:
   1) Less than 1,999
   2) 2,000 to 4,999
   3) 5,000 to 9,999
   4) 10,000 to 30,999
   5) 31,000 to 50,000
   6) 51,000 to 80,000
   7) More than 80,000

31. YOUR MOTHER'S FORMAL EDUCATION:
   1) 8th grade or less
   2) 9 to 11 grades
   3) High school grad. or equivalent
   4) Technical/Community college grad.
   5) 4 year college grad.
   6) Graduate/Professional degree

32. YOUR FATHER'S FORMAL EDUCATION:
   1) 8th grade or less
   2) 9 to 11 grades
   3) High school grad. or equivalent
   4) Technical/Community college grad.
   5) 4 year college grad.
   6) Graduate/Professional degree
APPENDIX C

INSTRUCTIONS READ ALOUD PRIOR TO ADMINISTRATION OF 1986-87 SMOKING BEHAVIOR QUESTIONNAIRE
SMOKING BEHAVIOR QUESTIONNAIRE

There are 5 sections in the questionnaire you are about to answer, however you may or may not be required to complete all 5 sections. Please follow the directions at the beginning of each section of the questionnaire to indicate whether or not you are to answer the questions contained in that specific section. As noted on the questionnaire, everyone will answer sections 1 and 5.

You have been provided with a #2 pencil to recore your answers on the questionnaire. Mark only 1 circle per question. Make heavy, dark marks. If you change your mind, erase thoroughly.

Remember, your answers will be confidential - do not put your name on the questionnaire. The questionnaires will be collected when everyone has finished. Ask for help if you are not sure about a question.

Begin by indicating the school you are currently attending in the upper left-hand corner of the page. Make your mark in the first column of circles - either a 0, 1, or 2 - depending on your school.