AN ABSTRACT OF THE THESIS OF

Cuong Van Huynh for the degree of Master of Science in Public Health presented on April 28, 1999. Title: Smoking Initiation By Female College Students.

Abstract approved:  

Annette M. Rossignol

The purpose of this thesis was to gain insight into why female college students initiate smoking. This study examined the major factors influencing the formation of such habit among this group. The tool used to study these factors was the questionnaire.

Questionnaires were administered to randomly selected female students on the Oregon State University (OSU) campus. The Memorial Union and campus library were the only locations where these questionnaires were administered.

Results of the study suggested that peers and curiosity were paramount in influencing smokers to initiate smoking. The results also indicated that, with the exceptions of curiosity and the belief that smoking was “adult”, there were no differences between early and late initiators in the extent to which the factors under examination influenced them to start smoking. Both curiosity and the belief that smoking was “adult” had greater influence on early initiators to smoke their first cigarettes than they did with late initiators. Lastly, college-related stress was found to increase the daily level of smoking among smokers.

For non-smokers, health concern and odor were factors that influenced them greatly to remain smoke-free.

Overall, the findings suggested that prevention efforts should focus on strategies that reduce the acceptability of smoking in the social environment.
Smoking Initiation By Female College Students

by

Cuong Van Huynh

A THESIS

submitted to

Oregon State University

in partial fulfillment of
the requirements for the
degree of

Master of Science

Presented April 28, 1999
Commencement June 1999
Master of Science thesis of Cuong Van Huynh presented on April 28, 1999

APPROVED:

Redacted for Privacy

Major Professor, representing Public Health

Redacted for Privacy

Chair of Department of Public Health

Redacted for Privacy

Dean of Graduate School

I understand that my thesis will become part of the permanent collection of Oregon State University libraries. My signature below authorizes release of my thesis to any reader upon request.

Redacted for Privacy

Cuong Van Huynh, Author
TABLE OF CONTENTS

BACKGROUND..................................................................................................................................................1

Women and Smoking: A Historical Overview.................................................................1
Smoking and Women’s Health.........................................................................................3
Environmental Tobacco Smoke....................................................................................6
The Economic Burden of Cigarette Smoking...............................................................7
Determinants of Smoking Among Women.................................................................8
Advertising and Promotion: The Controversy..........................................................10
Smoking and Public Health.........................................................................................12
Smoking Cessation and Weight Gains........................................................................13
College Students: A Special Population.................................................................15

THE STUDY................................................................................................................................................16

METHODS.................................................................................................................................................17

HYPOTHESIS.............................................................................................................................................20

RESULTS....................................................................................................................................................21

Smokers................................................................................................................................................27
Smokers: A Second Look.............................................................................................................29
Non-Smokers........................................................................................................................................31
Quitters....................................................................................................................................................33

DISCUSSION...........................................................................................................................................34

BIBLIOGRAPHY.................................................................................................................................36

APPENDICES........................................................................................................................................39

Appendix A Instructions for Questionnaire.................................................................40
Appendix B Questionnaire...............................................................................................41
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Demographic Characteristics of the Sample</td>
<td>21</td>
</tr>
<tr>
<td>2.</td>
<td>Response Frequencies for Early Initiators</td>
<td>22</td>
</tr>
<tr>
<td>2b.</td>
<td>Response Frequencies for Late Initiators</td>
<td>23</td>
</tr>
<tr>
<td>3.</td>
<td>Response Frequencies for Non-Smokers</td>
<td>24</td>
</tr>
<tr>
<td>4.</td>
<td>College-related Stress and the Level of Smoking</td>
<td>26</td>
</tr>
<tr>
<td>5.</td>
<td>$\chi^2$ and p-values for Tables 2-2b</td>
<td>26</td>
</tr>
<tr>
<td>6.</td>
<td>Combined Response Frequencies for Early Initiators</td>
<td>30</td>
</tr>
<tr>
<td>6b.</td>
<td>Combined Response Frequencies for Late Initiators</td>
<td>30</td>
</tr>
<tr>
<td>7.</td>
<td>$\chi^2$ and p-values for Tables 6-6b</td>
<td>31</td>
</tr>
</tbody>
</table>
Women and Smoking: A Historical Overview

At the turn of the century, cigarette smoking among women was rare. Up until the 1920s, women who smoked were frowned upon (Stover, 1998). Smoking by women was socially discouraged (Stover, 1998). Women who smoked were said to be vulgar, and their habits were seen as improper and even immoral (Chollat-Traquet, 1992). Those who opposed tobacco believed that it exploited the poor and was unhealthy, hazardous, and unfeminine (Chollat-Traquet, 1992). However, such attitudes began to change with the coming of women's emancipation, combined not only with their increasing employment in paid occupations but also their development of careers of their own and a decreasing dependence on men for their livelihood (Chollat-Traquet, 1992). With these changing roles of women in our society, cigarette smoking, which is very much a dependence, ironically, has become a symbol of independence for women (Stover, 1998).

During WWI, sending cigarettes to soldiers was considered patriotic (Chollat-Traquet, 1992). This act became a symbol of American patriotism. Because of this, any organized anti-smoking efforts during this time were effectively put to an end (Chollat-Traquet, 1992). The New York Times, for example, did not carry a single item on the activities or pronouncements of anti-cigarette groups during 1918 (Troyer, 1983). Instead, the Times reported activities of citizen groups that sent cigarettes to soldiers, and they published statements by army personnel on the need for tobacco (Troyer, 1983). On July 18, 1918, for example, the Times quoted an army doctor as saying the cigarette is an “indispensable comfort to the men.” (Troyer, 1983). Soon, the cigarette became a critical part of the war effort (Troyer, 1983). General John J. Pershing is reported to have cabled Washington D.C. saying, “Tobacco is as indispensable as the daily ration; we must have thousands of tons of it without delay.” (Troyer, 1983) Later on, Pershing was quoted as saying, “You ask me what we need to win this war. I answer tobacco as much as bullets.” (Troyer, 1983).
During the 1920s, seeing women smoking in public became more common. However, some people still opposed this. Smoking was a sign of emancipation and equality for these women, although they smoked less than men (2.4 versus 7.2 cigarettes per day on average in 1929) (Chollat-Traquet, 1992). Congressman Paul Johnson from Mississippi, one of the officials who was against women smokers, introduced a bill that would have made it a crime for women to smoke in the District of Columbia (Troyer, 1983). This bill never became law, but some policemen acted without the support of legal statutes (Troyer, 1983). For example, in New York in July 1922, a woman was arrested for smoking a cigarette (Troyer, 1983). Even though the judge dismissed the case, a month later a policeman hit a woman smoker with his nightstick, knocking her cigarette to the ground (Troyer, 1983). Obviously, smoking in public was seen by some as inappropriate behavior for women (Troyer, 1983).

By the late 1920s, social attitudes were changing (Troyer, 1983). As women became more emancipated, smoking became more socially accepted (Troyer, 1983). As evidence, on August 8, 1927, the New York Times published an article entitled, “Woman No Longer Hides Her Cigarette” with the subtitle “She Now Finds She Can Smoke Anywhere.” (Troyer, 1983) Another example is found in 1928, when a Methodist church in Oak Park, Illinois, canceled a lecture by a woman because she smoked cigarettes (Troyer, 1983). Newspapers in the U.S. reacted indignantly and editorialized against the church’s action (Troyer, 1983).

By 1930, opponents of cigarette smoking had virtually lost their fight, and smoking became an acceptable behavior (Troyer, 1983). Smoking became fashionable in the 1930s as well, especially among women in the cities (Chollat-Traquet, 1992). The day Eleanor Roosevelt smoked a cigarette in public in 1934, 17% of women in the U.S. smoked (Bjornson, 1996).

It was during the 1940s, especially during WWII, that women began to smoke in large numbers, a habit bolstered by their assembly-line work to help the war effort (Breo, 1993). Equal to men on the assembly line, women were also free to smoke (Breo, 1993). As women contributed to the national war effort, smoking by women became associated with going out to work, and with independence, emancipation, and patriotism (Chollat-Traquet, 1992). Women were not only working like men, but adopting their behavior as well (Chollat-Traquet, 1992).

Women were slower than men to give up the habit of smoking, as tobacco use declined over the past few decades (PHR, 1996). In 1965, 52 percent of men 18 years of age and over and 34 percent of women smoked; by 1990 men were only slightly more likely (28 percent) than women to smoke (23 percent), with smoking prevalence for both men and women generally stable in recent years (PHR, 1996).
Smoking and Women's Health

According to the U.S. Food and Drug Administration (FDA), tobacco-related diseases kill more than 400,000 people in the U.S. each year (Lowalski, 1997). That is more than the combined number of deaths annually from AIDS, car accidents, alcohol, homicides, illegal drugs, suicides, and fire (Lowalski, 1997).

The list of diseases cause by cigarette smoking is extensive. However, certain smoking-related diseases tend to occur at greater frequencies than others. Since discussing every smoking-related disease in women is impractical, only the most common ones will be examined.

Cancer

The tobacco in cigarettes contains at least 40 known carcinogens (cancer-causing chemicals) (Dreher, 1995). Chemicals in tobacco smoke collect in the lungs and trigger the formation of cancerous growths (Dreher, 1995). Because lung cancer is the most prevalent cancer caused by these chemicals, lung cancer usually is associated with cigarette smoking (Dreher, 1995). These chemicals also cause cancer at other sites in the body as well. Other cancers associated with cigarette smoking include, but are not limited to, cervical cancer, cancers of the larynx (voice box), esophagus, pancreas, and mouth (Dreher, 1995).

Public health experts have begun to investigate why women start smoking, for in 1987, lung cancer surpassed breast cancer as the leading cause of cancer death among U.S. women (JAMA, 1994). In 1993, for example, lung cancer accounted for 22 percent of female cancer deaths, compared with 18 percent for breast cancer (Ernster, 1993). Smoking is the number one preventable cause of death in U.S. women.

More than 140,000 American women die each year from smoking-related causes (Stover, 1998). Though the death rate from smoking-related diseases for men has plateaued, women's rates are rising dramatically (Stover, 1998).

Lung cancer has always been and continues to be more prevalent in men than women, but the magnitude of this difference is declining (Baldini, 1997). In the 1970s, after several decades of a rapidly increasing rate of lung cancer deaths among men, the rate of increase began to slow (Baldini, 1997). Since 1990, this rate of lung cancer deaths among men has actually declined, whereas in women it has continued to rise (Baldini, 1997). As these lung cancer death rate patterns have changed over time, so too has the relative male to female lung cancer mortality.
ratio (Baldini, 1997). Whereas historically men died of lung cancer at a much higher rate than women, in recent years, the relative ratio is coming closer to unity (Baldini, 1997).

While heart disease is the leading cause of death for all women, for those ages 25 to 74, cancer is the leading cause of death, and lung cancer is the leading cause of cancer mortality (PHR, 1996). Between the early 1970s and the early 1990s, the age-adjusted incidence rate of lung cancer more than doubled and the age-adjusted death rate almost tripled among women (PHR, 1996).

The lung cancer death rate for women rose slowly from about 2.5 cases per 100,000 women in 1930 to about 5 cases per 100,000 in 1960 (Baldini, 1997). Since 1960, the lung cancer death rate has increased rapidly and steadily, and in 1990 it was over 30 per 100,000 women (Baldini, 1997). As a result of the rapid increase in lung cancer deaths between 1930 and 1990, lung cancer has moved from the seventh most common to the most common cancer cause of deaths in women (Baldini, 1997).

At least 79 percent of lung cancer cases in women are related to smoking (Baldini, 1997). Unfortunately, almost 90 percent of lung cancer patients die within five years of diagnosis (Dreher, 1995). If lung cancer is detected early, the probability of survival improves somewhat, but not many cases are detected early (Dreher, 1995). There is no effective treatment for lung cancer (Dreher, 1995).

Lastly, it has been shown that the risk of lung cancer increases with the number of cigarettes smoked daily, number of years of smoking, and with earlier age at smoking initiation (Cristiano, 1997).

**Chronic Obstructive Pulmonary Diseases**

Cigarette smoking is also a major cause of chronic obstructive pulmonary diseases (COPDs), the name given to a series of diseases such as chronic bronchitis or emphysema, which occur more often in women who smoke than in those who do not (Dreher, 1995).

COPD results in a permanent reduction of the amount of oxygen in the blood (Dreher, 1995). With less oxygen, a person with COPD is chronically short of breath and tires easily (Dreher, 1995).

COPD is a major cause of smoking-related deaths in the U.S. today (Dreher, 1995). Death rates for COPDs have been increasing over the past two decades (Dreher, 1995). In fact, death rates for COPDs have actually paralleled those for lung cancer (Dreher, 1995). According
to the U.S. Public Health Service, almost 80,000 people die each year from this condition (Dreher, 1995). Cigarette smoking accounts for 82 percent of these deaths (Dreher, 1995). Hence, cigarette smoking is the most important risk factor for COPD. According to the U.S. Department of Health and Human Services, between 1979 and 1993, the age-adjusted death rate for COPD among women more than doubled (PHR, 1996).

Cardiovascular Disease

In recent years, public health experts have begun researching smoking and heart disease among women. According to the American Heart Association (AHA), there are still misperceptions that cardiovascular disease is not a real problem for women, even though nearly 50 percent of women die of heart disease or stroke (Rose, 1998).

The AHA stated that cardiovascular disease, particularly coronary heart disease and stroke, remains the leading cause of death among U.S. women and, in 1994, accounted for 45.2 percent of all deaths in women (Rose, 1998). As the population ages, significantly more women will be at increased risk for morbidity and mortality associated with cardiovascular disease (Rose, 1998). Fortunately, studies have shown that coronary heart disease in women is largely preventable and that one of the major risk factors for coronary heart disease in women is cigarette smoking (Rose, 1998).

Heart disease is the greatest killer of women as they age (Dreher, 1995). Until she reaches menopause, a woman’s female hormones give her unique protection against heart disease (Dreher, 1995). This protection diminishes as her body produces less of these hormones in later years (Dreher, 1995). A woman’s coronary arteries can begin narrowing and hardening even before menopause (Dreher, 1995). The danger is that this process proceeds more rapidly in women who smoke (Dreher, 1995).

Other Physical Side Effects

Other side effects smoking women should consider are: bad breath, smelly clothes, stained teeth, and deep wrinkles around the eyes and lips caused by a reduction in blood circulation to the skin.

A few years ago, a study was conducted specifically to determine whether cigarette smoking is a risk factor for the development of premature facial wrinkling. The study results indicated that cigarette smoking is an independent risk factor for the development of premature wrinkling (Kadunce, 1991).
Pregnant Women

In pregnant women, annually, use of tobacco products is responsible for an estimated 19,000 to 141,000 tobacco-induced abortions, 32,000 to 61,000 infants born with low birthweight, and 14,000 to 26,000 infants who require admission to neonatal intensive care units (DiFranza, 1995). Tobacco use also annually is responsible for an estimated 1,900 to 4,800 infant deaths resulting from perinatal disorders, and 1,200 to 2,200 deaths from sudden infant death syndrome (SIDS) (DiFranza, 1995). Hence, tobacco use is an important, preventable cause of abortions, low birthweight, and deaths from perinatal disorders and SIDS (DiFranza, 1995). All pregnant women should be advised that smoking places their unborn child in danger (DiFranza, 1995). The low success rate of smoking cessation among pregnant women suggests that efforts to reduce the complications of pregnancy attributable to tobacco use by pregnant women should focus on preventing nicotine addiction among teenage girls (DiFranza, 1995).

Environmental Tobacco Smoke

The smoker is not the only one who is affected by tobacco smoke.

Environmental tobacco smoke (ETS), also known as secondhand smoke, adversely affects the health of non-smokers. ETS is made up of two components—“mainstream smoke,” which is the smoke the smoker exhales, and “sidestream smoke,” which is smoke given off by a burning cigarette between puffs (Scheller, 1998).

In 1986, the National Research Council of the National Academy of Sciences produced a landmark report on the health effects of ETS (Scheller, 1998). In that report, the Council concluded that secondhand smoke was responsible for 3,000 deaths from lung cancer annually in the U.S. (Scheller, 1998).

Since then, secondhand smoke has been shown to cause lung cancer in many studies. In fact, in 1992, the U.S. Environmental Protection Agency (EPA) classified secondhand smoke as a Group A carcinogen, the category reserved for the most dangerous cancer-causing substances (e.g. asbestos) (Jaen, 1996). Over 4,000 chemicals have been found in secondhand smoke, at least 40 of which are suspected to cause cancer (Scheller, 1998).

Lung cancer is just one tragic result of secondhand smoke (Scheller, 1998). According to the American Heart Association (AHA), some 40,000 people die each year from heart and blood-vessel diseases caused by secondhand smoke (Scheller, 1998). The AHA also found the risk of heart disease to increase by up to 30 percent among those exposed to secondhand smoke.
Heart, lung, and other diseases caused by secondhand smoke are responsible for 53,000 deaths each year, according to the American Cancer Society (Scheller, 1998). It is the third-leading cause of death in the U.S., after smoking and alcohol (Scheller, 1998).

The group that secondhand smoke has its greatest impact on is not adults, but infants and children.

**Sudden Infant Death Syndrome**

The major cause of death in U.S. infants between the ages of one month and one year is known as sudden infant death syndrome (SIDS) (Scheller, 1998), resulting in more than 5,500 deaths each year in the U.S. (Aligne, 1997). SIDS is defined as, “The sudden death of an infant under one year of age that remains unexplained after a thorough case investigation, including performance of a complete autopsy; examination of the death scene; and review of the clinical history.” (Carroll, 1998). Infants are three times more likely to die of SIDS if their mothers smoked during and after pregnancy, than infants born to non-smoking mothers (Scheller, 1998).

**Others**

Each year, up to 300,000 cases of pneumonia, bronchitis, and other respiratory infections in infants and children are linked to secondhand smoke (Scheller, 1998). Secondhand smoke is also one of the risk factors in the development of childhood asthma, causing 8,000 to 26,000 new cases each year (Scheller, 1998). In addition, it has been shown that children whose parents smoke are more likely to develop middle ear infections than children whose parents do not smoke (Scheller, 1998).

**The Economic Burden of Cigarette Smoking**

Equally important to the enormous health burden is the economic burden of cigarette smoking. In all the sources that I reviewed, the economic analysis done by the Berkeley Economic Research Associates (BERA) is the most widely accepted. Hence, this is the only cost study that will be discussed.

After being successful in analyzing the medical care costs of smoking to support lawsuits entered by state attorneys general against the tobacco industry, the former Miller & Associates, headed by Vincent P. Miller, expanded and renamed itself BERA (WWW, 1999).

BERA reported medical costs attributable to cigarette smoking in the U.S. to be $56.3 billion per year in 1993 (WWW, 1999)7. And about 43% of this amount is paid through local, state, and federal governments—meaning tax dollars (WWW, 1999)1.

The $56.3 billion cost estimate does not include any of the indirect costs of smoking, such as those associated with work days lost due to smoking-related illness or to years of potential life lost due to premature deaths caused by smoking (WWW, 1999)7. Medical care costs associated with secondhand smoke or those associated with the treatment of children exposed to tobacco before birth are not included in this estimate (WWW, 1999)7. This estimate also does not include costs associated with cigar, pipe, or smokeless tobacco consumption or with damages from fires and other accidents caused by cigarette smoking (WWW, 1999)7. "This must be understood as the absolute minimum, the floor, for the total economic burden imposed by tobacco," says Miller. "The full amount could easily be more than twice this figure." (WWW, 1999)7

In addition, BERA found smoking-attributable Medicaid expenditures for the U.S. to be $9.96 billion in 1993 (WWW, 1999)7. Though Medicare costs were not calculated, Miller says, "the total taxpayer burden (including Medicaid, Medicare, government employee health care benefits, and other programs) is probably well over $20 billion, since expenditures and the smoking-attributable portion of expenditures are higher in the older age groups." (WWW, 1999)7

**Determinants Of Smoking Among Women**

Many factors determine whether a person will become a smoker. These factors often are easy to identify; however, the interaction among these factors in producing an outcome is still unclear. These factors are described below.

**Sociocultural Factors**

**Social acceptability** Social acceptability refers to a situation within a specific cultural context, in which a particular behavior is considered appropriate, so that those demonstrating the behavior
are permitted to continue, even if they are harming themselves or others. It also implies that society may be reluctant to interfere with this behavior (Chollat-Traquet, 1992).

**Parental influence** Adolescents are more likely to take up smoking if their parents smoke or have permissive attitudes toward smoking (Chollat-Traquet, 1992).

**Peer influence** Having friends who smoke often determines whether a person will become a smoker. Peer pressure is a major factor influencing smoking behavior among young people (Chollat-Traquet, 1992).

**Personal Factors**

**Self-image** Cigarette advertisements usually show smoking as a way of attaining maturity, adulthood, and popularity, and of being sophisticated, sociable, feminine/masculine, and sexually attractive (Chollat-Traquet, 1992). Tobacco companies attract adolescent girls by promoting images of female attractiveness which equates being thin with desirability (Chollat-Traquet, 1992). Smoking studies consistently show that being thin is a major obsession among adolescent girls (Chollat-Traquet, 1992). Being slim gives these girls self-confidence and is regarded as fashionable (Chollat-Traquet, 1992).

**Self-esteem** Smoking studies have shown that girls who have low self-esteem are more likely to initiate smoking (Chollat-Traquet, 1992).

**Disposable income** The initiation of smoking among young girls often corresponds to a rise in disposable income (Chollat-Traquet, 1992).

**Knowledge** Knowledge, beliefs, and attitudes about smoking also influence smoking behavior (Chollat-Traquet, 1992).

**Environmental Factors**

**Advertising and Promotion** Discussed below (Chollat-Traquet, 1992).

**Availability** The easier it is to obtain cigarettes, the more likely it is that an individual will smoke (Chollat-Traquet, 1992).

**Price** Relative price of cigarettes is an important factor in determining the prevalence of smoking, especially among young people (Chollat-Traquet, 1992).

**Smoke-free environment** A smoke-free environment is self-promoting (Chollat-Traquet, 1992). If a person grows up in a smoke-free environment, whether in public or at home, that person will be more likely to perceive the odor of tobacco smoke as unpleasant (Chollat-Traquet, 1992).
All of the factors listed above are, to various degrees, important in influencing someone to take up and maintain the habit. However, advertising (and promotion) is a unique factor in that all of the other factors are, theoretically, related to and or affected by it in one way or another. On the one hand, advertising provides a mean for tobacco companies to recruit new smokers. On the other hand, public health advocates have argued strongly that their efforts to reduce smoking uptake have been counterbalanced by these same advertisements and promotion (Pierce, 1994). Hence, cigarette advertising is at the heart of almost every public policy debate. For this reason, advertising and promotion will be explored in detail below.

Advertising and Promotion: The Controversy

As mentioned elsewhere, hundreds of thousands of smokers die each year of lung cancer and other smoking-related diseases. Hence, the tobacco industry needs to replace these individuals with new smokers, especially women and children, in order to maintain tobacco sales.

Cigarettes are one of the most heavily marketed consumer products in the U.S. (WWW, 1999)\(^8\). Currently, the tobacco industry spends $4.6 billion a year (that is, $12.6 million a day) on tobacco advertising (Stover, 1998). The tobacco industry is the second largest advertiser in the print media, including magazines and newspapers, and the largest advertiser on billboards (WWW, 1999)\(^8\).

Cigarette advertisements and promotion may increase cigarette consumption through direct and indirect means (JAMA, 1990). Directly, it does so by encouraging children and adolescents to experiment with and initiate regular use of cigarettes, deterring current smokers from quitting, prompting former smokers to begin smoking again, and increasing smokers’ daily cigarette consumption by serving as an external cue to smoke (JAMA, 1990). Indirectly, cigarette advertising may increase consumption through means such as the inhibiting effect of cigarette advertising revenues on media coverage of issues related to smoking and disease (JAMA, 1990). In addition, the ubiquity of cigarette advertising may contribute to the perception that smoking is less hazardous, more prevalent, and more socially acceptable than it is (JAMA, 1990). Cigarette advertisements usually portray glamorous and successful lifestyles (Califano, 1995). Some examples include the sexy Virginia Slims advertisements; the affluent, healthy outdoor style of Newport, “Alive with Pleasure!”; the macho Marlboro Man; fun-loving Joe Camel; the groups of friends, guys and gals, having fun while they smoke (Califano, 1995).
The targeting of women in sales and advertising started in the late 1960s with the introduction of Philip Morris’ remarkably successful Virginia Slims brand and its “You’ve come a long way, baby” campaign (Kaufman, 1994). This could not have come at a better time in the U.S. for increasing tobacco sales, for during this decade America was experiencing major social and political changes. Hence, smoking became a symbol of freedom, rebellion, fashion, and social status for women. In addition, tobacco advertisements exploited women’s and adolescent girls’ concerns with staying slim by emphasizing the weight controlling benefits of smoking (Stover, 1998). That was partly why Virginia Slims and Capri Superslims were so attractive to teenage girls. Everything about the advertisements seemed to emphasize the idea of slim—their names, slim cigarette outlines, and the employment of extremely thin models in the advertisements (Califano, 1995). As evidence of the tobacco industry’s marketing success, six years after the introduction of Virginia Slims and other similar “women’s cigarettes,” the number of young girls smoking had increased by an astonishing 110% (Stover, 1998).

Cigarette advertising directed toward women attempts to associate smoking with sexual attractiveness, fitness, and female independence, images that belie the addiction and premature death that so often await women who smoke (Ernster, 1993). Such advertisements are especially notable for associating smoking with being thin; terms such as “slims” and “lights” and images of elongated female models or feminine objects are commonplace (Ernster, 1993). Such material plays into a cultural preoccupation with weight control, particularly among women (Ernster, 1993). A telephone survey of young adults (average age 19.2 years) conducted from 1986 through 1987 found that 58 percent of female smokers expressed concern about gaining a lot of weight if they quit smoking, compared with 26.3 percent of male smokers (Ernster, 1993). Although smokers who quit do gain more weight on average than smokers who do not quit, the relative differences in most women who quit smoking are minor and pale in relation to the health benefits associated with quitting (Ernster, 1993).

Studies have shown that girls’ perceptions of their physical appearance and overall sense of self-worth are much lower than those of boys and decline as they age during early adolescence (Kaufman, 1994). Young women sometime face gender role conflicts that are different from those of young men and may be more concerned about what is socially desirable (Kaufman, 1994). Societal preoccupation with female thinness affects adolescent girls’ perceptions of the benefits of smoking (Kaufman, 1994). These perceptions are associated with regular smoking (Kaufman, 1994).
The tobacco industry exploits and reinforces these vulnerabilities by linking smoking to fashion, because fashion is an effective approach for reaching young women (Kaufman, 1994). Females, particularly adolescent girls, tend to use fashion to enhance their image (Kaufman, 1994). Hence, women’s magazines have increasingly been used by tobacco companies to sell cigarettes, and cigarette advertising is associated with decreased coverage of the dangers of smoking (Kaufman, 1994). A study, which focused on cigarette advertising and magazine coverage of the hazards of smoking, provided strong statistical evidence that cigarette advertising in magazines is associated with diminished coverage of the hazards of smoking (Warner, 1992). This is particularly true for magazines directed toward women (Warner, 1992).

Advertising is a powerful weapon, indeed. Tobacco companies know this. Hence, they use it in creative ways in their war to win young smokers. The industry claims that its marketing is not aimed at children. This claim is questionable for, of the adults who smoke, some 90% started before the age of 18 years, and most “hard core” smokers begin between 11 and 13 years of age (Stover, 1998). Studies have shown that by the age of 6, Joe Camel is just as familiar to children as Mickey Mouse (Stover, 1998). Such familiarity is a known risk factor for tobacco addiction (Stover, 1998). When Joe Camel was first used in advertising, Camel’s market share among underaged smokers increased from .5% to 33%, making adolescents the fastest growing group of smokers in the U.S. (Stover, 1998). Hence, regardless of the industry’s marketing intent, it is the effect that matters.

**Smoking and Public Health**

The public health perspective is population-based, focusing on health problems which are greatest in number and severity and, importantly, are most amendable to prevention efforts (Curran, 1998). The goals of public health are disease prevention and health promotion (Steppe, 1996). With its emphasis on prevention, screening, and early detection, public health represents the first line of defense against high health care costs (Steppe, 1996).

In the past, helping smokers quit was the primary focus of efforts to reduce tobacco use. This strategy has been an important one, because smoking cessation at all ages reduces the risk of premature death. In recent years, however, the focus of tobacco control has expanded to include strategies to prevent individuals from ever starting to smoke. Reaching young people early is critical because the decision to use tobacco is nearly always made during adolescence.
In public health, the importance of prevention is well known—it is almost always more cost effective than, for example, treatment or the cost of lives. Public health professionals are not interested in just any prevention approach, they are interested in a more comprehensive, broad-based approach to prevention, because no one preventive method will work for everyone. Elements of a comprehensive preventive approach to reducing tobacco use include, but are not limited to, reducing minors’ access, promoting school health education, restricting advertising and promotion of counter-advertising, treatment of nicotine addiction, product regulation, and economic deterrents.

When the only sure way not to become addicted is to avoid the first puff, it is hard to overstate the value of prevention (Califano, 1995). The difficulty of quitting—Henningfield notes that by the age of 17 years, 50 percent of teenage smokers have tried to quit and failed—and the debilitating and deadly consequences of smoking make it essential never to start (Califano, 1995). It is hard to conceive of a better return on the nation’s investment in research than the knowledge of which prevention strategies—from restrictions on access and advertising to more appealing health education and higher cigarette taxes work best to convince adolescents not to smoke (Califano, 1995). It is easy to imagine how many fewer teenagers would have started smoking if, over the past two decades, the $60 billion that tobacco companies pumped into the marketing and advertising that have persuaded so many to light up had been invested instead into prevention research (Califano, 1995). Hence, to prevent the adverse health effects and deaths in women caused by cigarette smoking, the most effective approach is to deter smoking initiation by girls and adolescent women (WWW, 1999).

Since the late 1950s, when the hazards of smoking began making headlines and the anti-tobacco movement was launched, national, state, and local public health campaigns delayed an estimated three-quarters of a million deaths from tobacco-related disease by 1989 (Roper, 1991). Although many lives have been saved, one in every five deaths in 1988 was smoking-related; smoking directly caused 434,000 deaths in 1988 (Roper, 1991). Hence, public health efforts in controlling tobacco use is still much needed.

Smoking Cessation and Weight Gains

It is almost undisputed that preventing someone from starting to smoke is easier than having a smoker quit. Hence, prevention is the best approach to reducing tobacco use among
women. However, because prevention is not effective for everyone, smoking cessation is another way of achieving the same goal—a lower prevalence.

It is often challenging for public health professionals to assist women smokers in quitting due to the likelihood of gaining weight. What was once thought of as a myth, has become almost universal acceptance. Women who quit smoking usually do gain weight. A study by the Centers for Disease Control and Prevention (CDC) confirmed what many former smokers have learned from experience: quitters can expect to gain weight—an average of 8 pounds for women and 6 pounds for men (Horowitz, 1991). The study also reported that 1 in 8 women (1 in 10 men) who quit add 29 pounds or more, while continuing smokers tend to gain much less (Horowitz, 1991). Perhaps the most important of the findings was not the gaining of weight, but that women gained more than men. This same result was found in a different study focusing on linking quitting with weight gain. In this study, it was found that among people who quit smoking, women not only gained more weight on average than men (adjusted weight gain due to smoking cessation, 5.0 versus 4.4 kg), but also feel more intense social pressure to be thin (Califano, 1995).

Hence, it is reasonable to expect that concern about weight gain may be an important factor leading to the initiation and continuation of smoking, particularly among adolescent girls. In March of 1991, the American Journal of Public Health reported that more than twice as many adolescent girls as boys said they were worried about gaining weight if they quit (57.9 versus 26.3 percent expressing concern) (Pirie, 1991).

However, health professionals need to inform women who want to quit smoking that the benefits of quitting greatly outweigh any weight gain. The difficulty of dealing with high-school and college-age female smokers is that young people tend to be less concerned about the long-term dangers of smoking than, say, middle-aged people are (WWW, 1999)³. For these young smokers, “long-term” dangers are too far into the future to be concerned with now. They want immediate satisfaction. They want to be slim now. Hence, trying to warn girls barely twenty years old about the long-term health dangers of their smoking habits rarely lends itself to a successful prevention effort (WWW, 1999)³. It is hard to imagine any health expert who would disagree that it is better for someone to be a few pounds heavier and a nonsmoker, than smoke and be skinny.

Lastly, Henningfield found that weight gain accompanies smoking cessation regardless of strategy—whether one uses nicotine patches or gum or stops “cold turkey” (Califano, 1995).
College Students: A Special Population

Adolescent smoking prevalence is tracked annually and has increased in recent years (WWW, 1998)⁴. However, little is known about trends in smoking among college students, a group that has previously been more resistant to tobacco use than other young adults (WWW, 1998)⁴.

Until now, college students (about 18 to 24 years old) largely have been ignored by anti-smoking programs (WWW, 1999)⁵. Perhaps this is because historically, they were far less likely to smoke than less educated Americans (WWW, 1999)⁵. In addition, most smokers begin before they reach 18 years old (WWW, 1999)⁵. Hence, public health efforts have focused more on persuading children never to try cigarettes and helping older smokers quit (WWW, 1999)⁵.

According to a recent study done by the Harvard School of Public Health, smoking rose by 28 percent--from 22 percent to 28 percent--on college campuses between 1993 and 1997 (WWW, 1999)⁶. According to Henry Wechsler, principal investigator of the study, this finding was interesting because college students and people with college education have traditionally smoked at lower levels than did people not attending college (WWW, 1999)⁶. This rise in smoking among the most highly educated youth in America should be a wake-up call about the problem of smoking at all levels of society (WWW, 1999)⁶. However, the sharp increase in college-age smoking was not entirely unexpected, for researchers had been anticipating a significant rise since smoking among high school students increased by about 30 percent in the mid-1990s (WWW, 1999)³. The findings also indicated that the vast majority of students started smoking in high school—only 11% of college students had their first cigarette after the age of 18 years (WWW, 1999)⁵.

The smoking studies done on women up to this point have focused on women in general. Despite the startling findings of the Harvard (and other) studies, there was not one smoking study done specifically on female college students that I could find in my literature search. With findings from the Harvard (and other) studies, more public health research should really be focused on female college students. The current research helps to fill this gap.
THE STUDY

The purpose of this research was to gain insight into why female college students initiate smoking.

Information about cigarette smoking is very easily obtainable. However, in all the sources that I have reviewed, there were no study conducted specifically on female college students. What I found were “bits and pieces” of information on this population from various smoking studies. Up to this point, much of the research done on young people and smoking has focused on high school teens and pre/adolescence (those between the ages of 11 and 17 years or so). Hence, I am convinced that the result of this study will be a major contribution to the public health literature. The overall study objective was to make various comparisons among three groups of female college students: non-smokers, smokers who initiated before the age of 17 years (early initiators), and smokers who initiated at or after the age of 17 years (late initiators). These were the main questions I wanted to answer in my study results:

1. What influence, if any, does peer, parental, or sibling smoking have on a person’s smoking habit?
2. Does college-related stress affect the level of smoking among smokers?
3. Do cigarette ads affect a person’s decision to begin smoking?
4. Is smoking initiation influenced by the perception of one’s body weight?
5. What proportion of OSU female students are early initiators, late initiators, and non-smokers?
6. What are some major reason(s) why a non-smoking female would stay smoke-free?
7. Do college females who started to smoke between 17 and 24 years of age respond to the same types of influences as pre/adolescents who begin smoking?
METHODS

At the heart of my study was the questionnaire.

Smoking is prevalent among people of both genders and of all ages in the U.S. However, I focused only on the habits of female college students. I surveyed OSU undergraduates between the ages of 17 and 24 years. The reason for this age range was because the traditional and typical college undergraduate fell in this range.

Though I surveyed female students of all races, I limited my study to American students. Including international students in the study would have been inappropriate because international students were not representative of American students. Differences between American and international students may exist over culture, life experiences, political and economic backgrounds, or other characteristics. The information that I obtained for OSU should give a fairly accurate representation of the college student populations at other American four-year institutions.

The Questionnaire

In constructing the questionnaire, two goals were kept in mind—simple and short. Surveys generally have a reputation for being “long and dull.” Because a high response rate was desired, great effort was put into making the questionnaire completion time under one minute, without sacrificing completeness.

Pilot Test

Prior to the actual survey, the questionnaire was evaluated by ten randomly selected female students on campus, all between the ages of 17 and 24 years. Their suggestions for changes were incorporated into the final version of the questionnaire.

Sampling Method

I distributed the questionnaires at the Memorial Union (MU) and the Valley Library. The MU is central to the OSU campus. The MU is comprised of the university bookstore (and supplies), a coffee shop, restaurants, student dining facilities, study areas (lounges), student activities office, etc.. The Valley Library is the main university library. Hence, these locations were unlike any others on campus in that practically every student, theoretically, had to go there
at one time or another. In other words, these sites were where a variety of students congregated daily.

Survey Schedule
My weekly survey schedule, set prior to the implementation of the study, was as followed:

Daytime Only
On Mondays, Wednesdays, and Fridays, I surveyed from 10am to 3pm; and on Tuesdays and Thursdays, I surveyed from 10am to 1pm. I alternated between the MU and the library daily. Alternating locations like this provided me with different students to which to administer the questionnaires.

Nighttime Only
From Monday through Thursday, I surveyed from 6pm to 9pm at the library. On Sundays, I surveyed from 4pm to 7pm at the library.

During each survey time block, I handed out questionnaires to as many females who appeared to be between the ages of 17 and 24 years as possible--regardless of whether they were smoking at that moment or not. Having set days, locations, and time intervals beforehand like this increased the randomness and representation of the sample. It reduced the possibility of bias in my study. Basically, I used time and space to help generate a random sample. The randomness was whoever happened to be at these locations, during these time intervals, and on these days.

Classification of the Subjects
On the questionnaire, a subject was classified as a smoker if she usually smokes at least one cigarette every day. However, those who skipped a day or two were still considered smokers. Students who smoked fewer cigarettes (i.e. “occasional/weekend” smokers) were instructed to complete the non-smoker section of the questionnaire with the following instruction, “Mark the extent to which each of the following factors influences your decision NOT to start smoking regularly.”

Subjects who used to smoke regularly but no longer do, were classified as “Quitters.” Quitters were not required to complete the questionnaire, except to indicate that they were quitters.
Individuals who, for various reasons, declined to participate in the study when asked to do so, were classified as “No Response.”

Confidentiality of the Subjects

Each subject, prior to completing the questionnaire, was asked to read the confidentiality statement. In essence, this statement assured the subjects that their responses were strictly confidential.
HYPOTHESIS

My *a priori* hypothesis was that, with the exceptions of weight and the belief that smoking was "adult," there would not be any differences between early and late initiators in the extent to which each of the listed factors influenced them to smoke their first cigarettes. Specifically, I hypothesized that weight would have more influence on late initiators and the belief that smoking was "adult" to have more influence on early initiators, to smoke their first cigarettes.
RESULTS

The Sample

The total sample size was 623. The distributions of the sample by race and smoking status are shown in Table 1.

The mean age of smoking initiation among early initiators was 14.0 years (range: 8 to 16 years) and among late initiators was 18.1 years (range: 17 to 21 years). The sample contains less than one percent Black and less than one percent Asian. 1.8 percent of the sample was Hispanic, and 2.6 percent of the sample was Multi-racial. 1.8 percent of the sample considered themselves as “Other.”

For smoking status, 15.1 percent and 5.9 percent of the sample were early and late initiators, respectively. 75.8 percent of the sample were non-smokers, and 3.2 percent of the sample were quitters. There were 33 subjects who declined to participate in the study.

<table>
<thead>
<tr>
<th>TABLE 1 -- Demographic Characteristics of the Sample (n = 623)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Race</td>
</tr>
<tr>
<td>White</td>
</tr>
<tr>
<td>Black</td>
</tr>
<tr>
<td>Asian</td>
</tr>
<tr>
<td>Hispanic</td>
</tr>
<tr>
<td>Multi-racial</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td>Smoking status</td>
</tr>
<tr>
<td>Early initiators</td>
</tr>
<tr>
<td>Late initiators</td>
</tr>
<tr>
<td>Non-smokers</td>
</tr>
<tr>
<td>Quitters</td>
</tr>
<tr>
<td>No response</td>
</tr>
</tbody>
</table>
Early Initiators

The data for early initiators are shown in Table 2.

**TABLE 2 -- Response Frequencies for Early Initiators, n (%)**

<table>
<thead>
<tr>
<th>Factors</th>
<th>None</th>
<th>A Little</th>
<th>A Lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peers</td>
<td>11 (11.7)</td>
<td>28 (29.8)</td>
<td>55 (58.5)</td>
</tr>
<tr>
<td>Parent(s)</td>
<td>68 (72.3)</td>
<td>18 (19.1)</td>
<td>8 (8.5)</td>
</tr>
<tr>
<td>Sibling(s)*</td>
<td>68 (74.7)</td>
<td>15 (16.5)</td>
<td>8 (8.8)</td>
</tr>
<tr>
<td>Cigarette ads and promotion</td>
<td>74 (78.7)</td>
<td>16 (17.0)</td>
<td>4 (4.3)</td>
</tr>
<tr>
<td>Your weight</td>
<td>83 (88.3)</td>
<td>5 (5.3)</td>
<td>6 (6.4)</td>
</tr>
<tr>
<td>Curiosity</td>
<td>2 (2.1)</td>
<td>23 (24.5)</td>
<td>69 (73.4)</td>
</tr>
<tr>
<td>The belief that smoking was “adult”</td>
<td>44 (46.8)</td>
<td>38 (40.4)</td>
<td>12 (12.8)</td>
</tr>
<tr>
<td>Something to do to occupy your hands</td>
<td>54 (57.5)</td>
<td>23 (24.5)</td>
<td>17 (18.1)</td>
</tr>
<tr>
<td>Stress</td>
<td>52 (55.3)</td>
<td>24 (25.5)</td>
<td>18 (19.1)</td>
</tr>
<tr>
<td>Actors, actresses, musicians, etc.</td>
<td>73 (77.7)</td>
<td>18 (19.1)</td>
<td>3 (3.2)</td>
</tr>
</tbody>
</table>

*3 early initiators said they had no sibling and, hence, were omitted from all calculations for this factor.

58.5 percent of early initiators said that peer smoking influenced them a lot to smoke their first cigarettes. 29.8 percent said their smoking peers influenced them only a little.

72.3 percent of early initiators said parental smoking had no influence on them to smoke their first cigarettes. 19.1 percent said parental smoking influenced them only a little.

74.7 percent of early initiators said sibling smoking had no influence on them to smoke their first cigarettes. 16.5 percent said sibling smoking influenced them only a little to take up the habit.

78.7 percent of early initiators indicated that cigarette ads and promotion had absolutely no influence on their taking up the habit. 17.0 percent said ads and promotion did influenced them a little to start smoking.

88.3 percent of early initiators did not feel that their weight had any influence on their smoking initiation. However, 6.4 percent said that their weight influenced them a lot to smoke their first cigarettes.

73.4 percent of early initiators said that curiosity influenced them a lot to initiate smoking. 24.5 percent said that curiosity influenced them only a little.

Among early initiators, 46.8 percent said the belief that smoking was “adult” had no influence on their taking up the habit. 40.4 percent said this factor influenced them only a little.
Cigarette smoking, as something to do to occupy the hands, did not have any influence on 57.5 percent of the early initiators to smoke their first cigarettes. However, this factor influenced 24.5 percent of early initiators a little to initiate smoking.

Among early initiators, 55.3 percent said stress had no influence on their starting the habit. 25.5 percent said stress did influenced them, but only a little.

Finally, 77.7 percent of early initiators said that celebrities had no influence on them to smoke their first cigarettes. 19.1 percent said this factor did influenced them a little.

Late Initiators

The data for late initiators are shown in Table 2b.

<table>
<thead>
<tr>
<th>Factors</th>
<th>None</th>
<th>A Little</th>
<th>A Lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peers</td>
<td>3 (8.1)</td>
<td>12 (32.4)</td>
<td>22 (59.5)</td>
</tr>
<tr>
<td>Parent(s)</td>
<td>31 (83.8)</td>
<td>5 (13.5)</td>
<td>1 (0.0)</td>
</tr>
<tr>
<td>Sibling(s)*</td>
<td>28 (80.0)</td>
<td>7 (20.0)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Cigarette ads and promotion</td>
<td>34 (91.9)</td>
<td>3 (8.1)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Your weight</td>
<td>32 (86.5)</td>
<td>4 (10.8)</td>
<td>1 (2.7)</td>
</tr>
<tr>
<td>Curiosity</td>
<td>3 (8.1)</td>
<td>19 (51.4)</td>
<td>15 (40.5)</td>
</tr>
<tr>
<td>The belief that smoking was “adult”</td>
<td>29 (78.4)</td>
<td>5 (13.5)</td>
<td>3 (8.1)</td>
</tr>
<tr>
<td>Something to do to occupy your hands</td>
<td>19 (51.4)</td>
<td>11 (29.7)</td>
<td>7 (18.9)</td>
</tr>
<tr>
<td>Stress</td>
<td>15 (40.5)</td>
<td>14 (37.8)</td>
<td>8 (21.6)</td>
</tr>
<tr>
<td>Actors, actresses, musicians, etc.</td>
<td>32 (86.5)</td>
<td>5 (13.5)</td>
<td>0 (0.0)</td>
</tr>
</tbody>
</table>

*2 late initiators said they had no sibling and, hence, were omitted from all calculations for this factor.

Among late initiators, 59.5 percent said that peer smoking influenced them a lot to smoke their first cigarettes. 32.4 percent said this factor influenced them only a little.

83.8 percent of late initiators said that parental smoking had absolutely no influence on them in puffing their first cigarettes. 13.5 percent said that parental smoking influenced them only a little to initiate smoking.

4 out of 5 (80.0%) late initiators said sibling smoking had no influence on them in smoking their first cigarettes. However, 1 out of 5 (20.0%) late initiators said that because their sibling(s) smoked, this act influenced them a little to initiate smoking.

91.9 percent of late initiators did not think that cigarette ads and promotion had any influence on them in taking their first puffs. 8.1 percent said that cigarette ads and promotion did influenced them, but only a little.
86.5 percent of late initiators said their body weight was not a factor in their decisions to smoke their first cigarettes. However, 10.8 percent said weight was a factor, but with little influence.

Over 9 out of 10 late initiators said that curiosity was an influential factor in their smoking their first cigarettes. Specifically, 51.4 percent said curiosity influenced them a little and 40.5 percent said curiosity influenced them a lot, to initiate smoking.

78.4 percent of late initiators did not think that the image of being "adult" that is associated with cigarette smoking had any influence on their initiating smoking. 13.5 percent felt that the association of smoking with being "adult" did influenced them, but only a little.

Cigarette smoking, as something to do to occupy the hands, did not have any influence on 51.4 percent of late initiators to start the habit. However, this factor influenced 29.7 percent of late initiators a little to smoke their first cigarettes.

Well over half of late initiators said that stress influenced them to begin smoking. Specifically, 21.6 percent said stress influenced them a lot, and 37.8 percent said stress influenced them a little, to initiate smoking.

Finally, 86.5 percent of late initiators did not think that celebrities had any influence on their smoking initiation. 13.5 percent said celebrities influenced them only a little to initiate smoking.

Non-Smokers

The data for non-smokers are shown in Table 3.

**TABLE 3 -- Response Frequencies for Non-Smokers, n (%)**

<table>
<thead>
<tr>
<th>Factors</th>
<th>None</th>
<th>A Little</th>
<th>A Lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>7 (1.5)</td>
<td>44 (9.3)</td>
<td>421 (89.2)</td>
</tr>
<tr>
<td>Peers</td>
<td>223 (47.2)</td>
<td>188 (39.8)</td>
<td>61 (12.9)</td>
</tr>
<tr>
<td>Parent(s)</td>
<td>98 (20.8)</td>
<td>155 (32.8)</td>
<td>219 (46.4)</td>
</tr>
<tr>
<td>Sibling(s)*</td>
<td>219 (49.4)</td>
<td>136 (30.7)</td>
<td>88 (19.9)</td>
</tr>
<tr>
<td>Negative social image</td>
<td>126 (26.7)</td>
<td>208 (44.1)</td>
<td>138 (29.2)</td>
</tr>
<tr>
<td>Expensive</td>
<td>180 (38.1)</td>
<td>139 (29.5)</td>
<td>153 (32.4)</td>
</tr>
<tr>
<td>Clothes smell bad**</td>
<td>35 (7.4)</td>
<td>107 (22.7)</td>
<td>329 (69.9)</td>
</tr>
<tr>
<td>Bad breath</td>
<td>37 (7.8)</td>
<td>116 (24.6)</td>
<td>319 (67.6)</td>
</tr>
<tr>
<td>Stains teeth</td>
<td>47 (10.0)</td>
<td>117 (24.8)</td>
<td>308 (65.3)</td>
</tr>
</tbody>
</table>

*29 non-smokers said they had no sibling and, hence, were omitted from all calculations for this factor.
** One subject did not complete this factor and hence, was omitted from all calculations for this factor.
Among non-smokers, 89.2 percent said that health influenced them a lot to not initiate smoking. 9.3 percent said health concerns deterred them a little from starting the habit.

47.2 percent of non-smokers said that their non-smoking peers did not have any influence on their not starting the habit. 39.8 percent said that having non-smoking peers did influenced them a little to stay away from cigarettes.

46.4 percent of non-smokers indicated that their non-smoking parent(s) influenced them a lot to not take up the habit. 32.8 percent said that having non-smoking parents influenced them a little to not initiate smoking.

49.4 percent of non-smokers said having non-smoking siblings did not have any influence on their not taking up the habit. However, 30.7 percent said the fact that their sibling(s) did not smoke influenced them a little to not smoke also.

More than 7 out of 10 non-smokers said the negative social image often associated with smoking influenced them not to start smoking. Specifically, 44.1 percent of non-smokers said this factor influenced them a little and 29.2 percent of non-smokers said this factor influenced them a lot, to not initiate smoking.

More than 6 out of 10 non-smokers said the cost of cigarettes did have an influence on their staying away from smoking. 32.4 percent said that the cost of cigarettes influenced them a lot to not initiate smoking. 29.5 percent said this factor influenced them a little to not smoke their first cigarettes.

69.9 percent of non-smokers said that fear of their clothes smelling bad influenced them a lot to not start the habit. 22.7 percent said this factor influenced them a little to not smoke their first cigarettes.

67.6 percent of non-smokers indicated that bad breath influenced them a lot to not begin smoking. 24.6 percent said this factor influenced them a little to stay smoke-free.

Finally, 65.3 percent of non-smokers said that fear of teeth staining influenced them a lot to not smoke. 24.8 percent said this factor influenced them only a little to remain smoke-free.

Responses to the question regarding the relationship between college-related stress and the number of cigarettes the subjects smoked on any given day are shown in Table 4.

From Table 4, it is clear that college-related stress increased the level of smoking among smokers in my study. 74.5 percent of early and 78.4 percent of late initiators said that college-related stress increased the number of cigarettes they smoked on any given day.

It is somewhat unusual to see 4.3 percent of early and 10.8 percent of late initiators indicating that college-related stress decreased the number of cigarettes they smoked on any
given day. One would expect that college-related stress would either increase or not affect the level of smoking among smokers. In fact, 18.1 percent of early and 8.1 percent of late initiators indicated that college-related stress did not affect their daily level of smoking. 3.2 percent of early and 2.7 percent of late initiators said they do not know how college-related stress affected their daily cigarette consumption.

**TABLE 4 -- College-related Stress and the Level of Smoking (%)**

<table>
<thead>
<tr>
<th>Type</th>
<th>Increases</th>
<th>Decreases</th>
<th>Does Not Affect</th>
<th>Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early initiators</td>
<td>74.5</td>
<td>4.3</td>
<td>18.1</td>
<td>3.2</td>
</tr>
<tr>
<td>Late initiators</td>
<td>78.4</td>
<td>10.8</td>
<td>8.1</td>
<td>2.7</td>
</tr>
</tbody>
</table>

*The Null Hypothesis and the Chi-Square Test*

The null hypothesis being tested was that there was no difference between early and late initiators in the extent to which each of the listed factors influenced them to smoke their first cigarettes. This was tested using the Chi-Square ($\chi^2$) test. Descriptive statistics were used where neither the $\chi^2$ test or any other statistical tools was applicable.

Using the responses in Tables 2-2b as the observed frequencies (and the null hypothesis to generate the expected frequencies), the $\chi^2$ test was performed on each of the ten factors listed on the smoker section of the questionnaire. The $\chi^2$ test statistics and the corresponding p-values for Tables 2-2b are shown in Table 5.

**TABLE 5—$\chi^2$ and p-values for Tables 2-2b**

<table>
<thead>
<tr>
<th>Factors</th>
<th>$\chi^2$</th>
<th>p-values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peers</td>
<td>0.39</td>
<td>*</td>
</tr>
<tr>
<td>Parent(s)</td>
<td>2.24</td>
<td>*</td>
</tr>
<tr>
<td>Sibling(s)</td>
<td>3.35</td>
<td>*</td>
</tr>
<tr>
<td>Cigarette ads and promotion</td>
<td>3.59</td>
<td>*</td>
</tr>
<tr>
<td>Your weight</td>
<td>1.85</td>
<td>*</td>
</tr>
<tr>
<td>Curiosity</td>
<td>12.94</td>
<td>p &lt; .01</td>
</tr>
<tr>
<td>The belief that smoking was “adult”</td>
<td>11.11</td>
<td>p &lt; .01</td>
</tr>
<tr>
<td>Something to do to occupy your hands</td>
<td>0.47</td>
<td>*</td>
</tr>
<tr>
<td>Stress</td>
<td>2.60</td>
<td>*</td>
</tr>
<tr>
<td>Actors, actresses, musicians, etc.</td>
<td>1.92</td>
<td>*</td>
</tr>
</tbody>
</table>

Note: df = 2, $\alpha$ = .05

*Not significant at df = 2, $\alpha$ = .05
Smokers

Early and Late Initiators: Similarities and Differences

For χ² with df = 2, a value of 5.99 was needed for significance at P = .05. Hence, looking at the χ² values in Table 5, with the exceptions of curiosity and the belief that smoking was “adult,” there were no differences between early and late initiators in the extent to which each of the listed factors influenced them to smoke their first cigarettes. For these eight factors, the null hypothesis was not rejected. Therefore, OSU female students who started smoking at or after the age of 17 years, overall, responded to the same types of influences as did pre/adolescents who began smoking. This finding paralleled the results of a study done in Minnesota. In that study, it was found that women who start to smoke after the age of 17 years tend to respond to the same types of influences as adolescents who begin smoking (Daly, 1993). However, for both curiosity and the belief that smoking was “adult,” the null hypothesis was rejected. Here, the observed frequencies were sufficiently different from the expected frequencies to justify rejection of the null hypothesis. The differences between the observed and expected frequencies for these two factors were statistically significant.

Analysis of the data in Tables 2-2b showed that curiosity had a greater influence on early initiators to smoke their first cigarettes than it did with late initiators. This difference was determined by the fact that the majority (73.4%) of early initiators said curiosity influenced them a lot to smoke their first cigarettes; whereas, the majority (51.4%) of late initiators said curiosity influenced them only a little to smoke their first cigarettes.

The belief that smoking was “adult” influenced more early initiators to smoke their first cigarettes than it did with late initiators. This was clear from the fact that 78.4 percent of late initiators said this factor had absolutely no influence on them to smoke their first cigarettes, versus only 46.8 percent of early initiators who said the same. These results were consistent with our reasonable expectation that curiosity and the association of smoking with being “adult,” if these factors had any effect, would influence younger people more than older individuals.

Weight

Contrary to popular belief, smoking was not used to lose weight by most of the subjects in my study. However, one should interpret this result carefully, for the questionnaire asked whether weight influenced a subject to smoke her first cigarette—not whether weight influenced
her to continue smoking. There is a difference. This difference was made clear from a couple of personal interviews with female smokers on campus who indicated that smoking, as a weight-loss strategy, was popular among their circles of friends. Surprisingly, when these same individuals were asked for their reasons for smoking their first cigarettes, weight was not a factor. This same situation may have been the case for other smokers in my study.

*Cigarette Ads and Promotion*

The result for cigarette ads and promotion downplayed the claims made by other studies of cigarette smoking, for the majority of early and late initiators said ads and promotion had absolutely no influence on them to smoke their first cigarettes.

*Peers*

For both early and late initiators, peers were paramount to their decisions to smoke their first cigarettes. For late initiators, the result paralleled the findings of a study done on late smoking initiation among Minnesota women. That study found having peers who smoke to be highly associated with late onset of smoking among those women (Daly, 1993).

*Parent(s) and Sibling(s)*

Because parents are true role models for their children, one would expect parental smoking to have major influences on their children’s habits.

Surprisingly, parental (and sibling) smoking did not have significant influences on either early or late initiators to smoke their first cigarettes. This lack of effect implies that much of the influence must have been external to the home. This made sense because peers, as mentioned before, were a major factor influencing smokers to smoke their first cigarettes. One should note that in a recent study assessing the relationship between parental and youth smoking, males were more inclined to be influenced by parental smoking than were females (Males, 1995). This may be the case here.

*Something to Do to Occupy Your Hands*

The majority of both early and late initiators said this factor had absolutely no influence on them to smoke their first cigarettes.
Stress
The majority of both early and late initiators said stress had no influence on their taking up the habit.

Actors, Actresses, Musicians, etc.
Contrary to anecdotal evidence from other studies, celebrities overall did not have any significant influence on either early or late initiators. This lack of effect was interesting because many movies and television programs portray smoking as more common and socially acceptable than it in fact is among the general population (Arnst, 1998). Cigarette smoking in movies and television dramas has become more frequent in recent years as well (Arnst, 1998). Looking at Table 4, it appears that college-related stress increased the level of smoking among female smokers on campus.

Smokers: A Second Look
From Table 2b, it is apparent that there were only a limited number of late initiators who responded either “A Little” or “A Lot” to many of the factors. Hence, for each of these factors, the response frequencies for “A Little” and “A Lot” were combined. With the exceptions of peers and curiosity, this combining was done for every factor listed in both Table 2 and Table 2b. The new data are shown in Tables 6-6b.

Because the response frequencies for “A Little” and “A Lot” were combined, “None” on the questionnaire can be considered as equivalent to “No” and “A Little and A Lot” together as “Yes,” to whether influence was present or not for each factor. Hence, there was no “degree” of influence—just “Yes” or “No”.
The data for early initiators, with combined frequencies, are shown in Table 6.

**TABLE 6 – Combined Response Frequencies for Early Initiators, n (%)**

<table>
<thead>
<tr>
<th>Factors</th>
<th>None</th>
<th>(A Little + A Lot)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peers</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Parent(s)</td>
<td>68 (72.3)</td>
<td>26 (27.7)</td>
</tr>
<tr>
<td>Sibling(s)</td>
<td>68 (74.7)</td>
<td>23 (25.3)</td>
</tr>
<tr>
<td>Cigarette ads and promotion</td>
<td>74 (78.7)</td>
<td>20 (21.3)</td>
</tr>
<tr>
<td>Your weight</td>
<td>83 (88.3)</td>
<td>11 (11.7)</td>
</tr>
<tr>
<td>Curiosity</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>The belief that smoking was “adult”</td>
<td>44 (46.8)</td>
<td>50 (53.2)</td>
</tr>
<tr>
<td>Something to do to occupy your hands</td>
<td>54 (57.5)</td>
<td>40 (42.6)</td>
</tr>
<tr>
<td>Stress</td>
<td>52 (55.3)</td>
<td>42 (44.7)</td>
</tr>
<tr>
<td>Actors, actresses, musicians, etc.</td>
<td>73 (77.7)</td>
<td>21 (22.3)</td>
</tr>
</tbody>
</table>

The data for late initiators, with combined frequencies, are shown in Table 6b.

**TABLE 6b—Combined Response Frequencies for Late Initiators, n (%)**

<table>
<thead>
<tr>
<th>Factors</th>
<th>None</th>
<th>(A Little + A Lot)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peers</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Parent(s)</td>
<td>31 (83.8)</td>
<td>6 (16.2)</td>
</tr>
<tr>
<td>Sibling(s)</td>
<td>28 (80.0)</td>
<td>7 (20.0)</td>
</tr>
<tr>
<td>Cigarette ads and promotion</td>
<td>34 (91.9)</td>
<td>3 (8.1)</td>
</tr>
<tr>
<td>Your weight</td>
<td>32 (86.5)</td>
<td>5 (13.5)</td>
</tr>
<tr>
<td>Curiosity</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>The belief that smoking was “adult”</td>
<td>29 (78.4)</td>
<td>8 (21.6)</td>
</tr>
<tr>
<td>Something to do to occupy your hands</td>
<td>19 (51.4)</td>
<td>18 (48.7)</td>
</tr>
<tr>
<td>Stress</td>
<td>15 (40.5)</td>
<td>22 (59.5)</td>
</tr>
<tr>
<td>Actors, actresses, musicians, etc.</td>
<td>32 (86.5)</td>
<td>5 (13.5)</td>
</tr>
</tbody>
</table>
The $\chi^2$ test statistics and the corresponding p-values for Tables 6-6b are shown in Table 7.

**TABLE 7—$\chi^2$ and p-values for Tables 6-6b**

<table>
<thead>
<tr>
<th>Factors</th>
<th>$\chi^2$</th>
<th>p-values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peers</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Parent(s)</td>
<td>1.88</td>
<td>*</td>
</tr>
<tr>
<td>Sibling(s)</td>
<td>0.39</td>
<td>*</td>
</tr>
<tr>
<td>Cigarette ads and promotion</td>
<td>3.18</td>
<td>*</td>
</tr>
<tr>
<td>Your weight</td>
<td>0.08</td>
<td>*</td>
</tr>
<tr>
<td>Curiosity</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>The belief that smoking was “adult”</td>
<td>10.73</td>
<td>p &lt; .01</td>
</tr>
<tr>
<td>Something to do to occupy your hands</td>
<td>0.40</td>
<td>*</td>
</tr>
<tr>
<td>Stress</td>
<td>2.32</td>
<td>*</td>
</tr>
<tr>
<td>Actors, actresses, musicians, etc.</td>
<td>1.30</td>
<td>*</td>
</tr>
</tbody>
</table>

Note: df = 1, $\alpha = .05$

*Not significant at df = 1, $\alpha = .05$

For $\chi^2$ with df = 1, a value of 3.84 was needed for significance at $P = .05$. Hence, looking at the $\chi^2$ values in Table 7, with the exception of the belief that smoking was “adult,” there were no differences between early and late initiators in whether each of the factors (with combined frequencies) had an influence on their decisions to smoke their first cigarettes or not. Looking at the response frequencies in Tables 6-6b, a larger percentage of early initiators (53.2%) were influenced by the belief that smoking was “adult” than were late initiators (21.6%).

**Non-Smokers**

Refer to Table 3.

**Health**

Overall, health was the dominant reason why non-smokers stayed away from cigarettes. 89.2 percent of non-smokers said health influenced them a lot to not start smoking. 9.3 percent said “A Little” to this factor.

**Peers**

Nearly half (47.2%) of the non-smokers said that their non-smoking peers had no influence on them to not start smoking. This result suggests that smoking peers had greater influence on smokers to smoke their first cigarettes than non-smoking peers had on non-smokers.
to not start the habit. The behavior of peer influence is unusual indeed. 39.8 percent said their non-smoking friends influenced them only a little to not initiate smoking.

**Parent(s)**

Unlike smokers, whose parental smoking did not influence them significantly to smoke their first cigarettes, non-smoking parents had major influence on their children not to start smoking. Up to 46.4 percent of the non-smokers said that their non-smoking parent(s) influenced them a lot to not start the habit. 32.8 percent said “A Little.”

**Sibling(s)**

49.4 percent of the non-smokers said that their non-smoking sibling(s) had no influence on their not starting to smoke. 30.7 percent said that their non-smoking sibling(s) influenced them only a little to not initiate smoking. 19.9 percent said “A Lot.”

**Negative Social Image**

It was interesting to note that the negative social image associated with smoking had a strong influence on non-smokers, deterring them from initiating smoking. 29.2 percent of the non-smokers said this factor influenced them a lot to not start. 44.1 percent of non-smokers said “A Little” to this factor.

**Expensive**

This factor had mixed results. The non-smokers were almost equally divided among the three levels of influence. Hence, not much can be said here except that costs had different levels of influence on different people.

**Clothes Smell Bad, Bad Breath, and Stains Teeth**

Overall, subjects tended to group all three factors together; that is, if a subject marked “A Little” for clothes smelling bad, chances are, she marked the same for bad breath and teeth staining. Looking at Table 3, it appears that these factors together had a sizable influence on non-smokers to stay away from cigarettes.
Quitters

Not all quitters were asked for their reasons for quitting. However, out of curiosity, among those who were asked, health concern was a popular reason.
DISCUSSION

This study’s findings have important implications for public health. These results are useful for consideration in the development of prevention programs designed to prevent smoking among female college students.

For instance, peers, as demonstrated in this and many other studies, are a powerful force which influences people to smoke their first cigarettes. From random talks with a few of the subjects in my study, smoking is definitely a “social thing.” You see your friends/peers do it, and after a while, being around that environment makes you want to do it too. Smoking is a social tool. It gives a person something to do when drinking or hanging out with friends. If so, this fact offers high school and college personnel a number of unique opportunities for prevention with this group during their high school and college years. For example, residence halls and other shared living quarters may provide a strategic channel for development and modification of social norms around this health behavior (Emmons, 1998). Social norm is the key. Prevention efforts should focus on strategies that reduce the acceptability of smoking in the social environment. In addition, to achieve health goals, the focus should be on “changing policies and not people.” For example, smoking studies consistently have shown that the effectiveness of cigarette warning labels in reducing the prevalence of smoking is limited. This lack of effect occurs because warning labels are aimed at changing people, not policies. I am convinced that anti-smoking policies are more effective.

At the high school level, prevention may include anti-smoking policies within school boundaries and health education and promotion.

Sources of Error

Like all studies, this one was not free of errors.

A potential error was in the way some non-smokers may have interpreted the listed factors of peers, parent(s), and sibling(s) on the questionnaire. When the questionnaire was constructed, parent(s) for example, was intended to mean, “My parents do not smoke, therefore, this influenced me not to start smoking”. However, it is natural to expect that some may instead interpret it as, “My parents smoke, and I hate it. Therefore, I do not smoke”. Though this potential problem was not raised by any of the pilot study subjects, there probably were study
subjects who interpreted the questions differently from their intended meanings. However, there was no indication that this was a large source of error in the current study.

Because the smoker section of the questionnaire did not include the response choice “My peers/parent(s)/sibling(s) don’t smoke,” there may be some erroneous responses to the listed factors of peers, parent(s), and sibling(s). For example, if a smoker’s parent(s) did not smoke, it was almost certain that she marked “None” as her response to this factor. However, “None” on the questionnaire meant her parent(s) smoke, but this act had no influence on her to smoke her first cigarette. The questionnaire did not allow for the possibility of the smokers’ peers, parent(s), or sibling(s) not being smokers.

Another potential error results from the unusual smoking behavior of some sample subjects. Normally, a person is either a regular smoker (often because s/he is addicted) or does not smoke at all. It is uncommon to find a person who only smokes “sometimes.” In this study, there were quite a few subjects who smoke only occasionally and, hence, were asked to complete the non-smoker section of the questionnaire with a change of instruction, as mentioned before. These subjects may have affected the results for non-smokers. Because I did not anticipate this problem, I did not keep a record of how many “occasional/weekend” smokers there were in the sample. My best estimate of the number of “occasional/weekend” smokers is between 20 to 30 out of the 472 subjects classified as “Non-smokers.”

Finally, because the number of late initiators in the sample was quite small, this increased the study’s random error. As pointed out elsewhere, of the adults who smoke, about 90% started before the age of 18 years. Thus, late initiators are harder to find.

Suggestions for Future Research

Because this research project was of a public health nature, the emphasis was on prevention, that is, primary prevention. Hence, the questionnaire only asked for reasons why the subjects started smoking—not why they continue to smoke. For those who are interested in researching this topic in the future, I would highly suggest that two questionnaires be administered. One that asks why she started and one that asks why she continues to smoke. Because of limited resources, this was not possible for the current project.


World Wide Web References


7. “New Estimate Puts the Direct Medical Care Costs Of Cigarette Smoking At Over $56 Billion Per Year In the U.S.” http://www.bera.com/nr091697.htm Accessed on March 16, 1999

APPENDICES
APPENDIX A

INSTRUCTIONS

♦ The purpose of this study is to understand why female college students initiate smoking.

♦ Complete this questionnaire only if you are a U.S. citizen AND between the ages of 17 and 24 years.

♦ Unless otherwise indicated, please answer EVERY question.

♦ Your responses will be strictly CONFIDENTIAL.
APPENDIX B

QUESTIONNAIRE

◊ Age (Circle One): 17 18 19 20 21 22 23 24

◊ Ethnicity (Circle One): Black Asian White Hispanic Multi-Racial Other

◊ Are you a smoker?>> You are a smoker if you usually smoke at least one cigarette every day.

    (Circle One): a. Yes...If yes, answer questions on the FRONT only.
    b. No....If no, answer questions on the BACK only.

Smokers ONLY

◊ How old were you when you smoked your FIRST cigarette? Age: __

Mark the extent to which each of the following factors influenced your decision to smoke your FIRST cigarette:

<table>
<thead>
<tr>
<th>Degree of Influence</th>
<th>None</th>
<th>A Little</th>
<th>A Lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peers</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Parent (s)</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
</tbody>
</table>
| Sibling (s)         | [ ]  | [ ]     | [ ]   | I have no siblings [ ]
| Cigarette ads and promotion | [ ] | [ ] | [ ] |
| Your weight         | [ ]  | [ ]     | [ ]   |
| Curiosity           | [ ]  | [ ]     | [ ]   |
| The belief that smoking was “adult” | [ ] | [ ] | [ ] |
| Something to do to occupy your hands | [ ] | [ ] | [ ] |
| Stress              | [ ]  | [ ]     | [ ]   |
| Actors, actresses, musicians, etc. | [ ] | [ ] | [ ] |

◊ How has college-related stress affected the number of cigarettes you smoked on any given day?

    (Circle One): a. Increases b. Decreases c. Does NOT affect d. Don’t know

Thank You!
APPENDIX B (cont.)

Non-Smokers ONLY

Mark the extent to which each of the following factors influences your decision NOT to start smoking:

<table>
<thead>
<tr>
<th>Factor</th>
<th>Degree of Influence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>None</td>
</tr>
<tr>
<td>Health</td>
<td>[ ]</td>
</tr>
<tr>
<td>Peers</td>
<td>[ ]</td>
</tr>
<tr>
<td>Parent (s)</td>
<td>[ ]</td>
</tr>
<tr>
<td>Sibling (s)</td>
<td>[ ]</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>I have no siblings</td>
<td>[ ]</td>
</tr>
<tr>
<td>Negative social image</td>
<td>[ ]</td>
</tr>
<tr>
<td>Expensive</td>
<td>[ ]</td>
</tr>
<tr>
<td>Clothes smell bad</td>
<td>[ ]</td>
</tr>
<tr>
<td>Bad breath</td>
<td>[ ]</td>
</tr>
<tr>
<td>Stains teeth</td>
<td>[ ]</td>
</tr>
</tbody>
</table>

Thank You!