Running head: SMOKING SIMULATION INTERVENTION

# EFFECTS OF A SMOKING SIMULATION INTERVENTION ON FIFTH GRADE STUDENTS' ATTITUDES ABOUT SMOKING CIGARETTES

by

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Abstract

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EFFECTS OF A SMOKING SIMULATION INTERVENTION ON FIFTH GRADE STUDENTS' ATTITUDES ABOUT SMOKING CIGARETTES

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The purpose of this study was to test an interactive smoking prevention program's effectiveness in strengthening fifth grade students' negative attitudes toward smoking cigarettes. The NICoteen™ Program is a commercial product marketed to the education field to education teenagers about the physical, emotional, financial, and social consequences of tobacco addiction.

The program is a two-part educational tool. The first component consists of student and instructor materials. The materials are a compilation of worksheets and discussion topics that focus on various aspects of education. The second component is an interactive device that resembles a cigarette pack. The pack demonstrates to students the loss of control over their lives caused by addiction to cigarettes. The pack is designed to

discourage smoking by subjecting the students to the smoking regimen that an addicted smoker must follow on a daily basis.

Fifth grade teachers of Howard Lake-Waverly Middle School volunteered their classes to be asked to participate in the study. Two of the classes served as the intervention group while the third class served as the comparison group. Surveys were administered to all fifty-five students that participated in the study preceding the program and once again upon completion of the program.

The surveys measured individual behavioral beliefs, perceived subjective norm and predicted level of self-control concerning a smoking addiction. Based on the theory of planned behavior (Ajzen, 1988), these three concepts together form an intent to perform a given behavior. As, expected, the results of the study showed that the intervention group, but not the comparison group, shifted in their beliefs, perceived subjective norm and predicted level of self-control to form a stronger intention not to have a cigarette if an older child were to offer them one within the following year.

Specific comparisons tests showed significant or marginally significant differences between the pre- and post-survey responses of the intervention group. These results suggest that the program has altered the intervention group's intentions to not smoke cigarettes. The theory of planned behavior also proved quite useful in assessing the intervention. Overall, results were promising in their implications for the effectiveness of the NICoteen™ Program.

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Table of Contents

# Chapter I

## Introduction

The Youth Risk Behavior Surveillance System Report, released every two years by the Centers for Disease Control, estimates that three-fourths of all deaths among individuals from 10 to 24 years of age in the United States are a results of am mere four causes: motor vehicle accidents, homicide, suicide, and other unintentional injuries. Individuals engaging in risky behaviors only serve to increase the likelihood of dying from any of these four causes (CDC, 2000).

Of the six areas of health risk behavior the report studies, tobacco use has demonstrated the most consistent rise, resulting in a 30 percent increase over the course of the decade. It is now estimated that 6,000 adolescents try their first cigarette every day in the United States alone. More detrimental is the fact that 3,000 of these individuals become regular smokers each day (CDC, 2000).

The history of developing programs aimed at preventing cigarette smoking in adolescence has been many in years and numbers. Of the current recommendations of the National Cancer Institute and CDC, the intervention programs should start early and incorporate the family, school, and community. The program should increase in intensity throughout the middle school years due to the fact that this is the time when susceptibility to smoke cigarettes begins. Community support from various organizations will heighten the strength of the intervention. Lastly, it is recommended that all programs be scientifically based and evaluated (CDC, 2000).

Millions of dollars are allocated to school systems across the United States for the purpose of prevention and intervention. Applying methods of behavior prediction is of particular importance due to the interventions' purpose of being effective. Behavior, however, cannot always be realistically or ethically measured. Therefore, constructs have been identified as being involved in the decision-making process regarding the impending behavior. Of the most acclaimed models, the theory of planned behavior has successfully predicted a multitude of subsequent behaviors.

The theory of planned behavior is a result of an evolving concept created by researchers Ajzen and Fishbein. The premise of the model is to specify the predictors of behavior through assessing an individual's particular attitudes and beliefs regarding the behavior (Fishbein & Ajzen, 1975). Three components are of essential importance: behavioral beliefs, normative beliefs, and control beliefs. In effect, these three components subjoin to form intention. Intention is the direct antecedent of behavior and equates to an individual's readiness to perform the behavior. The theory of planned behavior is widely utilized to predict health behavior.

The curriculum and simulation of the NICoteen™ Program both fit nicely into the constructs of the theory of planned behavior. The curriculum seeks to invoke thoughtful discussion as it teaches of the consequences and corrects any prior misgivings. Also included in the curriculum is the emphasis on pressures such as the cigarette companies and their desire to target teens in their hopes to acquire future cigarette smokers. The simulation's main purpose is to demonstrate the loss of control a smoking addiction has on an individual's life. In essence, each of these statements of the program's purpose also serve as each of the constructs of the theory of planned behavior (behavioral beliefs,

normative beliefs, and control beliefs). Therefore, by determining how effective each of the statements are to an individual, one could also form an intent to perform (or not perform) the subsequent behavior.

Purpose of the Present Investigation

The purpose of the present investigation was to assess whether participating in the NICoteen™ Program would affect fifth-graders' attitudes towards cigarette smoking. The attitudes measured specifically centered on behavioral beliefs, normative beliefs, and control beliefs in accordance with Ajzen's theory of planned behavior.

Hypotheses and Rationale

Students should have general knowledge regarding the risks associated with cigarette smoking, as well as awareness of the existence of pressure from outside individuals for them to smoke. It was expected that differences between the intervention and comparison groups' scores would depend on the item. It was hypothesized that those individuals that participated in the intervention would have less of a desire to try smoking upon completion of the intervention than would the comparison group (item numbers one and two).

It was also hypothesized that when analyzing among the three health belief items (item numbers three, four and five) item number five will differ the most between both the pre- and post-intervention surveys of the intervention group, and between the intervention and comparison groups. This hypothesis was based on the premise that the smoking simulation should personalize the effects of smoking cigarettes. This includes both the immediate effects and the students' recognition that they themselves would undergo the long-term health consequences of smoking.

It was further hypothesized that the post- intervention responses to the items related to the image of smoking (item numbers seven and eight) would show a significant change in the intervention groups' image of smoking compared to their pre-intervention responses and those of the comparison group. Students who experienced the intervention were expected to be less likely to see cigarette smoking as looking cool and grownup.

The most influential sources for children in fifth grade were assumed to be parents, friends, advertisements and older, "cool" kids. Children ages 10 and 11 are still highly influenced by their parents. It is around this time that peer and media influences also start to become more persuasive, as susceptibility to smoking initiation begins around the age of 10 years and peaks by age 14 years in close to 60 percent of this population (General of the World Health Organization, 1998). It was hypothesized that students in both groups would report in both the pre- and post-intervention surveys that parents and friends would not like it if they smoked cigarettes. However, the students participating in the intervention were expected to rate cigarette companies higher for wanting them to smoke cigarettes at the post- than the pre-intervention, and in contrast to the comparison group at the post-intervention assessment (item number thirteen).

Consistent with the subjective norm, it was expected that fifth grade students would feel that they want to do what their parents and friends would like them to do. Responses to this item were not expected to show differences between or within groups. However, students who experienced the NICoteen™ Program were expected to be more strongly against doing what the cigarette companies think they should do (item number seventeen).

The premise of the smoking simulation centers on teaching the loss of control that cigarette smoking has on an individual's life. The section of the survey that centers on control issues was expected to show the greatest change in responses within the intervention group (item numbers twenty through twenty-five). It was hypothesized that the NICoteen™ Program would give the intervention students a more realistic view of the amount of control the addiction would have over their lives. Therefore, individuals who have participated in the intervention were expected to demonstrate an increase in the amount of control they believe a smoking addiction would have on their lives.

# Chapter II

# Review of Literature

## Overview of Adolescent Risky Behavior

Teenage risky behavior has created an enormous concern for social psychologists and society at large. The Youth Risk Behavior Surveillance System Report, released every two years by the Centers for Disease Control (CDC), is a compilation of information denoting current trends in six categories of "priority health-risk behaviors". The six behaviors that contribute the most significantly to unintentional and intentional injuries are: tobacco use; alcohol and other drug use; sexual behaviors which contribute to pregnancy and other sexually transmitted diseases; unhealthy dietary behaviors; and lack of physical activity.

An estimated three-fourths of all deaths among individuals from 10 to 24 years of age in the United States alone are a result of a mere four causes: motor vehicle accidents, homicide, suicide, and other unintentional injuries. Results from the survey also convey that engaging in risky behavior serves to increase the likelihood of death from any of these four causes (CDC, 2000).

The most recent data, which consists of statistics for 1999, demonstrates that among the behaviors studied, risky sexual behavior is down from 1991, while other activities like smoking and drug and alcohol use have remained steady or have increased in frequency during the same time period (CDC, 2000). This survey is completed by more than 15,000 students in grades 9 through 12 nationwide. It assesses six areas of

health risk behavior: intentional and unintentional injuries; tobacco use; alcohol and other drug use; sexual behaviors; dietary behaviors; and physical activity.

Across the nation, teenagers demonstrated an increase in responsible choices in their sexual behaviors throughout the decade. The percentage of adolescents who reported having sex in the 1999 report decreased by eight percent from 1991, however, despite the decline, half of the teenage population reported having sex. There was also a slight decline in the frequency of those reporting high sexual activity (having had four or more sexual partners since initiation of sex). In addition, condom usage increased by 26 percent (CDC, 2000.)

Ironically, the results for tobacco and drug use showed the opposite trend. Current marijuana use nearly doubled to about one in four students. Those that reported having tried marijuana at least once in their lives increased by 50 percent. The current rate of cocaine use showed a four percent decrease, however, it still had more than doubled since 1991. Teenagers who had tried cocaine at least once in their lives had also risen slightly (CDC, 2000).

Alcohol usage remained constant over the decade, with about 50 percent of teenagers reporting current use. Approximately one-third of the adolescents had recently had a minimum of five alcoholic drinks at the same occasion. The frequency of those who chose to ride in a car when the driver had been drinking alcohol was about one out of three, an improvement since 1991 (CDC, 2000).

Many of the injury-related behaviors improved. The number of students that carried a gun or other weapon to school decreased, as did the number of teenagers who

got into fights. Yet, slightly more individuals reported feeling less safe at school in the 1999 report compared to responses in 1991 (CDC, 2000).

Most detrimental was the 30 percent increase over the course of the decade of current and frequent cigarette use. The number of adolescents that start smoking each year has risen to approximately one million. This number equates to two teenagers every minute (CDC, 2000. See appendix A).

No definite reasons for these findings have been established. For many teenagers, risk taking is the norm. In accordance with a report from the Institute of Medicine, it is a natural part of an adolescent's life. Some risks must be taken in order to learn the consequences, according to the 1999 report. Young people favor their own experience over vicarious information in making decisions, especially regarding social situations. The risk-taking can lead to disastrous consequences. The authors state that the sense of invulnerability combined with the lack of maturity makes it more difficult for teenagers to understand the consequences of their decisions.

New research also indicates that certain biological factors could prove to be contributing predictors of risk taking. The prefrontal cortex, the area of the brain responsible for judgment and control, is not fully developed at this age. A recent study by researchers at the Mclean Hospital Brain Imaging Center used functional magnetic resonance imaging (MRI) to compare the emotional processing of 10- to 18-year-olds to that of normal adults. The researchers found that in adolescence, the level of brain activity in the amygdala (a region that guides instinctual reactions) was higher than the activity in the prefrontal cortex when processing emotion. However, as adulthood was

reached, the levels of activity in each area shifted so that the prefrontal cortex demonstrated higher amounts of activity.

Much research has also been conducted highlighting a conglomeration of factors that place children and adolescents at an increased risk for substance abuse, adolescent pregnancy, school failure and dropout, and other self-defeating behaviors. Researchers at The Center for Substance Abuse Prevention (CSAP) introduced a new approach in 1993 when they emphasized five domains in which risk factors could be identified: individual; family; school; peer group; and community. The theory states that by identifying the factors that can place individuals at risk, countervailing factors can be created in turn to protect them. The Relationship Between Mental Health and Substance Abuse Among Adolescents (1999) is a report that describes the association between psychological functioning and substance use among those aged 12 to 17 years. The researchers, who combined data from the 1994-1996 National Household Survey on Drug Abuse (NHSDA) and the Youth Self-Report (YSR), assessed the correlation between the prevalence of use of a variety of drugs and the adolescents' mental health. The findings show that the incidence of substance use among adolescents is associated with the severity of emotional and behavioral problems across age and gender groups. Some of the specific results are as follows:

- adolescents with serious emotional problems were nearly twice as likely to use alcohol within the past month than those with low levels of emotional problems;
- alcohol was three times as likely to be used by adolescents with serious behavioral problems than those with low levels of behavioral problems;
- past-month cigarette smoking was twice as prevalent for adolescents with

serious emotional problems than those with low levels of emotional problems;

- smoking was three times more likely in the past month for adolescents with serious behavioral problems than those with low levels of behavioral problems;
- adolescents with serious emotional problems were almost four times as susceptible to be dependent on alcohol or illicit drugs than those with low levels of emotional problems; and
- among adolescents with serious behavioral problems, alcohol or illicit drug dependence was more than seven times as likely than those with low levels of behavioral problems.

Smoking cigarettes continues to be one of the most prevalent teenage risk-taking behaviors. There are a number of complex and interdependent factors that predispose adolescents to smoke. These factors are extremely transient and vary among populations. As part of engaging in a risky behavior, many teenagers do not often take into account the long-term consequences. Young people have also demonstrated knowledge gaps and misconceptions surrounding the behavior.

Current Trends of Smoking Behavior

Tobacco use is a learned and socially regulated behavior. Experimentation holds an attraction to children and young adults due to the social identity they wish to establish (Lynch & Bonnie, 1994). At the current rate, 3,000 teenagers pick up the smoking habit each day in the United States alone. Each day, 6,000 new young adults try a cigarette (CDC, 2000). While the overall smoking rate has decreased to approximately 25 percent among adults over the decade, current cigarette use has risen to more than one in three adolescents (Dickson, 2000).

Overall smoking rates among high school students have declined from 1997, when 36.4 percent claimed to engage in the behavior. According to the CDC, the rates that dropped to 34.8 percent in 1999 do not hold an accurate depiction of the population as a whole. The drop in percentage is skewed by a significantly large decrease in smoking among Black male students (from 28.2 percent in 1997 to 21.8 percent in 1999). The decrease itself is positive, however, the decline isn't across all ages, genders, and race/ethnicity groups.

According to the Youth Risk Behavior Surveillance of 1999 conducted by the CDC, as well as state, territorial, and local school-based surveys; 34.8 percent of students had smoked cigarettes on more than one of the 30 days prior to the survey, 16.8 percent of the students had smoked on more than 20 of the last 30 days, and 5.2 percent of students who reported current cigarette usage smoked more than ten cigarettes a day nationwide (CDC, 1999. See Appendix B for the breakdown by grade level.)

Since the first Surgeon General Report, which targeted smoking in 1964, the Centers for Disease Control and Prevention (CDC) estimate that cigarette usage has resulted in the deaths of more than 10 million Americans. Congruently, the CDC also reports that smoking kills more people each year than does alcohol, AIDS, drug abuse, car crashes, murders, suicides, and fires combined (Smith & Stutts, 1999). As of late, about 430,000 American adults die each year from smoking. Couple this with the increased prevalence of smoking among youth and it can be estimated that five million young people, ages 0-17 years who are alive today, will die prematurely from a smoking-related illness (Singleton & Pope, 2000).

The US Public Health Service coins nicotine addiction as being the most widespread proof of drug dependence in the country (Tobacco Truth, 2001). Yet, young people tend to underestimate the addictiveness of nicotine and difficulties correlated with smoking cessation. Eighty percent of the nation's 47 million adult smokers began smoking before the age of 18 years (Lavelle, 2000). Although adolescents believe it is easier for them than for adults to quit, research demonstrates that few actually succeed. In a study of high school seniors, only 5 percent of those that currently smoked predicted that they would still be smoking two years after graduation. Ironically, 75 percent of these individuals were still smoking eight years later. The younger a person is when they begin smoking, the less likely they are to quit and the deeper their addiction. Once adolescents have experimented, an estimated 50 percent continue to smoke and become addicted. Unless these people quit, more than half of them can expect to die from a tobacco-related disease (Singleton & Pope, 2000).

Susceptibility

The transition from childhood to adulthood marks many stages in the process of development. Some children are equipped with more coping skills and abilities to make healthy decisions as they reach adulthood. A lack of these skills is a factor that influences an adolescent's decision to smoke. Those that have personal problem-solving skills are aided in their resistance to smoking, handling peer pressure and demonstrating confidence in decision-making (A Report of the Surgeon General, 1994, p.124-140). Risk factors that increase adolescent susceptibility to smoking have been identified as an integration of sociodemographic, environmental, behavioral, and personal factors. Researchers also conclude that risk factors are cumulative. The more risk factors present

in an individual, the higher the chance that child will smoke. Therefore, preventative methods that target multiple risk factors show the greatest success.

Predictor variables identified in a single study characterized adolescents as at an increased risk to smoke. Variables previously examined in separate studies were combined in a survey of 246 adolescents (Smith & Stutts, 1999). The variables that were found to be significant predictors of smoking level included: prior beliefs; peer pressure; family smoking behavior; advertising; and antismoking information. As a whole, prior beliefs, family smoking behavior, and peer pressure were stronger predictors than were advertising and antismoking information.

Prior beliefs about the dangers and advantages of smoking was deemed by researchers Smith and Stutt the most influential factor in determining adolescent smoking. Teenage smokers were more likely than non-smokers to believe that cigarette smoking facilitated relaxation, reduced stress, indicated maturity, and relieved boredom. Adolescent non-smokers and smokers alike both recognized the dangers associated with smoking, however, smokers were inclined to believe the dangers do not apply to them (Smith & Stutts, 1999).

Family influence and poor family functioning were also predictors of subsequent teenage smoking. Low family cohesion and parental smoking proved to be the strongest familial factors. In addition, it was noted that if a sibling smoked, the adolescent held a less negative attitude toward smoking (Smith & Stutts, 1999).

Stronger than the effect of parental smoking was the effect of friends' smoking. Pressure was broken down into direct pressure and normative pressure. An adolescent is directly pressured through peers asking, daring or directly persuading. Normative

pressure consisted of the indirect pressure that came with socializing with peers who smoke. Direct pressure failed to solicit an individual's smoking, however, normative pressure did lead to an increased susceptibility to smoke. Smith and Stutts based this conclusion mainly on the fact that adolescents who were experimenting with smoking or who were smokers overestimated the amount of smoking by their closest friends.

David A. Kessler, the former U.S. Food and Drug Commissioner, reported that peer pressure started around the age of eleven to thirteen years and was directed to nonsmokers by smokers. He also proclaimed serious smoking to begin around the age of fourteen or fifteen years (Smith & Stutts, 1999). Subsequently, a review of findings from twenty-seven studies published since 1980 showed a strong relationship between the onset of cigarette smoking and peer and social bonding, approval, and offers (Smith & Stutts, 1999).

Cigarette advertising was also found to be a significant predictor in the study. The Surgeon General's 1994 report gave support to the belief that there are negative effects of cigarette advertising on adolescents. This evidence indicates that cigarette advertising is influential in regards to teenage perceptions, attitudes, and smoking behavior. Interviews of adolescents aged eleven to fourteen years demonstrated that those who were more aware of cigarette advertising when first interviewed showed more positive intentions to smoke when interviewed a year later (Smith & Stutts, 1999). The authors of the study concluded that the findings support the belief that, "cigarette advertising has predisposing, as well as reinforcing effects on children's attitudes and behavior with respect to smoking" (Smith & Stutts, 1999, p. 325).

Claims have been made concerning the appeals used in cigarette advertising and the evidence that adolescents have a heightened vulnerability. Klitzner, Gruenewald, and Bamberger illustrate this relationship in their 1991 study that showed that adolescents who experimented with cigarettes were better able to recognize advertised cigarette products than those who had not (Smith & Stutts, 1999). Experts claim that tobacco companies "label" young adults with paraphernalia give-aways such as hats and t-shirts. Adolescents who own this merchandise are three times as likely as other teenagers to try cigarettes. Researchers believe these findings support the tobacco industry's subtle and successful portrayal of smoking as defiant and cool. Teenagers seeking autonomy and striving for rebellion fall prey to these schemes and start smoking for a sense of individuality. The role of advertising has evolved into a crucial conditioning process in which users are depicted as glamorous, popular, independent, adventurous and macho. A study performed in the United States illustrated that among teenagers who smoke, 85 percent chose the three most heavily advertised brands of cigarettes, compared to only 35 percent of adults (General of the World Health Organization, 1998).

A cross-sectional survey, completed by sixth through eighth grade students at an urban junior high school, assessed teenage attitudes toward cigarette advertising (Sun, Anderson, Shah, & Julliard, 1998). Of the one hundred students who completed the survey, individuals were divided into two groups that included former and current smokers and nonsmokers. The results were that 27 percent (of both groups combined) believed that cigarette advertising significantly influenced their fellow classmates or themselves. Forty-two percent of the former and current smokers and 70 percent of the nonsmokers believed that cigarette smoking should be banned (Sun et al., 1998).

Antismoking information was the final, however weak, predictor variable. The impact depended largely on the focus of the information received by adolescents. When the message contained specific health risks, adolescents were less likely to accept it. Several states have now launched a new antismoking advertising campaign (Smith & Stutts, 1999).

New messages, recently filtered through different media, have had a marked effect on decreasing the incidence of adolescent smoking. These advertisements are different in that they do not educate teens about the health risks of smoking. Instead, they bring attention to the cigarette companies' manipulation of teenagers over the years. The purpose is for adolescents to see the tobacco industry as being another group of adults who try to influence teenage decision-making. Given the need for self-efficacy and autonomy during this period of life, the theory's premise is that teenagers will no longer see smoking cigarettes as being rebellious (Smith & Stutts, 1999).

Interestingly, predictor variables show much variance across the multitude of studies. Research executed by Bauman, Foshee, Linzer and Koch (1990) examined the effect of classification of parental smoking influences. Consistently supported by studies is the hypothesis that adolescents are more likely to smoke cigarettes if their parents also smoke. However, the conceptualization and measurement of parent behaviors can influence the strength of this predictor variable.

Initially, parent smoking behavior was categorized as either smoker or nonsmoker. No thought was given to those parents categorized as nonsmokers yet had smoked at some point in the child's life. Through differential classification, Bauman, et al. Discovered that the smoking behavior of adolescents of parents who had quit smoking

was much more similar to the smoking behavior of adolescents of current smokers. In fact, adolescents of parents who had quit smoking more likely to smoke than were adolescents of parents who were currently smoking. When using this classification, parental smoking was as strong a predictor of adolescent smoking as peer smoking behavior.

The magnitude of the factors and their interrelationships concerning adolescent smoking is a precarious phenomenon. The premise of past studies was that adolescents model parental behaviors. The results of this study, however, support a behavioral explanation. Since past parental smoking behavior illustrated a larger impact than that of parents' current behavior, it seems that adolescents form evaluative definitions of smoking cigarettes based on the consequences of the behavior. Therefore, parents may influence adolescent smoking more by providing the subjective experience that health consequences and other costs may be perceived as unlikely (Bauman, et al., 1990).

Prevention

Programs developed for the prevention of cigarette smoking are many in number and diversity. The National Cancer Institute (NCI) and CDC have established research-based recommendations for under-age tobacco-use prevention programs. The organizations suggest the programs start early and have a continual connection with the family, school, and community, due to the fact that teenagers are less likely to perform a behavior that would cause disapproval from those they care about. This program is supported by the social development model that suggests that family and community support, or lack thereof, have an enormous impact on risky behavior (CDC, 2000).

The program should increase in intensity throughout the middle school years. In the United States, susceptibility to smoking starts at approximately ten years of age and peaks by the age of 14 years in nearly 60 percent of the population (General of the World Health Organization, 1998). Prevention programs should also follow the adolescent through high school. Initial benefits obtained through programs are lost if they are not continued.

Enlisting in community support from various organizations also increases the probability of success. Law enforcement, government officials, healthcare professionals and even merchants who sell the product are all viable modes of persuasion.

The method used should also be scientifically based and evaluated. A federally funded smoking-prevention study conducted by the Fred Hutchinson Cancer Research Center in Seattle showed that a fifteen-year school-based smoking-prevention program that used a social influences approach had little effect and failed to keep teenagers from smoking (Kaufman, 2000).

The social influences model was started 25 years ago. Many school districts across the country adapted the program without ever testing it to see if it was effective. The study, which followed 8,400 students in the state of Washington from third grade through high school graduation, examined the effects of countering social influences, from peer pressure to tobacco advertising. The program focused on identifying and resisting influences to smoke and correcting any inaccurate information in order to motivate individuals to becoming smoke-free. Within the program's design were the "best practices" guidelines suggested by the CDC and the NCI. Beginning in 1984, 40 school districts were randomly assigned to the experimental and control groups.

Questionnaires completed by students in their senior year, along with an additional follow-up study two years after high school, demonstrated nearly identical rates of smoking between the groups in 1999 (Kaufman, 2000).

Of those characteristics of successful programs scientifically evaluated, the importance of the following should be emphasized:

- Interactive teaching techniques—students should be engaged through discussions, role playing, and working in small groups;
- Normative education—children should have a more realistic perception of how many people actually smoke;
- Resistance skills—adolescents should learn how to resist the influences that encourage them to begin smoking; and
- Social skills training—teenagers should be equipped with a range of personal and social skills such as communication, problem-solving, and decision-making skills (Surgeon General, 1994).

The prevention programs that have held the most success are those that teach skills to enable adolescents to make informed choices, develop positive attitudes, and practice resistance skills. Many researchers promote interactive programs.

In 1994, the Surgeon General provided the following recommendations in the Prevention Update:

1. Classroom sessions should be held a minimum of five times per year in both sixth and eighth grades;
2. Social factors that illustrate smoking onset, short-term consequences and refusal skills should be emphasized;

8. The program should mesh with the existing school curricula;
8. The program should begin with the transition from elementary to junior high school;
8. Parents should be encouraged to become involved;
8. Training should exist for teachers;
8. The program should be socially and culturally sensitive to each community; and
8. Students should be involved in the presentation and delivery of the information.

The actual responsibility for preventing adolescent tobacco use has fallen primarily on individual school districts, often with the guidance of state legislatures or departments of education. Schools tend to reach the most diverse group of young people. Research that led to various approaches to school-based prevention began with the publication of the Surgeon General's report in 1964. During this time, the most effective components were identified. Secondly, the capacity to conduct elaborate research among large populations advanced with experience and technology. The evolution of the best approaches and policies is a result of much trial (Lynch & Bonnie, 1994).

Information-Deficit Model. Evidence provided by the Surgeon General's report of 1964 led to the widespread knowledge that smoking was associated with many life-threatening conditions. The information reached adults and subsequently, many acted on the information by quitting smoking. Public health professionals and educators alike assumed that this information would have a similar effect on children and youths.

Therefore, informational programs were designed using a variety of the available media (books, pamphlets, posters, films, lectures). The message was intended to arouse fear concerning the various physical consequences throughout life, including heart

disease and premature death. Reviews of the affiliated programs conducted in the 1970s showed that the model had not influenced youths to refrain from smoking. Conclusions from these findings were that while informing individuals of the health complications is a necessary step, it fails to address the association between obtaining knowledge and the change of behavior, other addictive nature of tobacco and peer influences to smoke (Lynch & Bonnie, 1994).

Affective Education Model. Due to the shortcomings of the information-deficit model, behavioral scientists refocused attention on more personal factors that intermingle with cognitive factors, such as beliefs, attitudes, intentions, and perceived norms. Included in this era was an approach based on the belief that teenagers engaged in health-compromising behaviors because of compatible self-perceptions. This approach attempted to increase perceived self-worth by implementing general skills of assertiveness, communication and problem solving. The assumption here was that increase of self-esteem could positively affect all deviant behaviors. Subsequent research showed that this approach was no more effective than the information-deficit model (Lynch & Bonnie, 1994).

Social Influences Resistance Model. A third approach to the attempt to prevent tobacco usage was developed on the basis of two learned deficiencies of previous models. The first of these was the targeted age of the population. Prior models focused on high school and college students. Although this is the time of heaviest smoking rates, the development of the behavior actually begins when students are in sixth or seventh grade.

The second oversight was based on the cycle of tobacco usage. Typically, usage involves a series of phases, with the individual progressing from experimentation to

actual addiction. The time span involved, coupled with the progression through the phases, implied additional influential factors involved beyond information and affective factors. Sociodemographic, environmental, behavioral, personal, and pharmacological factors were then also taken into consideration.

The approach of resisting social influences targeted the impact of the social environment. The emphasis mainly concerned facilitating the development of skills that enabled adolescents to identify and resist social influences. The foundation of the prevention approach was based on three assumptions: (a) overestimating the amount of people who smoke; (b) the appeal of advertising; and (c) the desire to conform to tobacco use based on role models, peers, and family members who use tobacco. Most interventions included training components that taught assertiveness, decision making, and communication skills to combat the need to perform behaviors to belong to a certain group (Lynch & Bonnie, 1994).

The theory of social modification has held promising results. A 12-year intervention study led by Dr. J. David Hawkins, which involved schools with students living in Seattle's most crime-filled neighborhoods, was implemented in the elementary school years. Students in grades one through six participated in activities designed to habituate an interest in school, promote learning among groups and build self-esteem. Compared to those who did not receive the elementary school intervention, these children were 19 percent less likely to have committed violent acts, 38 percent less likely to participate in binge drinking, 13 percent less likely to engage in sexual intercourse, 19 percent less likely to have had multiple sex partners and 35 percent less likely to have

either become pregnant or help cause the pregnancy by the age of 18 years ( in Brody, 1999).

However, in most attempts to prevent smoking behaviors, the knowledge base was limited to a broad understanding about the social factors that influenced teenagers. Large information gaps existed concerning the multidimensional nature of the influencing factors.

Flay and Petraitis (1993) assessed 13 theories to develop an all-inclusive approach toward prevention. Their composite theory involves indirect factors, such as behaviors of family members and traits that are genetically inherited, and how they affect more direct predictors of adolescent smoking (such as social skills, motivations, and expectancies). They theorized that factors on one level could be controlled by causes at another level, known as the statistical interaction effect. It proved to be difficult to interpret how the diverse combination of factors worked to affect smoking behavior. In fact, to date, no single theory encompasses all of the factors or can account for all of the variance in the behavior. Prevention programs are able to target the most direct social influences; however, no research shows the effects of the more indirect factors.

The Waterloo Smoking-Prevention Program, implemented by researchers Best, Thomson, Santi, Smith, and Brown (1988) targeted sixth grade students of Ontario, Canada in six one-hour sessions. An example of a large-scale trial that was based on the social influences resistance model, the program was effective in preventing the onset of experimental smoking through the end of the eighth grade.

One of the many variations of this model uses a combination of trained teachers with older peer leaders. The peer-led social influences model reduced the incidence of

daily and weekly smoking 35-50 percent more than a program which emphasized health consequences and was led by adults. However, differences were diluted at the five- and six- year follow-ups.

Many social influences models that implement a personal approach have been successful in reducing experimental smoking, initiation of smoking and in reducing regular smoking. The life skills approach focuses on general knowledge, skills and capabilities in addition to specific resistance skills and on enhancing self-esteem, autonomy and assertiveness.

In an examination of 143 studies of drug-use prevention programs for sixth- through twelfth-grade students, it was found that peer-led programs and programs dealing with social influences were more effective than others for improving behavior, skills and knowledge regarding the social influences of smoking cigarettes (Lynch & Bonnie, 1994). These results were later confirmed by the Rundall and Bruvold (1988) meta-analysis of 47 studies of school-based smoking prevention programs. This study examined the knowledge, attitude, and behavioral outcomes of social influence programs versus more traditional programs. It was found that social influences programs were more likely to affect attitudes and behavior regarding smoking cigarettes (in Lynch & Bonnie, 1994).

Rooney (1992) analyzed 90 school-based programs from 1974 through 1989 that sought to develop resistance skills. Results illustrated smoking prevalence to be 4.5 percent lower in students who underwent the social influences program versus those in the control group. Rooney also listed the components of the programs that were most effective in a one-year follow-up; they were targeted at sixth-graders, used booster

sessions, implemented the program in a short time period, and used an untrained peer to present the information. If these conditions were present, long-term smoking prevalence was approximately 25 percent lower than if they were not (in Lynch & Bonnie, 1994).

Bruvold (1993) performed a meta-analysis of 94 separate intervention programs from 1970 through 1980. In this instance, the programs were categorized as, rational (based on factual information), developmental (enhancing self-esteem and decision-making skills), social-norms-oriented (providing alternatives and reducing alienation), and social-reinforcement-oriented (developing skills to handle the peer pressures to smoke). Findings were that the rational approach showed little effect on smoking behavior, the developmental and social norm approaches had similar and more impactful results, and the social reinforcement approach had the greatest effect on smoking behavior (Lynch & Bonnie, 1994).

The Attitude-Behavior Relationship in Interventions

Every year, millions of dollars are provided to school systems across the United States to implement prevention and intervention programs. The problems of preventative health behavior and a true philosophy of the health promotion can never be adequately addressed until a focus on health promotion becomes an integral part of intervention programs (Taylor, 1995). There is as yet no formal diagnostic process for identifying and targeting preventative health behaviors on an individual basis. Therefore, programs designed to prevent certain behaviors have resorted to being constructed to serve the collective target population with little thought for individual differences.

Practice of risk reduction behavior has been the focus of many recent interventions for the prevention of risky behavior. Studies have shown that increasing

knowledge may not always change risky behaviors (Lynch & Bonnie, 1994). Attention to attitudes concerning perceptions of vulnerability to disease and peer norms, beliefs about the value of prevention behavior, recognition of high risk behavior, behavior intention and self-efficacy are considered necessary. Several behavior change models have been deemed useful to program designers in that they suggest specific areas of concentration for educational intervention. Many of the models overlap in their components and may work simultaneously in influencing behavior.

Applying methods of behavior prediction is of particular importance due to the interventions' need to reduce the likelihood of negative health consequences and increase the likelihood of positive outcomes. Due to the fact that behavior cannot always realistically or ethically be implemented into research, constructs have been identified that are involved in the decision-making process regarding the impending behavior. A well noted area of study is of attitude-behavior consistency.

Attitude-Behavior Consistency

The term "attitude" is truly an evolutionary concept. The construct was first fully attended to by Darwin in 1872 who defined it as a motor concept or the physical expression of an emotion (Kantowitz, Lee, Becker, Bittner, Kantowitz, Hanowski, Kinghorn, McCauley, Sharkey, McCallum, & Barlow, 1997). This paved the road for early psychologists who utilized the emotion and motoric component in their areas of study.

As early as 1888, Lange's demonstration of individual reaction times suggested that those who were consciously prepared to press a telegraph key immediately upon receiving a signal had quicker reaction times than those who were attending to the

incoming stimulus (Ajzen & Fishbein, 1980). The first implication that attitude is a social behavioral construct, however, is credited to Thomas and Znaniecki (1918), who defined attitudes as "individual mental processes that determine a person's actual and potential responses (in Ajzen & Fishbein, 1980, p. 13). From this point, researchers began to develop techniques for the measurement of attitudes.

L. L. Thurstone is noted for creating an instrument that assesses attitudes in particular domains. He argued that measurement must be specified along a continuum to which the measurement is to take place. He defined attitude as "the affect for or against a psychological object." Therefore, for Thurstone, the critical description in attitude measurement ranged from positive to negative or favorable to unfavorable (Ajzen & Fishbein, 1980).

Beginning in the 1930s, psychologists began to question what components the attitude concept should comprise. Although there was a general consensus that attitudes contained an evaluative component, theorists actively argued whether beliefs and behaviors should be included as part of the underlying definition.

The LaPiere study of 1934 again caused theorists to reevaluate the relationship between attitudes and behavior. He reported that hotel managers' attitudes toward Chinese guests failed to predict their responses to a Chinese couple who asked for a room. Following this revolution, many other researchers reported similar findings, and it was concluded that attitudes alone did not predict behavior (in Kantowitz et al., 1997).

These findings raised serious doubts about the validity of the attitude-behavior relationship. Researchers then considered possible explanations for the failed prediction. The first of these was Doob (1947), who used the behavior theory to define attitude as an

implicit mediating response to a stimulus object. He theorized that although the attitude may influence an individual to behave in a specific manner, the resulting behavior ultimately depends on the nature of the reinforcements received (Ajzen & Fishbein, 1980). The impending focus was in discovering indirect relationships between attitude formation and a resulting behavior.

Most investigators were unwilling to give up the assumption that there is a direct link between attitude toward an object and any given action in respect to the object. Alternative explanations were still being considered for the failure of the linkage. A concern first expressed by Allport (1935) was reassessed (in Kantowitz, et al., 1997). The unidimensional, evaluative scales for the measurement of attitudes was questioned. After analyzing a vast collection of definitions proposed by other theorists, he defined attitude as a "mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related" (Ajzen & Fishbein, 1980, p. 18). He brought attention to the complexity of attitudes. The surmounting view among cognitive social psychologists was that both affective and belief components should be incorporated, and behavior should be consistent with attitudes.

This multifaceted depiction of attitudes was further enhanced by the works of such scholars as Cartwright (1949), Smith (1947), and Katz and Stotland (1959) who presented the framework of attitudes in a trinity of cognition, affect and conation. An individual's beliefs about an object, feelings toward the object, and action tendencies all were contained in the system comprising attitudes.

Upon this inclusive conceptualization of attitude arose Rosenberg and Hovland's (1960) schematic representation of the three-component view of attitude (in Fishbein & Ajzen, 1975). They surmised that attitudes are tendencies to respond to some class of stimuli with particular classes of response. All responses to a stimulus object are a direct result of an attitude; however, the different classes are divided into three categories. The affective class defines positive or negative feelings about the object. The cognitive class includes information and thoughts about the object. Lastly, the behavioral component constitutes tendencies to act toward the object. Consequently, the formulation of an attitude depends on all three components' assessment.

At that time, the most important development in attitude measurement was that of the semantic differential by Osgood and associates. This scale consists of a set of bipolar evaluative continuums such as from good to bad, harmful to beneficial, positive to negative. Responses are scored on a scale from –3 to 3 and the sum of all scales of adjectives is a measure of the respondent's attitude toward a certain object (in Ajzen & Fishbein, 1980). Despite this development, it was pointed out that this measurement failed to assess factors beyond the affective component. Whereas earlier scales (Likert, 1932; Thurstone, 1931) solely measured beliefs or intentions, whether measures are based on beliefs, feelings, intentions, or behaviors, the results proved to be much the same and unlikely to result in a behavioral prediction (in Ajzen and Fishbein, 1980).

The multicomponent view led to Rosenberg's illustration that a person's evaluation of an object is strongly correlated to the expectations or beliefs that the object furthers or hinders the attainment of valued goals. To explain the relationship between affect and cognition, he contrived an expectancy-value model of attitude. This line of

research has roots in Thurstone's claim, confirming an individual's evaluation of an object is not necessarily related to a given belief, but is strongly related to a pattern of beliefs concerning the object.

Similar findings were reported supporting the relationship between affect and conation. Upon the development of a measuring instrument known as the behavioral differential, Triandis (1964) identified diverse dimensions of interpersonal intentions and related their relations to measures of affect. He found the connection was highly subjective, based on the types of intention. For example, intentions to admire or respect were highly correlated to affect, whereas intention to subordinate or marry did not demonstrate a correlation (in Ajzen & Fishbein, 1980).

The investigation of intentions led to the most notable models in the field of attitude-behavior consistency (Petty & Cacioppo, 1996). Ajzen and Fishbein viewed behavior as consisting of four elements. Among the four are, action performed, target at which the action is directed, context in which the action is performed and, time component. First, an individual must decide on a specific behavior of interest. The next step is to measure it. The target that is defined can have a large impact on the results based on whether it is a general category or a single instance of the category. The context is defined by the circumstances under which the behavior is performed and, of course, time relates to when the behavior is performed (Conner & Armitage, 1998). In order to predict a specific behavior, Ajzen and Fishbein argue that the attitude measure utilized should correspond to the behavior on all four elements. Given this new development, these theorists claim the lack of significant results in the past is due to mismatching measures of attitude. Take, for instance, Corey's inability to predict cheating behaviors

from attitudes toward cheating. Given the Ajzen and Fishbein analysis, his problem rested in the employment of a general measure of attitude to try to predict a very specific behavior (whether students would cheat on a particular kind of test in a specific course) (Ajzen & Fishbein, 1980).

In an exhaustive review of attitude-behavior consistency, Fishbein and Ajzen proposed three conditions under which attitudes are a strong predictor for behaviors. The first is when global attitudes are used to predict general behavior. In 1974, both scholars compiled a list of 100 religious behaviors and devised four general scales of attitude toward religion. The average correlation of general attitude measures used to predict a very specific behavior was a mere .14, however, with a compilation of behaviors, the correlation was .63 (in Conner & Armitage, 1998).

The second condition of importance is when specific attitudes are used to predict specific behaviors. This consists of the four elements, action, target, context, and time defined earlier. A study of attitude towards birth control performed by Davidson and Jaccard in 1979 demonstrated a correlation of .57 when all four elements were included in the measurement (in Petty & Cacioppo, 1996).

The last condition depended on social norms. Ajzen and Fishbein claimed that what other people think of the behavior impacts the prediction of an individual's behavior (in Petty and Cacioppo, 1996). The inclusion of social impact lead to Ajzen and Fishbein's proposal of the theory of reasoned action.

Alongside attitudes and norms, Triandis (1980) brought forth the role of habit in which behaviors become automatic in certain situations. He expands by saying that the first few times a behavior is performed, attitudes and norms play a leading role in

determining the nature of the behavior. However, as the individual engages in the behavior through time, habit plays a more immediate role (in Petty and Cacioppo, 1996). This concept evolved to define the term "mindlessness". Langer proposed that mindlessness occurs when categories or distinctions created in the past are relied on too rigidly, causing a sort of automatic behavior (Langer, 1989). This was accentuated in an experiment conducted in 1978 in which people at the City University of New York using a copy machine were approached and asked whether they would let an individual go in front of them to copy something. Requests were made having either sound or senseless reasons. Regardless of whether "Excuse me, may I use the Xerox machine because I am in a rush," or "Excuse me, may I use the Xerox machine because I want to make copies," was said, the participants responded identically. In both states, people gave a request and a reason. If a reason was absent in the request, participants were significantly less likely to comply. Therefore, the study showed that people responded mindlessly to the familiar framework rather than concentrating on the content (Langer, 1989).

Over the last two decades, the research on attitude-behavior consistency has focused on facilitating processes or variables. One of these conditions has focused on the subject's previous experience with the target behavior. The attitude accessibility model suggests that attitudes based on direct experience should predict behaviors better than those attitudes that are not. Fazio defines attitude as a "learned association between a concept and an evaluation" (in Petty & Cacioppo, 1996, p.27). He suggests that attitudes do not differ solely in the context of being evaluatively positive or negative (attitude direction) or how positive or negative they are (attitude intensity). In addition, attitudes vary in strength. Attitude is conceptualized as an association in memory between the

attitude object and one's evaluation of the object. The accessibility of an attitude from memory signifies attitude strength and is measured by response latency. How strongly the object and its evaluation are associated is theorized to depend upon the amount of direct experience the individual has with the attitude-object (Conner & Armitage, 1998).

This model was used in a study of judgments of politicians in which respondents listened to 25 statements about Reagan and Mondale (1984 presidential candidates). Response latencies were recorded and individuals with the same attitudes were divided into 'high' and 'low' accessibility groups on the basis of their latencies. In accordance with the accessibility model view, initial attitudes towards Reagan were more strongly correlated with judgment on his TV performance for those designated to have highly accessible attitudes. Regardless of the direction of their views, respondents with strong attitudes were more likely to be consistent throughout the time (in Ajzen & Fishbein, 1980).

More recent work by the Fazio group has shown that direct experience increases the likelihood of an attitude upon exposure to a corresponding attitude object. This experience increases the attitude-behavior correlation (Koslowsky & Hoffman, 1990).

The Theory of Planned Behavior

Fishbein and Ajzen (1975) originally proposed the theory of reasoned action to specify the predictors of behavior. Their model, tested in various health-behavior settings, suggests that intention to behave is a function of attitudes toward the act, which is based upon an individual's beliefs concerning the consequences of performing the behavior, and the normative beliefs of subjective social pressure exerted upon the individual to perform the behavior. In turn, there is a direct effect of intention on

behavior, whereas the function of attitudes toward the act and normative beliefs are indirect variables. Simply put, intention is the likelihood an individual will engage (or will not engage) in a given behavior. From the model's perspective, the person's intention to perform the behavior is the one primary component obtained to predict subsequent behavior.

The theory is based on the assumption that humans are rational animals that are able to process the information that becomes available to them. Therefore, the relationship among beliefs, attitudes and behaviors can be explained in a mathematical method in which the information is used in a methodical way to arrive at a corresponding behavioral prediction. By and large, this model has proven to produce correlations between intention and behavior averaging .55 (in Kantowitz et al., 1997).

The theory of reasoned action also specifies that behavioral acts, behavioral categories, and goals must be distinguished. Goals represent broad statements of purpose or intention such as "avoiding illness" or "reducing drunk driving incidences." Behavioral acts are categorized by four elements: action; target; context; and time (as specified earlier in this review). If one or more of these elements is redefined to broaden the meaning, it may no longer be measuring a single behavior but in effect a behavior category. This distinction is recognized due to the fact that behavior categories may require a variety of behavioral skills. For example, if adolescents were measured on their intent to use a condom for each time they had sexual intercourse, it may be relevant to specify using a condom with one's main partner and using a condom when having sex with an occasional partner. Due to the assumption that these behaviors most likely have different beliefs associated with them (e. g. about the consequences of performing/not

performing these behaviors), the most accurate results would be obtained by defining the elements (Bennett & Bozionelos, 2000).

Using the Ajzen and Fishbein model, Sherman, Presson, Chanssin, Bensenberg, Corty, and Olshavsky (1982) investigated junior high school and high school participants' smoking experience in regards to intention to smoke in the future. The interaction of attitudes and experience produced a slight increase of variance explained in intentions (the dependent measure). Secondly, the attitude-intention correlation was examined for high-, middle-, and low-experienced participants. The prediction comparison showed marginal increases in r (.005 for junior high and .003 for high school students). Correlations among the three groups demonstrated moderate differences on magnitude (the largest being .14) (Koslowsky & Hoffman, 1990).

The theory of reasoned action has shown significant prediction of behaviors in a multitude of cases. Among the many are studies conducted by Fishbein and Ajzen (1972, 1974, 1975, 1976); Fishbein and Coombs (1974); Fishbein and Jaccard (1973); Fishbein, Loken, Chung and Roberts (1978); and Fishbein, Thomas, and Jaccard (1976) (in Ajzen & Fishbein, 1980).

After considerable research, Ajzen and Fishbein (1980) suggested that intentions only demonstrated significant prediction of behaviors when the behavior is under the individual's volitional control. This control is said to vary according to circumstances, the individual's skills and their behavioral repertoire. To account for this factor, a third variable was added to the theory of reasoned action: perceived behavioral control. This aspect encompasses past experiences along with anticipated impediments and facilitators that may influence the performance of a behavior. Functionally similar to Bandura's

construct of self-efficacy, perceived behavioral control relates to an individual's internal locus of control in a given situation. However, perceived behavioral control is defined by the measurement of an individual's perception of the level of ease or difficulty of performing a behavior (Rhodes & Fishbein, 1997). It is comprised of "control beliefs" that assess the relevance and impact of both internal and external factors that have the potential to influence one's ability to perform the behavior. In encompassing the new predictor variable, the model became known as the theory of planned behavior.

Behavioral Beliefs. Behavior beliefs associate the identified behavior to expected outcomes. Although a person may contain a multitude of behavioral beliefs concerning a given behavior, only a relatively small amount of these beliefs can be accessed at a given time. The accessible beliefs along with the deemed values of the outcomes comprise the attitude toward the behavior. In effect, the evaluation of a behavior contributes to the attitude along with the belief that the behavior will produce the outcome in question. Attitude evaluation is measured on a continuum from positive to negative. Therefore, the weight of the evaluation, and the subjective connection of a behavior to a specified outcome can directly determine the strength of a belief (Ajzen, 1988).

Normative Beliefs. Normative beliefs are defined as the perceived behavioral expectations of individuals that have referent power over the individual. Depending on the population, these people could be family, peers, doctors, media, coworkers, and so forth. Normative beliefs, in conjunction with an individual's desire to comply with the beliefs of others, create a subjective norm (or perceived social pressure). In accordance with this model, the strength of a normative belief is directly proportional to subjective

expectations of referent others and the motivation to comply with each referent (Ajzen, 1988).

Control Beliefs. Control beliefs relate to the perception of factors that impede or facilitate the performance of a behavior. These factors, both internal and external, determine the amount of power an individual perceives oneself to have over performing a given behavior. Control beliefs, associated with the perceived level of control over each belief, determine perceived behavioral control. In summary, dissecting each of the three predictor variables will result in a belief and an evaluative component (Ajzen, 1988).

Intention. Attitude toward the behavior, subjective norm, and perceived behavioral control subjoin to form intention. Intention is the direct antecedent of behavior and equates to an individual's readiness to perform the behavior. Each situation is unique in that the predictor variables that contribute to intention vary according to the type of behavior in question. For example, in a particular situation, behavioral beliefs may be the largest contributing factor to intent to perform the behavior, whereas in other contexts, behavior may rely mainly on normative beliefs (Ajzen, 1988. See Appendix C).

The theory of planned beahvior is a widely utilized model to predict health behavior. Bennett and Bozionelos (2000) conducted a narrative review of twenty studies that used the model in research solely concerned with condom usage. The qualitative review analyzed various methodology issues related to the theory's usage and how this affected the subsequent results. Findings showed that the more the design of the study mirrored the intended purpose of the model and its constructs, the higher the level of significance found. Consistent with the model, in the eight studies that measured behavior, save for one, intention did show to predict a person's condom usage. In

addition, behavior was measured from four weeks to three months after intention had been assessed. Through time, the strength of the association between intentions and behavior showed no significant diminishment.

In assessing the twenty studies, significant results were most likely to be found when the terms of a behavior (action, target, context, time) were defined. This was especially true in cases where in changing any of the four terms, the evaluation of the behavior was affected. The example of condom usage and partner was given. An individual may have different evaluations of condom usage with a primary partner than with a casual partner. Use of a condom may be rated with far more frequency when with a casual partner than with a primary partner (Bennett & Bozionelos, 2000).

The theory of planned behavior was also used to assess wastepaper-recycling behavior among Hong Kong college students. A questionnaire designed to measure the constructs associated with recycling behavior was given to two hundred and eighty-two students. Results confirmed that the model significantly predicted both behavioral intention and actual wastepaper-recycling behavior reported the subsequent month. Perceived difficulty also predicted intention; however, perceived control showed no significant effect (Cheung & Chan, 1999).

According to previous research on recycling behavior (including two studies that used the theory of planned behavior), attitude has been deemed to have a reliable effect on recycling. Vining and Ebreo (1990) found that nuisance and economic motives specifically related to recycling could differentiate recyclers from nonrecyclers. In the two previous applications of the theory of planned behavior specifically, attitude toward the act was found to be a significant predictor of the intention to recycle (Boldero, 1995;

Taylor & Todd, 1995). Although the attitude-intention link has demonstrated consistent results to support the model, the effect of normative pressure has not illustrated such unequivocal results. Whereas the construct was found to be significant by Taylor and Todd, Boldero found no significance for normative pressure to predict either intention or actual behavior (Cheung & Chan, 1999). The same findings hold true when comparing the significance of perceived behavioral control.

In an attempt to account for these inconsistencies, Fishbein and Ajzen concluded that the underlying beliefs are likely to vary across behaviors, and different populations will find different beliefs to be relevant. The theorists suggest that specific beliefs should be elicited from the target population to control for this discrepancy. In effect, Taylor and Todd studied beliefs specific to the target population, whereas Boldero had not (Cheung & Chan, 1999).

Similarly, the unreliability of the perceived behavioral control construct could be explained in the methods by which it was operationalized. In the two studies discussed, the construct was measured only in terms of perceived control. Perceived difficulty was not measured. The study conducted by Cheung and Chan controlled for this variable and measured both difficulty and control in defining the control belief constructs.

In the last decade, the theory of planned behavior has been successful in the prediction of a wide variety of behaviors (Cheung & Chan, 1999). These behaviors range from condom usage, attending health checks, class attendance, various leisure activities, participating in regular exercise, and the violation of driving regulations. Dishonest behaviors such as shoplifting and cheating on an examination have also been predicted

using this model. These general findings indicate the predictive power of the three constructs that supersede intention and actual behavior.

Experiential Learning

Experiential learning, or learning through experience, has long been a method of educating individuals. John Dewey, a profound American philosopher whose works date back to the end of the nineteenth century, was a huge proponent of the value of experience in education. He believed that intelligence was a form of practical reason rooted in experience (Smith, 1994). Dewey defined experience as the "psychophysical process of doing and undergoing" (in Smith, 1994, p.359). When an individual participates in an event, he or she reflects on the consequences and undergoes a process of learning that works to eliminate unsavory consequences in exchange for developing intentions for more informed decision-making. Dewey communicated his belief that experience is a guide for subsequent actions. Two generalities can be assumed from his work. The first is that experience is mainly an active-passive concept, it is not primarily cognitive. Secondly, the association of relationships that connect with the experience measures the value of the experience. Therefore, the process becomes cognitive contingent on the fact that the experience holds meaning to the individual (Dewey, 1916).

Dewey's writings became valuable contributions to education. In his essay, "My Pedagogic Creed," he vocalized that mere instruction that is not accompanied with direct participation in school affairs is not an effective means of learning. He believed it was the duty of the educational community to overcome rote learning with interactive cooperation (in Halliburton, 1997). Action, he believed, unifies various educational functions. Whereas learning by instruction usually breaks down information into

meaningless data that is memorized by the students, by participating in constructive activities, blocks of knowledge needed for doing something can be learned by meaningful experience. In summary, his theory is that students learn by experiencing things in the world. Therefore, true learning infuses mental activity with physical activity.

Various theorists have accentuated the need for interactive learning in the last century. As every concept has its evolutionary course, experiential learning arose again in the early 1980s when Mezirow, Freire and others stressed that the heart of learning lies in the way experiences are processed (in Kemp et al., 1996). Of particular importance, is critical reflection of experience by the individual. Learning was explained as a cyclic process that began with the experience, continued with reflection and later led to action, which was defined as a concrete experience for reflection.

David Kolb further refined this concept in his theory of experiential learning (in Kemp et al., 1996). He expounded on the cycle of learning by dividing the reflection component into two separate learning activities; critical reflection and abstract conceptualization. In the critical reflection stage, questions about the experience are asked in terms of previous experiences. It is in the abstract conceptualization phase that these questions are answered. In this stage, logic and ideas are used in learning to understand problems or situations (in Kemp et al., 1996).

According to Leutner (1993), traditionally, the teacher has had the responsibility for the students' learning. This typically involves lecturing in which students take notes and memorize and recall the information for evaluation. As a means for students to take personal responsibility, guided discovery was introduced. This method, developed by Dr.

Charles E. Wales at the Center for Guided Design, stimulates group interaction and forces students to utilize a multitude of resources beyond the classroom (1993). Menn (1993) evaluated student retention of subject matter when students used various instructional media. He stated:

> "It was found that students remember only 10 percent of what they read; 20 percent of what they hear; 30 percent, if they see visuals related to what they are hearing; 50 percent, if they watch someone do something while explaining it; but almost 90 percent, if they do the job themselves even if only as a simulation."(in Gokhale, 1996, p.36).

Although experience has been deemed an important function of learning, cases do exist that demonstrate that experiencing to learn can become unethical or risky. In the example of learning the impact of smoking and its health costs, it would be unrealistic to teach an individual an addiction by experiencing the addiction first hand. In cases such as these, interactive computer simulations have been created to produce a life-like experience and forgo the actual consequences.

Computer Simulations

Interactive computer simulations help individuals create explanations for certain events and solidify the explanations using a mixture of their own ideas. There is also evidence that these simulations enhance students' problem-solving skills by allowing them to go through the motions of decision-making. In particular, simulations can motivate, expose misconceptions and areas of knowledge deficiency, integrate information, and enhance transfer of learning (Farynairz & Lockwood, 1992).

Anu A. Gokhale of Illinois State University incorporated the characteristics of guided discovery in interactive computer simulations to determine the effects they had on students' problem solving abilities. It was found that students who used the computer simulation software significantly performed better on problems needing problem-solving skills than did those students who were taught using traditional instruction. In effect, Gokhale concluded that simulations help develop higher-order thinking skills that help individuals to solve real-life problems.

As a result of the new findings concerning the effectiveness of computer simulations, a field of inquiry named Captology arose. Dr. B. J. Fogg, Director of Research and Design at Stanford University's Persuasive Technology Lab, introduced Captology to define how persuasive computers are designed to change peoples' attitudes and behaviors (King & Tester, 1999). The Persuasive Technology Lab has tracked existing and evolving computing devices with the intent to change human attitudes and behaviors since 1997. Approximately fifty devices, including the NICoteen™ Pack used in the present study, have been identified and studied.

In analyzing the purposes of such technologies, researchers have defined no less than 12 domains for which persuasive technologies have significant potential. The most widely used is marketing, which uses persuasive technologies to sell a product or service. A profound example of this is e-commerce or branding on the Internet. Second to marketing is the health domain. Health management through technology is predicted to continually grow. Persuasive technologies that promote wellness are likely to benefit from a large and willing market of individuals seeking innovative means to maintain

health. The NICoteen™ Program, along with its sister, The Baby Think It Over® Program are both located within the health domain.

Of the many persuasive strategies, simulated experience is merely one of the influential tactics used by the technologies. The purpose of simulations, much like the effectiveness of role playing (Janis & King, 1954), is to present the user with an environment or object similar to its real-life counterpart. The key factor of simulations is the fact that decisions can be made and acted upon without the adverse consequences in real life. Choices made in a simulation can demonstrate the results, both negative and positive, to which the choices can be applied in the individual's own life (King & Tester, 1999).

In order to operationalize the functions of persuasive computers, Fogg introduced the Functional Triad View. He proposed that computers function in three general ways: as tools, as media, and as social actors. These functions are used to explain the various means people view or respond to such technologies.

A computer when used as a tool can provide individuals with an ability or power that enables them to do things they couldn't do before, or allows them to do things more easily. The benefits attached to this function are increasing self-efficacy, providing information for better decision making, and changing an individual's mental model (Fogg, 1998).

As a medium, a computer can transfer information of symbolic and sensory content that provides an individual with an experience. This provides an individual with first-hand learning in the understanding of cause/effect relationships. The experience itself can also be a motivator to an individual (Fogg, 1998).

Computers can also function as social actors. In this instance, computer technologies adopt animate characteristics, roles, or follow social rules. The computer forms a relationship in which social norms, rules, and expectations are established along with social support or sanction associated with a behavior (Fogg, 1998).

The NICoteen™ Program

Various models have been examined to determine the underlying processes that predict adolescent risky behavior. Current social science theories and models help to shed light on the processes related to health-related behavior change and decision-making. The conceptual frameworks of many have been shown to be quite similar, although each differs in their own aspects. For the purpose of this intervention the focus is on those that form a connection between attitudes regarding smoking cigarettes and the resulting behavior and the effects of interactive technologies.

The NICoteen™ Program smoking simulation is a prevention program aimed at children between the fifth and eighth grades. The purpose of early intervention is in accordance with the guidelines proposed by the CDC listed earlier in this review.

The program explores the physical, mental, social, and financial consequences of smoking. The creators defined its intention in five aspects, to help young adults understand that a smoking addiction is demanding, consumes a great deal of time, negatively affects one's health, is expensive, and takes away independence (NICoteen™ Program Guide, 2000).

The scope of the program is bifocal. The first five days consist of various sessions, approximately one hour in length, which educate adolescents in various concrete negative consequences of smoking addiction. Following the completion of the

curriculum, students carry with them a small interactive device for the weekend that resembles a pack of cigarettes. The device requires the student to simulate the estimated amount of time an addicted smoker spends smoking each day by subjecting the student to the smoking regimen of an addicted smoker. The student interacts with the pack ten to twenty times throughout each day, each lasting an average of three minutes. Using an identification chip (ID) and voice recognition technology, students must repeat an anti-smoking message into the pack for the amount of time it would take to smoke a cigarette. Throughout each session, the student will hear various smoking related facts and thought-provoking questions. The NICoteen™ pack records the student's interaction during the smoking simulation. When the student returns the pack to the instructor, the instructor hears a report of the student's simulation and if they heeded when the pack made demands to "have a cigarette".

Explanation of Program Curriculum and Theoretical Basis. Preceding the program, the instructor must follow school policy in introducing a new program. For some, this means getting permission from the principal and for others, it may have to be voted on by the local school board. A letter is then sent to the school faculty members to inform them of the program and gain school-wide support. The parents of the potential student participants also receive a letter that explains the content of the program. Upon parental consent for their child to participate in the program, students complete a pre-program survey that serves as a baseline for the instructor. The curriculum begins with a briefing that emphasizes the basis of the smoking prevention program: to provide students with the information to make an informed decision regarding cigarette smoking. Unlike programs that center on lecture, allowing an adolescent to make his or her own

decision helps to avoid psychological reactance to the program. When freedom to choose is threatened or eliminated, individuals (especially teenagers) strive to regain a feeling of autonomy. This often results in an attitude change in an opposite direction than the one that was suggested. Reactance is defined by Brehm (1966) as both "when a specific behavioral freedom is threatened, that freedom becomes more attractive and attempts to reassert the freedom are initiated" (Gilbert, Fiske & Lindzey, 1998, p. 551).

Much research has linked the concept of empowerment and its close relation to health outcomes. Empowerment is the method that allows an individual to project control over his or her life. Studies that investigate health outcomes associate powerlessness as a broad-based risk factor for disease. Conclusively, people who feel they have control in a health situation have better outcomes than those who feel powerless (Ungar, 2000).

Students then watch the student video, which familiarizes them with the NICoteen™ Program and allows them to gain an understanding of what to expect over the next week.

Locus of control is a fundamental component of the program. The basis of the smoking simulation is to attempt to give students a sense of what it feels like to lose control in hopes of providing a form of negative reinforcement. Lepper and Malone (1987) argue that control is an essential part of intrinsic motivation. Humans want to have direct experience with the outcomes of one's own actions and choices, not merely a 'Pawn' of external forces. The first activity also uses this concept as students discuss as a class or in small groups how addictions make a person lose control of their lives. This activity stimulates discussion for the explanation of an addiction. Students are then asked

to discuss the characteristics of an addiction to gain an understanding of the lack of control it creates. The session concludes with a "Words 'n Meanings" worksheet that is meant to reinforce students' understanding of the meanings of the words discussed throughout the curriculum.

Day two begins with the "Breathing Activity." Students insert a drinking straw (cut in half prior to the exercise) into their mouths and are asked to hold their noses and breathe solely through the straw. Students then stand and run in place. This allows individuals first hand knowledge of the physical discomforts smokers feel when they lose the ability to hold enough oxygen within their lungs.

Mezirow and Freire stressed that the basis for all learning rests in the manner an individual processes an experience and of particular interest, the critical reflection of an experience. The experimential learning theory defines learning as a cycle that begins with experience, continues to critical reflection, then moves to abstract conceptualization and concludes with active experimentation. In the critical reflection stage, present experience is questioned in terms of past experiences, whereas the abstract conceptualization stage is the stage where the answers are sought. Following the entirety of reflection, the active experimentation stage is the point what which the hypothesis is tested (Kemp, Morrison, & Ross, 1996).

The experience the students undergo provides them with a tested hypothesis for future reference when confronted with the decision of whether to smoke. Inasmuch as they have heard the implications associated with smoking, after the exercise, they have the ability to apply this prior knowledge to the "Breathing Activity."

Students then discuss how smoking damages physical fitness and how the activities in which they enjoy participating would be affected. This discussion leads into the "Smoking Makes Me Sick" activity. Most researchers agree that adolescents are more responsive when the immediate consequences of smoking cigarettes are included with the long-term health costs. Health conditions from smoking cigarettes thirty years into the future often seem irrelevant to them (Surgeon General's Report, 1994).

Students have different levels of awareness of the health effects associated with smoking. To broaden their awareness, students are asked as a group to think of diseases that can be caused by smoking. Once diseases are listed and understood, the instructor distributes the "Portrait of a Teen Smoker" worksheet. Students are asked to sketch a face of a person and relate the previously listed diseases' effects. Students specifically indicate some of the characteristics on their portraits. This gives them a very concrete association to bring home the effects.

Day two concludes with handing out the "Interview with a Smoker" worksheet. The purpose of the worksheet is to illustrate how an addiction controls an individual's life through social proof. Students must interview an adult smoker to find the impact smoking has had on their life. The worksheet is to be handed in at the program's completion.

The program's third day begins with a brief discussion of the media, its mediums and how they seek to persuade individuals. This information is applied to tobacco companies to help students understand how cigarette advertising is targeted to them. Cartoons, giveaways, and promotional products are analyzed in how they attempt to get teenagers to smoke. Basic statistics are related to students to solidify the impact.

The "Behind Media's Smoke Screen" worksheet is distributed and students take out the newspapers or magazines with smoking advertisements they were asked to bring. Students reference the advertisement to answer the questions on the worksheet. The worksheet brings attention to cigarette advertisements and their intent. Students are confronted with what the advertisements imply and how this is targeted to them. They then share their advertisements along with their findings to talk about what the advertisements portray in comparison with reality.

For the curriculum of day four, students are asked to find out if their favorite movie pictures people smoking. This is discussed as a forward to the "Up In Smoke" activity. Actual costs of selected brands of cigarettes are written on the blackboard. Students then complete the worksheets based on the prices provided to determine the monetary costs of smoking given different brands and amounts of cigarettes smoked. This makes students more aware of immediate costs of smoking cigarettes, which has been demonstrated to be more powerful than long-term health costs (Lynch & Bonnie, 1994).

Lastly, student contracts are given to each student that must be signed and returned before they start the simulation. Students go through a practice mode of the smoking simulation to learn the options, such as how to smoke a cigarette, change the volume, pause the simulation, and shut it off to go to sleep at night.

Beginning day five of the NICoteen™ Program, students are asked to hand in their signed Student Contracts. The Student Video is played again to refresh the operational components of the simulation. Students take the "Ready to Burn" quiz to answer any last

questions. Students are given a journal to record activities during the smoking simulation and then wristbands are attached to each student's wrist.

Purpose of the Present Investigation

The purpose of the present investigation was to assess whether participating in the NICoteen™ Program would affect fifth-graders' attitudes towards cigarette smoking. The attitudes measured specifically centered on behavioral beliefs, normative beliefs, and control beliefs in accordance with Ajzen's theory of planned behavior.

Hypotheses and Rationale

Students should have general knowledge regarding the risks associated with cigarette smoking, as well as awareness of the existence of pressure from outside individuals for them to smoke. It was expected that difference between the intervention and comparison groups' scores would depend on the item. It was hypothesized that those individuals that participated in the intervention would have less of a desire to try smoking upon completion of the intervention then would the comparison group (item numbers one and two).

It was also hypothesized that when analyzing among the three health belief items (item numbers three, four and five) item number five will differ the most between both the pre- and post-intervention surveys of the intervention group, and between the intervention and comparison groups. This hypothesis was based on the premise that the smoking simulation should personalize the effects of smoking cigarettes. This includes both the immediate effects and the students' recognition that they themselves would undergo the long-term health consequences of smoking.

It was further hypothesized that the post- intervention responses to the items

related to the image of smoking (item numbers seven and eight) would show a significant change in the intervention groups' image of smoking compared to their pre-intervention responses and those of the comparison group. Students who experienced the intervention were expected to be less likely to see cigarette smoking as looking cool and grownup.

The most influential sources for children in fifth grade were assumed to be parents, friends, advertisements and older, "cool" kids. Children ages 10 and 11 are still highly influenced by their parents. It is around this time that peer and media influences also start to become more persuasive, as susceptibility to smoking initiation begins around the age of 10 years and peaks by age 14 years in close to 60 percent of this population (General of the World Health Organization, 1998). It was hypothesized that students in both pre- and post-intervention surveys would report that parents and friends would not like it if they smoked cigarettes in both groups. However, the students participating in the intervention were expected to rate cigarette companies higher for wanting them to smoke cigarettes at the post- than the pre-intervention, and in contrast to the comparison group at the post-intervention assessment (item number thirteen).

Consistent with the subjective norm, it was expected that fifth grade students would feel that they want to do what their parents and friends would like them to do. Responses to this item were not expected to show differences between or within groups. However, students who experienced the NICoteen™ Program were expected to be more strongly against doing what the cigarette companies think they should do (item number seventeen).

The premise of the smoking simulation centers on teaching the loss of control that cigarette smoking has on an individual's life. The section of the survey that centers on

control issues was expected to show the greatest change in responses within the intervention group (item numbers twenty through twenty five). It was hypothesized that the NICoteen™ Program would give the intervention students a more realistic view of the amount of control the addiction would have over their lives. Therefore, individuals who have participated in the intervention were expected to demonstrate an increase in the amount of control they believe a smoking addiction would have on their lives.

# Chapter III

# Methodology

## Participants

The participants were enrolled in a relatively small public school district located in Wright County, Minnesota. The three fifth grade teachers of the school had interest in the NICoteen™ Program and volunteered their class time for students to participate in the study. The participants consisted of fifty-five students with a mean age of 134.45 months, or 11.2 years. Of the three classes, only seven did not complete the surveys due to either not participating in the entire program if the individual was in the intervention group or either student or parent refusal to complete the survey in the control group. As a result, the control group consisted of 19 individuals and the intervention group, 36.

Wright County has a population of 87,864 people, an estimated 98.8 percent of which were predicted as white in 1997 for 1999 (U. S. Census Bureau, 1997). Using the same predictor methods, the median household income was estimated at $47, 713. Of the 18,068 households, 7.8 percent of the children were estimated to be living below the poverty level (19.9 percent is the national level).

Wright County is moderately populated, having 661 square miles and 133.0 persons per square mile. (In contrast, Los Angeles County has approximately 2,298.0 persons per square mile.) Many of the school districts are small, and the county does not contain any metropolitan areas. Therefore, this school district may not be socioeconomically representative of the state or the country as a whole.

Stimulus Materials

A survey was developed by the researcher for the purpose of this study, based on the basic components of Ajzen's theory of planned behavior. The same instrument was used at both the pre- and post-intervention assessments. Gender, age, and parental smoking behavior were included in the questionnaire.

Items one through ten assessed behavioral beliefs and attitudes toward smoking. Students' beliefs on whether they would smoke, along with health and image beliefs were asked. In addition, their attitudes were assessed in relation to these beliefs. Item number one defined the behavior of interest using specified terms of its action, target, context, and time elements. The intervention sought to deter adolescents from smoking in general and didn't have specific action, target, context, and time elements. Therefore, the survey items did not need to include very specific elements (as Ajzen and Fishbein stated that global attitudes should be used to predict general behavior). However, the researcher included the question, "If an older kid offers me a cigarette within the next year I will say no" based on her prediction that responses to this item will show less change between pre- and post-intervention questionnaires than the more global questions. The more general question regarding future smoking behavior is posed in item two.

Items three through five measured health beliefs related to smoking. The item of particular interest is, "If I start smoking now, I will start having health problems right away." As research demonstrates, most children are aware of the long-term health consequences of smoking. However, individuals tend to disregard the effects that are immediate and are directed towards the individual. As the optimistic bias in perceiving physical and mental health risks states, in order to preserve self-esteem, an individual is

motivated to assess his or her risk for the possible harmful outcomes of engaging in a risky behavior as being low. For example, even though smokers are willing to acknowledge an increased health risk associated with smoking, they still have an optimistic bias related to their individual risk for a smoking-related illness. In fact, they believe that their probability is lower than the actual risk for the disease (Weinstein, 1987).

Item six assessed attitude toward the behavior, specifically how important being healthy is to them. According to Ajzen and Fishbein, behavioral beliefs are only predictive of a behavior if attitude toward the behavior is congruent with the beliefs. Therefore, it would be of no consequence that students had a deep understanding of the health consequences associated with smoking cigarettes if being healthy was not important to them.

Items seven and eight assessed the students' perceived image of cigarette smoking. Items nine and ten measured how important it was for the individual to have this image.

Normative beliefs were assessed in items eleven through fourteen. The most influential sources for children in fifth grade, parents, friends, advertisements and older, "cool" kids, were included in separate items.

The subjective norm was assessed in items fifteen through eighteen. The same group of influential others identified in items eleven through fourteen was listed (parents, friends, cigarette companies, and older, cool kids). The subjective norm seeks to determine how important it is to perform behaviors congruent with what influential others

believe. For example, item number fifteen states, "I want to do what my parents think I should do."

Items nineteen through twenty-two assessed control beliefs. Items nineteen and twenty-two address young people's underestimation of the addictiveness of nicotine and the difficulties associated with cessation. Items twenty and twenty-one evaluated beliefs regarding how smoking would affect their health and financial resources.

Items twenty-three through twenty-five assessed how important it was for individuals to be in control of their lives as a whole. This included financial control as well as being in control of one's health.

Procedure

The three fifth grade classes were randomly placed by class into either the comparison or intervention groups. One class served as the comparison group while the other two both served as the intervention group. Consent forms were given to the students to take home to parents or caregivers prior to any mention of the NICoteen™ Program in the classroom. The letters explained the program in detail, along with the expectations of the weekend simulation in which the students would participate. The parents of the intervention group had a choice to either let their child participate in the entire study, the in-school curriculum only, or have their child be assigned alternative activities as a substitute for participating in the NICoteen™ Program.

The teacher of the comparison group was given the option of implementing the program into his classroom upon completion of the intervention program. Therefore, the consent forms that were distributed to parents of the comparison group had similar information. Since students in the comparison group would likely hear about the

program from the students in the other two classes, the teacher was told to tell his students that if the program proved to be beneficial in the other classes, the comparison class may have an opportunity to also participate at a later date.

In order to minimize error due to variability in using the simulated computer interaction, the teachers met with the researcher (also an employee from BTIO Educational Products, Inc.) to go over operation of the NICoteen™ Pack and to ask questions prior to the study. An outline was provided to each of the teachers so that the curriculum would be taught as similarly as possible across classes. For example, the program suggested having the students look up the Tobacco Industry's Poster Child on the Internet (www.tobaccofacts.org/teacher1.html). At this meeting, they were also reminded of additional responsibilities for the study (e. g., coding the pre- and post intervention surveys with the NICoteen™ Packs, reading the script when initiating the surveys, and supplying an envelope for the completed surveys to ensure confidentiality). Teachers were also given an operational handbook to review the information needed to operate the pack.

Upon parental consent, students from all three classes were given similar information about the purpose and nature of the research at the time of the pre-intervention questionnaire administration and before initiation of the NICoteen™ Program. (This information was included in the script the instructors read before conducting the surveys.)

The teachers were asked to develop a method of coding both the pre- and post intervention questionnaires along with the NICoteen™ pack so that each student's data could be coded by a single number. This enabled the researcher to associate level of

student participation in the simulation with their change in attitudes without compromising confidentiality. The teachers were instructed to read from the script provided by the researcher to ensure uniformity across classes. Included in the script was the right of the student to refuse to answer a question or the survey as a whole. Students were instructed not to write their names on the survey and were assured that their responses would be anonymous to their parents, teachers and the researcher. The script stated:

> "I am handing out a survey that is going to ask you some questions about cigarette smoking. I will read each question out loud and would like you to silently pick what you think is the best answer. This survey is going to help us understand your feelings about cigarette smoking so it is very important that you answer all of the questions as honestly as possible. Please no talking while we are filling out the survey.
>
> Please do not put your name on the survey. This way you don't have to worry about how you answer each question because no one will know whose survey is whose. You also have the right to not answer a question or any of the survey if it bothers you to do so. By completing the survey, you are saying it is all right for a researcher to use your survey in the research she is completing for her Master's thesis at the University of Wisconsin-Stout. She will not report on answers from individual surveys, only on group results."

The script also contained an explanation how to use the Likert scale in reference

to each question asked. Teachers were instructed to write the scale on the blackboard in order for students to have a visual representation. Students completed the survey at the same time, as the teacher read each question aloud. When the questionnaires were completed, students were instructed to place them in the envelope provided and seal the envelope.

Beginning on the Monday after the consent forms were returned, the five-day NICoteen™ curriculum was introduced into the classroom. Approximately one hour of class time was set aside each day to perform activities included in the program.

On the Thursday prior to the Friday the Packs were sent home, the parents of the students participating in the entire project were given another letter. The letter asked the parents to support the program over the weekend by requiring the students to go outside when the Pack made its demands along with reminding the student to take the Pack with them to all activities. In addition, the letter outlined the basic components of operating the Pack so that the parents had the necessary information to help their child if needed.

On that weekend, participating students brought the NICoteen™ packs home until the following Monday. When students returned the packs to school, the teacher met individually with each student to listen to the read-out of how well the simulation was followed and checked for any damage to the pack. The day following completion of the entire program, instructors issued the post-intervention survey using the same procedures used for the pre-intervention survey.

Data Analysis

The intervention assessment was a quasi-experiment with a mixed design. A reliability analysis was performed on items one through twenty-five to determine which

items clustered together. A slight degree of consistency was present on certain combinations of questions, however, not strong enough to justify creating new variables from them.

Due to the mixed design, the pre- and post-intervention survey responses were entered as separate variables. Then separate Repeated Measures Analyses of Variance (ANOVAs) were used to test both group effects and pre- and post-intervention affects, one for each survey item. The within-subjects factor was time of testing (pre and post) and intervention (present and absent) was the between-subjects factor for each analysis.

When interactions were found within items, paired samples t-tests and independent t-tests were used to determine specific differences. When differences were found between the pre- and post-survey responses of the intervention group, a paired samples t-test that filtered out the comparison group was used. When differences existed between the post-intervention survey responses of the comparison and intervention groups, independent t-tests were used. The Bonferroni test was applied in the specific comparisons tests, due to the large number of comparisons made. Therefore, the probability of error for the specific comparisons was .008.

# Chapter IV

## Results

As expected, there was no main effect for any of the twenty-five items tested. This finding confirmed the hypothesis that there were no significant differences between the groups that were due to factors other than the intervention.

Four of the twenty-five items showed an interaction of some sort, according to Pillai's Trace, Wilk's Lambda, Hotelling's Trace, and Roy's Largest Root. The interaction for item number one, "If an older kid offers me a cigarette within the next year I will say no," was significant, $F(1,53)=4.308$, $p=.043$. As hypothesized, the specific comparison test showed that the difference from the pre- and post-survey responses in the intervention group was marginally significant, $t(35)=2.534$, $p=.016$.

The interaction for item number thirteen, "Cigarette companies would like it if I smoked cigarettes," was also significant, $F(1,53)=5.330$, $p=.025$. The specific comparison test showed a significant difference between the pre- and post-survey responses in the intervention group, $t(35)=3.162$, $p=.003$.

The interaction for item number fourteen, "The older, cool kids would like it if I smoked cigarettes," was also significant, $F(1,53)=5.975$, $p=.018$. The specific comparison test showed that the difference between the pre- and post-survey responses approached significance in the intervention group, $t(35)=1.641$, $p=.055$.

The interaction for item number twenty-three, "It is important to me to be able to buy the things I like," was also significant, $F(1,53)=3.759$, $p=.029$. The specific comparison test showed that the difference between the pre- and post-survey responses in the intervention group was marginally significant, $t(35)=2.788$, $p=.009$.

Subsequent specific comparison tests showed additional differences between the pre- and post- survey responses of the intervention group that approached significance for items 6, 9, 14, 22, 24, and 25.

The difference approached significance between the pre- and post-survey responses of the intervention group to item six, "Being healthy is important to me," $t(35)=1.821$, $p=.0385$.

The difference also approached significance between the pre- and post-survey responses of the intervention group to item nine, "It would be nice to look more grown up," $t(35)=-1.972$, $p=.0285$.

The difference also approached significance between the pre- and post-survey responses of the intervention group to item fourteen, "The older, cool kids would like it if I smoked cigarettes," $t(35)=1.641$, $p=.055$.

The difference also approached significance between the pre- and post-survey responses of the intervention group to item twenty-two, "If I started smoking, it would control my life," $t(35)=2.019$, $p=.0255$.

The difference also approached significance between the pre- and post-survey responses of the intervention group to item twenty-four, "It is important to me to be able to play the activities I like to play," $t(35)=2.127$, $p=.0205$.

The difference also approached significance between the pre- and post-survey responses of the intervention group to item twenty-five, "It is important for me to be in control of my life," $t(35)=1.642$, $p=.055$.

No other significant differences were found. All of the means and standard deviations are shown in Appendix E.

# Chapter V

# Discussion

## Behavioral, Normative and Control Beliefs

Due to the absence of item grouping as demonstrated by the reliability testing, items were individually analyzed. There was no hypothesis that items in any of the three constructs (behavioral, normative, and control beliefs) would group together, although due to the number of items, grouping would have resulted in more efficient data analysis. Absence of grouping does not demonstrate fault in the intervention program or the instrument, it merely suggests that students vary in their attitudes and knowledge depending on the item.

As expected, there was no main effect for either the intervention or time of testing factors for any of the twenty-five items. However, the means of the comparison group were consistently higher than those of the intervention group on the pre-intervention survey. This trend can be explained by the teachers' assessment of their classes. The teachers of the intervention group stated that their classes include students with greater needs. These students have demonstrated fewer skills, greater behavioral problems, and showed more signs of engaging in risky behavior than the students in the comparison group. This information not only explains the initial differences (although not significant) between groups, but also suggests that the program's effectiveness extends to students of relatively high need.

The within groups differences followed expectations to a large degree. Most of the students tended to be very knowledgeable about the consequences of smoking. The

means in the pre-intervention survey suggested little room for improvement in understanding for both comparison and intervention groups. The only exception to this rule was item five, "If I start smoking now, I will have health problems right away." Even though post-intervention scores showed increased acknowledgment for the intervention group, there was no significant effect. This could be due to the fact that students still refused to admit the health consequences applied to themselves. It would be interesting to test whether, if the question were worded in the third person, the students would be more willing to identify the immediate health costs.

Consistent with the hypothesis that parents and friends were the most influential others in the students' decision-making, little difference was found between the pre- and post-intervention responses in these items. Of great importance, however, was the intervention group's increased agreement in the post-intervention surveys that cigarette companies would like it if they smoked cigarettes. Approaching significance was the intervention group's post-intervention agreement that older, cool kids would like it if they smoked cigarettes. This implies that the intervention was effective in demonstrating both how adolescents are targeted by cigarette companies and the ability to recognize the onset of peer pressure.

In accordance to this understanding, students in the intervention group also rated wanting to do what the cigarette companies or older, cool kids wanted them to do lower although not significantly so, in the post-than the pre-test. Pre-test means suggested that they were not yet strongly influenced by these two groups.

Of recondite importance were the findings in items that measured control beliefs. Of the six, four pre- to post-intervention response differences approached significance in

the intervention group. Of most importance was item twenty-two, "If I started smoking, it would control my life." The NICoteen™ Program's hypothesized basis for effectiveness centers on demonstrating the loss of control that results from an addiction. The expected effect is that upon experiencing the simulated loss of control, students would be less attracted to experimenting with smoking cigarettes. The simulation seeks to delete any of the "romanticism" associated with smoking as it provides a realistic depiction of an addiction.

Intent to Not Smoke

On the post-intervention survey, the intervention group agreed more strongly than on the pretest that "if an older kid offered me a cigarette within the next year, I would say no." This result suggests that not only is the model of planned behavior an accurate predictor of intentions, but also, the program has altered the students' intentions which, in turn, are directly related to their future behavior. However, the intervention failed to alter these students' perceptions concerning trying a cigarette (item number two). Perhaps this is due to the item being more abstract rather than lack of effectiveness on the program's part. It seems most effective to explicitly state the specific elements of the assessment items in terms of action, target, context, and time, as suggested by Fishbein and Ajzen.

Limitations

After the intervention groups' completion of the simulation, feedback was solicited from the parents. Nearly all of them found the program to be effective in teaching the loss of control experienced by an addiction. Furthermore, parents stressed that their children and they themselves both became very annoyed with the pack by the

end of the weekend. Parents claimed this was an excellent way to deter their children from cigarette smoking.

Unfortunately, students' degree of actual simulation participation was not available in time for completion of this thesis. It is expected that this additional data will further strengthen the results presented here. Greater involvement in the simulation should lead to greater understanding of the consequences of smoking.

It should also be noted that due to the small size of the sample, findings can not be generalized to the population as a whole. In addition, a larger number of participants would likely demonstrate greater group differences as a result of the program.

Summary and Conclusions

The results were fairly consistent with predictions and seemed to support students' greater intent to not smoke a cigarette within the next year if offered a cigarette by an older child. Examination of degree of simulation participation is expected to further elucidate the effectiveness of the NICoteen™ Program. It is recommended that future studies include more diversity in age, gender and geographic location in their population.

The theory of planned behavior proved quite useful in assessing the intervention. It is recommended that future researchers explicitly state the four elements within the intent-action, target, context, and time, for each assessment item. Students seemed more able to predict their future behavior when these were included in defining the intent.

Finally, further assessments should be longitudinal in order, to determine how accurately intentions predict behavior. Additionally, a "refresher course" of the program should be provided yearly so that effects are not diminished over time. A study that

follows students from fifth through twelfth grade with yearly implementation of the program would provide the clearest assessment of the program's effectiveness as a long-term deterrent of cigarette smoking.

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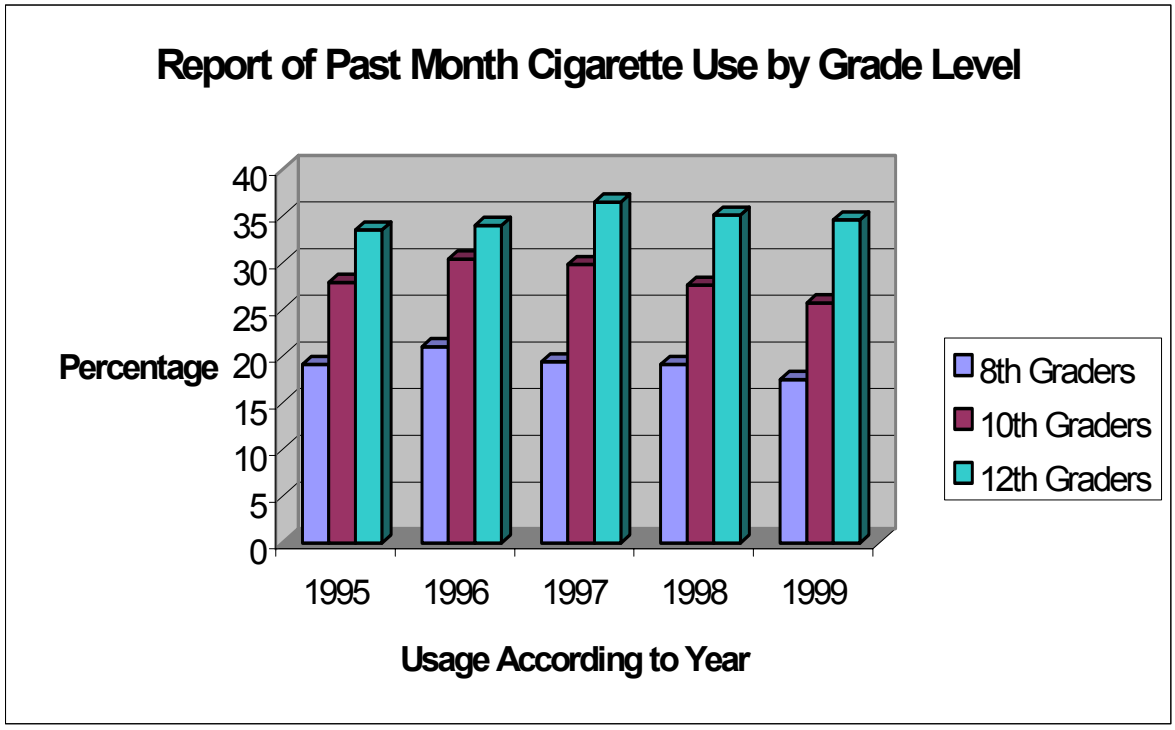
# Appendix A

## Trends in the Prevalence of Health Risk Behaviors

| Prevalence | 1991 | 1993 | 1995 | 1997 | 1999 | %Change 1991-1997 |
|---|---|---|---|---|---|---|
| Current Cocaine Use | 1.7 | 1.9 | 3.1 | 3.3 | 4.0 | +135.3 |
| Current Marijuana Use | 14.7 | 17.7 | 25.3 | 26.2 | 26.7 | +81.6 |
| Frequent Cigarette Use | 12.7 | 13.8 | 16.1 | 16.7 | 16.8 | +32.3 |
| Suicide Attempt | 7.3 | 8.6 | 8.7 | 7.7 | 8.3 | +13.7 |
| Binge Drinking | 31.3 | 30.0 | 32.6 | 33.4 | 31.5 | +0.6 |
| Current Alcohol Use | 50.8 | 48.0 | 51.6 | 50.8 | 50.0 | -1.6 |
| Sexual Intercourse | 54.1 | 53.0 | 53.1 | 48.4 | 49.9 | -7.8 |
| Fighting | 42.5 | 41.8 | 38.7 | 36.6 | 35.7 | -16.0 |
| Suicide Ideation | 29.0 | 24.1 | 24.1 | 20.5 | 19.3 | -33.4 |
| Weapon Carrying | 26.1 | 22.1 | 20.0 | 18.3 | 17.3 | -33.7 |

Appendix B

Students' Reports of Cigarette Use by Year and Grade Level



Appendix C

The NICoteen™ Pack Parts Identification and Explanation

Appendix C, Continued

**A** **Button**. Press and hold this down while speaking into the microphone.

**B** **Student Instructions**. A brief overview of operating directions for the student.

**C** **Microphone**. The student and instructor speak into this part of the Pack.

**D** **Speaker**. Information is heard through this part of the Pack.

**E** **Contact point**. IDs are touched to this part for identification and interaction purposes.

**F** **Approved NICline™ phrases**. A list of the anti-smoking phrases the Pack accepts.

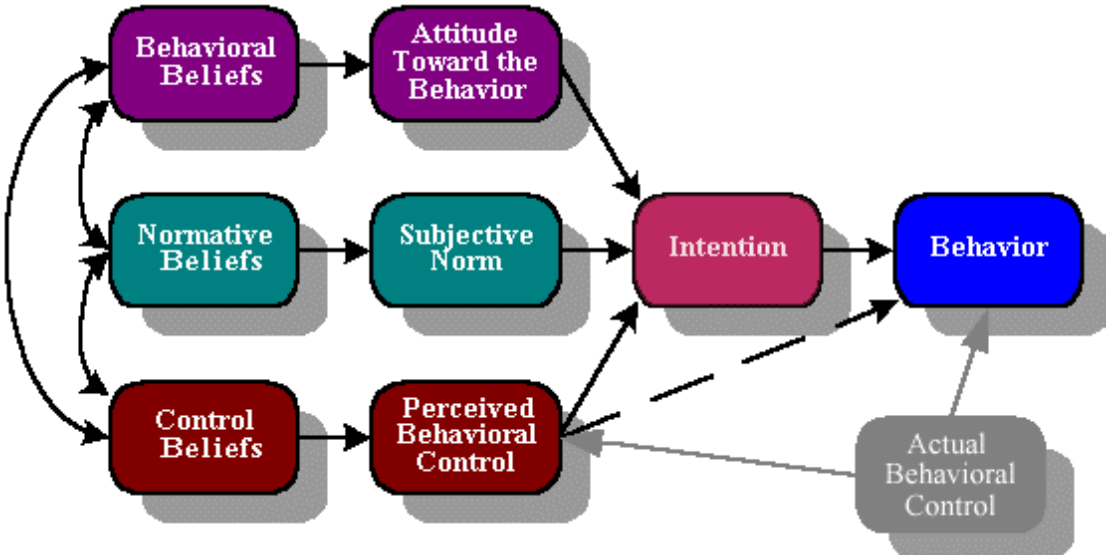
**G** **Student ID**. A devise used by the student for identification and to select Options. It is attached to the student's wrist with a tamperproof wristband.

**H** **Battery compartment lock**. Insert the battery compartment key here. Turn counterclockwise to unlock the battery compartment and clockwise to lock it.

**I** **Instructor key ring.** The key ring holds the Instructor ID and battery Compartment keys. The Instructor ID is the only ID that is able to select options and terminate the simulation.

Appendix D

Flow Chart of the Theory of Planned Behavior



Appendix E

Means and Standard Deviations for Each Survey Item

| | Comparison | | Intervention | |
|---|---|---|---|---|
| | n=19 | | n=36 | |
| | Mean | SD | Mean | SD |
| Pre-Intervention Survey | | | | |
| Item 1 | 1.26** | .73 | 1.97 | 1.68 |
| Item 2 | 4.79 | 2.23 | 5.08 | 2.17 |
| Item 3 | 1.16 | .50 | 1.39 | 1.32 |
| Item 4 | 1.89 | 1.66 | 1.97 | 1.52 |
| Item 5 | 3.95 | 2.20 | 3.22 | 2.10 |
| Item 6 | 1.16* | .37 | 1.64 | 1.59 |
| Item 7 | 6.21 | 1.75 | 6.72 | 1.11 |
| Item 8 | 6.58 | 1.22 | 6.58 | 1.40 |
| Item 9 | 3.67* | 2.20 | 4.17 | 1.95 |
| Item 10 | 3.63 | 2.54 | 4.19 | 2.15 |
| Item 11 | 7.00 | .00 | 6.67 | 1.39 |
| Item 12 | 6.74 | .73 | 6.58 | .91 |
| Item 13 | 1.79*** | 1.96 | 2.17 | 1.95 |
| Item 14 | 3.26* | 2.05 | 4.69 | 1.85 |
| Item 15 | 1.32 | .75 | 2.22 | 1.87 |
| Item 16 | 4.42 | 2.22 | 3.53 | 1.83 |
| Item 17 | 6.84 | .69 | 6.75 | .87 |
| Item 18 | 6.47 | 1.17 | 5.72 | 1.50 |
| Item 19 | 6.74 | .65 | 5.81 | 1.82 |
| Item 20 | 1.84 | 1.77 | 2.09 | 1.77 |
| Item 21 | 1.32 | .67 | 1.58 | 1.27 |
| Item 22 | 1.84* | 1.89 | 2.33 | 1.96 |
| Item 23 | 1.47** | .84 | 2.06 | 1.24 |
| Item 24 | 1.16* | .50 | 1.53 | .97 |
| Item 25 | 1.16* | .50 | 1.42 | 1.11 |
| Post-Intervention Survey | | | | |
| Item 1 | 1.37** | 1.16 | 1.39 | 1.13 |
| Item 2 | 5.05 | 2.15 | 5.33 | 1.88 |
| Item 3 | 1.79 | 1.87 | 1.22 | .54 |
| Item 4 | 1.89 | 1.70 | 2.06 | 1.60 |
| Item 5 | 3.74 | 2.45 | 3.39 | 2.02 |

| | | | | |
|---|---|---|---|---|
| Item 6 | 1.16* | .69 | 1.14 | .35 |
| Item 7 | 6.05 | 1.93 | 6.72 | .94 |
| Item 8 | 6.89 | .46 | 6.64 | 1.13 |
| Item 9 | 4.11* | 2.18 | 4.83 | 2.18 |
| Item 10 | 3.89 | 2.51 | 3.97 | 2.44 |
| Item 11 | 7.00 | .00 | 6.92 | .50 |
| Item 12 | 6.28 | 1.27 | 6.36 | 1.13 |
| Item 13 | 2.11*** | 2.28 | 1.17 | .56 |
| Item 14 | 4.32 | 2.31 | 4.19 | 2.04 |
| Item 15 | 1.79 | 1.23 | 2.03 | 1.36 |
| Item 16 | 4.05 | 2.17 | 3.19 | 2.03 |
| Item 17 | 6.79 | .71 | 6.81 | .71 |
| Item 18 | 6.32 | 1.11 | 5.61 | 1.74 |
| Item 19 | 6.16 | 1.77 | 6.11 | 1.45 |
| Item 20 | 1.95 | 1.65 | 1.61 | 1.25 |
| Item 21 | 1.16 | .37 | 1.42 | .77 |
| Item 22 | 1.58* | 1.07 | 1.61 | .93 |
| Item 23 | 1.79** | 1.93 | 1.44 | .77 |
| Item 24 | 1.05* | .23 | 1.17 | .45 |
| Item 25 | 1.05* | .23 | 1.11 | .32 |

***signifies a significant interaction
** signifies a marginally significant interaction
* signifies an interaction approaching significance

## Appendix F

### Fifth Grade Parental Consent Form for Intervention Group

Dear Parents or Guardians:
Your fifth grade son or daughter has an opportunity to participate in the NICoteen™ Program, developed by BTIO Educational Products, Inc. This product has been created to educate youths about the physical, emotional, financial, and social consequences of tobacco addiction. Initial field trials of the product have shown very promising results. This program has the full support of your child's principal.

With your permission, your child will participate in a survey, and the curriculum and simulation exercise that will help determine the effectiveness of this new program. This survey will ask them what they know and how they feel about smoking cigarettes. The last question asks if either parent has ever smoked cigarettes.

The NICoteen Program™ is a two-part educational tool. The first component consists of student and instructor materials. The materials are a compilation of worksheets and discussion topics that focus on various aspects of smoking education. The second component is the "NICoteen™ Pack." The Pack is a computerized smoking simulator that demonstrates to students the loss of control over their lives caused by addiction to smoking cigarettes. The Pack is designed to discourage smoking by subjecting the student to the smoking regimen that an addicted smoker must follow on a daily basis. Students with consent will use the Packs for half a day of school on a Friday and that entire weekend.

The NICoteen™ Pack may cause disruptions at functions such as church services and other places where the noise would be disrespectful. In such cases, the Pack can be left at home. Your child will be able to take two, one-hour breathers in which the pack can be paused for such instances. It will be up to your discretion; however, the NICoteen™ Pack SHOULD be taken to all social settings such as restaurants and sports events. The pack will also be inactive at night.

The NICoteen™ Pack will make 15-30 demands throughout each day, each lasting an average of three minutes. The student interacts with the pack by using an ID and voice recognition technology. Each participant has a personal ID and a NICline (smoking phrase). The ID insures that the designated student is the only one who can operate the device. The simulated smoking regimen is experienced through the student's periodic repetition of the NICline, normally an anti-smoking message, for the amount of time that it would take to smoke a cigarette. Throughout each session the student will hear various smoking related facts and thought-provoking questions. The NICoteen™ Pack records the student's interaction throughout the smoking simulation. When the student returns the pack to the instructor, the instructor hears a report of the student's simulation.

I (Beth Winge, a Master's student from the Program of Applied Psychology at the University of Wisconsin-Stout, also an employee of BTIO Educational Products, Inc.)

will be working with your student's instructor to analyze the surveys to be used for my thesis. Your child's teacher will have results of the program upon completion of the research. Please feel free to contact him/her if your have an interest. Your son's or daughter's identity will be available only to the instructor at the middle school. As the researcher, I will only have access to a number that codes information without identifying the participant. Please read and sign the attached Parent Consent Form and return it to your son's or daughter's teacher by _____.

No harm is predicted to occur to your child for participating in this study. Your child has the right to withdraw at anytime during the program. If you have questions or concerns about the study, please contact me at 1.715.233.0272 or my advisor, Dr. Helen Swanson, Department of Psychology, University of Wisconsin-Stout at 1.715.232.2784. Questions or concerns about participation in the research or subsequent complaints should be directed first to the researcher or the research advisor and second to Research Services, University of Wisconsin Stout at 1.715.232.1126. Thank you for your consideration of this project.

Best regards,

Beth Winge

PS Each of these packs is worth $150. By signing the form, you and your child are taking responsibility for caring for the pack.

Parent Consent Form

As the parent or guardian of a fifth grade student who is eligible to participate in the NICoteen™ Program and research project with the University of Wisconsin-Stout, I have read and understand the following:

- The NICoteen™ Program is a two-part educational tool. The first component consists of student and instructor materials. The second component is the NICoteen™ computerized smoking simulator. My child will be trained on how to use the simulator and will also have a set of written instructions to take home the weekend of the simulation.
- The NICoteen™ Program will require my son or daughter to participate in a smoking simulation. The pack will require interaction throughout the day. When the pack requests a cigarette, it will be the responsibility of my son or daughter to fulfill the simulator's time demand. During this time, my son or daughter will go outside and repeat an anti-smoking statement for approximately three minutes.
- Beth Winge, a student at the University of Wisconsin – Stout, will gather research information on the effectiveness of the program. My son's or daughter's identity will be available only to the instructor at the middle school. The researcher will not be able to identify my child's work.

## Please read the statements carefully and check which statement you agree with

___ Having read all of the above, I agree to allow _____ to participate in **the entire study**, including the curriculum, smoking simulation and survey.

___ Having read all of the above, I agree to allow _____ to **only** participate in the curriculum. I would not like him or her to participate in the survey or smoking simulation. He or she will be provided with alternative work as a substitution for the simulation.

___ Having read all of the above, I do **NOT** wish _____ to participate in the NICoteen™ Program and research study. I understand that if I do not allow my son or daughter to participate in this project, he or she will not receive a lower grade because of my refusal. I understand that he or she will be assigned alternative activities requiring an equal amount of work as a substitute for the completion of the smoking simulation and the curriculum. During the in-class activities, he or she will be placed in a different classroom so as not to be disturbed with the substitute work. If grades are given upon completion of this program, it will be at the discretion of the teacher. The researcher will have no access to this grade.

Signed_____Date_____

Appendix G

Fifth Grade Parental Consent Forms for Comparison Group

Dear Parents or Guardians:
Your child's fifth grade class has the opportunity to take part in a survey regarding what they know and how they feel about cigarette smoking. The last question asks if either parent has ever smoked cigarettes. This study has the full support of your child's principal. Your child's class will be given the same survey two times to measure the effectiveness of a new smoking prevention program that will run for a week in the other two fifth grade classes. For comparative purposes, the surveys of your child's class, who haven't yet gone through the program, will be measured to those who have.

The NICoteen™ Program, developed by BTIO Educational Products, Inc. has been created to educate youths about the physical, emotional, financial, and social consequences of tobacco addition. Initial field trials of the product have shown very promising results.

The NICoteen™ Program is a two-part educational tool. The first component consists of student and instructor materials. The materials are a compilation of worksheets and discussion topics that focus on various aspects of smoking education. The second component is the "NICoteen™ Pack." The pack is a computerized smoking simulator that demonstrates to students the loss of control over their lives caused by addiction to smoking cigarettes. The pack is designed to discourage smoking by subjecting the student to the smoking regimen that an addicted smoker must follow on a daily basis. Students participating in the NICoteen™ Program will use the packs for half a day of school on a Friday and that entire weekend.

The NICoteen™ Pack may cause disruptions at functions such as church services and other places where the noise would be disrespectful. In such cases, the Pack can be left at home. Your child will be able to take two, one-hour breathers in which the pack can be paused for such instances. It will be up to your discretion; however, the NICoteen™ Pack SHOULD be taken to all social settings such as restaurants and sports events. The pack will also be inactive at night.

The NICoteen™ Pack will make 15-30 demands throughout each day, each lasting an average of three minutes. The student interacts with the pack by using an ID and voice recognition technology. Each participant has a personal ID and a NICline (smoking phrase). The ID insures that the designated student is the only one who can operate the device. The simulated smoking regimen is experienced through the student's periodic repetition of the NICline, normally an anti-smoking message, for the amount of time that it would take to smoke a cigarette. Throughout each session the student will hear various smoking related facts and thought-provoking questions.

The NICoteen™ Pack records the student's interaction throughout the smoking simulation. When the student returns the pack to the instructor, the instructor hears a report of the student's simulation.

I (Beth Winge, a Master's student from the Program of Applied Psychology at the University of Wisconsin-Stout, also an employee of BTIO Educational Products, Inc.) will be working with your student's instructor to analyze the surveys for my thesis. Your child's teacher will have results of the Program upon completion of the research. Please feel free to contact him or her if you have an interest. Your son's or daughter's identity will be available only to the instructor at the middle school. As the researcher, I will only have access to a number that codes information without identifying the participant. Please read and sign the attached Parent Consent Form and return it to your son's or daughter's teacher by _____.

Your child's teacher has expressed interest in implementing the NICoteen™ Program into his classroom if the other two classrooms report benefits of the program. Therefore, your child may have the opportunity to participate in the NICoteen™ Program upon completion of this study. **If you would like your child to participate in the entire Program, please indicate that by checking to allow your student to participate in the curriculum, smoking simulation and survey on the attached Parent Consent Form.**

No harm is predicted to occur to your child for participating in this study. Your child has the right to withdraw at any time during the survey or Program. If you have questions or concerns about the study, please contact me at 1.715.233.0272 or my advisor, Dr. Helen Swanson, Department of Psychology, University of Wisconsin-Stout at 1.715.232.2784. Questions or concerns about participation in the research or subsequent complaints should be directed first to the researcher or the research advisor and second to Research Services, University of Wisconsin Stout at 1.715.232.1126. Thank you for your consideration of this project.

Best regards,

Beth Winge

PS Each of these packs is worth $150. By signing the form, you and your child are taking responsibility for caring for the pack.

Parent Consent Form

As the parent or guardian of a fifth grade student who is eligible to participate in the NICoteen™ Program™ and research project with the University of Wisconsin-Stout, I have read and understand the following:

- My child's class will be given a survey used to measure the effectiveness of the NICoteen™ Program implemented into the other two fifth grade classes. If the Program proves to be beneficial, my child may have the opportunity to later go through the Program.
- The NICoteen™ Program is a two-part educational tool. The first component consists of student and instructor materials. The second component is the NICoteen™ computerized smoking simulator. My child will be trained on how to use the simulator and will also have a set of written instructions to take home the weekend of the simulation if he or she participates in the Program.
- The NICoteen™ Program will require my son or daughter to participate in a smoking simulation. The pack will require interaction throughout the day. When the pack requests a cigarette, it will be the responsibility of my son or daughter to fulfill the simulator's time demand. During this time, my son or daughter will go outside and repeat an anti-smoking statement for approximately three minutes.
- Beth Winge, a student at the University of Wisconsin – Stout, will gather research information on the effectiveness of the program. My son's or daughter's identity will be available only to my child's teacher. The researcher will not be able to identify my child's work.

## Please read the statements carefully and check which statement you agree with

___ Having read all of the above, I agree to allow _____ to participate in the **curriculum, smoking simulation and survey**.

___ Having read all of the above, I agree to allow _____ to **only** participate in the survey. I would not like him or her to participate in the curriculum or smoking simulation at a later date.

___ Having read all of the above, I do **NOT** wish _____ to participate in any part of the NICoteen™ Program and research study. I understand that if I do not allow my son or daughter to participate in this project, he or she will not receive a lower grade because of my refusal. I understand that he or she will be assigned alternative activities requiring an equal amount of work as a substitute for the completion of the smoking simulation and the curriculum. During the in-class activities, he or she will be placed in a different classroom so as not to be disturbed with the substitute work. If grades are given upon completion of this program, it will be at the discretion of the teacher. The researcher will have no access to this grade.

Signed _____ Date_____

Appendix H

Pre- and Post-Intervention Survey

# Smoking Survey

I am (Check one):
__ Male
__ Female

I am (Fill in the Blank):
__ years and __ months old

1. If an older kid offers me a cigarette within the next year I will say no.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| strongly agree | | | | | | strongly disagree |

2. I might try smoking sometime in my lifetime.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| strongly agree | | | | | | strongly disagree |

3. People who smoke endanger their health.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| strongly agree | | | | | | strongly disagree |

4. If I start smoking now, I will get sick when I am older.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| strongly agree | | | | | | strongly disagree |

5. If I start smoking now, I will start having health problems right away.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| strongly agree | | | | | | strongly disagree |

6. Being healthy is important to me.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| strongly agree | | | | | | strongly disagree |

7. Smoking would make me look more grownup.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| strongly agree | | | | | | strongly disagree |

8. Smoking would make me look cool.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| strongly agree | | | | | | strongly disagree |

9. It would be nice to look more mature.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| strongly agree | | | | | | strongly disagree |

10. It would be nice to have people think I am cool.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| strongly agree | | | | | | strongly disagree |

11. My parents would like it if I smoked cigarettes.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| strongly agree | | | | | | strongly disagree |

12. My friends would like it if I smoked cigarettes.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| strongly agree | | | | | | strongly disagree |

13. Cigarette companies would like it if I smoked cigarettes.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| strongly agree | | | | | | strongly disagree |

14. The older, cool kids would like it if I smoked cigarettes.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| strongly agree | | | | | | strongly disagree |

15. I want to do what my parents think I should do.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| strongly agree | | | | | | strongly disagree |

16. I want to do what my friends think I should do.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| strongly agree | | | | | | strongly disagree |

17. I want to do what the cigarette companies think I should do.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| strongly agree | | | | | | strongly disagree |

18. I want to do what the older, cool kids think I should do.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| strongly agree | | | | | | strongly disagree |

19. I think it would be pretty easy to quit if I ever started smoking.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| strongly agree | | | | | | strongly disagree |

20. If I started smoking, I would have to give up buying other things to buy cigarettes.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| strongly agree | | | | | | strongly disagree |

21. If I started smoking, it would be harder to do some of the activities I do now (like playing sports).

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| strongly agree | | | | | | strongly disagree |

22. If I started smoking, it would control my life.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| strongly agree | | | | | | strongly disagree |

23. It is important to me to be able to buy things I like.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| strongly agree | | | | | | strongly disagree |

24. It is important to me to be able to play the activities I like to play.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| strongly agree | | | | | | strongly disagree |

25. It is important for me to be in control of my life.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| strongly agree | | | | | | strongly disagree |

26. Check all that apply (go back only until the time you were born).

__ my mom smokes cigarettes
__ my mom quit smoking cigarettes
__ my mom has never smoked cigarettes
__ my dad smokes cigarettes
__ my dad quit smoking cigarettes
__ my dad has never smoked cigarettes