The influence of a school-based substance abuse prevention program in reducing smoking among sixth grade African American students in Louisiana

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THE INFLUENCE OF A SCHOOL-BASED SUBSTANCE ABUSE
PREVENTION PROGRAM IN REDUCING SMOKING
AMONG SIXTH GRADE AFRICAN AMERICAN STUDENTS IN LOUISIANA

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
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requirements for the degree of
Doctor of Philosophy

in

The School of Social Work

by

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ABSTRACT

Youth tobacco smoking is one of the major public health problems of this society. Although, by some reports, adult cigarette smoking has been declining, teen smoking rates continue to remain unacceptably high. Current data indicates that smoking rates among minority youth which had declined in the past few years are beginning to rise again. The current increase in teen smoking and subsequent health dangers associated with smoking demonstrates a need for more effective, empirically based youth smoking prevention strategies. The purpose of this study was to examine the influence of a substance abuse prevention program in reducing smoking among sixth grade African American students in Louisiana. The literature identifies several demographic and psychological variables that can influence smoking rates. These variables include anti-smoking attitudes, normative beliefs about smoking, decision-making ability, smoking refusal ability, general assertiveness ability, and selected demographic characteristics. This study also examined these variables to determine their significance in preventing smoking among African American youth. The study utilized a quasi-experimental non-equivalent control group design. Data was collected from 68 sixth grade African American students enrolled in one middle school located in South Central Louisiana. Results of the study indicate that sixth grade African American students: (a) report “low intentions” to smoke cigarettes; (b) exhibit lower levels of smoking behavior if they live in two-parent homes; and (c) have misconceptions about smoking in which they tend to overestimate the smoking rates of their peers and adults. The findings also indicate that sixth grade African American students who have higher academic performance are less likely to smoke cigarettes. Finally, the study found that sixth grade African American
students who have higher levels of decision-making ability, smoking refusal ability, and anti-smoking attitudes have lower extent of smoking behavior and lower intentions to smoke cigarettes.
CHAPTER 1
INTRODUCTION

Rationale

Impact of Smoking

Health Issues in the United States

Tobacco use is one of the nation's most critical public health problems. Cigarette smoking is considered the leading cause of preventable death and disease in the United States (Centers for Disease and Prevention Control (CDC, 2001)). Smoking cigarettes contributes to illnesses such as cancers, emphysema, premature and low infant birth rates, and sudden infant death syndrome. Eighty-seven percent of lung cancers are related to smoking (CDC, 1998). In addition, cigarette smoking contributes to chronic cardiovascular and respiratory illness that compromises the quality of life and results in lost productivity.

Each year in the United States approximately 430,000 people die as a result of tobacco use (CDC, 2001). Every day, 6,000 children in the United States begin smoking and 1,000 of these children will die prematurely from their addiction (CDC, 1998).

African Americans suffer disproportionately from preventable smoking related diseases (CDC, 1996). Smoking related deaths are the number one cause of death among African Americans and approximately 45,000 African Americans die from smoking related diseases every year (CDC, 1998). In 1997, an estimated 1.6 million African Americans under the age of 18 became regular smokers and 500,000 of these smokers will die prematurely from a smoking related illness (CDC, 1998). Compared to Caucasian men, African American men are 50% more likely to develop lung cancer
Two factors that seem to explain why African Americans have extremely high morbidity and mortality rates due to smoking are genetics and smoking habits. It has been reported that African Americans absorb nicotine at a higher rate (than Caucasians) and metabolize nicotine more slowly (Perez-Stable, Herrera, Jacob, & Benowitz, 1998); also, African Americans smoke menthol cigarettes more often (75% of African Americans prefer menthol cigarettes compared to 25% of Caucasians) than other ethnic groups, and smoking menthol cigarettes has been identified as a possible contributor to the cause of lung cancer (CDC, 1998). Smoking menthol cigarettes may lead to higher rates of lung cancer because menthol is thought to facilitate the absorption of nicotine and cancer-causing chemicals (CDC, 1998), and menthol’s cooling and analgesic properties might allow a person to take larger puffs, permit deeper inhalations, and hold smoke in the lungs longer, which would result in greater exposure to carcinogens in tobacco smoke (Ahijevich & Parsley, 1999; Eccles, 1994).

Health Issues in Louisiana

In Louisiana, tobacco use causes more deaths than AIDS, alcohol, car accidents, murders, suicides and illegal drug use combined (Louisiana Department of Health and Hospitals (LADHH), 1999). According to the Louisiana Office of Public Health, cigarette smoking accounted for 6,427 deaths and 96,085 years of potential years of life lost in Louisiana in 1999 (LADHH, 1999). Cigarette smoking was responsible for 25% of deaths from cardiovascular disease, almost half (47.3%) of deaths due to cancer, and 60% of deaths due to respiratory disease (LADHH, 1999).

A report conducted by the Louisiana Office of Public Health (LOPH) (2002) indicated that in the year 2000 more than 750,000 adults, 79,000 high school students,
and 28,000 middle school students in Louisiana smoked cigarettes. Approximately 100,000 Louisiana youth who were smoking in 2000 will prematurely die from cigarette smoking (LOPH, 2002).

Cigarette smokers not only endanger their own lives, but also their smoking habit affects family and friends. Research has shown that the exposure to secondhand smoke increases the risk of sudden infant death syndrome, lower respiratory tract infections, and asthma among children (Cook & Strachan, 1999). According to results from the 2000 Louisiana Behavioral Risk Factor Surveillance System, over 350,000 children in Louisiana were exposed to secondhand smoke in their homes and an estimated 91,000 of these children were under five years of age (LADHH, 1999). These statistics demonstrate that thousands of children in Louisiana are at great risk for the health consequences associated with secondhand smoke. In addition to the enormous impact tobacco use has on mortality and illness, there are also substantial economic costs associated with smoking.

**Economic Costs**

The economic costs associated with tobacco use are enormous. In the United States it is estimated that tobacco use results in between $53 billion and $73 billion in medical expenses, and nearly $50 billion in lost productivity annually (CDC, 2001).

Total costs in Louisiana attributed to tobacco use were almost 3 billion dollars or $645 per capita annually (LADHH, 1999). This figure includes direct medical costs totaling $1.15 billion, in addition to, $1.66 billion of indirect costs associated with lost productivity due to premature death (LADHH, 1999).
Gateway Drug

Tobacco is considered a “gateway” drug that increases the odds that individuals will eventually progress to drug addiction. Adolescence is a time of cognitive and physical change, individuation, and experimentation. During this developmental stage, teenagers tend to experiment with different behaviors and lifestyle choices in which they struggle to find their independence and sense of self. As part of this process of separation and new found autonomy, some teenagers will experiment with psychoactive substances. Research has shown a predictable pattern of initiation of substance use. Smoking appears to be associated with future alcohol and drug abuse (NIDA, 1991; USDHHS, 1994). Typically, teenagers begin experimenting with tobacco and alcohol; move on to marijuana, and for some, eventually to other illicit and dangerous drugs (Hamburg, Kraemer, & Jahnke, 1975; Kandel, 1978). According to the National Institute on Drug Abuse (NIDA) (1991), teenagers who smoke cigarettes are 14 times more likely to abuse alcohol, 100 times more likely to smoke marijuana, and 32 times more likely to use cocaine than non-smokers.

Extent of Smoking among Youth

Cigarette Use Begins in Youth

Almost all adult smokers start smoking in their youth. Approximately 90% of smokers began smoking as teenagers and the average teen smoker starts smoking at age 12.5 and becomes a daily smoker by age 14 (CDC, 1999). Most youths underestimate the addictive power of nicotine. Seventy-five percent of the teenagers who are smoking cigarettes today will still be smoking in five years (CDC, 1999).
Cigarette Use Is High among Youth

The 2002 National Youth Tobacco Survey (NYTS) indicated that adolescent smoking rates remain unacceptably high. It is estimated in the United States there are over five million adolescents that smoke cigarettes (CDC, 2003). The survey reported almost a quarter (22.9%) of high school students and over 13% (13.3%) of middle school students indicated they smoked cigarettes on a regular basis (CDC, 2003).

In the 1990’s adolescent smoking rates increased dramatically, especially among minority groups. The 1998 Surgeon General Report concluded that tobacco use among African American youth increased in the 1990’s (USDHHS, 1998). "This increase is particularly striking among African American youths, who had the greatest decline (in tobacco use) of all racial/ethnic minority groups during the 1970s and 1980s" (USDHHS, 1998, p. 6).

A 1998 CDC youth survey indicated that African American youth smoking rates increased 80% from 1991 to 1997. The smoking rates jumped from 12.6 percent to 22.7 percent in six years (CDC, 1998). The increase in smoking rates for African American adolescent males were even more dramatic, increasing twice as much from a low of 14.1 percent in 1991 to 28.2% in 1998 (CDC, 1998).

Programs to Stop and Prevent Smoking

The dangers of smoking cigarettes have motivated millions of people to try to stop smoking. However, individual attempts to stop smoking have been short-lived and largely unsuccessful. For many years, researchers have attempted to find a cost-effective, long-term solution to help people stop smoking. As more smokers became aware of the dangers of smoking, smoking cessation programs were created and marketed to fill this
need. Although these smoking cessation programs produced short-term behavioral changes, they failed to generate any long-term benefits (Botvin, Eng, & Williams, 1980). Ultimately, cessation programs have proven to have high rates of recidivism and low success rates (Botvin et al., 1980). For the majority of regular smokers quitting smoking permanently has been difficult and mostly unsuccessful.

For the most part, smoking begins in adolescence. Studies have shown that if a teenager does not begin smoking before 20 years old, generally they will remain a non-smoker. As noted earlier, once someone is addicted to cigarettes it is very difficult to quit. The most logical strategy for decreasing smoking rates would be preventing teenagers from starting smoking in the first place.

**Early Smoking Prevention Programs**

Early smoking prevention programs initial approach was to provide factual information on the harmful effects of smoking. The assumption was that if adequate information was presented on the dangers of smoking adolescents would refrain from smoking cigarettes. However, most recent research studies have reported that programs that only disseminate information have some success in changing the knowledge and attitudes of teenagers, but fail to affect smoking behavior. (Lynam, Milich, Zimmerman, Novak, Logan & Martin, 1989). Researchers discovered that knowledge about the consequences of smoking in itself is not a significant deterrent to prevent teenagers from smoking cigarettes (Lynam et al., 1989). Through years of research, studies have demonstrated that the traditional fear-based and information dissemination approaches to smoking prevention were minimally effective and researchers began to develop programs that focused on psychosocial factors, including peer and media influences, which

Researchers originally focused on how social influences pressure youth to smoke (Evans, Rozelle, Maxwell, Raines, Dill, Guthrie, Henderson, & Hill, 1978; Flay, Ryan, Best, Brown, Kersell, d’Avernas, & Zanna., 1989). These studies found that along with presenting information on the dangers of cigarettes smoking, program effectiveness improved when information about social pressures, and strategies on how to cope with peer pressure, media influences, and parent modeling is provided.

The most recent research has focused on both psychological and social influences. Researchers discovered that psychological factors also play an important role in smoking behavior. These psychological factors that influence teenager smoking behavior include self-esteem, communication skills, decision-making skills, assertiveness, and self-confidence (Botvin, Griffin, Diaz, Miller, & Ifill-Williams, 1999; Sussman, Dent, Stacy, Sun, Craig, Simon, Burton, & Flay, 1993).

In conjunction with these new developments in smoking prevention, researchers realized early on that prevention programs were best suited for the school environment since adolescents spend a significant portion of their day in school. Researchers also realized that schools provide a captive audience to conduct studies, carry out interventions, and perform effective evaluations.

Currently, most researchers agree that school-based prevention programs are essential in order to prevent and reduce adolescent smoking; however, smoking prevention approaches also need to be multifaceted and multidimensional.
Prevention Programs Need to be Multifaceted

Steven A. Schroeder, M.D., president of the Robert Wood Johnson Foundation, the nation's largest philanthropy devoted exclusively to health and health care, said, "No single factor is responsible for the increase (in youth smoking), and no single intervention will halt or reverse the trend. A sustained, comprehensive approach is necessary to address this problem" (Hollendonner & Searight, 1997, p. 1).

Most successful youth anti-smoking campaigns include community involvement (Dusenbury, 1994; Pentz, Dwyer, MacKinnon, Flay, Hansen, Wang, & Johnson, 1989). These community efforts include tobacco tax increases, restriction of youth access to cigarettes, and youth-oriented mass media campaigns (CDC, 1999).

Nonetheless, the central part of any effective prevention system should include a school-based tobacco use prevention program that emphasizes early prevention that continues through high school, parent training, and intense interventions with high-risk children (Kumpfer, Olds, Alexander, Zucker, & Gary, 1998). Finally, studies have consistently demonstrated that the most successful school-based programs are scientifically based and stress the importance of interactive teaching techniques, normative education, resistance skills, and social skills training (Botvin, G., Dusenbury, Baker, James-Ortiz, Botvin, E., & Kenner, 1992; Sussman et al., 1993).

Prevention Should Start Early

Many researchers agree that prevention should start early in a child's education and continue through high school (Botvin, Griffin, Diaz, Scheier, Williams, & Epstein, 2000; Dusenbury, 1994; Elickson, Bell, McGuigan, & Diaz, 1993). The National Cancer Institute (NCI) and the Center for Disease Control (CDC) agree that prevention should
focus on the middle school years when kids begin to experiment with tobacco, drugs and alcohol. The NCI "recommends a minimum of two, five session blocks be taught in the middle school years (between sixth and ninth grade)" (Western Region for Drug-Free Schools and Communities, 1994, p. 22). Moreover, Dr. Roger Weissberg, a professor at the University of Illinois believes that "researchers who focus on the junior high school years need quick results, but the battle will not be won that way. We need to focus on younger kids and give them hope" (Dusenbury, 1994, p. 6). The research indicates that the sixth and seventh grades (between the ages of 12 and 13) are the peak years when children try their first cigarette (DiFranza, J.R. et al.; Johnston, L.D. et al.).

A 1992 survey conducted in Massachusetts found that twelve was the average age when teenage smokers reported smoking their first cigarette (DiFranza, J.R. et al). The CDC (2000) reported that approximately 25% of high school students indicated they had smoked at least one cigarette by age thirteen. The current data shows that the age when children begin to smoke continues to drop. In 1991, Washington State conducted a survey in which 30% of 10 and 11 year olds reported they had already experimented with smoking. The 2003 ‘Monitoring the Future’ nationwide survey found that 13% of eighth grade students started smoking in fifth grade (ages 10 and 11).

Research has also shown that the earlier children begin to smoke, the more likely they will become regular smokers and, therefore, have a higher risk of developing lung cancer, respiratory illness, and other medical problems as adults (Hegmann, Fraser, Keaney, Moser, Nilasena, Sedlars, Higham-Gren & Lyon, 1993). Consequently, most school-based smoking prevention programs are designed to begin in the first year of middle school (sixth grade) in attempt to prevent the initiation of smoking and reduce the
number of experimental smokers becoming regular smokers. Researchers believe that focusing on smoking prevention beginning in early adolescence will have the greatest impact and ultimately lead to reductions in tobacco-related illnesses and morbidity (Botvin et al., 2000; Dusenbury, 1994; Elickson et al., 1993).

Although during the past 20 years considerable strides have been made in developing school-based prevention programs based on past research studies (Botvin et al., 1980; Flay et al., 1985), there is a substantial gap in the prevention literature. Not until the past decade have researchers begun to study the effectiveness of school-based prevention programs among the minority population, in general, and principally, African American youth (Botvin, Batson, Witts-Vitale, Bess, Baker & Dusenbury, 1989; Botvin, Dusenbury, Baker, James-Ortiz & Kenner, 1989; Botvin et al., 1992, 2000). The majority of research on smoking prevention has been traditionally conducted with predominately white, middle class populations and the few “minority population” studies that have been completed were entirely conducted on urban and inner-city minority youth (Botvin et al., 1989, 1992, 2000). There does not appear to be any studies completed in predominately African American rural communities. Because of the lack of research with African American youth in rural communities, it is not known whether prevention strategies that are effective with African American urban youth will be effective with African American rural youth. Research that focuses on the etiology of cigarette smoking among rural African American youth is considered necessary to provide empirical findings that will establish the effectiveness of school-based prevention strategies with African American youth in rural communities. New research on predominately African American youth concerning the effectiveness of promising
psychosocial approaches to smoking prevention is vitally important since all available data indicates that African Americans are at a high risk for cancer and other tobacco-related illnesses.

**Significance of the Study**

In the past three decades there has been tremendous progress in understanding the etiology of youth tobacco use and how to deter adolescent cigarette smoking. The most promising smoking prevention approaches have been school-based intervention programs that focus on the psychosocial factors associated with smoking initiation. Several of these factors seem to play primary roles in the development of a smoking habit. These factors seem to interact in complex and unexplained ways to influence the initiation and escalation of cigarette smoking. How they exactly interact has yet to be established, however, researchers have recognized the importance of these factors in smoking prevention (Botvin et al., 1980, 1983, 1999, 1999, 2001; Sussman et al., 1993; Trudeau, Lillehoj, Spoth, & Redmond, 2003).

The majority of smoking prevention programs has been designed to teach middle school students how to resist pressure from the media and their peers to begin smoking. These prevention programs attempt to teach a broad array of social and personal skills (protective factors) including disseminating general information on tobacco use, the physiological effects of tobacco use, decision-making, resistance skills training, and social skills training.

Currently, research studies on youth smoking prevention are progressing in two different pathways. First, researchers have begun to examine the effectiveness of youth
smoking prevention programs on minority youth. Secondly, they are attempting to identify the mediating variables of effective youth smoking prevention programs. In addition, researchers are trying to isolate these variables to determine specifically which ones have the greatest impact on reducing underage smoking rates. Several research studies have examined and have identified selected variables as important mediators in preventing tobacco use. Some of these potentially important mediating variables include: (1) anti-smoking attitudes (Botvin et al., 1983, 1998, 2001); (2) decision making ability (Trudeau et al., 2003; Wills, 1986); and (3) assertiveness (Pentz et al., 1989; Trudeau et al., 2003).

Despite the recent progress made in increasing the knowledge base in the area of youth smoking prevention, there is still a significant gap in prevention research literature. The majority of existing prevention research studies in the past 25 years has been conducted with white middle class adolescents (Botvin et al., 1980, 1983, 1998; Pentz et al., 1989; Sussman et al, 1993) and the few studies that have been conducted on minority youth have focused on inner-city youth (Botvin et al, 1992, 1999; Trudeau et al., 2003).

Finally, 90% of smokers begin smoking during their teenage years, and smoking rates among African American youth increased dramatically in the 1990’s. Moreover, African American teenagers have a higher risk of developing long term health problems than other ethnic groups. Nevertheless, the rural African American youth population continues to be understudied with regard to smoking prevention, even though smoking rates among African American youth remain unacceptably high and smoke-related health problems are inevitable.
Therefore, it is crucial that effective youth substance abuse prevention programs are identified which can reduce the onset of smoking and decrease smoking rates among African American youth in Louisiana and elsewhere that will ultimately lead to the reduction of long term public health issues and medical costs associated with the harmful effects of tobacco use.

**Objectives**

The primary purpose of this study was to examine the influence of a school-based substance abuse prevention program in reducing smoking among sixth grade African American students in Louisiana. The objectives are as follows:

1. Describe sixth grade African American students in Louisiana on the following selected demographic characteristics:
   a. Age
   b. Gender
   c. Living arrangements (as measured by who the respondent lives with most of the time).
   d. Academic performance (as measured by self-reported grades in school).
   e. Socio-economic status (as measured by whether or not students received free or reduced lunch in school).

2. Describe sixth grade African American students in Louisiana on the following selected psychological characteristics:
   a. Decision-making ability (as measured by Botvin’s six item modified version (Botvin et al., 2001) of the Bugen and Hawkin’s Coping Assessment Battery (1981)).
b. General assertiveness ability (as measured by Botvin’s 10-item modified version (Botvin et al. (2001) of the Gambrill and Richey Assertion Inventory (1975)).

c. Smoking refusal ability (as measured by Botvin’s five item modified version (Botvin et al. (2001) of the Gambrill and Richey Assertion Inventory (1975)).

d. Anti-smoking attitudes (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Teenager’s Self-Test: Cigarette Smoking Scale (U.S. Public Health Service, 1974)).

e. Normative beliefs about peer smoking (as measured by subjects’ beliefs about the prevalence of smoking use among peers) (Botvin et al., 2001).

f. Normative beliefs about adult smoking (as measured by subjects’ beliefs about the prevalence of smoking use among adults) (Botvin et al., 2001).

3. Describe sixth grade African American students in Louisiana on their self-reported extent of smoking behavior. This variable was measured as the frequency of smoking behavior reported by subjects in the study on a nine-point scale designed to represent this construct. The scale included the following descriptors 1 = “Never,” 2 = “A few times but not in the past year,” 3 = “A few times a year,” 4 = “Once a month,” 5 = “A few times a month,” 6 = “Once a week,” 7 = “A few times a week,” 8 = “Once a day,” and 9 = “More than once a day.”

4. Describe sixth grade African American students in Louisiana on their self-reported intention to smoke cigarettes. This variable was measured as the intention of
smoking cigarettes in the next two years reported by subjects in the study on a five point Likert-type scale ranging from 1 (definitely not) and 5 (definitely will).

5. To determine if a model exists explaining a significant portion of the variance in self-reported extent of smoking behavior among sixth grade African American students in Louisiana from the following treatment, psychological, and demographic characteristics:

   a. Whether or not the student participated in the school-based substance abuse prevention program;

   b. Decision-making ability (as measured by Botvin’s six item modified version (Botvin et al., 2001) of the Bugen and Hawkin’s Coping Assessment Battery (1981));

   c. General assertiveness ability (as measured by Botvin’s 10-item modified version (Botvin, et al., 2001) of the Gambrill and Richey Assertion Inventory (1975));

   d. Smoking refusal ability (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975));

   e. Anti-smoking attitudes (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Teenager’s Self-Test: Cigarette Smoking Scale (U.S. Public Health Service, 1974));

   f. Normative beliefs about peer smoking (as measured by subjects’ beliefs about the prevalence of smoking use among peers) (Botvin et al., 2001);
g. Normative beliefs about adult smoking (as measured by subjects’ beliefs about the prevalence of smoking use among adults) (Botvin et al., 2001);

h. Age;

i. Gender;

j. Living arrangements (as measured by who the respondent lives with most of the time);

k. Academic performance (as measured by self-reported grades in school);

l. Socio-economic status (as measured by whether or not students received free or reduced lunch in school).

6. To determine if a model exists explaining a significant portion of the variance in self-reported intention to smoke cigarettes among sixth grade African American students in Louisiana from the following treatment, psychological, and demographic characteristics:

a. Whether or not the student participated in the school-based substance abuse prevention program;

b. Decision-making ability (as measured by Botvin’s six item modified version (Botvin et al., 2001) of the Bugen and Hawkin’s Coping Assessment Battery (1981));

c. General assertiveness ability (as measured by Botvin’s 10-item modified version (Botvin, et al., 2001) of the Gambrill and Richey Assertion Inventory (1975));
d. Smoking refusal ability (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975));

e. Anti-smoking attitudes (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Teenager’s Self-Test: Cigarette Smoking Scale (U.S. Public Health Service, 1974));

f. Normative beliefs about peer smoking (as measured by subjects’ beliefs about the prevalence of smoking use among peers) (Botvin et al., 2001);

g. Normative beliefs about adult smoking (as measured by subjects’ beliefs about the prevalence of smoking use among adults) (Botvin et al., 2001);

h. Age;

i. Gender;

j. Living arrangements (as measured by who the respondent lives with most of the time);

k. Academic performance (as measured by self-reported grades in school);

l. Socio-economic status (as measured by whether or not students received free or reduced lunch in school).

Based on the review of literature, the following hypotheses were established by the researcher.

1. Sixth grade African American students in Louisiana who have participated in the school-based substance abuse prevention program will report a lower extent of self-reported smoking behavior than sixth grade African American students who have not participated in the school-based substance abuse prevention program.
2. Sixth grade African American students in Louisiana who have participated in the school-based substance abuse prevention program will report lower intentions to smoke cigarettes than sixth grade African American students who have not participated in the school-based substance abuse prevention program.

3. Among sixth grade African American students, there will be a negative relationship between self-reported smoking behavior and each of the following psychological characteristics (such that lower levels of self-reported smoking behavior will be associated with higher measurements on each of the specified psychological characteristics):

   a. Decision-making ability (as measured by Botvin’s six item modified version (Botvin et al., 2001) of the Bugen and Hawkin’s Coping Assessment Battery (1981)).

   b. General assertiveness ability (as measured by Botvin’s 10-item modified version (Botvin et al. (2001) of the Gambrill and Richey Assertion Inventory (1975)).

   c. Smoking refusal ability (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975)).

   d. Anti-smoking attitudes (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Teenager’s Self-Test: Cigarette Smoking Scale (U.S. Public Health Service, 1974)).

   e. Normative beliefs about smoking (as measured by the subjects’ beliefs about the prevalence of smoking use among peers) (Botvin et al., 2001);
f. Normative beliefs about smoking (as measured by the subjects’ beliefs about the prevalence of smoking use among adults) (Botvin et al., 2001).

4. Among sixth grade African American students, there will be a negative relationship between self-reported intention to smoke cigarettes and each of the following psychological characteristics (such that lower levels of self-reported intentions to smoke cigarettes will be associated with higher measurements on each of the specified psychological characteristics):

   a. Decision-making ability (as measured by Botvin’s six item modified version (Botvin et al., 2001) of the Bugen and Hawkin’s Coping Assessment Battery (1981)).

   b. General assertiveness ability (as measured by Botvin’s 10-item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975)).

   c. Smoking refusal ability (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975)).

   d. Anti-smoking attitudes (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Teenager’s Self-Test: Cigarette Smoking Scale (U.S. Public Health Service, 1974)).

   e. Normative beliefs about peer smoking (as measured by the subjects’ beliefs about the prevalence of smoking use among peers) (Botvin et al., 2001);
f. Normative beliefs about adult smoking (as measured by the subjects’ beliefs about the prevalence of smoking use among adults) (Botvin et al., 2001).

5. Sixth grade African American students in Louisiana who have participated in the school-based substance abuse prevention program will exhibit higher levels of each of the following psychological characteristics than sixth grade African American students who have not participated in the school-based substance abuse prevention program:
   a. Decision-making ability (as measured by Botvin’s six item modified version (Botvin et al., 2001) of the Bugen and Hawkin’s Coping Assessment Battery (1981)).
   b. General assertiveness ability (as measured by Botvin’s 10-item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975)).
   c. Smoking refusal ability (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975)).
   d. Anti-smoking attitudes (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Teenager’s Self-Test: Cigarette Smoking Scale (U.S. Public Health Service, 1974)).
   e. Normative beliefs about peer smoking (as measured by the subjects’ beliefs about the prevalence of smoking use among peers) (Botvin et al., 2001);
f. Normative beliefs about adult smoking (as measured by the subjects’ beliefs about the prevalence of smoking use among adults) (Botvin et al., 2001)
CHAPTER 2

REVIEW OF LITERATURE

The purpose of this review is to systematically examine the critical social problem of underage smoking especially among African American youth. The review begins with an examination of the overall health and economic impact of smoking on the individual and on society as a whole, followed by information on the prevalence of smoking, and concluding with a discussion of the risk and protective factors associated with youth smoking. Smoking cessation programs and various school-based substance abuse prevention programs are reviewed, including a detailed description of the Life Skills Training (LST) Program (a nationally recognized, evidence-based program). Finally, a presentation of the underlying theoretical framework of effective substance abuse prevention programs completes this review.

Overall Health Issues

Smoking-Related Deaths

The World

Smoking is the single most preventable cause of death and disability in the world (CDC, 2001). The World Health Organization (WHO) estimated that approximately five million people worldwide will die this year from tobacco use (WHO, 2004). A report commissioned by the World Bank found that currently one in 10 adult deaths in the world are caused by tobacco use, and by the year 2030 that figure will climb to one in six or 10 million deaths each year (WHO, 2004). If this trend continues, 500 million people alive
today will die from tobacco use and over half of them will die in middle age, thus losing 20-25 years of life (WHO, 2004).

The United States

Every year in the United States smoking kills more people than AIDS, alcohol, auto accidents, murders, suicides, and fires combined; in fact, premature deaths from smoking have been attributed to three major causes: lung cancer, heart disease, and emphysema (CDC, 2002). Over 400,000 people die from smoking in the United States each year (CDC, 2002) and approximately 38,000 people die from secondhand smoke and pregnancy smoking (CDC, 2002). Also, smoking during pregnancy causes the death of almost 1,000 infants annually (CDC, 2002). In 1982, the Surgeon General published a report which stated, “Cigarette smoking is the single major cause of cancer mortality in the United States” (USDHHS, 1982, p. v.). Nevertheless, in 2003, more than one third of all the cancer deaths in the United States are attributed to smoking (USDHHS, 2004).

Moreover, there are over 750,000 children who become daily smokers every year in the United States and almost one third of these children will die prematurely from smoking (CDC, 2004). Unless smoking rates substantially decline, over six million children under the age of 18 in the United States who are alive today will die prematurely from smoking (CDC, 2004).

Louisiana

In 1999, an estimated 6,500 deaths in the state of Louisiana were attributed to cigarette smoking, which accounted for 16.0% of all deaths in that state (LADHH, 1999). An estimated 96,000 Years of Potential Life Lost (YPLL) in Louisiana in 1999 was due to premature death caused by cigarette smoking (DHH, 1999). In Louisiana alone, cancer
due to smoking accounted for over 41,000 YPLL, 38,000 YPLL was attributed to cardiovascular disease, and almost 16,000 YPLL was due to respiratory disease (DHH, 1999).

**African Americans**

It is estimated that 45,000 African Americans die from a smoking-related illness every year (CDC, 1995). African Americans suffer disproportionately (compared to other ethnic groups) from smoking related diseases such as heart disease, cancer, and stroke, despite having lower smoking rates (20%) than Native Americans (34%) and Caucasians (22%) (CDC, 2005). Also, African American men die from lung cancer at a higher rate (100.8 per 100,000) than do Caucasian men (70.1 per 100,000) (American Cancer Society, 2000). A recently published study (Leistikow & Tsodikov, 2005) found that cancer deaths in the United States attributed to smoking are extremely high among African American men (63%) with the highest percentage of smoking-related deaths occurring among African American men who live in the South (67%).

**Smoking-Related Health Problems**

Not only does smoking result in premature death, but also the impact of smoking on one’s overall health is substantial. The harmful effects of smoking can damage almost every organ of the body. Over 8.6 million people in the U.S. currently have a smoke-related illness and smoking is associated with cancer of the esophagus, larynx, pancreas, kidney, and cervix (CDC, 2005). The long term consequences of smoking can lead to asthma, lung cancer, emphysema, heart disease, and organ damage. These health problems are not surprising since smoke from cigarettes contains more than 4,000
chemicals and 69 known carcinogens including formaldehyde, lead, arsenic, benzene and radioactive polonium 210 (NCI, 2001).

Smoking related health problems cause smokers to experience a less active lifestyle, which can lead to other health problems. Lung cancer, causing more deaths in both men and women than any other cancer, produces very few warning signs, spreads quickly, and is usually diagnosed in the advanced stage. It is estimated that eighty percent of lung cancer is caused by cigarette smoking (USDHHS, 2004).

For many teenagers the long term effects of smoking are perceived to be insignificant because they are mostly focused on their present. However, long term health problems are not the only consequences of smoking. Well-known short term effects that include coughing, shortness of breath, and premature aging are much more noticeable (USDHHS, 2004). Additionally, athletic performance among youth is often impaired because smoking produces physical effects such as shortness of breath, rapid heart rate, and decreased circulation (CDC, 2005). Smokers are unable to perform at their maximum physical level and are usually unable to compete successfully in athletics with non-smokers.

Studies have shown there is an increased risk of illness due to smoking. Smokers are more likely to catch colds, flu, bronchitis, and pneumonia than non-smokers, as smoking tends to compromise the immune system, which often causes these illnesses to worsen (CDC, 2005).

Another risk of smoking is osteoporosis, which leads to loss of bone density eventually causing bones to break more easily. Smoking affects the body’s ability to
produce collagen as well, and collagen is the major component of ligaments and tendons (CDC, 2005). Without collagen there is a greater risk of injury and a subsequent increase in healing time.

Smokers lose their teeth at a higher rate than non-smokers because smoking cigarettes damages the teeth and destroys gum tissue (CDC, 2005). In addition, smoking causes persistent bad breath and discoloration of the teeth and fingernails (CDC, 2005).

Additionally, smoking restricts the flow of blood which prevents oxygen and nutrients from getting to the skin causing premature aging and facial skin wrinkling (Koh, Kang, Choi, & Kim, 2002). As a result, smokers tend to look pale and unhealthy.

Finally, smoking can eventually lead to cancers of the tongue, cheek, gums, and throat (CDC, 2005). And, although direct smoking of cigarettes is the major cause of cancer, secondhand smoke is also a known health hazard.

**Secondhand Smoke**

Glantz and Barnoza (2005) found evidence of adverse affects on the heart and circulatory system when someone is exposed to secondhand smoke. “Despite the much lower dose that nonsmokers receive compared to smokers, secondhand smoke can have effects nearly as significant as active smoking” (Glantz & Barnoza, 2005, p. 10). These researchers indicated that the deleterious effects of secondhand smoke to the general public are even greater than the effects of air pollution on respiratory and cardiovascular system. “Even a little secondhand smoke is dangerous because the effects on the blood, blood vessels, and heart are immediate” (Glantz & Barnoza, 2005, p. 11). Over 15
million children are exposed to secondhand smoke in their homes each year and as a result, secondhand smoke is reported to be a major contributor to childhood illnesses (CDC, 1997).

**Women’s Reproductive Health**

Damaging effects on a women’s reproductive health and perinatal complications are associated with maternal tobacco use. For instance, smoking is associated with reduced fertility, higher risk of miscarriage, still birth, and infant death. Babies born to mothers who smoke cigarettes are more likely to be born prematurely (Andres & Day, 2000). Mothers who smoke cigarettes account for more than 15% of all premature births and between 15% and 20% of low birth weight babies (Andres & Day, 2000). Premature babies born to mothers who smoke have much lower birth weight and, even if not premature, weigh on average 200 grams less than babies born to moms who do not smoke (Andres & Day, 2000). Babies are smaller because smoking tends to retard the babies growth in the uterus. Smoking in the last trimester is particularly harmful because of the need for the baby to grow rapidly during this time. However, smoking during any stage is risky not just the last few months. Premature babies and small size babies tend to have more health problems. For instance, mothers who smoke, even mothers who do not smoke often (less than 10 cigarettes per day), can give birth to babies who have neurological problems due to nicotine withdrawal which causes babies to be tense, excitable, and nervous (Andres & Day, 2000). Besides smoking-attributable health problems and mortality rates, economic costs associated with smoking are tremendous to both the smoker and society.
**Economic Impact of Smoking**

The cost of purchasing cigarettes continues to escalate with the average cost of a pack of cigarettes in the United States over $4.00 (Campaign for Tobacco Free Kids, 2005). Therefore, a pack a day smoker can spend nearly $1,500 annually. However, the economic and health-related costs to the individual and society are substantially higher.

During 1995-1999, the CDC (2002) calculated that smoking caused approximately $157 billion in health-related expenditures annually in the United States. The average loss of productivity in the United States due to smoking related deaths was almost $82 billion and annual health-care medical costs were over $75 billion (CDC, 2002). The CDC (2002) calculated that for each of the 46.5 million adult smokers in 1999, smoking caused $1,760 in lost productivity, and $1,623 in medical costs.

In Louisiana in 1999, smoking cigarettes accounted for $2.81 billion or $645 per capita in direct and indirect costs, and direct medical costs attributed to smoking were estimated at $1,115 million (CDC, 2002). Indirect costs, which include lost income due to premature death or illness caused by cigarette smoking, accounted for $1,663 million (CDC, 2002).

Frank Sloan and associates (2004) calculated what a pack of cigarettes costs the smoker, family, and society over a lifetime of smoking. They reported that the lifetime social cost of smoking by a 24-year-old woman over 60 years is $83,000, and for a 24-year-old man, the cost is $183,000 (Sloan, Taylor, Ostermann, Picone, & Conover, 2004). Nationally this comes to $204 billion for 60 years for all current smokers (Sloan et al., 2004). This figure includes the expense for cigarettes and taxes, individual life insurance, medical care for the smoker and their family, and lost earnings due to
disability. The social cost increases dramatically when you include indirect costs, such as the cost to others (Medicare, Medicaid, Social Security, and secondhand smoke). The social cost amounts to $106,000 for a woman and $220,000 for a man (Sloan et al., 2004). Therefore, the actual cost of a pack of cigarettes to society over a lifetime comes to around $40.00 (Sloan et al., 2004).

**Smoking Prevalence**

Approximately 45 million adults in the United States are current smokers (smoked at least once in the past month), or more than 20% of the adult population (CDC, 2005a). Almost 22% of high school students in the United States currently smoke (CDC, 2005b).

Practically every adult smoker (90%) started smoking before they were 18 (CDC, 2005b). Each day over 4,000 youth (under 18) start smoking and 2,000 become regular (daily) smokers (CDC, 2005b). Over 650,000 youth in the United States become regular smokers (CDC, 2003b) each year and over 5 million youth between the ages of twelve and seventeen consume approximately 900 million packs of cigarettes every year (DiFranza & Librett, 1999).

In 1999, one fifth of adults in Louisiana (35 years and older) reported that they were current smokers (CDC, 2002). In Louisiana, smoking rates were higher among African Americans (23.5%) compared to Caucasians (20.1%) (CDC, 2002). In addition, African American males (31.6%) in Louisiana had substantially higher smoking rates than their Caucasian counterparts (18.5%) (CDC, 2002). In contrast, adult smoking rates in the United States are higher for Caucasians (22%) than African Americans (20%) (CDC, 2005).
According to the Louisiana Youth Tobacco Survey (LOPH, 2002), nearly 60% (100,000) of middle school students (sixth, seventh, and eighth grade) reported in 1999 that they had tried some form of tobacco (cigarettes, cigars, bidis, pipes, and smokeless tobacco). Of those students, 78,000 middle school students tried cigarette smoking (LOPH, 2002). Almost one in five (28,000) middle school students (17.1%) were current smokers (smoking at least once in 30 days) in 1999 (LOPH, 2002). The survey indicated that 11.9% of sixth grade students, 16.3% of seventh grade students, and 23.0% of eighth grade students reported that they were current cigarette smokers (LOPH, 2002). The data revealed that the prevalence of cigarette smoking among Louisiana middle school students was 55% higher than the national average (LOPH, 2002).

LOPH (2002) found that 22,000 middle school students in Louisiana smoked their first cigarette before age 11. The survey results also indicated that middle school students were significantly more likely to have smoked their first cigarette before age 11 as compared to middle school students nationally (28.6% compared to 8.4%) (LOPH, 2002). In addition, African American adolescents tend to start smoking later in age (14 years old) compared to White adolescents who are more likely to begin smoking at age 12 (Headen, Bauman, Deane, & Koch, 1991).

According to the 2005 University of Michigan “Monitoring the Future” study, teen smoking rates reached their peak in the mid-1990s. These smoking rates began declining through 2004 and are now leveling off in most areas of the country, but increasing specifically among African American eighth grade students (Johnston, O’Malley, Bachman, & Schulenberg, 2005). The study also indicated that underage smoking in the South remains the highest in the country (Johnston et al., 2005).
The youth smoking rates in the United States and in Louisiana remain unacceptably high. “Although the recent decreases in smoking have more than offset the substantial rise in teen smoking during the early 1990s, the current rates are still far higher than parents and the public health community would like to see … and considerable evidence is accumulating that the downturn in teen smoking may stall at about these still unacceptable levels” (Johnston et al., 2005, p. 3). In an effort to develop effective smoking prevention strategies to decrease the incidence of smoking, researchers have sought to identify factors that influence youth to smoke.

**Risk and Protective Factors**

The literature indicates that most research of substance abuse prevention programs for the past 20 years has concentrated on evaluating strategies that reduce substance abuse rates among adolescents (Botvin et al., 1980, 1992, 2000; Ellickson, Bell, & McGuigan, 1993; Hansen & Graham, 1991; Sussman et al., 1993). These studies have focused mostly on the etiological basis for drug, alcohol, and tobacco use. Many of these studies identified risk and protective factors that influence substance use. Most researchers agree that there are certain factors that can reduce the rates of tobacco use and these include healthy family and peer relationships, good decision making skills, assertiveness, anti-smoking attitudes, academic achievements, good self-esteem, and positive community support (Botvin et al., 1992; Ellickson et al., 1993; Pentz et al., 1989; Sussman et al., 1993). According to the Surgeon General’s 1994 report on tobacco use, teens start using tobacco because of the interaction of environmental, behavioral, demographic, and psychological factors (USDHHS, 1994). However, developmental factors can also affect a teenager’s decision to start smoking cigarettes.
Adolescence is a time of transition from childhood to adulthood. Some teenagers emerge from this time without the appropriate coping and social skills that enable them to resist the temptations to smoke cigarettes. A combination of factors influences the teenager’s decision to use tobacco (USDHHS, 1994). “Many factors interact to encourage cigarette smoking among youth, including smoking by peers and family members, tobacco advertising and promotion, and easy availability of tobacco” (National Institute of Drug Abuse (NIDA), 1997, p. 1). Moreover, some reports warn that if a parent smokes there is a strong likelihood that their children will become smokers (NIDA, 1997; USDHHS, 1994, 1998).

Risk Factors

Recent research on youth tobacco use addresses environmental and demographic components as risk factors (Kropp, 1997; Kumpfer et al., 1998; Pentz et al., 1989). According to Kropp (1997), demographic factors, gender differences, and socioeconomic status contribute to youth tobacco use. "Most young smokers are girls… and young people from poor families have higher smoking rates than other teens" (p. 1). Dr. Karol Kumpfer (1998), reports "poor family management, lack of parenting skills, and dysfunctional care giving are strongly related to chronic substance abuse and delinquency"(p. 11). There also seems to be a negative correlation between socioeconomic status and rates of youth smoking (Kropp, 1997). According to a report by the Surgeon General (1994), adolescents from families with lower socioeconomic status and those living in single-parent homes are more likely to smoke.

There are family system influences that are risk factors for youth smoking including financial stressors, family structure, poor communication, and inadequate
parent involvement and supervision (Johnson, Hoffman & Gerstein, 1996; Kumpfer et al., 1998). Peer influences also tend to be one of the main determinants of teen smoking (Botvin, Baker, Dusenbury, Tortu, & Botvin, 1990; Botvin et al., 1992; Sussman et al., 1993). According to Dr. Steve Sussman (1993), “social influences are among the most important determinants of adolescent cigarette and smokeless tobacco use, and most such use begins in a peer group context” (p. 1245).

Reports show that there is a positive correlation between older sibling smoking and the likelihood of a younger sibling starting to smoke (NIDA, 1997; USDHHS, 1994, 1998). Furthermore, smoking is a way to gain acceptance in one’s peer group. "Hanging out" is a way of life for teenagers and smoking can become part of that ritual.

Psychological factors also play a prominent role in teen smoking (Kumpfer et al., 1998). Research has determined that youth who have developed pessimistic, negative outlooks and those who experience depression are at greater risk to start smoking (Kumpfer et al., 1998). Stress and social anxiety can be risk factors in underage smoking habits as well (Botvin et al., 1990, 1992).

Many of the same risk factors that contribute to higher smoking rates appear to affect all teenagers. However, there are several risk factors that may be unique to African American teenagers. Gardiner (2001) suggests that an increase in specific risk factors results in an increase in African American teen smoking rates. These unique risk factors are as follows: (1) tobacco industry marketing directly to African American teenagers; (2) tobacco industry sponsorships (i.e., African American Cultural Expo, National Black Arts Festival); (3) adoption of cigarettes, cigars, and marijuana by the hip-hop culture; (4)
greater access to tobacco products; and (5) increased poverty and discrimination of inner-city African American teenagers (Gardiner, 2001, p. 217).

There have been years of speculation that tobacco companies were targeting ads to African Americans, especially this culture’s teenagers. The recent release of tobacco company documents confirmed the suspicion that these companies were advertising to African-American teens during the 1980’s and 1990’s and substantiate the allegations that tobacco companies developed and promoted menthol cigarettes that are preferred by African American teens (USDHHS, 1998). In addition, there is evidence that billboard advertising for tobacco products are found to be four to five times more prevalent in black communities than in white communities (USDHHS, 1998). Tobacco companies also sponsor African American events, such as the Kool Jazz Festival, that draw large numbers of black youth. The rap music scene reinforces the image of “it’s cool to smoke cigarettes.” In many music videos the hip-hop artists can be seen smoking cigars and cigarettes.

Researchers found that the availability of tobacco products was the number one determining factor regarding whether teenagers would begin experimenting with cigarettes (Robinson, Klesges, Zbikowski, & Glaser, 1997). African American teens were more likely to be sold cigarettes than their Caucasian counterparts (Landrine, Klonoff, Campbell, & Reina-Patton, 2000). A correlation has been found between poverty, discrimination, oppression, racism and the increased rate of smoking among African American youth (Landrine & Klonoff, 1996). Furthermore, Landrine and Klonoff (1996) reported that stress caused by years of racism and oppression may be the main reason that African American teen smoking increased in the 1990’s. In their
extraordinary study on the negative physical and mental health consequences of racial discrimination, they stated that “racist discrimination is rampant in the lives of African Americans and is strongly related to psychiatric symptoms and to cigarette smoking” (Landrine & Klonoff, 1996, p. 144). In conclusion, Landrine and Klonoff (1996) reported that African Americans who smoke reported a higher incidence of racial discrimination than African Americans who did not smoke. These researchers have shown a positive correlation between the constant discrimination and oppression experienced by African American youth and African American teen smoking rates.

The “lack of supervision” is another risk factor that influences teen smoking. Richardson and associates (1993) reported that teenagers left unsupervised were more likely to engage in risk-taking behaviors. This information is significant with regard to African American youth smoking rates. Many African American families are impoverished, must work long hours to make ends meet, and as a result are unable to provide supervision for their teenagers during the day. “Swing and graveyard shifts, reliance on public transportation, long distances to and from work, lack of affordable childcare, few after-school programs, multiple jobs, all contribute to the unsupervised character of many adolescent African Americans and may, therefore, create the conditions for increasing smoking rates” (USDHHS, 2001, p. 220).

Based on the current research it seems that during the 1990’s there has been a trend in which risk factors have escalated. This trend is a significant predictor of the constant increase in smoking rates among all adolescents, but especially among African American youth. Just as an increase in risk factors has been shown to increase smoking rates, an absence of protective factors can also influence teenage smoking behavior.
Protective Factors

Several researchers have investigated protective variables called “personal factors”. These protective factors include self-esteem, decision-making skills, assertiveness, confidence, problem-solving skills, communication skills, and stress reduction strategies, and they have been found to provide adolescents with the ability to resist tobacco smoking (Botvin, et al., 1990, 1992; Pentz et al., 1989; Sussman et al., 1993). Teens who have good self-esteem and confidence are able to withstand peer pressure (Botvin et al., 1990, 1992). In addition, youth who utilize problem-solving skills are better able to make healthy choices (Botvin et al., 1990, 1992; Pentz et al., 1989).

Assertiveness

Assertiveness has been identified as a key protective factor and mediating variable that may be linked to smoking initiation among youth (Trudeau, Lillehoj, Spoth, & Redmond, 2003). ‘Assertiveness’ has been recognized by researchers as one of several protective factors, which helps teenagers resist tobacco use (Botvin, et al., 1990, 1992; Epstein, et al., 1999; Trudeau, et al., 2003). In fact, recent studies have found that adolescents with higher levels of assertiveness have shown a greater propensity to resist tobacco use. Teens who lack assertiveness skills are more likely to perceive smoking as a way of relieving stress and coping with everyday problems (Botvin et al., 1990, 1992, 1999; Epstein et al., 1999; Pentz et al., 1989; Sussman et al., 1993).

Trudeau et al. (2003) identifies assertiveness as an interpersonal construct which takes place in close personal relationships. He further defines assertiveness as a “learned, goal-oriented, primarily verbal behavior that increases the likelihood that personal needs will be met in the context of interpersonal relationships” (Trudeau et al., 2003, p. 303).
During his studies, Trudeau et al. (2003) found that adolescents start smoking with their closest personal friends in peer group situations. Trudeau et al. (2003) then linked assertiveness in several important ways to tobacco prevention: (1) assertiveness appears to be a mediating variable when it comes to smoking prevention; (2) studies have shown an inverse relationship between assertiveness and smoking intentions, expectancies, and perceived norms; and (3) assertiveness may influence refusal behavior skills, indirectly affecting smoking initiation.

**Smoking Refusal Skills**

Several studies have found a positive correlation between preventing smoking and smoking refusal skills (Botvin et al., 2001; Epstein et al., 1999; Trudeau et al., 2003). Smoking refusal skills has been defined as the ability to successfully refuse offers to smoke (Botvin et al., 2001). The ability to refuse smoking offers is a product of strong assertiveness skills and can affect behavioral intention to smoke cigarettes.

**Decision-Making Skills**

Research studies have consistently found that sound decision-making skills act as protective factors that help prevent underage smoking (Botvin et al., 1990, 1992; Epstein et al., 1999; Pentz et al., 1989; Sussman et al., 1993). Trudeau et al. (2003) defines ‘decision-making skills’ as “active strategies to gather information, weigh pros and cons, solve problems, and choose appropriate actions” (p. 303). An early study by Wills (1985) found a link between the ability to make competent decisions and smoking initiation. Epstein et al. (1999) has suggested that the lack of decision-making skills may well predict subsequent tobacco use and several studies by Botvin et al. (1989, 1992, 2000) have concluded that strong decision making skills can protect against cigarette
smoking onset. Moreover, Botvin et al. (1992) have suggested that weak decision-making is a determinant in the escalation of alcohol and tobacco use.

Furthermore, recent studies have provided evidence that the use of decision-making skills have a significant effect on negative expectancies (perceived negative social and personal consequences of tobacco use) and resisting offers to smoke cigarettes (Botvin et al., 2001; Trudeau et al., 2003). These studies suggest that there is a negative correlation between decision-making skills (weighing and considering consequences) and the ability to refuse offers to smoke cigarettes (Botvin et al., 2001; Trudeau et al., 2003). Information processing, a skill associated with decision-making, has also been found to be important in developing negative attitudes towards smoking cigarettes (Botvin et al., 2001; Trudeau et al., 2003).

**Smoking Attitudes**

Smoking attitudes among teens tends to be one of the main determinants of the onset of smoking (Botvin et al., 2001, Epstein et al., 1999; Griffin, Botvin, Doyle, Diaz, & Epstein, 1999). Social influences plays an important role in shaping a teenager’s attitudes about smoking (Sussman et al., 1993). For instance, smoking attitudes of family and friends has been found to be determining factor in whether an adolescent starts smoking (Botvin et al., 1992). There is evidence that those teens who express anti-smoking attitudes are less likely to smoke than teens who have favorable attitudes towards tobacco (Griffin et al., 1998). Additionally, Botvin et al. (1983) determined that adolescents who view health consequences of smoking cigarettes as insignificant were more likely to become regular or heavy smokers. Lastly, some teen smokers tend to believe there are social benefits to smoking cigarettes i.e., “makes you look cool” and
“seem more grown-up.” These perceived social benefits have been found to influence subsequent smoking behavior (Epstein et al., 1999).

Normative Beliefs about Smoking

Adolescent beliefs about the prevalence of tobacco use among adults and peers can also influence smoking rates. Many adolescents tend to overestimate how many adults and peers smoke cigarettes. For instance, a study by the Institute of Medicine (1994) found that teenagers estimated adult smoking rates at 66% when the actual smoking rates were 33%. In addition, adolescents who smoke cigarettes are more likely to overestimate the prevalence of smoking than those who do not smoke (Institute of Medicine, 1994). Also, cigarette advertisements glamorize smoking and promote the idea that smoking is socially acceptable. These repeated messages can eventually lead to the misconception that the majority of people smoke cigarettes. Researchers have found that adolescents who believe that smoking is the norm are more likely to smoke (Botvin et al., 2001; Hansen and Graham, 1991). Research also has shown that normative education is an effective prevention strategy (Botvin et al., 2001; Hansen and Graham, 1991). Normative education is an integral part of most school-based substance abuse prevention programs and provides accurate smoking percentages, corrects misconceptions about smoking prevalence, and shows that smoking is not the social norm (Botvin et al., 2001; Orlando et al. (2005); Sussman, 1993).

Supervision and Supportive Families

Youth who have supportive families and friends are less likely to smoke (Kumpfer et al., 1998; Pentz et al., 1989). Research has found that children living with both natural parents provides for better supervision (Cookston, 1999) and protects
teenagers from substance abuse (Johnson et al., 1996). Good communication skills are protective factors that can help prevent underage smoking (Botvin et al., 1990, 1992; Pentz et al., 1989). Youth who are able to express their feelings about substance abuse, and have caring adults who listen, are less likely to engage in risky behaviors such as smoking (Kumpfer et al., 1998).

**Academic Performance, School Involvement, and Community Support**

Academic performance and educational goals are protective factors with regard to underage smoking (Pentz et al., 1989). Children who are involved in school activities, who have good grades, and who have educational aspirations are less likely to smoke (Pentz et al., 1989). Community support plays an important role in increasing the effectiveness of youth anti-smoking campaigns as well. Pentz et al. (1989) writes, "A prevention intervention model that uses multiple environmental influences might be required to effect long-term changes... these influences could be used to support and extend prevention skills learned in a school program" (p. 3).

**Protective Factors for African Americans Youth**

Some research studies have identified a unique set of protective factors for African Americans (Chaloupka & Pacula, 1999). The study identified several protective factors, which have a significant impact on African American adolescent smoking rates. These factors are: (1) cost of cigarettes, (2) sports participation, (3) ethical and religious concerns, (4), influence of peers, and (5) parental smoking habits.

An increase in the cost of cigarettes has been shown to reduce the use of tobacco among African American adolescents (Chaloupka & Pacula 1999). Additionally, these researchers noted that price increase affects African American teens more than Caucasian
teens. The CDC (2001) reported that a 50% increase in tobacco pricing would result in a 12.5% decrease in teen cigarette smoking and that African American teenagers would more likely reduce their smoking than Caucasian teenagers if there was an increase in tobacco costs.

There appears to be a correlation between sports participation and lower teen smoking rates, especially among African American youth who tend to participate in high intensity sports such as football, basketball, and track and field as a way out of poverty, a means to get into college, and later a possible avenue into pro sports. Davis and associates (1997) reported that Caucasian high school athletes were more likely to use tobacco than African American high school athletes, and that athletes participating in high intensity sports were less likely to smoke cigarettes than athletes involved in low intensity sports. Klesges et al. (1997) supported Davis and associates findings when they reported that African American teenagers who participated in sports smoked less compared to Caucasian athletes.

Religion plays a significant role in the lives of African American teenagers in many ways. Brown and Gary (1994) reported that high church attendance correlates with lower smoking rates. Also, a survey by Taylor and associates (1999) found that African American teenagers “ranked parental influence, death, and moral/ethical principles as major themes explaining why people choose not to smoke” (p.37).

Several research studies indicated that African American teenagers are more influenced by family and friends concerning smoking than are Caucasian teenagers (DHHS, 1994 & 1998; Gritz, Prokhorov, Hudmon, Chamberlain, Taylor, DiClemente, Johnston, Hu, Jones, L., Jones, M., Rosenblum, Ayars, & Amos, 1998). Gritz and
colleagues (1998) reported that among African American youth the most significant predictor of initiating smoking was the smoking habits of their three best friends. A study by Botvin, Dusenbury, and associates (1992) supports these findings “that friends and peers were the most important social influences in predicting smoking behavior among inner-city African American seventh graders” (p. 297). Another study by Botvin, Baker, and associates (1992) reported that the smoking status of friends, low-self esteem issues, and beliefs about the harmful effects of smoking were influential in predicting whether African American teens would start smoking.

The literature indicates that risk and protective factors play a vital role in a teenager’s decision to start smoking, while it also suggests that African American teens’ smoking behaviors are influenced by a distinctive set of factors. At the same time research was being conducted on risk and protective factors, additional research was taking place that would develop ways to help people stop smoking.

**Smoking Cessation Programs**

In the 1960s and 1970s, as the risks and dangers of cigarette smoking became more apparent, smoking cessation approaches began to emerge. Initially, developing smoking cessation strategies seemed very promising based on statistics that indicated over 75% of adult smokers reported they would like to stop smoking, and about 60% reported they had already attempted to stop smoking (CDC, 1994). In addition, surveys found that up to 67% of adolescent smokers had tried to quit or thought about quitting (Sussman et al., 1993). However, research determined that smoking is highly addictive and that 97% of all attempts to stop smoking end in failure (CDC, 1994). Even those
smokers who eventually quit smoking relapsed multiple times before they finally succeeded.

Law and Tang (1993) conducted a review of 188 randomized controlled trials to help adult smokers quit, and they reviewed a variety of stop smoking approaches, including self-help groups, hypnosis, behavior modification, acupuncture, aversion therapy, and pharmacological intervention (nicotine replacement). The efficacy of these interventions (efficacy was measured by the difference between the percentages of treated and control subjects who were not smoking one year after the intervention) was found to be mostly ineffective. Intervention effectiveness ranged from unproven for hypnosis (1%), to little or no effect for behavior modification and acupuncture (2-3% efficacy), and to the most effective intervention being the nicotine patch at 13%.

Although stop smoking strategies were initially developed for adults, recently there have been a few smoking cessation programs developed for adolescents, though these have not been extensively evaluated (Dino, Horn, Goldcamp, Fernandes, Kalsekar, & Massey, 2001; Sussman, Dent, & Lichtman, 2001).

**Not on Tobacco (NOT) Smoking Cessation Program**

The most well-known adolescent smoking cessation program is Not on Tobacco (NOT), a program developed by the American Lung Association. NOT is a voluntary, school-based smoking cessation program for students 14-19 years old. There are ten weekly sessions and four booster session. The program consists of lessons that address stress management, nutrition, coping skills, relapse prevention, building self esteem, and dealing with peer pressure. Results from two feasibility studies on the NOT program
showed some improvement in smoking cessation as compared to a brief health curriculum intervention (Dino et al., 2001).

**Project EX Smoking Cessation Program**

Project EX is another teen smoking cessation program that has been shown to be somewhat effective in smoking cessation. Sussman et al. (2001) found the eight-session school-based program to be effective in stopping smoking in 17% of the treatment group compared to 8% in the control group. However, the researchers reported issues with recruiting smokers and students dropping out. Recruitment and retention has been reported to be an issue as well in other voluntary smoking cessation programs for adolescents.

Beginning in the 1960’s, researchers began to spend progressively more effort in developing programs to prevent teens from starting to smoke rather than developing cessation programs that had relatively low success rates. Researchers understood that the majority of smokers begin smoking in early adolescence; therefore, teaching school-based smoking prevention curriculum beginning in sixth grade provided the best opportunity to reduce overall youth smoking rates. Researchers realized that school-based smoking prevention programs could reach all students, not just students who smoked, thereby improving the delivery and impact of smoking prevention programs.

**School-Based Smoking Prevention Programs**

In the late 1960’s, schools began to develop “health belief” strategies about tobacco use and, as a result, school-based tobacco prevention programs began to evolve. Educators believed that if students simply received adequate information on the consequences of tobacco use they would refrain from smoking. Teachers used lectures,
demonstrations, films, posters, and books to increase awareness of the health consequences of smoking. Although students were receiving ample information on the harmful effects of tobacco use, youth smoking rates in the 60’s were not decreasing. Therefore, researchers and developers of prevention programs began investigating other smoking prevention approaches that could prevent and reduce youth smoking.

Following in the late 1970’s and early 1980’s, school-based prevention programs began to emerge that were based on the “social influences” approach to smoking prevention. The “social influences” smoking prevention model maintains that social pressures exerted by peers, family, and the media have considerable influence on why teenagers begin to smoke (Botvin et al. 2001, Evans, Rozelle, Mittelmark, Hansen, Bane, & Havis, 1978; Flay, Ryan, Best, Brown, Kersell, d’Avernas, & Zanna, 1985; Hurd, Johnson, Pechacek, Bast, Jacobs, & Luepkder, 1980; McAlister, Perry, Killen, Slinkard, & Maccoby, 1980; Perry, Killen, Slinkard, & Danaher, 1980; Telch, Killen, McAlister, Perry, & Maccoby, 1982). Instead of solely providing information and lecturing students on the deleterious effects of smoking, social influences tobacco prevention programs provide skill-building lessons on how to resist direct and indirect pressures to smoke. These programs offer information on how social pressure from peers, family, and the media tend to influence a person to smoke. The “social influences” approach makes students aware of social norms and perceptions of smoking, attempts to correct inaccurate beliefs about smoking, and presents behavioral strategies on how to resist social pressure to smoke. Generally, these programs also provide information on the short and long term consequences of smoking.
In the mid 1980’s, youth smoking prevention programs began to appear that incorporated “social influences” curriculum plus other social and psychological components associated with youth smoking initiation (Botvin et al., 1983, Wills, 1986). This so-called “social competence” approach established an additional rationale for why teenagers start smoking. The “social competence” proponents contend that teenagers who exhibit negative or anti-social patterns of behavior such as low self-esteem and poor attitudes toward family, school, and community are more likely to smoke cigarettes (Wills, 1986). Based on this concept and subsequent research, more comprehensive programs were developed with curriculum that included protective factors (competencies) such as decision-making, goal setting, stress management, communication skills, assertiveness skills, self-esteem building skills, and normative education (which teaches adolescents that most people do not smoke).

Youth smoking prevention programs fall into two basic categories: “Social Influences” and “Social Competence” smoking prevention programs. These two program types along with the Life Skills Training Program will be examined in the following literature review section.

“Social Influences” Smoking Prevention Programs

Houston School-Based Smoking Prevention Program

Evans and associates (1978) at the University of Houston conducted studies on the “social influences” approach primarily based on McGuire’s (1964) social inoculation theory. The Houston group (Evans et al., 1978) was the first to test the effectiveness of a social influences approach to smoking prevention. The studies investigated the effects of social inoculation on smoking. Social inoculation is similar to biological inoculation, a
procedure whereby a person is given a small dose of an infectious disease in order that their body will build immunities to that disease. The inoculation would then reduce the susceptibility to future exposures to the disease and increase resistance to the disease.

This principle as it applies to smoking suggests that one could develop convincing arguments which would counter the social pressures to smoke. These counterarguments should inoculate one against the pressures from peers, family, and the media that influence youth to smoke.

The Houston group also incorporated the attitude change theory (persuasive communications) by McGuire (1969) and social learning theory (Bandura, 1977) in their school-based program. Seven hundred and fifty students from ten junior high schools were involved in the Houston study. The study examined a smoking prevention program, which used non-smoking same-age peers to discuss the three major social influences to smoke: peer pressure, parent modeling, and media influences. Information was introduced by watching a film that targeted the short-term consequences rather than long-term consequences of smoking. The study compared the smoking rates of seventh grade students who received the prevention program over four consecutive days with seventh grade students who did not receive the program. The results indicated that students who completed the program reported smoking at approximately half the rate than that of the students who did not receive the program.

Houston Program – Second Generation Studies

Other researchers conducted further studies on the Houston anti-smoking program (Hurd et al., 1980; McAlister et al., 1980; Perry et al., 1980; Telch et al., 1982). These researchers adapted and expanded on the “social influences” model. They attempted to
augment social inoculation by including aspects of social learning theory. In addition, they tested the significance of the different components of their more complex prevention interventions. The first study on social influences by Evans et al (1978) relied on a film that presented information on peer pressure to smoke and the methods used to resist smoking. However, teaching skills to resist smoking was not a primary concern of the initial Houston program. The second generation studies included role-play activities from which students received feedback on their ability to learn these resistance skills. The following section reviews four smoking prevention programs adapted from the Houston Program.

**Counseling Leadership Against Smoking Pressures Program (CLASP)**

A group of Stanford University researchers (McAlister et al., 1980; Perry et al., 1980; Telch et al., 1982) expanded on the basic social inoculation model. CLASP incorporated the same features as the Evans et al. (1978) program, but added new components: (1) high school students were utilized as “peer” teachers for the seventh grade students; (2) a lesson was added to increase social commitment not to smoke; and (3) behavioral learning techniques (Bandura, 1977) were incorporated whereby students role played how they would resist social influences to smoke. The seventh grade students were pretested before the introduction of the program and posttested at the end of seventh grade. Results indicated that the treatment group reported significantly less smoking (5.3%) than students in the control group (11%). The authors admitted that the encouraging results might be biased due to methodological problems of the study which was conducted in two schools and random assignment was used only in one school. One of the schools was identified as having a high rate of smoking in which administrators
were seeking a solution to the smoking problem. The researchers reported that the results could be biased due to differences among the students in the two schools and also due to statistical regression.

McAlister et al. (1980) conducted another study on the CLASP curriculum in which seventh and eighth grade students received 12 sessions over a two-year period. Five matched pairs of middle schools were randomly assigned to the control and experimental condition. A self-questionnaire was used to collect data at pretest, and at 6-month, 12-month, and 18-month posttests. Although, the percent of smokers decreased in the experimental group and increased in the control group in two pairs of schools, the authors indicated that the schools that received the program had a 60% higher smoking rate prior to the introduction of the program than the control schools. This methodological flaw casts doubt on the significance of the results.

The North KareliaYouth Project

The North KareliaYouth Project (Vartiainen, Pallonen, McAlister, Koskela, & Puska, 1983) began in the fall of 1978 in North Karelia, Finland. This research project was developed to determine if a comprehensive program of community interventions (mass media campaign) and the CLASP school-based smoking prevention intervention program would influence behaviors that are risk factors for cardiovascular disease.

Seventh grade students from six schools participated in the study. The experimental condition included two schools in North Karelia in which project staff provided a 10-session curriculum (intensive intervention group). In addition, seventh grade students in two matched schools in North Karelia were taught a five-session version of the curriculum. The control group consisted of two matched schools from
another province that received no prevention curriculum. The students were surveyed prior to the interventions, posttested after a two-year intervention, and surveyed again six months later. At the first posttest, reported monthly smoking rates in the intensive treatment group were 21%; in the “modified curriculum” treatment group the rate was 19%; and in the control groups the smoking rate was 29% (Vartiainen et al., 1998). The results from the final posttest indicated that smoking percentages increased to 24%, 22%, and 34% respectively (Vartiainen et al., 1998). Though these seemed to be very impressive results, the researchers reported two methodological flaws that may have influenced their findings. First, the participating schools were chosen and not randomly selected, and therefore, selection bias could account for the results. In addition, the school-based prevention program was a small component of an overall community-wide prevention strategy. Therefore, it is impossible to determine what part the school-based interventions played in the decrease in smoking rates. A 15-year follow-up was conducted and found that the mean lifetime cigarette consumption was 22% lower among program subjects than among control subjects (Vartiainen et al., 1998).

The Robbinsdale Anti-Smoking Program (RASP)

RASP was studied in 1977 in Minnesota (Hurd et al., 1980). It was the first study that investigated the value of same-age peer leaders and a public commitment component. This program consisted of film presentations and group discussions that included the social consequences of smoking, resistance skill building, normative education (correcting misconception about smoking prevalence) and media pressures. Interactive student groups practiced behavioral skills to resist smoking persuasion techniques, developed counterarguments to smoking, and engaged in role play activities.
Students involved in the commitment procedure recorded a statement about why they were not going to smoke. The curriculum consisted of five sessions and was implemented in seventh grade evenly throughout the school year.

There were four experimental conditions (1) control groups – no prevention curriculum; (2) social influences curriculum; (3) social influences curriculum with peer leaders; and (4) social influences with peer leaders and a commitment procedure. The researchers randomly assigned classrooms in one school to receive commitment procedures. The four remaining schools were assigned the remaining experimental conditions so that a low socioeconomic status (SES) school and a high SES school were alternately assigned to the treatment condition and the control condition. A pretest was given between the second and third lesson and a posttest at the end of the first year.

The results indicated that the social influences program both with and without peer leader involvement reduced experimental smoking, but only the peer leader experimental group prevented an increase in regular smoking. Although this study introduced some innovative advances to previous smoking prevention programs, the results could not be attributed to the program with a great deal of confidence. A major methodological flaw was that the school that received the “social influences” curriculum with peer leaders had the highest SES and was the lowest on risk factors, and the control group had the lowest SES and the highest risk factors. Therefore, without the treatment (social influences program) the highest smoking rates would be expected in the control school and lowest rates in the peer-led experimental school.

In the late 1970s and 1980’s, prevention researchers continued to conduct larger and improved studies on “social influences” smoking prevention programs. Individual
researchers from the first Minnesota study and the Stanford study were involved in several additional studies in which the “social influences” prevention programs were tested.

A second Minnesota Study project, consisting of two studies, was conducted in 1979 and 1980 (Arkin, Roehmild, Johnson, Luepker, & Murray, 1981; Murray, Johnson, Luepker, & Mittelmark, 1980) in an attempt to correct the methodological problems that occurred in the first study of RASP. In the first study by Arkin et al. (1981), three versions of the social influences curriculum were compared with a “health- only” curriculum. The three versions included: (1) curriculum presented by an adult health educator versus a same-age peer; (2) the use or non-use of films; and (3) a public commitment procedure. In the second study, a research staff health educator or a regular classroom teacher taught the curriculum. The curriculum for all versions consisted of five class sessions for seventh grade students over the course of the school year.

In an attempt to improve the methodology, the first study by the Arkin group (1980) randomly assigned eight schools to the four conditions and half of those classes were randomly assigned the commitment procedure. The control groups consisted of two schools from Project RASP in which historical data was used as the only control for the first study. The second study added two nonrandomized schools as control groups. Seventh grade students were pretested by self-reporting surveys, posttested at the end of the year, and a one year follow-up was conducted.

The findings in the first study indicated that the health consequence curriculum was most successful with nonsmokers and the “social influences” curriculum was most successful when compared with the historical control group (Arkin et al., 1980). The
study also found that peer-led social influences programs were more effective than adult social influences or health curriculum at preventing smoking. Although the study showed significant effects in preventing smoking, there was no evidence that the four programs reduced smoking among pretest smokers. The second study by Murray et al. (1981) found no differences between the four program conditions, but did find that all four programs were more effective than the control group. Even though this study improved methodological procedures by incorporating randomization, there still remained flaws that resulted in threats to internal validity. The researchers did not account for the differences in baseline data between the nonsmokers in the peer-led groups and other conditions. The use of historical and non-equivalent control groups could also be threats to internal validity.

Australian Study of the RASP Model.

Fisher, Armstrong, and de Klerk (1985) tested a modified RASP in Western Australia. Fisher et al. (1985) changed slightly the context of the film materials for the Australian student. The anti-smoking program was taught to seventh grade students over a five-month period. The researchers compared results from same-age peer groups and teacher led groups. Forty-five elementary schools were randomly assigned to experimental and control groups. Researchers reported some significant results. Both the teacher-led and peer-led experimental groups showed a 26% reduction on the onset of smoking among girls, but only the teacher-led experimental groups was effective for boys (39% reduction). The findings indicated no program effects for students who were already smokers.
The Waterloo School Smoking Prevention Program

The Waterloo School Smoking Prevention Program, based on the “social influences” model, was initiated in 1979 in Waterloo, Canada. The program consisted of six one-hour sessions in sixth grade with booster sessions in seventh and eighth grades. The curriculum was designed to help students realize the pressures exercised by peers, parents, and the media to entice youth to smoke. Lessons were devised to teach behavioral skills that would help youth resist the social pressure to smoke. Several teaching methods were used including the use of film, classroom discussion, role-play, and modeling. Flay et al. (1985) conducted a study to determine the effectiveness of this program. Twenty-two schools (N=560) were randomly assigned to the intervention condition or control condition. Sixth grade students from 11 schools received six one-hour sessions from the research staff. Two additional sessions were given at the end of sixth grade; two booster sessions were given in seventh grade and two booster sessions in eighth grade. A self-reporting questionnaire was used to collect data at pretest, immediately after the implementation of the program, at the end of sixth grade, at the beginning and ending of seventh grade, and at the end of eighth grade. Flay et al. (1985), found that the program was successful in preventing the onset of experimental smoking up to the eighth grade. Both high risk students (students who reported that their parents, siblings, and friends were smokers) and experimental smokers (sixth grade students who smoked less than once a week) who received the treatment reported reduced levels of smoking. However, regular smokers (once a week or more) who received the treatment did not report a reduction in their rates of smoking.
Oslo Youth Smoking Prevention Program

A study by Tell et al. (1981) in Oslo, Norway investigated a “social influences” smoking prevention program that was part of a health education curriculum. Fifth, sixth, and seventh grade students were given a 10-session program taught by older peer leaders and project staff. Six schools were matched and one school from each pair was randomly assigned to receive the program. The students were pretested and posttested two years later. The data revealed that the program had a significant influence on the smoking rates of students who were nonsmokers prior to receiving the intervention. Only 17% of participants in the treatment group reported smoking by posttest compared to almost 27% of the control group reported smoking at posttest. Significant effects were also reported for smoking knowledge and smoking intentions. The results of the Oslo study were comparable to previous studies in which nonsmokers receiving a social influences prevention program reported smoking 39% less than the control group.

However, the results of this survey are questionable based on several factors. As in some previous studies, the social influences smoking prevention curriculum was only part of a more comprehensive health curriculum. So it is difficult to be certain that the changes in smoking behavior occurred solely due to the prevention curriculum. There were also reported pretest differences in which the treatment group was found to be more knowledgeable about smoking and less approving of smoking than the control group. Finally, there was greater attrition in the control groups than in the treatment groups.

Towards No Tobacco Use (TNT) Program

Sussman et al. (1993) conducted a study on the “social influences” TNT program in which 6,716 seventh graders in 48 junior high schools in Southern California were
randomly assigned to one of five conditions: each of four experimental groups had different smoking prevention curricula, and a control group had a standard health curriculum. The object of the study was to investigate two distinct types of social influences that might pressure adolescents to smoke cigarettes: (1) normative social influence, and (2) informational social influence. Sussman et al. (1993) describes normative social influence as a way in which youth achieve acceptance into a peer group by agreeing to smoke.

Informational social influence is defined by Sussman et al. (1993) as covert pressure to begin smoking. Adolescents will adopt favorable attitudes about smoking through various social sources including positive statements about tobacco made by their peer group and parents, advertising, and the media (movies and music videos). Information from these sources implied that smoking cigarettes is widespread and that the smoker can obtain a desired social image such as being cool or appearing older. Individuals perceive themselves as being accepted by the group if they smoke and rejected by the group if they refuse offers to smoke.

Sussman et al. (1993) hypothesized that resistance to tobacco use will be greater among subjects who participate in a social influences prevention program that teaches skills needed to resist social pressure to use tobacco. The study focused on manipulating peer disapproval of tobacco use in the classroom. Sussman et al. (1993) used a comprehensive prevention model comprised of three components that counteracted social influences. The first prevention component included activities that reduced the effects of normative social influence on tobacco use. The second component consisted of activities that counteracted the informational social influences factor. There were several activities
that were employed that included information on tobacco company advertising techniques and the correction of misinformation on the high prevalence of tobacco use. In addition, communication skills were taught to improve the absorption of the accurate information presented in the classroom activities. Lastly, the third prevention component was comprised of activities that addressed the physical consequences of tobacco use. Although not a true component of the social influences model, information about the short and long term affects of tobacco use has been shown to be effective in preventing tobacco use.

The results indicated that each of the components were effective in reducing cigarette smoking, except for the curriculum in which refusal skills and classmate disapproval of tobacco use were taught. The data also suggested that the normative social influence component was more effective with preventing smokeless tobacco use than cigarette smoking. Additionally, the presentation of physical consequences was as effective as the social influences component. The researchers attributed the effectiveness of the physical consequences curriculum on a contemporary interactive teaching style that was more relevant to adolescents. This contemporary teaching style included: role-play techniques, dispelling myths about smoking, and conveying the probabilities and physical consequences of tobacco use. Sussman et al. (1993) reported that there were limitations to this study due to the fact that the subjects were mostly white middle-class students, thereby, limiting generalizability to other ethnic groups.

**Structural Model of Smoking Influence**

Flay, Miller, Hedeker, Siddiqui, Brannon, Johnson, Hansen, Sussman, & Dent (1995) used a structural equation model to address gender and ethnic differences on
smoking behavior. A sample of 6,695 seventh grade students from 35 public schools in
Los Angeles and 12 public schools in San Diego Counties were part of the television,
school, and family project smoking prevention program. The data was analyzed using a
structural model of social influences developed by Flay et al. (1995). The results
indicated that “friends’ smoking” affected the initiation rate of smoking among teens.
Parents smoking had an indirect effect. Parent approval of smoking played an important
role in the smoking rates of females, but not males. Limitations for this study are as
follows: the measures of smoking were provided by teens, including the data about
smoking among parents and friends; students who were from divorced families were not
included in the study, therefore the results can only be generalized to students from intact
families; and finally, data on sibling smoking, especially older siblings, was not collected.

“Social Competence” Smoking Prevention Programs

In the 1980’s as research continued on the social influences smoking prevention
program model, research on a new type of smoking prevention program began to appear.
This new social competence model was both an extension and expansion of the social
influences approach to smoking prevention. Researchers began to study protective
factors that could improve one’s ability to resist the temptation to smoke. New social
competence smoking prevention programs not only included lessons on how to resist
social pressures to smoke, but also included new lessons on these unique protective
factors. The programs offered a range of competency building skills that included good
decision-making, healthy self-esteem, assertiveness, anti-smoking attitudes, and
improved communication.
Will’s Decision-Making & Coping Skills Study

In 1986, T. A. Wills conducted a study that measured stress and coping as it related to cigarette smoking and alcohol use. The population studied was two groups of seventh and eighth graders, one group consisting of 675 students and the second group consisting of 901 students. Stress, coping, and smoking measures were used. Under stress measures there was a 14-item subjective stress scale, a 20-item mood scale, a 12-item recent event scale, and a 22-item major life event scale. The coping measure was based on the coping assessment battery (Bugen & Hawkins, 1981). A factorial analysis of the coping measure indicated three important components: decision-making, cognitive coping, and social support. The use of both decision-making and cognitive coping significantly reduced smoking rates. Analysis of data indicated that stress and the four coping mechanisms were inversely correlated to smoking. Limitations of this study are not indicated in the literature; however, this study was tested with urban school samples and, therefore, cannot be generalized in other environments.

Cognitive Behavioral Therapy Approach

Pentz et al. (1989) studied 1,193 students from 8 schools in rural and suburban Tennessee in grades sixth through ninth. “Assertiveness skills” were taught in seven 55-minute lessons. Following the lessons, the study looked at how acquisition of these skills might affect smoking and substance use rates. The results indicated that the intervention program improved social competence, self-efficacy (the conviction that one can successfully execute behaviors necessary to produce desired outcomes), and grade point average. Students who received the prevention treatment demonstrated a decrease in substance use rates as compared to the no-treatment control group. However, the
prevention treatment decreased alcohol use, but not cigarette smoking. Social
competence training produced increases in school grades and decreases in “smokeless
tobacco use,” however, limitations are based on the fact that cigarette smoking was not
affected.

Project Alert

Project Alert is a two-year program consisting of eight lessons taught in the
seventh grade and three lessons taught in the eighth grade. The program includes
interactive classroom discussion in which student smoking beliefs are challenged,
coupled with role-playing activities to teach students smoking resistance skills. There
are homework assignments which involve the participation of the parents in discussions
with the students on how to resist tobacco use.

Ellickson et al. (1993) conducted a study on 30 schools (N=6,527) that were
randomly assigned to an intervention group and a control group that were facilitated by
an adult health educator or a peer health educator. The results indicated occasional
cigarette users who received the Project Alert program reported a 20% lower smoking
rate than students who did not receive the program. Both regular and heavy cigarette
smokers who received the program reported a 33% to 55% lower smoking rate than the
control group.

Orlando, Ellickson, McCaffrey, & Longshore (2005) went a step further in
investigating the Project Alert substance abuse prevention program. Orlando et al. (2005)
conducted a mediation analysis to determine the underlying mechanisms by which
Project Alert impacted the rates of cigarette and alcohol use. The study targeted several
mediating variables including self-efficacy, positive and negative beliefs about use, and
the effects of peer influence on reducing tobacco and alcohol use. The study was conducted with 4,277 (2,554 treatment and 1,732 control) South Dakotan middle school students. A self-reporting survey measured the outcomes at pretest and one-year later at posttest. The results indicated that all the mediating variables had some effect on intentions to smoke with peer influence being the most significant.

**D.A.R.E. (Drug Abuse Resistance Education) Program**

D.A.R.E. is the most widely used school-based substance abuse prevention program in the United States. This program consists of 17 weekly one-hour lessons, taught by police officers that include information on the long and short term consequences of tobacco use, ways to resist peer pressure, and techniques to improve decision-making skills and build self-esteem.

Lynam and associates (1989) completed a large-scale study on the efficacy of the DARE program. Two thousand seventy-one sixth grade students from 31 schools were involved in the study of which 23 schools were randomly assigned to intervention and control conditions. Self-reporting surveys were used at pretest and follow-up surveys were conducted through the 10th grade. The study found no statistically significant differences in self-reporting tobacco use between the control group and the experimental group. Lynam et al. (1989) conducted a 10-year follow up survey on the subjects who were now between 19-21 years of age. The results indicated there was no difference in smoking rates (past month cigarette use) between the subjects who received the DARE program and those who did not.

The Lynam et al. (1989) study was followed by Susan Ennett and colleagues (1994) research that found similar results. Ennett, Rosenbaum, Flewelling, Bieier,
Ringwalt, & Bailey (1994) conducted a study with 1,213 fifth and sixth grade students from 24 schools in Illinois. Schools were randomly assigned to the experimental group that received the D.A.R.E. program and the control group that did not. Tobacco use was measured through a student self-reporting questionnaire. Subjects were pretested prior to receiving the intervention and posttested two years later. The results reported two years after the program’s completion indicated that D.A.R.E. had no significant impact on students’ alcohol use and smoking rates compared to the control group.

Subsequent criticism of the D.A.R.E. program based on the previous studies’ findings that the D.A.R.E. program was ineffective in preventing substance use prompted D.A.R.E. America to introduce in 2002 an enhanced version called D.A.R.E Plus (Play and Learn under Supervision). The new program added extracurricular activities, such as dance and theater and more parental involvement. The parent participation component consisted of peer-led classroom parental involvement sessions, mail-outs to the parents, and parent community action teams. Four lessons were taught weekly by specially trained teachers that focused on skills to resist influences by peers, friends, and the media. A randomized controlled study was conducted by Perry et al. (2003) in 24 schools in the Minneapolis-St. Paul school district. All seventh grade students (N=6,237) participated in the study. Eight schools were randomly chosen to receive D.A.R.E. only, eight schools D.A.R.E. Plus, and eight schools did not receive any curriculum. The interventions were implemented over a two-year period in seventh and eighth grade. Data was collected through a self-reporting questionnaire at the beginning and the end of seventh grade and at the end of eighth grade. The researchers found no differences between the D.A.R.E. program and the control groups. However, the results indicated
that boys who received the D.A.R.E Plus program reported less increases in tobacco use than boys that did not receive the D.A.R.E. Plus program. There were no differences reported for girls. The researchers concluded that differences between girls and boys in response to the intervention program might have been because boys could have viewed the male police officers who presented the program as positive role models and were motivated to respond more positively to the program. Also, the boys might have been at higher risk for tobacco use prior to the intervention and, therefore, boys would show the highest improvement after receiving the program. Finally, the researchers reported that D.A.R.E. Plus demonstrated a need for a multi-component approach to school-based substance abuse prevention programs.

Hutchinson Smoking Prevention Project (HSPP)

HSPP smoking prevention program includes 65 sessions emphasizing social influences as well as motivational, self-confidence, and family components. The HSPP curriculum contains several “social influences” components: improving skills to recognize pressures to smoke by advertisers and peers; developing skills for resisting those influences; and increasing awareness of and promoting anti-smoking norms. Peterson, Kealey, Mann, Marek, & Sarason (2000) conducted one of the largest field studies (n=8400) ever on a “social influences” smoking prevention program. During the 15 year study, forty school districts in Washington State were matched, paired, and then randomly assigned to either the intervention or control condition. Sixty-five lessons were taught from 3rd grade to 10th grade. Nine lessons were taught in third through fifth grades; 10 lessons in sixth and seventh grades, eight lessons in eighth grade, and five lessons in the 9th and 10th grades. The researchers found no statistically significant
differences between the control group and the experimental group on current, daily, or cumulative smoking rates.

**Trudeau’s Decision-Making and Assertiveness**

Another study conducted on social competencies took place in 2003 by Trudeau and associates. The study examined the mediating effects of assertiveness and decision-making on teen substance abuse. Four hundred ninety-four seventh grade students were studied in 12 schools in a mid-western state. A randomized block design was used. Each block contained one of three experimental conditions. In one group the “Life Skills Training” (LST) program was used; in another group LST and a 7-session family program was used; the 3rd group was a control group receiving no treatment. 

Assertiveness was measured using a modified version of the Gambrill and Richey Assertion Inventory (1975), and decision-making was measured using a modified version of the Coping Assessment Battery (Bugen & Hawkins, 1981). The results indicated that assertiveness and decision-making skills “were positively associated with negative expectancies and refusal intentions, directly or indirectly” (Trudeau et. al, 2003, p. 301).

**The Life Skills Training Program (LST)**

The Life Skills Training (LST) program authored by Gilbert Botvin is a comprehensive middle school psychosocial substance abuse prevention program (Botvin, 2000). It incorporates techniques that include most of the protective factors which help adolescents resist pressure to use cigarettes and other substances.

LST incorporates strategies such as increasing self esteem, resisting media pressure, improving communication skills, coping with anxiety, and a variety of other social skills, including decision making, and assertiveness training.
The LST program contains 18-lessons divided into three life skill’s areas: (1) personal self-management skills; (2) social skills; and (3) information on substance use (Botvin, 2000). The personal self-management component includes instruction on how to (1) develop good decision-making and problem-solving skills; (2) resist media pressure; (3) cope with anxiety and anger; and (4) improve personal behavior (Botvin, 2000). The social skills’ training component includes material on: (1) stress management techniques; (2) goal setting; (3) communication skills; and (4) assertiveness training (Botvin, 2000). The smoking information section focuses on teaching resistance skills and dealing with peer pressure. This component contains information on: (1) short- and long-term consequences of smoking; (2) misconceptions about the prevalence of tobacco use; (3) decreasing acceptance of cigarette smoking; (4) media pressure to smoke; (5) tobacco company strategies used to encourage people to smoke; and (6) specific skills to resist indirect and direct pressures to smoke (Botvin, 2000). It also utilizes various teaching methods that include conventional didactic and lecture methods, cognitive behavioral strategies, classroom demonstrations, behavioral rehearsal (role play), facilitating group discussions, and social reinforcement. The LST program emphasizes interactive teaching in small groups utilizing discussions and role play instead of the traditional didactic approaches.

Over the past 20 years, Botvin and other researchers have studied the effects of the LST program across various ethnic groups in a variety of environmental settings. They have studied urban black youth, white middle class populations, and female youth in various settings, such as inner city and public housing developments. They have also investigated the effects of different dependent variables: smoking status, decision
making, risk-taking behaviors, and anti-smoking attitudes. Several of these studies are reviewed below.

Study 1). Botvin et al. (1980) studied the effectiveness of a 10-session psychosocial approach (LST program) to prevent cigarette smoking among 281 eighth, ninth, and tenth graders predominately middle class science and health students in suburban New York. Two schools were randomly assigned to experimental and control groups. Subjects were pre and posttested using a self reporting survey. This study was designed to increase students’ ability to resist peer pressure to begin smoking and to improve their ability to cope with anxiety. Following treatment, results for the experimental group revealed a four percent smoking initiation rate compared to a 16% rate for the control group. The generalizability of this study is limited due to the predominately middle class sample.

Study 2). In 1983, Botvin examined the effectiveness of a 15-session psychosocial smoking prevention program on 972 seventh graders from seven junior high schools in suburban New York. The effectiveness of booster sessions conducted a year after completion of the program was also studied. A predominately Caucasian middle- to upper-middle class group of students were randomly assigned to experimental and control groups. They were pretested and posttested using a self reporting survey. Results indicated that the prevention program was able to reduce cigarette smoking by 50% at the end of the first year and 87% in the second year for students who received the booster sessions (Botvin et al., 1983). Limitations of this study again are that the results cannot be generalized to minority youth because the sample is predominately white and middle class.
Study 3). Botvin et al. (1998) examined 743 seventh grade predominately white middle class suburban students. This was a six-year follow up study that investigated “how risk and protective factors measured during early adolescence were associated with later heavy smoking” (Botvin et al., 1998, p. 280). The students in this study were tested in the seventh grade with a self reporting questionnaire which addressed risk taking factors, anxiety reduction skills, self reinforcement skills, anti-smoking attitudes, and smoking status. A logistical regression analysis was performed and indicated that heavy smoking could be predicted by several variables: poor grades, experimentation with cigarettes or alcohol, parents or friends who smoked, and a high level of risk-taking behaviors. Additionally, the study found that anti-smoking attitudes among parents or friends predicted less heavy smoking among females. This study examined predominately white middle class students, therefore, limiting generalizability to minority populations.

Study 4). Botvin and colleagues (1999) studied 2,690 seventh grade females in 29 New York City schools. The sample contained mostly minority youth: 60% African-American, 23% Hispanic, 7% Asian, and 3% White. The objective was to examine the effectiveness of the LST program on reducing initiation and escalation of smoking in minority junior high school girls (Botvin et al., 2001). The participants were assigned to either an experimental or control group and the experimental group received booster programs the following year. They were pretested and then posttested at the end of the eighth grade using a self reporting questionnaire. Results showed girls from the experimental group were less likely to begin smoking than the girls in the control group. Smokers in the experimental group were also less likely to increase smoking compared to
the control group. Also, the LST program produced significant effects in the areas of smoking intention, smoking knowledge, peer and adult smoking norms, drug refusal skills, and risk taking behaviors. This study was performed in New York City schools and, therefore, it limits generalizability to similar environmental characteristics.

Study 5). A study by Epstein et al. (1999) was conducted on 1,875 economically disadvantaged sixth and seventh grade students from 22 middle and junior high schools in New York City. The students were pretested and then posttested at the end of one year using a self reporting questionnaire. The study investigated four predictors of smoking including demographic characteristics, social influences to smoke, social and personal competence, and individual psychological differences. Epstein et al. (1999) found that social influences to smoke (mothers & friends who were smokers) predicted smoking behavior one year later. The results also indicated that there was an inverse relationship between extent of smoking and decision-making ability. The researchers concluded that teaching adolescents to resist social pressure to smoke, problem solve effectively, and make good decisions are important factors in preventing cigarette smoking. Finally, Epstein et al. (1999) noted generalizing the findings to other environmental settings might be limited since the study was conducted with students living in New York.

Study 6). Botvin et al. (2001) assessed the impact of the LST program on a sample of predominately minority students (N=3,621) in 29 New York City junior high schools. The schools were divided into high, medium, or low smoking prevalence. The schools were randomly assigned to the intervention group (16 schools) or control group (13 schools). The intervention group received 15 lessons in seventh grade and 10 booster lessons in eighth grade, and the control group received the program that was normally
taught in the schools. A self-reporting questionnaire was used to collect the data. The students were pretested in seventh grade, posttested three months later, at the end of eighth grade, and one year later. The findings indicated that students who received the LST program reported less smoking, drinking, and poly-drug use as compared to the control group. The results also indicated that students who received the LST program scored higher on knowledge, smoking intentions, and normative expectations regarding smoking compared to the control group. The authors reported that although the study was conducted on a predominately minority population (61% African American, 22% Hispanic, 6% Asian) one should be cautious in making judgments on the effectiveness of LST on other minority sub-groups in different environmental settings.

Study 7). A study of the effectiveness of the LST program was recently conducted outside the New York area. Zollinger, Saywell, Muegge, Wooldridge, Cummings, and Caine (2003) conducted a study from 1997-2000 on the effects of the LST program on tobacco use among middle school students in grades six to eight in Marion County, Indiana inner city school system. The population sample (N= 1598) was 59% African American and 31% Caucasian. The study compared the extent of smoking of students who received the LST program compared to students who did not receive the program. They also compared tobacco use behavior, anti-smoking attitudes, and general knowledge about smoking among students who received the intervention (LST) and those in the control group. The findings indicated that students exposed to the LST program reported a reduction in smoking and an improvement in self-efficacy, anti-smoking attitudes, and general knowledge about smoking. The researchers indicated several
flaws, including self-reporting errors, students not completing the full LST curriculum, and selection bias due to student turnover.

**Limitations of Existing Research**

There are major limitations of the existing research on school-based tobacco prevention programs. First, a majority of prevention research has historically been conducted with predominately white, suburban youth (Botvin, 1980, 1983, 1993). Secondly, the small number of prevention studies on minority youth, principally African Americans teenagers, has primarily been conducted with urban and inner city youth (Botvin, 1998, 2001). Botvin and fellow researchers have been fairly successful in expanding research on the LST program to various minority populations (Botvin, 1999, 2001, Epstein, 1999). However, virtually all of Botvin’s studies on minority groups including African Americans were conducted within the New York City school system (Botvin, 1999, 2001, Epstein, 1999). Therefore, not much is known concerning the effectiveness of LST with African American youth in other cultural settings in the United States. Since there is lack of research data concerning the efficacy of the LST program with African American students in Louisiana, the factors that provide adolescents with the ability to resist tobacco smoking may be substantially different and a different prevention approach might be necessary. LST’s generic skills training approach might be adequate or perhaps a more culturally focused prevention approach might be needed. In conclusion, finding an effective smoking prevention program is particularly important considering the high smoking rates of African Americans in Louisiana and the overall consequences to their physical health.
**Theoretical Foundations**

Understanding why teenagers start smoking is an extremely complex process involving many factors. An integral part of this process is understanding the underlying conceptual models in developmental and social psychology that appear to explain the processes involved in the initiation of smoking among adolescents. Being familiar with theoretical frameworks on why adolescents start smoking is essential in order to understand how to prevent smoking. Developmental and social psychology theories are vital in identifying direct and indirect influences on why teenagers begin smoking. These theories are also important in explaining the processes leading to the initiation of smoking and providing the underlying conceptual framework for the LST program and other effective smoking prevention programs.

**Cognitive Developmental Theory**

Piaget’s theory, one of the most recognized and prominent cognitive developmental theories, focuses on the origin and nature of intellectual development. A child’s cognitive development, informational acquisition, and decision-making processes are important in understanding smoking initiation. Piaget explains that a child utilizes two intellectual processes through an adaptive interaction with the environment: (1) assimilation (incorporation of concepts into existing cognitive structures), and (2) accommodation (modification of cognitive processes) (Piaget, 1972). Piaget identifies four stages of intellectual development: 1) sensory-motor development (birth to 2 years); 2) preoperational period (2 to 7 years); 3) concrete operational period (7 to 11 years); and 4) formal operational period (11 to 15 years).
Key components of Piaget’s theory are that an individual uses knowledge and cognitions to make decisions and is continually adapting to their social environment. Based on Piaget’s theory, smoking initiation appears to involve both decision-making processes and responses to social influences. By the time a child reaches middle school they have learned that smoking is unhealthy and have been taught the dangers of smoking cigarettes. Despite the knowledge that smoking is dangerous, many adolescents still experiment with cigarettes and some progress to smoking on a regular basis. Drawing on Piaget’s view of intellectual development, a situation occurs during smoking initiation in which “social adaptation” supersedes “intellectual adaptation” or, in other words, social influences sometimes override concrete knowledge (Evans et al., 1978). Therefore, an individual who is against smoking for health reasons might become a smoker due to social pressures.

**Theory of Psychosocial Development**

Erikson’s model involving eight psychosocial stages has greatly influenced and contributed to the field of developmental psychology. The eight stages include: (1) trust vs. mistrust (zero to one year); (2) autonomy vs. shame and doubt (two to three years); (3) initiative vs. guilt (four to five years); (4) industry vs. inferiority (6 to 11 years); (5) identity vs. role diffusion (12 to 18 years); (6) intimacy vs. isolation (young adulthood); (7) generativity vs. stagnation (middle adulthood); and (8) ego integrity vs. despair (later adulthood) (Erikson, 1968). Psychosocial stages four and five are important in understanding the initiation of smoking. During stage four, a lack of confidence can be a barometer to determine initial smoking behavior (Evans, et al., 1978). An individual’s desire to fit in and be accepted coupled with peer pressure can greatly determine if
someone will experiment with cigarettes. In stage five, adolescents struggle with self-identity and self-esteem issues which can influence smoking behavior.

**Social Learning Theory**

The most widely recognized theory that provides an underlying conceptual basis for current prevention programs, such as the Life Skills Program, is Bandura’s modeling theory. Bandura’s theory suggests that behavior is learned through modeling and reinforcement (Bandura, 1977). It emphasizes the importance of “reciprocal determination” which is defined as a “continuous mutual interaction between self-generated and environmental determinants in exploring human behavior” (Evans et al. 1978, p. 77). Principally, the theory hypothesizes that parents and friends directly influence smoking behavior by setting example and reinforcing behavior. In order to acquire a behavior, Bandura postulates that adolescents acquire behaviors through direct observation and imitation (Bandura, 1977). Bandura later expanded on his modeling theory by identifying direct modeling and cognitive mediation as important influences to behavior acquisition (Bandura, 1977). In his modified social learning theory model, Bandura recognized other factors that directly affect behavior acquisition. He identified two constructs, self-efficacy and outcome expectations, that are influenced by direct observation of role models. For instance, an adolescent’s expectation about cigarette smoking or their beliefs about the consequences of smoking are directly correlated to observation of significant others. This theory suggests that observing a peer smoking cigarettes may diminish the ability to refuse cigarettes. Secondly, Bandura proposes that role models can influence adolescent self-efficacy (the belief that one can perform a certain behavior). Simply “observing” a peer purchasing or smoking cigarettes, for
example, can increase an adolescent’s skill and knowledge about how to purchase and smoke cigarettes.

**Cognitive-Affective Models**

Cognitive-affective theorists have proposed other cognitive processes that can affect smoking behavior. Cognitive-affective theorists (Ajzen, 1985; Ajzen & Fishbein, 1980) claim that behaviors are influenced indirectly through cognitive-affective processes. Ajzen (1985) in his Theory of Planned Behavior (TOPB) suggests that “intentions” are the immediate determinants of behavior. According to Ajzen (1985), intentions are produced by three factors: attitudes towards the behavior, normative beliefs, and self-efficacy. TOPB proposes that factors other than these constructs do directly influence adolescent behavior, but is limited to shaping these constructs (Ajzen, 1985). Ajzen and Fishbein (1980) claim that the more positive attitude and favorable normative belief a person has towards a behavior, the stronger the person’s intention to perform that specific behavior. For instance, the more favorable attitude an adolescent has towards smoking cigarettes the greater likelihood he/she will try smoking.

**Cognitive Developmental Model**

The Cognitive Developmental Model (CDM) was formulated by Hirschman, Leventhal, & Glynn (1984). This model includes several components that predispose a teenager to become a smoker. One essential feature of this model is the idea that teenagers are not passive respondents who because of lack of social skills or refusal skills are defenseless against the social pressures to smoke. Hirschman et al. (1984) argue that teenagers self-regulate their behavior rather than passively accede to social pressure to smoke. Another feature of CDM is its focus on affective responses to stimuli and the
influence of these responses on perception, interpretation, and memory of the stimuli (Hirschman et al., 1984). This model maintains that tobacco addiction follows a predetermined course from non-smoker to regular smoker. This addiction pathway includes four distinct stages: 1) the preparatory stage, 2) the initial experimenting stage, 3) the becoming-a-smoker stage, and 4) the identity-as-a-smoker stage (Hirschman et al., 1984). According to Hirschman et al. (1984), since an individual’s motivation to move from one stage to another is inconsistent, it is necessary to utilize different strategies to prevent an individual from reaching the higher stages.

CDM suggests categorizing smoking prevention strategies on how effective they are in each stage of the smoking addiction pathway. For instance, teenagers would be taught different prevention strategies depending on whether they are a non-smoker, a novice smoker or an addicted smoker. Hirschman et al. (1984) claim their model is most effective in discouraging smokers from progressing from experimentation to regular smoker. They admit that some prevention programs are effective in preventing some teenagers from experimenting with cigarette smoking or moving from stage one to stage two. However, they believe that other programs become ineffective to prevent movement from stage two to stage three. The authors contend that since their model deals with the cognitions and affective responses of experimenting smokers and their connection with their past experiences, then CDM complements the social skills approach to smoking prevention by discouraging experimenting smokers to become regular smokers.

Hirschman et al. (1984) suggest CDM complements the social skills prevention programs in several important ways. This program (1) makes a connection between cognitive process and the social pressure to smoke; (2) demonstrates that despite the lack
of social pressure to smoke teenagers can still become regular smokers; (3) allows for self-determination and a more active role in establishing their status as a smoker or non-smoker; (4) focuses on the evolving smoking category of an individual and is concerned with the process of becoming a smoker as well as the end result of the process; (5) takes into account that teenagers have different responses to the process of smoking initiation; and (6) acknowledges that a teenager’s previous history of smoking is important regarding how others interpret his/her smoking behavior. For example, is the teenager experimenting, conforming to his peers, or physically addicted?

Communication Persuasive Theory

Another essential contribution to the theoretical framework of smoking prevention is the communication model. McGuire’s Communication Persuasive Theory (CPT) emphasizes the persuasive nature of communication and the impact it has on behavior. McGuire (1969) identifies five communication processes: attention, comprehension, yielding, retention, and action. These can be used to explain why teenagers begin smoking. An individual must first be paying attention for any communication process to begin. The content of the message must be comprehended, and then the individual needs to yield or agree with the overall message to obtain the desired affect. Retention is a very important factor in order to change an individual’s belief system and to retain information to challenge contradictory messages. Finally, action or behavioral change is a result of the communication process. Communication skills can be a powerful tool in preventing smoking among youth. McGuire’s communication model (1969) includes a very useful strategy called inoculation, which can be employed to change attitudes. The inoculation approach proposes that existing
attitudes and beliefs can be reinforced by inoculating an individual against counter arguments. Inoculation is a way to introduce a prevention concept and then provide the skills to deter smoking among youth. For example, using this strategy could inoculate teenagers against social influences that pressure them to smoke. This approach is utilized in several prevention programs where an adolescent is presented with information about different types of social pressures to smoke and is followed up by the introduction of coping strategies to resist these types of pressures.

Problem-Behavior Theory

The Problem-Behavior Theory is concerned with how an individual’s behavior is shaped by a set of complex interactions between the individual and their environment. Jessor & Jessor (1977) explain that adolescent risk-taking behavior cannot be attributed to a single source, but rather is a result of the relationship among three categories (systems) of psychosocial variables. These categories are: (1) the personality system which includes values, expectations, beliefs, attitudes, and orientations toward self and society; (2) the perceived environmental system that consists of perceptions of friends’ and parents’ attitudes toward social behaviors; and (3) the behavior system which is concerned with socially unacceptable behaviors and risk-taking behaviors including alcohol, tobacco, drug use, and delinquency (Jessor & Jessor, 1977).

The Problem-Behavior Theory was instrumental in establishing life skill strategies to decrease risk-taking behaviors. According to (Jessor & Jessor, 1977), psychosocial systems include variables that generate controls on problem behaviors. The stronger these control variables become, the less likely problem behaviors will occur.
Jessor’s (1992) more recent work has identified two additional psychosocial systems that influence the “overall proneness for problem behaviors.” The updated Problem-Behavior Theory recognizes the concept of the ‘social environment’, which consists of poverty and family structure factors and the ‘biology/genetics’ construct, which takes into account variables such as a family history of substance abuse and high intelligence (Jessor, 1992). The ‘biology/genetics’ component may be useful in identifying youth who have a genetic predisposition for certain problem behaviors, such as tobacco use. The ‘social environment’ may be beneficial in validating a correlation between low academic performance and risk-taking behaviors. In addition, Jessor (1992) noted that these variables are interconnected and by developing skills to change these variables, problem behaviors can be influenced. For instance, if adolescents have a clear understanding of their values and beliefs and then utilize critical thinking to analyze their social environment, they may be less likely to begin cigarette smoking.

Social Influence Theory

The Social Influence Theory is derived from Bandura’s (1977) social learning theory and the inoculation theory developed by McGuire (1964). Social Influence Theory postulates that adolescents will be influenced by social pressure to participate in risk-taking behaviors such as smoking cigarettes. These social pressures include “peer pressure, models of smoking parents, and smoking-related messages in the mass media that feature attractive smokers” (Evans et al., 1979, p. 78). The Social Influence Model proposes that smoking initiation is greatly influenced by social factors and that teenagers tend to model smoking behavior exhibited by peers, significant adults, and the media. This model suggests that there is a lack of social or refusal skills with regard to cigarette
smoking. Implicit in this model is the supposition that through health education and the acquisition of social skills, teenagers can learn how to refuse to smoke. This theory evolved from prevention research that found programs that simply discussed the consequences of smoking and utilized fear to reduce smoking behaviors were largely unsuccessful. The Social Influence Theory emphasizes that “fear induced by knowledge of the long-term dangers of smoking appears to be insufficient to prevent its onset among many young adolescents, when exposed to social pressure to engage in the behavior” (PAHO, 2001, p. 16).

A meta-analysis by Hansen et al. (1991) indicated that social influence programs were more effective than programs that relied on information-only education. Social Influence Theory was pioneered in the late seventies in smoking prevention programs by Evans et al. (1978). The term currently used to describe this approach is “peer resistance education” and many substance abuse prevention programs utilize this approach. The typical program based on social influence model employs social resistance training by educating teenagers on the dangers of smoking, teaching peer resistance skills, and changing attitudes about tobacco use.

Competence-Building Model

Competence-building model proposes that teaching young children interpersonal cognitive problem solving skills can reduce and prevent impulsive behaviors. Research by Shure and Spivack (1980) indicated that children display different levels of interpersonal cognitive skills. Some children demonstrated positive social behaviors while others demonstrated early high-risk behaviors that include antisocial behaviors, low frustration tolerance, and poor peer relationships (Shure & Spivack, 1980). This primary
prevention model emphasizes improving the ability to consider alternate solutions to interpersonal problems, and increasing the ability to realize the consequences of one’s behavior. A connection was found between positive social adjustment and possessing problem solving skills among young children as well as in adolescents (Shure & Spivack, 1980). The goal of this model is to develop interpersonal cognitive problem-solving skills in early childhood in order to prevent more severe problems later on in life. In this model, skill building consists of activities such as solving hypothetical dilemmas, role-playing, and thinking out loud while continually receiving feedback. The research showed that competence-building training resulted in the improvement of everyday coping skills among preschool and kindergarten children compared to children who did not receive the training (Shure & Spivack, 1980. Research found children that were taught these cognitive problem solving skills were better able to understand the consequences of their behaviors, develop alternative solutions to everyday problems, cope with frustration, decrease impulsivity, and reduce aggressive behaviors and overreactions when not receiving immediate gratification (Shure & Spivack, 1980).

Theory of Multiple Intelligences

Prior to 1993, the existing belief about human intelligence consisted of a precise set of cognitive abilities that included primarily verbal-linguistic and mathematical-logical aptitudes. In 1993 Howard Gardner published “Frames of Mind,” in which he proposed that there existed a variety of human intelligences that encompass a wide assortment of thinking capacities. Gardner (1993) theorized that human beings are born with eight intelligences that include linguistic, logical/mathematical, musical, spatial, bodily/kinesthetic, naturalist, interpersonal, and intrapersonal intelligences. He suggested
that individuals possess different capabilities and they use their various intelligences to develop skills and solve problems (Gardner, 1993).

The theory of multiple intelligences has important implications for teaching life skills to prevent smoking. Teachers who recognize the existence of multiple intelligences can adopt their teaching styles and classroom instruction to incorporate a wide variety of teaching methods. Traditionally, instruction is based on the premise that students learn best through verbal and mathematical approaches. Based on this theory, teachers can incorporate different teaching styles to tap into the other intelligences. By using interactive and participatory learning strategies, teachers could encourage the children to use spatial, naturalist, intrapersonal, and interpersonal intelligences to develop skills to both resist smoking and learn how to reduce smoking (PAHO, 2001).

Other researchers have studied the importance of interpersonal intelligence, the ability to understand and determine the feelings and intentions of others, and intrapersonal intelligence, the ability to understand your own feelings and motivations (Goleman, 1997; Hawkins, Catalano, & Miller, 1992). Goleman (1997) concluded that “knowing how to manage one’s emotions is at least as important for success in life as intellect” (PAHO, 2001, p. 17). Social and emotional learning approaches to smoking prevention have recently been investigated (Hawkins et al., 1992). Hawkins et al (1992) found that learning how to manage one’s feelings can be a factor in preventing substance abuse.

Resilience and Risk Theory

The Resilience and Risk Theory proposes that there are protective factors that counteract risk factors. The theory suggests that individuals who possess these protective
factors are better able to cope with stress and adversity than others. Resilience theory contends that children who have strong protective factors can resist harmful behaviors that are a result of social stressors and risk factors.

Protective factors are separated into external and internal factors. Examples of internal protective factors include positive self-esteem, good decision-making skills, and assertiveness, while external factors center on social supports from family and community and positive role models (Luthar & Zigler, 1991; Rutter, 1987). Bernard (1991) identified other protective factors that produce resiliency in children, which include social competence, problem solving skills, autonomy, and sense of purpose.

According to Meyer and Farrell (1998), although some children have multiple risk factors in their lives, resilient children have “protective qualities, including caring and supportive relationships, high expectations, and opportunities for youth participation and involvement” (p. 472). Resilience theory provides an important aspect of the conceptual basis of a life skills training approach to smoking prevention.

Theories on adolescent psychosocial development (Erikson, 1968, Piaget, 1972), social learning (Bandura, 1977), cognitive development (Ajzen, 1985; Gardner, 1993; Hirschman, 1984; Shure & Spivack, 1980), communication (McGuire, 1969), problem behavior (Jessor & Jessor, 1977), and resiliency (Luthar & Zigler, 1991; Rutter, 1987) have contributed to understanding the causes of smoking initiation. Researchers have drawn on these theories to develop effective intervention strategies and programs to prevent or reduce tobacco use among adolescents.
CHAPTER 3

METHODOLOGY

The primary purpose of this study was to examine the influence of a school-based substance abuse prevention program on reducing smoking behavior among sixth grade African American students in Louisiana.

This chapter presents information on the procedures that were used in conducting this study. This chapter is divided into six sections: (1) research design, (2) human subjects review, (3) population and sample, (4) instrumentation, (5) data collection procedures, and (6) data analysis.

Research Design

The study used a quasi-experimental non-equivalent control group design (Campbell & Stanley, 1963) since random assignment of individual subjects to treatment groups was not feasible within the existing school system.

Human Subjects Review

This study was approved by the Louisiana State University Institutional Review Board for Research with Human Subjects (IRB# 2565). To assure confidentiality, students were only identified by code numbers and individual names were not linked in the data set; student records were kept in a locked file cabinet at the school board office; and database information was stored in a computer that requires an access code to enter.

Population and Sample

The study used a non-probability sampling design. The target population for this study was defined as sixth grade African American students in Louisiana. The accessible population was 68 sixth grade African American students currently enrolled in one
middle school in South Central Louisiana. The sample was 100% of the defined accessible population.

**Instrumentation**

A seven-part instrument (Appendix C) was utilized for data collection.

Part I of the instrument consisted of questions on selected demographic characteristics.

Part II of the instrument consisted of a measure of decision-making ability: a six item Decision-Making Scale (Botvin et al., 2001).

Part III of the instrument consisted of two measures of assertiveness: a 10-item General Assertiveness Scale (Botvin et al., 2001) and a five item Smoking Refusal Scale (Botvin et al., 2001).

Part IV of the instrument consisted of a measure of attitudes about smoking cigarettes: a five item Anti-Smoking Attitudes Scale (Botvin et al., 2001).

Part V of the instrument consisted of measures of normative beliefs about smoking among peers and adults (Botvin et al., 2001).

Part VI of the instrument consisted of a scale to measure the frequency of cigarette smoking.

Part VII of the instrument consisted of a scale to measure the intention to smoke cigarettes.

Each part of the instrument is discussed in more detail below.

**Part I – Demographic Profile**

This part of the instrument consisted of conventional survey questions to collect demographic information, which were derived from relevant literature. The demographic
information collected included: age, ethnicity, gender, living arrangements, grades, and socio-economic status.

Part II – Decision-Making Scale

Decision-making ability was measured using Botvin’s (2001) modified six item Decision-Making Scale (Table 1) that was derived from a nine item Coping Inventory (Wills, 1986) which was a modified version of the 35-item Bugen & Hawkins’s Coping Assessment Battery (1981).

TABLE 1

Decision-Making Ability Measured by Botvin’s Modified Six Item Decision-Making Scale (2001)

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<tr>
<th>Never</th>
<th>Almost Never</th>
<th>Sometimes</th>
<th>Almost Always</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

When I have a problem or need to make an important decision I:
1. Get the information needed to make the best choice.
2. Stop before doing anything to be sure I understand what the problem or decision is.
3. Think of as many possible choices or ways of solving the problem as I can.
4. Think about what will happen for each choice before doing anything.
5. Make the best choice and then do it.
6. I compromise to get something positive from the situation.

A factor analysis was conducted on the nine item Coping Inventory (Wills, 1986) that included items on active strategies to gather information, solve problems, and choose appropriate actions. All nine items had a factor loading above .50. The validity of the Coping Scale was confirmed by a previous study (Wills, 1986), which found a factor structure similar to the original Bugen & Hawkins’s Coping Assessment Battery (1981). Botvin et al. (2001) shortened the Wills nine item Coping Inventory to a six item decision-making subscale that was suitable for adolescents. This six item decision-making subscale has been well-documented and utilized in previous studies with
adolescents (Epstein et al., 1999; Trudeau et al., 2003). Responses were scored by using a five point anchored scale ranging from (1) never to (5) almost always. The Cronbach’s alpha reliability coefficient was calculated in previous research (Botvin et al., 2001) at .89, which demonstrates good internal consistency.

Part III – Assertiveness Scales

A shortened 15-item version of the 40-item Gambrill and Richey Assertion Inventory (1975), adapted for adolescents, was used to measure general assertiveness ability and resisting smoking use offers. The 15-item abbreviated assertiveness scale was divided into two subscales.

The first subscale is a 10-item scale (Table 2) that lists several situations in which an individual might have to assert himself/herself in some way (Botvin et al., 2001).

<table>
<thead>
<tr>
<th>Table 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Assertiveness Ability Measured by Botvin’s Modified 10-Item General Assertiveness Scale (2001)</td>
</tr>
<tr>
<td><strong>Definitely would</strong></td>
</tr>
<tr>
<td>1</td>
</tr>
</tbody>
</table>

How likely would you be to do the following things?

1. Tell someone if they give you less change (money) than you’re supposed to get back after you pay for something.
2. Say “no” to someone who asks to borrow money from you.
3. Tell someone to go to the end of the line if they try to cut in line ahead of you.
4. Tell people your opinion, even if you know they will not agree with you.
5. Ask someone for a favor.
6. Start a conversation with someone you would like to know better.
7. Return defective merchandise to a store.
8. Ask someone out for a date.
9. Tell people when you feel they have done something that is unfair to you.
10. Request the return of a borrowed item.
Researchers have discovered that some adolescents find it difficult to assert themselves in certain interpersonal situations. Respondents were asked to rate their individual assertive behavior skills in specific social conditions and indicate the likelihood of displaying a certain behavior in a social interaction.

General assertiveness ability was measured by a five point Likert-type scale ranging from 1 (definitely would) to 5 (definitely would not). Several research studies have used the modified assertiveness scale and have substantiated the test-retest reliability of a reduced set of items (Botvin et al., 1992, 1999, 2001; Epstein et al., 1999). The reliability of the modified assertiveness scale was determined from previous research studies (Botvin et al., 2001; Epstein et al., 1999; Trudeau et al., 2003). The Cronbach’s alpha reliability coefficient was calculated in previous research at .83 which demonstrates good internal consistency (Botvin et al., 2001).

The second subscale (Table 3) is a five item scale that Botvin et al. (2001) adapted from the Gambrill and Richey Assertion Inventory (1975) that measures the ability to resist offers to smoke.

**TABLE 3**

**Smoking Refusal Ability Measured by Botvin’s Modified Five Item Smoking Refusal Scale (2001)**

<table>
<thead>
<tr>
<th>Definitely would</th>
<th>Probably would</th>
<th>Not sure</th>
<th>Probably would not</th>
<th>Definitely would not</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

If someone asked you to smoke?

1. Tell them “no” or “no thanks.”
2. Tell them not now.
3. Change the subject.
4. Tell them you don’t want to do it.
5. Make up an excuse and leave.
The smoking refusal scale includes five items measured on a five point Likert-type scale ranging from 1 (definitely would) to 5 (definitely would not) assessing the likelihood that subjects will use various refusal techniques, if offered cigarettes. Previous studies have used the smoking refusal scale (Botvin et al., 2001; Epstein et al., 1999; Trudeau et al., 2003) and have determined the scale shows good reliability (Cronbach’s alpha = .86).

Part IV – Anti-Smoking Attitudes Scale

Perceived social benefits and anti-attitudes about cigarette smoking were assessed using a five item scale (Table 4) that Botvin et al. (2001) derived from the Teenager’s Self-Test: Cigarette Smoking Inventory (U.S. Public Health Service, 1974).

**TABLE 4**

Anti-Smoking Attitudes Measured by Botvin’s Modified Five Item Anti-Smoking Attitudes Scale (2001)

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

1. Smoking cigarettes makes you look cool.
2. Smoking cigarettes is a good way of dealing with your problems.
3. Kids who smoke cigarettes are more grown up.
4. Kids who smoke cigarettes have more friends.
5. Smoking cigarettes lets you have more fun.

The five items chosen for the anti-smoking attitude scale were selected from the larger 64-item inventory that assessed characteristics of smokers, social benefits of smoking, and the health consequences of smoking. The items were selected based on age appropriateness. Respondents was scored with values ranging from (1) strongly disagree to (5) strongly agree. The validity of the Anti-Smoking Attitudes Scale was confirmed
by a previous research studies (Botvin et al., 2001, Epstein et al., 1999; Griffin et al., 1998). The Cronbach’s alpha reliability coefficient was calculated from previous research (Botvin et al., 2001, Epstein et al., 1999; Griffin et al., 1998) and demonstrated good internal consistency (Cronbach’s alpha = 0.85).

A real benefit of this measure is that it has already been used with an African American cohort (Epstein et al., 1999). Although the study was only conducted with inner city adolescents, this measure could be used with African American rural youth with some confidence.

Part V – Normative Beliefs about Smoking

Many adolescents have misconceptions about the prevalence of smoking among youth and adults. Adolescents tend to overestimate how many people smoke cigarettes and the acceptability of tobacco use. Adolescents that perceive smoking as normal and acceptable are more likely to experiment with tobacco.

Two items were used to measure the subjects’ normative beliefs concerning the prevalence of smoking use among peers and adults. A five point anchored scale ranging from 1 (none) to 5 (all or almost all) was used to measure the subjects’ beliefs about “how many people their age they think smoke cigarettes” and “how many adults they think smoke cigarettes” (Botvin et al., 2001).

Part VI – Smoking Status

A nine point anchored scale was used to measure the frequency of cigarettes smoked. The scale range is from 1 (never) to 9 (more than once a day).
Part VII – Behavioral Intention to Smoke Cigarettes

A five point Likert-type scale was used to measure the intention to smoke cigarettes in the next two years. Because prevalence rates for smoking are often low (11.9%) among sixth grade students in Louisiana (LOPH, 2002), behavioral intention to smoke cigarettes was measured using a Likert-type scale range from 1 (definitely not) to 5 (definitely will).

**Data Collection Procedures**

The seven-part self-reporting instrument (Appendix C) was used for data collection. The data was collected using the following procedures.

Permission to conduct the study was granted from the Superintendent of the school district where the middle school is located. The entire sixth grade class of seventy-five students was asked to participate in the study. A parental consent form (Appendix A) was sent to all parents requesting permission to allow their children to participate in the study. A student assent form (Appendix B) written at a sixth grade reading level was given to all sixth grade students participating in the study. Even though all students participated in the study, the data from African American students was used in accomplishing the study objectives. The reason all students were included was to avoid a novelty or disruption effect that would have been caused by separating the seven non-African American students.

The study was conducted in (6) sixth grade classes in which three classes were randomly assigned to the treatment group and three classes to the control group. One teacher was assigned to implement the 18-lesson “Life Skills Training Program” curriculum (intervention) in three classes (experimental group). The students in the
remaining three classes (control group) received no treatment. The teachers provided
instructions and administered the self-reporting instrument during a regular 50-minute
classroom period. The teacher taught the experimental group three lessons a week for six
consecutive weeks during the months of January, February, and March, 2006. A total of
68 sixth grade African American students completed the pretest and posttest. The
accessible population, therefore, was comprised of 68 sixth grade African American
students.

Prior to the study, the teacher assigned to the experimental group attended a two-
day, 12-hour workshop, on how to implement the curriculum. The teacher was instructed
on the rationale of the program, the content and concepts of the program, and interactive
teaching techniques.

**Data Analysis**

Data analysis procedures are described below for each objective. In all cases, the
alpha level of statistical significance was set a’priori at .05. All data was analyzed using
the SPSS Data Analysis System.

The descriptors developed by Davis (1971) were used to interpret correlation
coefficients. The descriptors are as follows:

.70 or higher indicates very strong association

.50 - .69 indicates substantial association

.30 - .49 indicates moderate association

.10 - .29 indicates low association

.01 - .09 indicates negligible association
Objective one of the study was to describe sixth grade African American students in Louisiana on selected demographic characteristics, which include age, gender, living arrangements, academic performance, and socio-economic status. Since the variables in this section are all categorical (nominal or ordinal) in nature, the data analysis to accomplish this objective included the frequencies and percentages in categories for each of the identified variables.

Objective two of the study was to describe sixth grade African American students in Louisiana on the following selected psychological characteristics: general assertiveness ability, decision-making ability, smoking refusal ability, anti-smoking attitudes, and normative beliefs about peer and adult smoking. The data analysis to accomplish this objective included the mean and standard deviation for each of the items in each of the sub-scales. In addition, each of the sub-scales was summarized as the overall mean of the items included in the sub-scale and then each of these sub-scales was summarized using the overall mean and standard deviation of the subjects.

Objective three of the study was to describe sixth grade African American students in Louisiana on their self-reported extent of smoking behavior. This variable was measured as the frequency of smoking behavior reported by subjects in the study on a nine point scale designed to represent this construct. The scale included the following descriptors: 1 = “Never,” 2 = “A few times but not in the past year,” 3 = “A few times a year,” 4 = “Once a month,” 5 = “A few times a month,” 6 = “Once a week,” 7 = “A few times a week,” 8 = “Once a day,” and 9 = “More than once a day.” The data analysis to accomplish this objective included frequencies and percentages for each response. Means and standard deviations were computed for both the pretest and posttest responses.
Objective four of the study was to describe sixth grade African American students in Louisiana on their self-reported intention to smoke cigarettes. This variable was measured as the likelihood of smoking cigarettes in the next two years reported by subjects in the study on a five point Likert-type scale that ranged from 1 (definitely not) to 5 (definitely will). The data analysis to accomplish this objective included frequencies and percentages for each response. Means and standard deviations were computed for both the pretest and posttest responses.

Objective five of the study was to determine if a model exists explaining a significant portion of the variance in self-reported extent of smoking behavior among sixth grade African American students in Louisiana from the following treatment, psychological, and demographic characteristics: (a) Whether or not the student participated in the school-based substance abuse prevention program; (b) Decision-making ability (as measured by Botvin’s six item modified version (Botvin et al., 2001) of the Bugen and Hawkin’s Coping Assessment Battery (1981)); (c) General assertiveness ability (as measured by Botvin’s 10-item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975)); (d) Smoking refusal ability (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975)); (e) Anti-smoking attitudes (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Teenager’s Self-Test: Cigarette Smoking Scale (U.S. Public Health Service, 1974)); (f) Normative beliefs about peer smoking (as measured by the subjects’ beliefs about the prevalence of smoking use among peers) (Botvin et al., 2001); (g) Normative beliefs about adult smoking (as measured by the subjects’ beliefs about the prevalence of smoking use
among adults) (Botvin et al., 2001); (h) Age; (i) Gender; (j) Living arrangements (as measured by three items regarding who the respondent lives with most of the time); (k) Academic performance (as measured by self-reported grades in school); and (l) Socio-economic status (as measured by whether or not students received free or reduced lunch in school).

The data analysis to accomplish this objective included a multiple regression analysis with the extent of smoking behavior score entered into the analysis as the dependent variable and each of the specified potential predictors entered into the analysis as independent measures. Variables treated as independent variables were entered into the regression analysis in three successive steps (blocks). Stepwise entry of the independent variables was used within each step of the analysis because of the exploratory nature of the study. This regression analysis was conducted using the following procedures: (1) As the first step in the analysis (block number one) the demographic variables (age, living arrangements, socio-economic status, academic performance, and gender) were entered stepwise into the regression analysis to identify any significant effects of these variables on the dependent measure; (2) The second step of the analysis (block number two) included the six psychological measures (general assertiveness ability, smoking refusal ability, decision-making ability, anti-smoking attitudes, normative beliefs about peer smoking, and normative beliefs about adult smoking) entered stepwise into the regression analysis since the literature indicates that one or more of these variables have a likelihood of making an impact on the smoking behavior of study subjects; and (3) finally, the variable, whether or not the student participated in the school-based substance abuse prevention program, was entered as the
third step (block number three) in the analysis to determine if participation in this program explained any additional variance over that explained by the control variables.

Objective six of the study was to determine if a model exists explaining a significant portion of the variance in self-reported intention to smoke cigarettes among sixth grade African American students in Louisiana from the following treatment, psychological, and demographic characteristics: (a) Whether or not the student participated in the school-based substance abuse prevention program; (b) Decision-making ability (as measured by Botvin’s six item modified version (Botvin et al., 2001) of the Bugen and Hawkins’ Coping Assessment Battery (1981)); (c) General assertiveness ability (as measured by Botvin’s 10-item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975)); (d) Smoking refusal ability (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975)); (e) Anti-smoking attitudes (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Teenager’s Self-Test: Cigarette Smoking Scale (U.S. Public Health Service, 1974)); (f) Normative beliefs about peer smoking (as measured by the subjects’ beliefs about the prevalence of smoking use among peers) (Botvin et al., 2001); (g) Normative beliefs about adult smoking (as measured by the subjects’ beliefs about the prevalence of smoking use among adults) (Botvin et al., 2001); (h) Age; (i) Gender; (j) Living arrangements (as measured by three items regarding who the respondent lives with most of the time); (k) Academic performance (as measured by self-reported grades in school); and (l) Socio-economic status (as measured by whether or not students received free or reduced lunch in school).
The data analysis to accomplish this objective included a multiple regression analysis with the intention to smoke cigarettes score entered into the analysis as the dependent variable and each of the specified potential predictors entered into the analysis as independent measures. Variables treated as independent variables were entered into the regression analysis in three successive steps (blocks). Stepwise entry of the independent variables was used within each step of the analysis because of the exploratory nature of the study. This regression analysis was conducted using the following procedures: (1) As the first step in the analysis (block number one) the demographic variables (age, living arrangements, socio-economic status, academic performance, and gender) were entered stepwise into the regression analysis to identify any significant effects of these variables on the dependent measure; (2) The second step of the analysis (block number two) included the six psychological measures (general assertiveness ability, smoking refusal ability, decision-making ability, anti-smoking attitudes, normative beliefs about peer smoking, and normative beliefs about adult smoking) entered stepwise into the regression analysis since the literature indicates that one or more of these variables have a likelihood of making an impact on the smoking behavior of study subjects; and (3) finally, the variable, whether or not the student participated in the school-based substance abuse prevention program, was entered as the third step (block number three) in the analysis to determine if participation in this program explained any additional variance over that explained by the control variables.

Hypothesis one was that sixth grade African American students in Louisiana who participate in the school-based substance abuse prevention program will report a lower extent of self-reported extent of smoking behavior than sixth grade African American
students who have not participated in the school-based substance abuse prevention program. This hypothesis was accomplished by comparing the self-reported extent of smoking among the subjects who participated in the school-based substance abuse prevention program (experimental group) with those who do not participate in the school-based substance abuse prevention program (control group). The analysis of covariance (ANCOVA) procedure was utilized to compare the posttest measurements when controlling for pretest scores.

Hypothesis two was that sixth grade African American students in Louisiana who participate in the school-based substance abuse prevention program will report lower intention to smoke cigarettes than sixth grade African American students who have not participated in the school-based substance abuse prevention program. This hypothesis was accomplished by comparing the self-reported intention to smoke cigarettes among the subjects who participated in the school-based substance abuse prevention program (experimental group) with those who do not participate in the school-based substance abuse prevention program (control group). The analysis of covariance (ANCOVA) procedure was utilized to compare the posttest measurements when controlling for pretest scores.

Hypothesis three was that among sixth grade African American students, there was a negative relationship between self-reported extent of smoking behavior score and each of the following psychological characteristics (such that lower levels of self-reported smoking behavior was associated with higher measurements on each of the specified psychological characteristics):
a. Decision-making ability (as measured by Botvin’s six item modified version (Botvin et al., 2001) of the Bugen and Hawkin’s Coping Assessment Battery (1981)). The data analysis used to test this portion of the hypothesis included the calculation of a Pearson Product Moment correlation coefficient between the self-reported extent of smoking behavior score and the decision-making ability score of the study subjects.

b. General assertiveness ability (as measured by Botvin’s 10-item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975)). The data analysis used to test this portion of the hypothesis included the calculation of a Pearson Product Moment correlation coefficient between the self-reported extent of smoking behavior score and the general assertiveness ability score of the study subjects.

c. Smoking refusal ability (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975)). The data analysis used to test this portion of the hypothesis included the calculation of a Pearson Product Moment correlation coefficient between the self-reported extent of smoking behavior score and the smoking refusal ability score of the study subjects.

d. Anti-smoking attitudes (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Teenager’s Self-Test: Cigarette Smoking Scale (U.S. Public Health Service, 1974)). The data analysis used to test this portion of the hypothesis included the calculation of a Pearson Product Moment correlation
coefficient between the self-reported extent of smoking behavior score and the anti-smoking attitudes score of the study subjects.

e. Normative beliefs about peer smoking (as measured by the subjects’ beliefs about the prevalence of smoking use among peers) (Botvin et al., 2001). The data analysis used to test this portion of the hypothesis included the calculation of a Pearson Product Moment correlation coefficient between the self-reported extent of smoking behavior score and the normative beliefs about peer smoking score of the study.

f. Normative beliefs about adult smoking (as measured by the subjects’ beliefs about the prevalence of smoking use among adults) (Botvin et al., 2001). The data analysis used to test this portion of the hypothesis included the calculation of a Pearson Product Moment correlation coefficient between the self-reported extent of smoking behavior score and the normative beliefs about adult smoking score of the study subjects.

Hypothesis four was that among sixth grade African American students, there was a negative relationship between self-reported intention to smoke cigarettes and each of the following psychological characteristics (such that lower levels of self-reported intentions to smoke cigarettes was associated with higher measurements on each of the specified psychological characteristics):

a. Decision-making ability (as measured by Botvin’s six item modified version (Botvin et al., 2001) of the Bugen and Hawkin’s Coping Assessment Battery (1981)). The data analysis used to test this portion of the hypothesis included the calculation of a Pearson Product Moment correlation coefficient
between the self-reported intention to smoke cigarettes score and the decision-making ability score of the study subjects.

b. General assertiveness ability (as measured by Botvin’s 10-item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975)). The data analysis used to test this portion of the hypothesis included the calculation of a Pearson Product Moment correlation coefficient between the self-reported intention to smoke cigarettes score and the general assertiveness ability score of the study subjects.

c. Smoking refusal ability (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975)). The data analysis used to test this portion of the hypothesis included the calculation of a Pearson Product Moment correlation coefficient between the self-reported intention to smoke cigarettes score and the smoking refusal ability score of the study subjects.

d. Anti-smoking attitudes (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Teenager’s Self-Test: Cigarette Smoking Scale (U.S. Public Health Service, 1974)). The data analysis used to test this portion of the hypothesis included the calculation of a Pearson Product Moment correlation coefficient between the self-reported intention to smoke cigarettes score and the anti-smoking attitudes score of the study subjects.

e. Normative beliefs about peer smoking (as measured by the subjects’ beliefs about the prevalence of smoking use among peers) (Botvin et al., 2001). The data analysis used to test this portion of the hypothesis included the
calculation of a Pearson Product Moment correlation coefficient between the self-reported intention to smoke cigarettes score and the normative beliefs about peer smoking score of the study.

f. Normative beliefs about adult smoking (as measured by the subjects’ beliefs about the prevalence of smoking use among adults) (Botvin et al., 2001). The data analysis used to test this portion of the hypothesis included the calculation of a Pearson Product Moment correlation coefficient between the self-reported intention to smoke cigarettes score and the normative beliefs about adult smoking score of the study subjects.

Hypothesis five was that sixth grade African American students in Louisiana who have participated in the school-based substance abuse prevention program will exhibit higher levels of each of the following psychological characteristics than sixth grade African American students who have not participated in the school-based substance abuse prevention program:

a. Decision-making ability (as measured by Botvin’s six item modified version (Botvin et al., 2001) of the Bugen and Hawkin’s Coping Assessment Battery (1981)). This hypothesis was accomplished by comparing the overall decision-making ability score among the subjects who participated in the school-based substance abuse prevention program (experimental group) with those who do not participate in the school-based substance abuse prevention program (control group). This comparison was made using the analysis of covariance (ANCOVA) procedure to compare the posttest measurements when controlling for pretest scores.
b. General assertiveness ability (as measured by Botvin’s 10-item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975)). This hypothesis was accomplished by comparing the overall general assertiveness ability score among the subjects who participated in the school-based substance abuse prevention program (experimental group) with those who do not participate in the school-based substance abuse prevention program (control group). This comparison was made using the analysis of covariance (ANCOVA) procedure to compare the posttest measurements when controlling for pretest scores.

c. Smoking refusal ability (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975)). This hypothesis was accomplished by comparing the overall smoking refusal ability score among the subjects who participated in the school-based substance abuse prevention program (experimental group) with those who do not participate in the school-based substance abuse prevention program (control group). This comparison was made using the analysis of covariance (ANCOVA) procedure to compare the posttest measurements when controlling for pretest scores.

d. Anti-smoking attitudes (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Teenager’s Self-Test: Cigarette Smoking Scale (U.S. Public Health Service, 1974)). This hypothesis was accomplished by comparing the overall anti-smoking attitudes score among the subjects who participated in the school-based substance abuse prevention program
(experimental group) with those who do not participate in the school-based substance abuse prevention program (control group). This comparison was made using the analysis of covariance (ANCOVA) procedure to compare the posttest measurements when controlling for pretest scores.

e. Normative beliefs about peer smoking (as measured by the subjects’ beliefs about the prevalence of smoking use among peers) (Botvin et al., 2001). This hypothesis was accomplished by comparing the overall normative beliefs about peer smoking score among the subjects who participated in the school-based substance abuse prevention program (experimental group) with those who do not participate in the school-based substance abuse prevention program (control group). This comparison was made using the analysis of covariance (ANCOVA) procedure to compare the posttest measurements when controlling for pretest scores.

f. Normative beliefs about adult smoking (as measured by the subjects’ beliefs about the prevalence of smoking use among adults) (Botvin et al., 2001). This hypothesis was accomplished by comparing the overall normative beliefs about adult smoking score among the subjects who participated in the school-based substance abuse prevention program (experimental group) with those who do not participate in the school-based substance abuse prevention program (control group). This comparison was made using the analysis of covariance (ANCOVA) procedure to compare the posttest measurements when controlling for pretest scores.
CHAPTER 4

FINDINGS

Parental consent was received from all 75 sixth grade students enrolled in the participating school. A total of 68 sixth grade African American students completed the baseline survey and the follow-up survey. This chapter presents findings of each objective and hypothesis. The results are organized by the objectives.

Objective One

The first objective of the study was to describe sixth grade African American students on selected demographic characteristics.

Age of Respondents

Respondents were asked to indicate their date of birth. This information was used to calculate their age to the nearest month. The mean age for the sixth grade students was 12.36 years ($SD = .87$). The youngest student was 11.03 years and the oldest was 14.65 years (See Table 5).

TABLE 5
Age of Sixth Grade African American Students in Louisiana

<table>
<thead>
<tr>
<th>Age in Years</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.00 – 11.99</td>
<td>23</td>
<td>33.8</td>
</tr>
<tr>
<td>12.00 – 12.99</td>
<td>31</td>
<td>45.6</td>
</tr>
<tr>
<td>13.00 – 13.99</td>
<td>13</td>
<td>19.1</td>
</tr>
<tr>
<td>14 and higher</td>
<td>1</td>
<td>1.5</td>
</tr>
</tbody>
</table>

Total 68 100.0

Note. The mean age was 12.36 years ($SD = .87$), Range 11.03 to 14.65
Gender of Respondents

Respondents were asked to report their gender. Of the 68 students, 38 (55.9%) indicated they were male, and 30 (44.1%) indicated they were female.

Living Arrangements of the Respondents

To describe the study participants on their living arrangements, respondents were asked to respond to the question, “Who do you live with most of the time?” The options provided for response included several anticipated living arrangements with an option to specify “Other” arrangements if appropriate. Over 35% ($n = 24$) of the respondents reported that they lived with their mother and father (See Table 6). Nearly 21% ($n = 14$) of the respondents reported that they lived with their mother only and almost 18% ($n = 12$) reported they lived with their mother and stepfather. Sixteen respondents (24%) reported that they lived with members of their extended family (grandmother, grandmother and mother, grandparent, uncle, aunt and uncle).

**TABLE 6**
Living Arrangements of Sixth Grade African American Students in Louisiana

<table>
<thead>
<tr>
<th>Living Arrangements</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother and Father</td>
<td>24</td>
<td>35.3</td>
</tr>
<tr>
<td>Mother only</td>
<td>14</td>
<td>20.6</td>
</tr>
<tr>
<td>Mother and Stepfather</td>
<td>12</td>
<td>17.7</td>
</tr>
<tr>
<td>Grandmother</td>
<td>10</td>
<td>14.7</td>
</tr>
<tr>
<td>Grandparent and Mother</td>
<td>3</td>
<td>4.4</td>
</tr>
</tbody>
</table>

(Table cont.)
Stepmother and Father 1 1.5
Father only 1 1.5
Grandparent 1 1.5
Aunt and Uncle 1 1.5
Uncle 1 1.5

Total 68 100.0

**Academic Performance of the Respondents**

Respondents were asked what grades they generally get in school. This information was obtained by asking the respondents to mark one of five grade categories that were provided (mostly A’s, mostly B’s, etc.).

Of the 68 respondents, over 35% (n = 24) reported that they received mostly “C’s” in school. Twenty-three respondents (33.8%) indicated that they received mostly “B’s” in school and none of the respondents (0.0 %) indicated that they received grades of “D’s” or lower” (See Table 7).

**TABLE 7**

Grades of Sixth Grade African American Students in Louisiana

<table>
<thead>
<tr>
<th>Grades</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mostly A’s</td>
<td>14</td>
<td>20.6</td>
</tr>
<tr>
<td>Mostly B’s</td>
<td>23</td>
<td>33.8</td>
</tr>
<tr>
<td>Mostly C’s</td>
<td>24</td>
<td>35.3</td>
</tr>
</tbody>
</table>

(Table cont.)
Socio-Economic Status of the Respondents

Socio-economic status of the respondents was operationally defined in this study as whether or not they received free or reduced lunch at school. Sixty-two respondents (91.2%) indicated that they received free or reduced lunch at school, while six respondents (8.8%) indicated they did not receive free or reduced lunch at school.

Objective Two

Objective two of the study was to describe sixth grade African American students in Louisiana on the following selected psychological characteristics: general assertiveness ability, decision-making ability, smoking refusal ability, anti-smoking attitudes, and normative beliefs about peer and adult smoking. The data analysis to accomplish this objective included the mean and standard deviation for each of the items in each of the subscales. In addition, each of the scales was summarized as the overall mean of the items included in the scale and then each of these scales was summarized using the overall mean and standard deviation of the subjects.

General Assertiveness Ability

To collect information on general assertiveness ability, respondents were given Botvin’s 10-item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975) and were asked “How likely would you be to do the following things.” Responses were reported on a five point Likert-type scale ranging from 1 (definitely would) to 5 (definitely would not). The reliability of the scale was
estimated using the Cronbach’s alpha internal consistency measure. Cronbach’s alpha for this scale was .64. The researcher established guidelines to aid in the interpretation of the mean values. The scale for interpretation of the mean values is as follows: 1.0 – 1.50 = definitely would, 1.51 – 2.50 = probably would, 2.51 – 3.49 = not sure, 3.50 – 4.49 = probably would not, 4.50 – 5.0 = definitely would not. Means and standard deviations were computed for each item for both the pretest and posttest responses.

At pretest, the general assertiveness item that received the highest mean score (M = 1.13, SD = .55) was “Tell someone if they give you less change (money) than you’re supposed to get back after you pay for something.” This item was in the “Definitely would” response category. “Request the return of a borrowed item” (M = 1.27, SD = .72) and “Return defective merchandise to a store” (M = 1.38, SD = .96) were also rated in the “Definitely would” response category. Only one item “Say no to someone who asks to borrow money from you” (M = 2.95, SD = 1.28) was classified in the “Not Sure” response category (See Table 8).

**TABLE 8**

Pretest Measurement of General Assertiveness Ability of Sixth Grade African American Students in Louisiana

<table>
<thead>
<tr>
<th>Items</th>
<th>M</th>
<th>SD</th>
<th>Response Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tell someone if they give you less change (money) than you’re supposed to get back after you pay for something</td>
<td>1.13</td>
<td>.55</td>
<td>Definitely would</td>
</tr>
</tbody>
</table>

(Table cont.)
<table>
<thead>
<tr>
<th>Activity</th>
<th>Mean</th>
<th>SD</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Request the return of a borrowed item</td>
<td>1.27</td>
<td>.72</td>
<td>Definitely would</td>
</tr>
<tr>
<td>Return defective merchandise to the store</td>
<td>1.38</td>
<td>.96</td>
<td>Definitely would</td>
</tr>
<tr>
<td>Tell people when you feel they have done something that is unfair to you</td>
<td>1.60</td>
<td>.83</td>
<td>Probably would</td>
</tr>
<tr>
<td>Tell someone to go to the end of the line if they try to cut in line ahead of you</td>
<td>1.94</td>
<td>1.11</td>
<td>Probably would</td>
</tr>
<tr>
<td>Ask some for a favor</td>
<td>1.95</td>
<td>1.00</td>
<td>Probably would</td>
</tr>
<tr>
<td>Start a conversation with someone you would like to know better</td>
<td>2.00</td>
<td>1.22</td>
<td>Probably would</td>
</tr>
<tr>
<td>Ask someone out for a date</td>
<td>2.11</td>
<td>1.36</td>
<td>Probably would</td>
</tr>
<tr>
<td>Tell people your opinion, even if you know they will not agree with you</td>
<td>2.40</td>
<td>1.28</td>
<td>Probably would</td>
</tr>
<tr>
<td>Say “no” to someone who asks to borrow money from you</td>
<td>2.95</td>
<td>1.28</td>
<td>Not sure</td>
</tr>
<tr>
<td><strong>Overall</strong></td>
<td>1.87</td>
<td>.39</td>
<td>Probably would</td>
</tr>
</tbody>
</table>

**Note.** Overall Means ranged from 1.00 to 290

*a* Mean values based on the response scale: 1 = definitely would, 2 = probably would, 3 = not sure, 4 = probably would not, 5 = definitely would not

*b* Response categories based on the following interpretive scale established by the researcher: 1.0 – 1.50 = definitely would, 1.51 – 2.50 = probably would, 2.51 – 3.49 = not sure, 3.50 – 4.49 = probably would not, 4.50 – 5.0 = definitely would not

Of the ten items in the general assertiveness scale, three had a mean rating in the “Definitely would” response category, six in the “Probably would” response category, and one in the “Not sure” response category. The ten items in the scale were combined to compute a general assertiveness ability score. The Mean general assertiveness ability scale scores ranged from 1.00 to 2.90. The Overall Mean Score ($\bar{M} = 1.87$, $SD = .39$) was in the “Probably would” response category (See Table 8).
At posttest, the general assertiveness item that received the highest mean score 
\( (M = 1.66, SD = 1.05) \) was “Tell someone if they give you less change (money) than 
you’re supposed to get back after you pay for something.” This item classified was 
classified in the “Probably would” response category. Two items “Tell people your 
opinion, even if you know they will not agree with you” \( (M = 2.60, SD = 1.14) \) and “Say 
no to someone who asks to borrow money from you” \( (M = 2.73, SD = 1.14) \) were 
classified in the “Not Sure” response category (See Table 9).

**TABLE 9**
Posttest Measurement of General Assertiveness Ability of Sixth Grade African American 
Students in Louisiana

<table>
<thead>
<tr>
<th>Items</th>
<th>( M )</th>
<th>( SD )</th>
<th>Response Category</th>
</tr>
</thead>
</table>
| Tell someone if they give you less change (money) than you’re supposed 
to get back after you pay for something                             | 1.66   | 1.05   | Probably would   |
| Return defective merchandise to the store                            | 1.76   | 1.00   | Probably would   |
| Request the return of a borrowed item                               | 1.93   | 1.03   | Probably would   |
| Ask some for a favor                                                | 1.95   | 1.00   | Probably would   |
| Tell people when you feel they have done something that is unfair to you | 2.06   | 1.16   | Probably would   |
| Start a conversation with someone you would like to know better      | 2.07   | 1.17   | Probably would   |
| Tell someone to go to the end of the line if they try to cut in line ahead of you | 2.12   | 1.23   | Probably would   |
| Ask someone out for a date                                          | 2.43   | 1.21   | Probably would   |
| Tell people your opinion, even if you know they will not agree with you | 2.60   | 1.14   | Not sure         |

(Table cont.)
Say “no” to someone who asks to borrow money from you  

| Overall | 2.15 | .54 | Probably would |

**Note.** Overall Means ranged from 1.20 to 3.40

^aMean values based on the response scale: 1 = definitely would, 2 = probably would, 3 = not sure, 4 = probably would not, 5 = definitely would not

^bResponse categories based on the following interpretive scale established by the researcher: 1.0 – 1.50 = definitely would, 1.51 – 2.50 = probably would, 2.51 – 3.49 = not sure, 3.50 – 4.49 = probably would not, 4.50 – 5.0 = definitely would not

Eight of the ten items in the general assertiveness scale had a mean rating in the “Probably would” response category. The ten items in the scale were combined to compute a general assertiveness ability score. The Mean general assertiveness ability scale scores ranged from 1.20 to 3.40. The Overall Mean Score (M = 2.15, SD = .54) was in the “Probably would” response category (See Table 9).

**Decision-Making Ability**

To collect information on decision-making ability, respondents were given Botvin’s six item modified version (Botvin et al., 2001) of Bugen and Hawkin’s Coping Assessment Battery (1981) and were asked ‘When I have a problem or need to make an important decision I.” Responses were reported on a five point anchored scale ranging from 1 (never) to 5 (always). The reliability of the scale was estimated using the Cronbach’s alpha internal consistency measure. Cronbach’s alpha for this scale was .76. The researcher established a scale to aid in the interpretation of the mean values. The scale for interpretation of the mean values is as follows: 1.0 – 1.50 = never, 1.51 – 2.50 = almost never, 2.51 – 3.49 = sometimes, 3.50 – 4.49 = almost always, 4.50 – 5.0 = always.

Means and standard deviations were computed for both the pretest and posttest responses.
At pretest, the decision-making ability item that received the highest rating ($M = 3.76$, $SD = 1.16$) was “Make the best choice and then do it.” This item was in the “Almost always” response category. “Stop before doing anything to be sure I understand what the problem or decision is” ($M = 3.70$, $SD = 1.09$), “Think about what will happen for each choice before doing anything” ($M = 3.50$, $SD = 1.19$) and “Think of as many possible choices or ways of solving the problem as I can” ($M = 3.50$, $SD = 1.07$) were also rated in the “Almost always” response category. Two items “Get the information needed to make the best choice” ($M = 3.22$, $SD = .91$) and “I compromise to get something positive from the situation” ($M = 3.06$, $SD = 1.16$) were classified in the “Sometimes” response category. Overall four items had a mean rating in the “Almost always” response category and two items had a mean rating in the “Sometimes” response category. The six items in the scale were combined to compute a decision-making ability score. The Mean decision-making ability scale scores ranged from 1.33 to 5.00 (See Table 10). The Overall Mean Score ($M = 3.44$, $SD = .72$) was in the “Sometimes” response category.

**TABLE 10**

Pretest Measurement of Decision-Making Ability of Sixth Grade African American Students in Louisiana

<table>
<thead>
<tr>
<th>Items</th>
<th>$M$</th>
<th>$SD$</th>
<th>Response Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make the best choice and then do it</td>
<td>3.76</td>
<td>1.16</td>
<td>Almost always</td>
</tr>
<tr>
<td>Stop before doing anything to be sure I understand what the problem or decision is</td>
<td>3.70</td>
<td>1.09</td>
<td>Almost always</td>
</tr>
<tr>
<td>Think about what will happen for each choice before doing anything</td>
<td>3.50</td>
<td>1.19</td>
<td>Almost always</td>
</tr>
</tbody>
</table>

(Table cont.)
Think of as many possible choices or ways of solving the problem as I can 3.50 1.07 Almost always

Get the information needed to make the best choice 3.22 .91 Sometimes

I compromise to get something positive from the situation 3.06 1.16 Sometimes

Overall 3.44 .72 Sometimes

Note. Overall Means ranged from 1.33 to 5.00

a Mean values based on the response scale: 1 = never, 2 = almost never, 3 = sometimes, 4 = almost always, 5 = always

b Response categories based on the following interpretive scale established by the researcher: 1.0 – 1.50 = never, 1.51 – 2.50 = almost never, 2.51 – 3.49 = sometimes, 3.50 – 4.49 = almost always, 4.51 – 5.0 = always

At posttest, the decision-making ability item that received the highest rating (M = 3.70, SD = 1.26) was “Make the best choice and then do it.” This item was in the “Almost always” response category. The remaining five items in the scale were classified in the “Sometimes” response category (See Table 11).

**TABLE 11**
Posttest Measurement of Decision-Making Ability of Sixth Grade African American Students in Louisiana

<table>
<thead>
<tr>
<th>Items</th>
<th>M^a</th>
<th>SD</th>
<th>Response Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make the best choice and then do it</td>
<td>3.70</td>
<td>1.26</td>
<td>Almost always</td>
</tr>
<tr>
<td>Think of as many possible choices or ways of solving the problem as I can</td>
<td>3.48</td>
<td>1.13</td>
<td>Sometimes</td>
</tr>
<tr>
<td>Get the information needed to make the best choice</td>
<td>3.34</td>
<td>1.24</td>
<td>Sometimes</td>
</tr>
</tbody>
</table>

(Table cont.)
Think about what will happen for each 3.33 1.22 Sometimes
choice before doing anything

Stop before doing anything to be sure I 3.31 1.25 Sometimes
understand what the problem or decision is

I compromise to get something positive 3.09 1.16 Sometimes
from the situation

Overall 3.37 .82 Sometimes

Note. Overall Means ranged from 1.00 to 5.00

\(^a\)Mean values based on the response scale: 1 = never, 2 = almost never, 3 = sometimes, 4  = almost always, 5 = always

\(^b\)Response categories based on the following interpretive scale established by the researcher: 1.0 – 1.50 = never, 1.51– 2.50 = almost never, 2.51 – 3.49 = sometimes, 3.50  – 4.49 = almost always, 4.51 – 5.0 = always

The six items in the scale were combined to compute a decision-making ability score. The Mean decision-making ability scale scores ranged from 3.70 to 3.09. The Overall Mean Score (M = 3.37, SD = .82) was in the “Sometimes” response category.

**Smoking Refusal Ability**

To collect information on smoking refusal ability, respondents were given Botvin’s five item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975) and were asked “If someone asked you to smoke.” Responses were reported on a five point Likert-type scale ranging from 1 (definitely would) to 5 (definitely would not). The reliability of the scale was estimated using the Cronbach’s alpha internal consistency measure. Cronbach’s alpha for this scale was .75. The researcher established a scale to aid in the interpretation of the mean values. The scale for interpretation of the mean values is as follows: 1.0 – 1.50 = definitely would, 1.51 – 2.50 = probably would, 2.51 – 3.49 = not sure, 3.50 – 4.49 = probably would not,
4.50 – 5.0 = definitely would not. Means and standard deviations were computed for both the pretest and posttest responses.

At pretest, the smoking refusal item that received the highest rating ($M = 1.30$, $SD = .78$) was “Change the subject.” This item was in the “Definitely would” response category. “Make up an excuse and leave” ($M = 1.37$, $SD = .89$) and “Tell them you don’t want to do it” ($M = 1.42$, $SD = 1.06$) were also rated in the “Definitely would” response category. Only one item “Tell them not now” ($M = 3.21$, $SD = 1.83$) was classified in the “Not Sure” response category. Of the five items in the scale, three had a mean rating in the “Definitely would” response category, one in the “Probably would” response category, and one in the “Not sure” response category. The five items in the scale were combined to compute a smoking refusal ability score. The Mean smoking refusal ability scale scores ranged from 1.00 to 4.80 (See Table 12). The Overall Mean Score ($M = 1.86$, $SD = .87$) was in the “Probably would” response category.

**TABLE 12**

Pretest Measurement of Smoking Refusal Ability of Sixth Grade African American Students in Louisiana

<table>
<thead>
<tr>
<th>Items</th>
<th>M $^a$</th>
<th>SD</th>
<th>Response $^b$ Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change the subject</td>
<td>1.30</td>
<td>.78</td>
<td>Definitely would</td>
</tr>
<tr>
<td>Make up an excuse and leave</td>
<td>1.37</td>
<td>.89</td>
<td>Definitely would</td>
</tr>
<tr>
<td>Tell them you don’t want to do it</td>
<td>1.42</td>
<td>1.06</td>
<td>Definitely would</td>
</tr>
<tr>
<td>Tell them “no” or “no thanks”</td>
<td>2.03</td>
<td>1.69</td>
<td>Probably would</td>
</tr>
<tr>
<td>Tell them not now</td>
<td>3.21</td>
<td>1.83</td>
<td>Not sure (Table cont.)</td>
</tr>
</tbody>
</table>
Overall 1.86 .87 Probably would

Note. Overall Means ranged from 1.00 to 4.80

*aMean values based on the response scale: 1 = definitely would, 2 = probably would, 3 = not sure, 4 = probably would not, 5 = definitely would not

*Response categories based on the following interpretive scale established by the researcher: 1.0 – 1.50 = definitely would, 1.51 – 2.50 = probably would, 2.51 – 3.49 = not sure, 3.50 – 4.49 = probably would not, 4.50 – 5.0 = definitely would not

At posttest, the smoking refusal item that received the highest rating (M = 1.58, SD = 1.25) was “Tell them no or no thanks” (See Table 13). This item was in the “Probably would” response category. “Change the subject (M = 1.72, SD = 1.18), “Tell them you don’t want to do it” (M = 1.73, SD = 1.25) and “Make up an excuse and leave” (M = 1.76, SD = 1.25) and were also rated in the “Probably would” response category. One item “Tell them not now” (M = 2.53, SD = 1.71) was classified in the “Not Sure” response category.

### TABLE 13

Posttest Measurement of Smoking Refusal Ability of Sixth Grade African American Students in Louisiana

<table>
<thead>
<tr>
<th>Items</th>
<th>M</th>
<th>SD</th>
<th>Response Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tell them “no” or “no thanks”</td>
<td>1.58</td>
<td>1.25</td>
<td>Probably would</td>
</tr>
<tr>
<td>Change the subject</td>
<td>1.72</td>
<td>1.18</td>
<td>Probably would</td>
</tr>
<tr>
<td>Tell them you don’t want to do it</td>
<td>1.73</td>
<td>1.25</td>
<td>Probably would</td>
</tr>
<tr>
<td>Make up an excuse and leave</td>
<td>1.76</td>
<td>1.25</td>
<td>Probably would</td>
</tr>
<tr>
<td>Tell them not now</td>
<td>2.53</td>
<td>1.71</td>
<td>Not sure (Table cont.)</td>
</tr>
</tbody>
</table>
Overall Means ranged from 1.00 to 5.00

Note. Overall Means ranged from 1.00 to 5.00

*aMean values based on the response scale: 1 = definitely would, 2 = probably would, 3 = not sure, 4 = probably would not, 5 = definitely would not

*bResponse categories based on the following interpretive scale established by the researcher: 1.0 – 1.50 = definitely would, 1.51 – 2.50 = probably would, 2.51 – 3.49 = not sure, 3.50 – 4.49 = probably would not, 4.50 – 5.0 = definitely would not

Of the five items in the scale, four had a mean rating in the “Probably would” response category and one in the “Not sure” response category. The five items in the scale were combined to compute a smoking refusal ability score. The Mean rating smoking refusal ability scale scores ranged from 1.00 to 5.03 (See Table 13). The Overall Mean Score (M = 1.88, SD = .96) was in the “Probably would” response category.

Anti-Smoking Attitudes

To collect information on anti-smoking attitudes, respondents were given Botvin’s five item modified version (Botvin et al., 2001) of the Teenager’s Self-Test: Cigarette Smoking Scale (U.S. Public Health Service, 1974) and were asked their level of agreement or disagreement regarding each item. Responses were reported on a five point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). The reliability of the scale was estimated using the Cronbach’s alpha internal consistency measure. Cronbach’s alpha for this scale was .78. The researcher established a scale to aid in the interpretation of the mean values. The scale for interpretation of the mean values is follows: 1.0 – 1.50 = strongly disagree, 1.51 – 2.50 = disagree, 2.51 – 3.49 = neither
agree nor disagree, 3.50 – 4.49 = agree, 4.50 – 5.0 = strongly agree. Means and standard deviations were computed for both the pretest and posttest responses.

At pretest, the anti-smoking attitudes item that received the highest rating \( (M = 1.38, \text{SD} = .77) \) was “Smoking cigarettes lets you have more fun”. This item was in the “Strongly disagree” response category. “Smoking cigarettes make you look cool” \( (M = 1.49, \text{SD} = .95) \) was also rated in the “Strongly disagree” response category. The remaining three items were rated in the “Disagree” response category. The five items in the scale were combined to compute an anti-smoking attitudes score. The Mean anti-smoking attitudes scale scores ranged from 1.00 to 5.00 (See Table 14). The Overall Mean Score \( (M = 1.54, \text{SD} = .80) \) was in the “Disagree” response category.

**TABLE 14**

Pretest Measurement of Anti-Smoking Attitudes of Sixth Grade African American Students in Louisiana

<table>
<thead>
<tr>
<th>Items</th>
<th>( M )</th>
<th>SD</th>
<th>Response (^b) Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking cigarettes lets you have more fun</td>
<td>1.38</td>
<td>.77</td>
<td>Strongly disagree</td>
</tr>
<tr>
<td>Smoking cigarettes makes you look cool</td>
<td>1.49</td>
<td>.95</td>
<td>Strongly disagree</td>
</tr>
<tr>
<td>Smoking cigarettes is a good way of dealing with your problems</td>
<td>1.59</td>
<td>.94</td>
<td>Disagree</td>
</tr>
<tr>
<td>Kids who smoke cigarettes have more friends</td>
<td>1.62</td>
<td>1.04</td>
<td>Disagree</td>
</tr>
<tr>
<td>Kids who smoke cigarettes are more grown-up</td>
<td>1.67</td>
<td>1.18</td>
<td>Disagree</td>
</tr>
<tr>
<td>Overall</td>
<td>1.54</td>
<td>.80</td>
<td>Disagree</td>
</tr>
</tbody>
</table>

*Note.* Overall Means ranged from 1.00 to 5.00  
(Table cont.)
At posttest, the anti-smoking attitudes item that received the highest rating ($M = 1.38, SD = .71$) was “Smoking cigarettes lets you have more fun”. This item was in the
“Strongly disagree” response category. “Kids who smoke cigarettes have more friends” ($M = 1.40, SD = .69$) and “Smoking cigarettes makes you look cool” ($M = 1.43, SD = .76$) were also rated in the “Strongly disagree” response category. Two items “Smoking is a good way of dealing with your problems” ($M = 1.51, SD = .82$) and “Kids who smoke cigarettes are more grown-up” ($M = 1.63, SD = 1.06$) were classified in the
“Disagree” response category. The five items in the scale were combined to compute an
anti-smoking attitudes score. The Mean anti-smoking attitudes scale scores ranged from
1.00 to 3.20 (See Table 15). The Overall Mean Score ($M = 1.47, SD = .60$) was in the
“Strongly disagree” response category.

**TABLE 15**

Posttest Measurement of Anti-Smoking Attitudes of Sixth Grade African American
Students in Louisiana

<table>
<thead>
<tr>
<th>Items</th>
<th>$M$</th>
<th>$SD$</th>
<th>Response $^b$ Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking cigarettes lets you have more fun</td>
<td>1.38</td>
<td>.71</td>
<td>Strongly disagree</td>
</tr>
<tr>
<td>Kids who smoke cigarettes have more friends</td>
<td>1.40</td>
<td>.69</td>
<td>Strongly disagree</td>
</tr>
<tr>
<td>Smoking cigarettes makes you look cool</td>
<td>1.43</td>
<td>.76</td>
<td>Strongly disagree</td>
</tr>
</tbody>
</table>

(Table cont.)
Smoking cigarettes is a good way of   1.51  .82 Disagree
dealing with your problems

Kids who smoke cigarettes are more grown-up  1.63  1.06 Disagree

Overall   1.47  .60 Strongly disagree

Note. Overall Means ranged from 1.00 to 3.20

aMean values based on the response scale: 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree

bResponse categories based on the following interpretive scale established by the researcher: 1.0 – 1.50 = strongly disagree, 1.51 – 2.50 = disagree, 2.51 – 3.49 = neither agree nor disagree, 3.50 – 4.49 = agree, 3.50 – 5.0 = strongly agree

Normative Beliefs about Smoking

To collect information on normative beliefs about smoking, respondents were asked to respond to two items “how many people your age do you think smoke cigarettes” and “how many adults do you think smoke cigarettes.” Responses were reported on a five point anchored scale ranging from 1 (none) to 5 (all or almost all).

Mean values were based on the response scale: 1 = none, 2 = less than half, 3 = about half, 4 = more than half, 5 = all or almost all. The researcher established a scale to aid in the interpretation of the mean values. The scale for interpretation of the mean values is follows: 1.0 – 1.50 = none, 1.51 – 2.50 = less than half, 2.51 – 3.49 = about half, 3.50 – 4.49 = more than half, 4.50 – 5.0 = all or almost all. The data analysis to accomplish this objective included frequencies and percentages for each response. Additionally, means and standard deviations were computed for each item at pretest and posttest.

Normative Beliefs about Peer Smoking

At pretest, 24 respondents (39.4%) indicated that they believed about half or more of people their age smoke cigarettes (See Table 16). Of those 24 respondents,
seventeen respondents (27.9%) indicated that “about half” of people their age smoke cigarettes. The overall mean of this item was 2.30 (SD = 1.09).

**TABLE 16**

Pretest Measurement of Sixth Grade African American Students in Louisiana on Their Beliefs about How Many People Their Age Smoke Cigarettes

<table>
<thead>
<tr>
<th>Responses</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>16</td>
<td>26.2</td>
</tr>
<tr>
<td>Less than half</td>
<td>21</td>
<td>34.4</td>
</tr>
<tr>
<td>About half</td>
<td>17</td>
<td>27.9</td>
</tr>
<tr>
<td>More than half</td>
<td>4</td>
<td>6.6</td>
</tr>
<tr>
<td>All or almost all</td>
<td>3</td>
<td>4.9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>61*</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*Seven respondents did not answer this question

Note. M = 2.30 (SD = 1.09)

Note. Mean values based on the response scale: 1 = none, 2 = less than half, 3 = about half, 4 = more than half, 5 = all or almost all

Note. Mean value interpretations based on a scale established by the researcher: 1.0 – 1.50 = none, 1.51 – 2.50 = less than half, 2.51 – 3.49 = about half, 3.50 – 4.49 = more than half, 3.50 – 5.0 = all or almost all

At posttest, 34 respondents (50%) indicated that they believed about half or more of people their age smoke cigarettes (See Table 17). Of those 34 respondents, 21 respondents (30.9%) indicated that “About Half” of people their age smoke cigarettes and 11 respondents (16.2%) indicated that “More than Half” of people their age smoke cigarettes. The overall mean of this item was 2.41 (SD = 1.18)
TABLE 17

Posttest Measurement of Sixth Grade African American Students in Louisiana on Their Beliefs about How Many People Their Age Smoke Cigarettes

<table>
<thead>
<tr>
<th>Responses</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>21</td>
<td>30.9</td>
</tr>
<tr>
<td>Less than half</td>
<td>13</td>
<td>19.1</td>
</tr>
<tr>
<td>About half</td>
<td>21</td>
<td>30.9</td>
</tr>
<tr>
<td>More than half</td>
<td>11</td>
<td>16.2</td>
</tr>
<tr>
<td>All or almost all</td>
<td>2</td>
<td>2.9</td>
</tr>
<tr>
<td>Total</td>
<td>68</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Note.  M = 2.41 (SD = 1.18)

Note.  Mean values based on the response scale: 1 = none, 2 = less than half, 3 = about half, 4 = more than half, 5 = all or almost all

Note.  Mean value interpretations based on a scale established by the researcher: 1.0 – 1.50 = none, 1.51 – 2.50 = less than half, 2.51 – 3.49 = about half, 3.50 – 4.49 = more than half, 3.50 – 5.0 = all or almost all

Normative Beliefs about Adult Smoking

At pretest, 51 respondents (83.6%) indicated that about half or more of adults smoke cigarettes (See Table 18). Of those 51 respondents, 20 respondents (32.8%) indicated that “More than Half” of adults smoke cigarettes and another 20 respondents (32.8%) indicated that “All or Almost All” of adults smoke cigarettes. The overall mean of this item was 3.82 (SD = 1.07).
### TABLE 18

Pretest Measurement of Sixth Grade African American Students in Louisiana on Their Beliefs about How Many Adults Smoke Cigarettes

<table>
<thead>
<tr>
<th>Responses</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Less than half</td>
<td>10</td>
<td>16.4</td>
</tr>
<tr>
<td>About half</td>
<td>11</td>
<td>18.0</td>
</tr>
<tr>
<td>More than half</td>
<td>20</td>
<td>32.8</td>
</tr>
<tr>
<td>All or almost all</td>
<td>20</td>
<td>32.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>61</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Note. $M = 3.82$ (SD = 1.07)

Note. Mean values based on the response scale: 1 = none, 2 = less than half, 3 = about half, 4 = more than half, 5 = all or almost all

Note. Mean value interpretations based on a scale established by the researcher: 1.0 – 1.50 = none, 1.51 – 2.50 = less than half, 2.51 – 3.49 = about half, 3.50 – 4.49 = more than half, 3.50 – 5.0 = all or almost all

 Seven respondents did not answer this question

At posttest, 55 respondents (80.9%) indicated that they believed about half or more of adults smoke cigarettes (See Table 19). Of those 55 respondents, 31 respondents (45.6%) indicated that “More than Half” of adults smoke cigarettes, 14 respondents (20.6%) indicated “About Half” of adults smoke cigarettes, and 10 respondents (14.7%) indicated that “All or Almost All” of adults smoke cigarettes. The overall mean of this item was 3.53 (SD = 1.03).
### TABLE 19

Posttest Measurement of Sixth Grade African American Students in Louisiana on Their Beliefs about How Many Adults Smoke Cigarettes

<table>
<thead>
<tr>
<th>Responses</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>2</td>
<td>2.9</td>
</tr>
<tr>
<td>Less than half</td>
<td>11</td>
<td>16.2</td>
</tr>
<tr>
<td>About half</td>
<td>14</td>
<td>20.6</td>
</tr>
<tr>
<td>More than half</td>
<td>31</td>
<td>45.6</td>
</tr>
<tr>
<td>All or almost all</td>
<td>10</td>
<td>14.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>68</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**Note.** \( M = 3.53 \) (SD = 1.03)

**Note.** Mean values based on the response scale: 1 = none, 2 = less than half, 3 = about half, 4 = more than half, 5 = all or almost all

**Note.** Mean value interpretations based on a scale established by the researcher: 1.0 – 1.50 = none, 1.51 – 2.50 = less than half, 2.51 – 3.49 = about half, 3.50 – 4.49 = more than half, 3.50 – 5.0 = all or almost all

**Objective Three**

Objective three was to describe sixth grade African American students in Louisiana on their self-reported extent of smoking behavior. This variable was measured as the frequency of smoking behavior reported by subjects in the study on a nine point scale designed to represent this construct. The scale included the following descriptors:

1 = “Never,” 2 = “A few times but not in the past year,” 3 = “A few times a year,” 4 = “Once a month,” 5 = “A few times a month,” 6 = “Once a week,” 7 = “A few times a week,” 8 = “Once a day,” and 9 = “More than once a day.” The data analysis to
accomplish this objective included frequencies and percentages for each response. Additionally, means and standard deviations were computed for both the pretest and posttest responses.

At pretest, 57 respondents (90.4%) reported that they never have smoked (See Table 20). Six respondents (9.6%) reported that they had smoked. Of those who reported that they smoked, nearly 5% (n = 3) reported smoking “A few times but not in the past year” and almost 5% (n = 3) reported smoking a “Few times a year”. The overall mean of this item was 1.14 (SD = .47). Mean values were based on the response scale: 1 = “Never,” 2 = “A few times but not in the past year,” 3 = “A few times a year,” 4 = “Once a month,” 5 = “A few times a month,” 6 = “Once a week,” 7 = “A few times a week,” 8 = “Once a day,” and 9 = “More than once a day.” The researcher established a scale to aid in the interpretation of the mean values. The scale for interpretation of the mean values is follows: 1.0 – 1.50 = never, 1.51 – 2.50 = A few times but not in the past year, 2.51 – 3.49 = A few times a year, 3.50 – 4.49 = Once a month, 4.50 – 5.49 = A few times a month, 5.50 – 6.49 = Once a week, 6.50 – 7.49 = A few times a week, 7.50 – 8.49 = Once a day, and 8.50 – 9.00 = More than once a day.

**TABLE 20**

Pretest Measurement of Sixth Grade African American Students in Louisiana on Their Self-Reported Extent of Smoking Behavior

<table>
<thead>
<tr>
<th>Responses</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>57</td>
<td>90.4</td>
</tr>
<tr>
<td>A few times but not in the past year</td>
<td>3</td>
<td>4.8</td>
</tr>
</tbody>
</table>

(Table cont.)
A few times a year 3 4.8

Total 63 100.0

Note. M = 1.14 (SD = .47)

Note. Mean values based on the response scale: 1 = never, 2 = a few times but not in the past year, 3 = a few times a year, 4 = once a month, 5 = a few times a month, 6 = once a week, 7 = a few times a week, 8 = once a day, 9 = more than once a day

Note. Mean value interpretations based on a scale established by the researcher: 1.0 – 1.50 = never, 1.51 – 2.50 = A few times but not in the past year, 2.51– 3.49 = A few times a year, 3.50 – 4.49 = Once a month, 4.50 – 5.49 = A few times a month, 5.50 – 6.49 = Once a week, 6.50 – 7.49 = A few times a week, 7.50 – 8.49 = Once a day, and 8.50 – 9.00 = More than once a day.

Five respondents did not answer this question

At posttest, 61 respondents (89.7%) reported that they never have smoked (See Table 21). Seven respondents (10.3%) reported that they had smoked. Of those who reported that they smoked, nearly 6% (n = 4) reported smoking “A few times but not in the past year” and almost 3% (n = 2) reported smoking a “Few times a year”. One respondent reported smoking “More than once a day”. The overall mean of this item was 1.21 (SD = .82). Mean values were based on the response scale: 1 = “Never,” 2 = “A few times but not in the past year,” 3 = “A few times a year,” 4 = “Once a month,” 5 = “A few times a month,” 6 = “Once a week,” 7 = “A few times a week,” 8 = “Once a day,” and 9 = “More than once a day.” The researcher established a scale to aid in the interpretation of the mean values. The scale for interpretation of the mean values is follows: 1.0 – 1.50 = never, 1.51 – 2.50 = A few times but not in the past year, 2.51– 3.49 = A few times a year, 3.50 – 4.49 = Once a month, 4.50 – 5.49 = A few times a month, 5.50 – 6.49 = Once a week, 6.50 – 7.49 = A few times a week, 7.50 – 8.49 = Once a day, and 8.50 – 9.00 = More than once a day.
TABLE 21

Posttest Measurement of Sixth Grade African American Students in Louisiana on Their Self-Reported Extent of Smoking Behavior

<table>
<thead>
<tr>
<th>Responses</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>61</td>
<td>89.7</td>
</tr>
<tr>
<td>A few times but not in the past year</td>
<td>4</td>
<td>5.9</td>
</tr>
<tr>
<td>A few times a year</td>
<td>2</td>
<td>2.9</td>
</tr>
<tr>
<td>More than once a day</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>68</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Note.  \( M = 1.21 \) (SD = .82)

Note.  Mean values based on the response scale: 1 = never, 2 = a few times but not in the past year, 3 = a few times a year, 4 = once a month, 5 = a few times a month, 6 = once a week, 7 = a few times a week, 8 = once a day, 9 = more than once a day.

Note.  Mean value interpretations based on a scale established by the researcher: 1.0 – 1.50 = never, 1.51 – 2.50 = A few times but not in the past year, 2.51 – 3.49 = A few times a year, 3.50 – 4.49 = Once a month, 4.50 – 5.49 = A few times a month, 5.50 – 6.49 = Once a week, 6.50 – 7.49 = A few times a week, 7.50 – 8.49 = Once a day, and 8.50 – 9.00 = More than once a day.

**Objective Four**

Objective four was to describe sixth grade African American students in Louisiana on their self-reported intention to smoke cigarettes. This variable was measured as the likelihood of smoking cigarettes in the next two years reported by subjects in the study on a five point Likert-type scale that ranged from 1 (definitely not) to 5 (definitely will). Mean values were based on the response scale: 1 = definitely
not, 2 = probably not, 3 = maybe, 4 = probably will, 5 = definitely will. The researcher established a scale to aid in the interpretation of the mean values. The scale for interpretation of the mean values is follows: 1.0 – 1.50 = definitely not, 1.51 – 2.50 = probably not, 2.51 – 3.49 = maybe, 3.50 – 4.49 = probably will, and 4.50 – 5.49 = definitely will. The data analysis to accomplish this objective included frequencies and percentages for each response. In addition, means and standard deviations were computed for both the pretest and posttest responses.

At pretest, almost 83% (n = 52) indicated “Definitely not” regarding their intention to smoke cigarettes (See Table 22). Almost 8% (n = 5) reported that they will “Probably not” smoke and nearly 8% (n = 5) reported that “Maybe” they will smoke. One respondent reported that they “Definitely will” smoke cigarettes. The overall mean of this item was 1.30 (SD = .75).

**TABLE 22**

<table>
<thead>
<tr>
<th>Responses</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definitely not</td>
<td>52</td>
<td>82.5</td>
</tr>
<tr>
<td>Probably not</td>
<td>5</td>
<td>7.9</td>
</tr>
<tr>
<td>Maybe</td>
<td>5</td>
<td>7.9</td>
</tr>
<tr>
<td>Probably will</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Definitely will</td>
<td>1</td>
<td>1.6</td>
</tr>
<tr>
<td>Total</td>
<td>63</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*Note. M = 1.30 (SD = .75)*

(Table cont.)
Note. Mean values based on the response scale: 1 = definitely not, 2 = probably not, 3 = maybe, 4 = probably will, 5 = definitely will

Note. Mean value interpretations based on a scale established by the researcher: 1.0 – 1.50 = definitely not, 1.51 – 2.50 = probably not, 2.51– 3.49 = maybe, 3.50 – 4.49 = probably will, and 4.50 – 5.49 = definitely will

Five respondents did not answer this question.

At posttest, over 85% (n = 58) indicated “Definitely not” regarding their intention to smoke cigarettes (See Table 23). Over 7% (n = 5) reported that they will “Probably not” smoke and nearly 6% (n = 4) reported that “Maybe” they will smoke.

One respondent reported that they “Definitely will” smoke. The overall mean of this item was 1.24 (SD = .63).

**TABLE 23**

Posttest Measurement of Sixth Grade African American Students in Louisiana on Their Self-Reported Intention to Smoke Cigarettes

<table>
<thead>
<tr>
<th>Responses</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definitely not</td>
<td>58</td>
<td>85.3</td>
</tr>
<tr>
<td>Probably not</td>
<td>5</td>
<td>7.4</td>
</tr>
<tr>
<td>Maybe</td>
<td>4</td>
<td>5.9</td>
</tr>
<tr>
<td>Probably will</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Definitely will</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>68</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Note. M = 1.24 (SD = .63)

Note. Mean values based on the response scale: 1 = definitely not, 2 = probably not, 3 = maybe, 4 = probably will, 5 = definitely will

(Table cont.)
Mean value interpretations based on a scale established by the researcher: 1.0 – 1.50 = definitely not, 1.51 – 2.50 = probably not, 2.51 – 3.49 = maybe, 3.50 – 4.49 = probably will, and 4.50 – 5.49 = definitely will

**Objective Five**

Objective five of the study was to determine if a model exists explaining a significant portion of the variance in self-reported extent of smoking behavior among sixth grade African American students in Louisiana from the following treatment, psychological, and demographic characteristics: (a) Whether or not the student participated in the school-based substance abuse prevention program; (b) Decision-making ability (as measured by Botvin’s six item modified version (Botvin et al., 2001) of the Bugen and Hawkin’s Coping Assessment Battery (1981)); (c) General assertiveness ability (as measured by Botvin’s 10-item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975)); (d) Smoking refusal ability (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975)); (e) Anti-smoking attitudes (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Teenager’s Self-Test: Cigarette Smoking Scale (U.S. Public Health Service, 1974)); (f) Normative beliefs about peer smoking (as measured by the subjects’ beliefs about the prevalence of smoking use among peers) (Botvin et al., 2001); (g) Normative beliefs about adult smoking (as measured by the subjects’ beliefs about the prevalence of smoking use among adults) (Botvin et al., 2001); (h) Age; (i) Gender; (j) Living arrangements (as measured by three items regarding who the respondent lives with most of the time); (k) Academic performance (as measured by self-reported grades in school); and (l) Socio-
economic status (as measured by whether or not students received free or reduced lunch in school).

The data analysis to accomplish this objective included a multiple regression analysis with the extent of smoking behavior score entered into the analysis as the dependent variable and each of the specified potential predictors entered into the analysis as independent measures. Variables treated as independent variables were entered into the regression analysis in three successive steps (blocks). Stepwise entry of the independent variables was used within each step of the analysis because of the exploratory nature of the study. This regression analysis was conducted using the following procedures: (1) As the first step in the analysis (block number one) the demographic variables (age, living arrangements, socio-economic status, academic performance, gender) were entered stepwise into the regression analysis to identify any significant effects of these variables on the dependent measure; (2) The second step of the analysis (block number two) included the six psychological measures (general assertiveness ability, smoking refusal ability, decision-making ability, anti-smoking attitudes, normative beliefs about peer smoking, and normative beliefs about adult smoking) entered stepwise into the regression analysis since the literature indicates that one or more of these variables have a likelihood of making an impact on the smoking behavior of study subjects; and (3) finally, the variable, whether or not the student participated in the school-based substance abuse prevention program, was entered as the third step (block number three) in the analysis to determine if participation in this program explained any additional variance over that explained by the control variables.
The demographic independent variables were entered as the first block in the regression model as follows: age, living arrangements, socio-economic status, academic performance, and gender. In conducting the multiple regression analysis, three (3) of the demographic variables were categorical in nature and had to be restructured as dichotomous variables in preparation for entry into the analysis. These variables included gender, living arrangements, and socio-economic status. Since gender is naturally a dichotomy, it did not need to be restructured. Socio-economic status was established as a dichotomous variable and was entered into regression equations as “received free or reduced lunch” or “did not receive free or reduced lunch.”

The variable, living arrangements, was measured in ten categories of response. However, the responses in all the categories of response except “Mother and Father” (n = 24 or 35.3%), “Mother only” (n = 14 or 20.6%), and Mother and Stepfather (n = 12 or 17.7%) (See Table 6) were judged by the researcher to be inadequate to use as separate independent variables in the analysis. For the variable, living arrangements, each of these three categories were established as a separate dichotomous variable. For example, each respondent was classified as either living with Mother and Father or not living with Mother and Father, etc. Each of these dichotomous variables was then entered into the regression analysis.

For descriptive purposes, two-way correlations between factors used as independent variables in the regression (seven demographic variables, six psychological variables, and the variable whether or not the student participated in the school-based substance abuse prevention program) and the dependent variable, extent of smoking behavior, are presented in Table 24.
The variable, “Smoking Refusal Ability”, had the highest association with the dependent variable, extent of smoking behavior ($r = .36, p = .001$). This relationship as characterized using Davis’ descriptors was a moderate association (Davis, 1971). The nature of this relationship was such that sixth grade African American students with higher smoking refusal ability scores tended to have lower extent of smoking behavior scores. For this instance a positive correlation is indicative of a negative relationship since lower values represented higher scores for “Smoking Refusal Ability” (e.g., Definitely would = 1, Definitely would not = 5).

Two other variables, “Decision-Making Ability” and “Academic Performance”, were also identified as having moderate associations with the dependent variable. The correlation between “Decision-Making Ability” ($r = -.34, p = .002$) and extent of smoking behavior indicated that those with higher decision-making scores tended to have lower extent of smoking behavior scores.

The correlation between “Academic Performance” ($r = .32, p = .004$) and extent of smoking behavior indicated that those with higher academic performance (as measured by self-reported grades with lower values indicative of higher grades, e.g., mostly A’s = 1, D’s or lower = 5) tended to have lower extent of smoking behavior scores.

The variables, “Age” ($r = .27, p = .014$), “Anti-Smoking Attitudes” ($r = .26, p = .017$), and “Living with Mother and Stepfather” ($r = .22, p = .039$) had low associations with the dependent variable.

The correlation between “Anti-Smoking Attitudes” and extent of smoking behavior indicated that those with higher anti-smoking attitude scores tended to have
lower extent of smoking behavior scores. In this instance a positive correlation is indicative of a negative relationship since lower values represented higher scores for “Anti-Smoking Attitudes” (e.g., Strongly Disagree = 1, Strongly Agree = 5).

The correlation between “Age” and extent of smoking behavior indicated that younger students tended to have lower extent of smoking behavior scores.

The correlation between “Living with Mother and Stepfather” and extent of smoking behavior indicated that sixth grade African American students who lived with their mother and stepfather tended to have lower extent of smoking behavior scores than those who did not live with their mother and stepfather.

The relationship between the remaining eight independent variables and extent of smoking behavior was not statistically significant.

**TABLE 24**

Relationship between Selected Demographic and Psychological Characteristics and Extent of Smoking Behavior among Sixth Grade African American Students in Louisiana

<table>
<thead>
<tr>
<th>Variable</th>
<th>r</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking refusal ability</td>
<td>.36</td>
<td>.001</td>
</tr>
<tr>
<td>Decision making ability</td>
<td>-.34</td>
<td>.002</td>
</tr>
<tr>
<td>Academic performance</td>
<td>.32</td>
<td>.004</td>
</tr>
<tr>
<td>Age</td>
<td>.27</td>
<td>.014</td>
</tr>
<tr>
<td>Anti-smoking attitudes</td>
<td>.26</td>
<td>.017</td>
</tr>
<tr>
<td>Living with Mother and Stepfather</td>
<td>.22</td>
<td>.039</td>
</tr>
<tr>
<td>Living with Mother and Father</td>
<td>-.15</td>
<td>.113</td>
</tr>
</tbody>
</table>

(Table cont.)
<table>
<thead>
<tr>
<th>Variable</th>
<th>Beta</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Living with Mother</td>
<td>-.13</td>
<td>.148</td>
</tr>
<tr>
<td>Normative Beliefs About Peer Smoking</td>
<td>.11</td>
<td>.182</td>
</tr>
<tr>
<td>Socio-economic status</td>
<td>-.08</td>
<td>.262</td>
</tr>
<tr>
<td>Participated in the substance abuse prevention program</td>
<td>-.02</td>
<td>.432</td>
</tr>
<tr>
<td>General Assertiveness</td>
<td>.01</td>
<td>.467</td>
</tr>
<tr>
<td>Normative Beliefs about Adult Smoking</td>
<td>.007</td>
<td>.477</td>
</tr>
<tr>
<td>Gender</td>
<td>-.006</td>
<td>.479</td>
</tr>
</tbody>
</table>

*Note. n = 68*

*Interpretation was based on Davis’ Descriptors: .70 or higher = very strong association; .50 - .69 = substantial association; .30 - .49 = moderate association; .10 to .29 = low association; and .01 to .09 = negligible association.*

The next step in conducting the multiple regression analysis was to examine the independent variables to be included in the analysis and determine if any of these variables were collinear. There are several methods used to identify multicollinearity, however, Lewis-Beck (1980) indicated that the most powerful method for assessing multicollinearity is to “regress each independent variable on all the other independent variables” (p. 60). This method uses cumulative $R^2$ to examine the interrelationships of each independent variable pairwise and in combination (Lewis-Beck, 1980). High collinearity is present when cumulative $R^2$ approaches 1.0 (Lewis-Beck, 1980). In the current study, the cumulative $R^2$ was examined for all the independent variables and no cases of collinearity were found.
The results of the multiple regression analysis utilizing extent of smoking behavior as the dependent variable is presented in Table 25. Examination of the overall regression model (See Table 25) reveals that a model was identified that explained a significant amount of the variance in extent of smoking behavior ($F_{3,64} = 4.966, p = .004$). The model summary presents the significant variables that entered the model at each step (block) of the multiple regression analysis.

In the first block of the regression analysis which examined demographic measures, the variable “Academic Performance” entered the regression equation as a significant explanatory variable. Considered alone, this variable explained 9.9% of the variance ($F = 7.281, p = .009$) in the dependent variable, extent of smoking behavior (See Table 25). Academic performance, therefore, was found to be a significant contributing factor to the regression model in explaining the variance in extent of smoking behavior. The nature of the influence of this factor was such that sixth grade African American students with higher academic performance (as measured by self-reported grades) tended to have lower extent of smoking behavior. None of the other demographic characteristics that were entered into the analysis were found to be significant explanatory factors.

In the second block, which examined the six psychological measures included in the study, “Smoking Refusal Ability” entered the regression model as a significant explanatory factor. This variable explained an additional 8.3% of the variance ($F = 6.582, p = .013$) in extent of smoking behavior (See Table 25). “Smoking Refusal Ability,” therefore, was found to be a significant contributor to the model in explaining the variance in extent of smoking behavior. The nature of the influence of this factor was such that sixth grade African American students with higher smoking refusal ability
scores tended to have lower extent of smoking behavior. None of the other psychological measures included in the second block of the analysis were found to significantly contribute to the regression model.

In the last step “Whether or not the student participated in the school-based substance abuse prevention program” was entered into the regression analysis. This variable was not found to make a significant contribution to the explanatory model ($F = .525, p = .471$). Additionally, when the variable was entered into the model, the amount of explained variable that it contributed was only .7%.

Therefore the three variables that were included in the model “Academic Performance,” “Smoking Refusal Ability,” and “Whether or not the student participated in the school-based substance abuse prevention program” explained a total of 18.9% of the variance in the extent of smoking behavior among sixth grade African American students in Louisiana.

**TABLE 25**

**Multiple Regression Analysis of the Extent of Smoking Behavior on Selected Demographic and Psychological Characteristics of Sixth Grade African American Students in Louisiana**

<table>
<thead>
<tr>
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<th>df</th>
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<th>p</th>
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<tbody>
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<td>.004</td>
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<td>Residual</td>
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<td>.572</td>
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</tr>
<tr>
<td>Total</td>
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(Table cont.)
<table>
<thead>
<tr>
<th>Variable</th>
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<th>R^2</th>
<th>F</th>
<th>Sig. F</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Change</td>
<td>Change</td>
<td>Change</td>
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<td></td>
</tr>
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<td>Block 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>.315</td>
<td>.099</td>
<td>.099</td>
<td>7.281</td>
<td>.009</td>
<td>.279</td>
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</tr>
<tr>
<td>Smoking Refusal Ability</td>
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<td>.182</td>
<td>.083</td>
<td>6.582</td>
<td>.013</td>
<td>.257</td>
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<tr>
<td>Participated in the substance abuse prevention program</td>
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<td>.189</td>
<td>.007</td>
<td>.525</td>
<td>.471</td>
<td>.138</td>
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<td></td>
</tr>
<tr>
<td>18.9% variance explained</td>
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<tr>
<td>Variables not in the Equation</td>
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<tr>
<td>Variable</td>
<td>t</td>
<td>sig t</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Age</td>
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<td>.095</td>
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<tr>
<td>Anti-Smoking Attitudes</td>
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<tr>
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<td>Decision making ability</td>
<td>-1.567</td>
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<td>.122</td>
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<td>Gender</td>
<td>1.075</td>
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<td>Living with Mother</td>
<td>-1.030</td>
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</table>

(Table cont.)
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Normative Beliefs about Peer Smoking</td>
<td>1.016</td>
<td>.314</td>
</tr>
<tr>
<td>General Assertiveness Ability</td>
<td>-.817</td>
<td>.417</td>
</tr>
<tr>
<td>Living with Mother and Father</td>
<td>-.602</td>
<td>.549</td>
</tr>
<tr>
<td>Normative Beliefs about Adult Smoking</td>
<td>.463</td>
<td>.645</td>
</tr>
<tr>
<td>Socio-economic status</td>
<td>-.353</td>
<td>.725</td>
</tr>
</tbody>
</table>

An effect size was determined using the multiple regression coefficient, $R^2$ (Cumulative). The effect size was interpreted using a set of descriptors developed by Cohen (1988) where: (a) .2600 or higher = large effect size; (b) .1300 - .2600 = medium effect size; and (c) .0196 - .1300 = small effect size. The cumulative $R^2$ for the multiple regression analysis was .189 indicating a medium effect size.

**Objective Six**

Objective six of the study was to determine if a model exists explaining a significant portion of the variance in self-reported intention to smoke cigarettes among sixth grade African American students in Louisiana from the following treatment, psychological, and demographic characteristics: (a) Whether or not the student participated in the school-based substance abuse prevention program; (b) Decision-making ability (as measured by Botvin’s six item modified version (Botvin et al., 2001) of the Bugen and Hawkin’s Coping Assessment Battery (1981)); (c) General assertiveness ability (as measured by Botvin’s 10-item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975)); (d) Smoking refusal ability (as measured by Botvin’s 5-item modified version (Botvin et al., 2001) of the
Gambrill and Richey Assertion Inventory (1975)); (e) Anti-smoking attitudes (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Teenager’s Self-Test: Cigarette Smoking Scale (U.S. Public Health Service, 1974)); (f) Normative beliefs about peer smoking (as measured by the subjects’ beliefs about the prevalence of smoking use among peers) (Botvin et al., 2001); (g) Normative beliefs about adult smoking (as measured by the subjects’ beliefs about the prevalence of smoking use among adults) (Botvin et al., 2001); (h) Age; (i) Gender; (j) Living arrangements (as measured by three items regarding who the respondent lives with most of the time); (k) Academic performance (as measured by self-reported grades in school); and (l) Socio-economic status (as measured by whether or not students received free or reduced lunch in school).

The data analysis to accomplish this objective included a multiple regression analysis with the intention to smoke cigarettes score entered into the analysis as the dependent variable and each of the specified potential predictors entered into the analysis as independent measures. Variables treated as independent variables were entered into the regression analysis in three successive steps (blocks). Stepwise entry of the independent variables was used within each step of the analysis because of the exploratory nature of the study. This regression analysis was conducted using the following procedures: (1) As the first step in the analysis (block number one) the demographic variables (age, living arrangements, socio-economic status, academic performance, and gender) were entered stepwise into the regression analysis to identify any significant effects of these variables on the dependent measure; (2) The second step of the analysis (block number two) included the six psychological measures (general
assertiveness ability, smoking refusal ability, decision making ability, anti-smoking attitudes, normative beliefs about peer smoking, and normative beliefs about adult smoking) entered stepwise into the regression analysis since the literature indicates that one or more of these variables have a likelihood of making an impact on the smoking behavior of study subjects; and (3) finally, the variable, whether or not the student participated in the school-based substance abuse prevention program, was entered as the third step (block number three) in the analysis to determine if participation in this program explained any additional variance over that explained by the control variables.

The demographic independent variables were entered as the first block in the regression model as follows: age, living arrangements, socio-economic status, academic performance, and gender. In conducting the multiple regression analysis, three (3) of the demographic variables were categorical in nature and had to be prepared as dichotomous variables in preparation for entry into the analysis. These variables included gender, living arrangements, and socio-economic status. Since gender is naturally a dichotomy, it did not need to be restructured. Socio-economic status was established as a dichotomous variable and was entered into regression equations as “received free or reduced lunch” or “did not receive free or reduced lunch.”

The variable, living arrangements, was measured in ten categories of response. However, the responses in all the categories of response except “Mother and Father” (n = 24 or 35.3%), “Mother only” (n = 14 or 20.6%), and “Mother and Stepfather” (n = 12 or 17.7%) were judged by the researcher to be inadequate to use as separate independent variables in the analysis (See Table 6). For the variable, living arrangements, each of these three categories were established as a separate dichotomous variable. For example,
each respondent was classified as either living with Mother and Father or not living with Mother and Father, etc. Each of these dichotomous variables was then entered into the regression analysis.

For descriptive purposes, two-way correlations between factors used as independent variables in the regression (seven demographic variables, six psychological variables, and the variable whether or not the student participated in the school-based substance abuse prevention program) and the dependent variable, the intention to smoke cigarettes are presented in Table 26.

The variable, “Decision-Making Ability”, had the highest association with the dependent variable, intention to smoke cigarettes ($r = -.49$, $p < .001$) (See Table 26). This relationship as characterized using Davis’ descriptors was a moderate association (Davis, 1971). The nature of this relationship was such that sixth grade African American students with higher decision-making ability scores tended to have lower intention to smoke cigarette scores.

One other relationship “Anti-Smoking Attitudes” ($r = .37$, $p = .001$) was identified also as a moderate association (See Table 26). The nature of this relationship was such that sixth grade African American students with higher anti-smoking attitude scores tended to have lower intention to smoke cigarette scores. In this instance a positive correlation is indicative of a negative relationship since lower values represented higher scores for “Anti-Smoking Attitudes” (e.g., Strongly Disagree = 1, Strongly Agree = 5).

The variables, “Smoking Refusal Ability” ($r = .26$, $p = .018$); “Academic Performance” ($r = .24$, $p = .024$), and “Living with Mother and Father” ($r = .22$, $p = .039$) had low associations with the dependent variable. The correlation between “Smoking
Refusal Ability” and intention to smoke cigarettes indicated that those with higher smoking refusal ability scores tended to have lower intention to smoke scores. For this instance a positive correlation is indicative of a negative relationship since lower values represented higher scores for “Smoking Refusal Ability” (e.g., Definitely would = 1, Definitely would not = 5).

The correlation between “Academic Performance” and intention to smoke cigarettes indicated that those with higher academic performance scores (as measured by self-reported grades with lower values indicative of higher grades, e.g., mostly A’s = 1, D’s or lower = 5) tended to have lower intention to smoke scores.

The correlation between “Living with Mother and Father” and intention to smoke indicated that sixth grade African American students who live with their mother and father tended to have lower intention to smoke cigarettes scores than those who did not live with their mother and father. The relationship between the remaining nine independent variables and intention to smoke cigarettes was not found to be statistically significant.

**TABLE 26**

<table>
<thead>
<tr>
<th>Variable</th>
<th>r</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decision making ability</td>
<td>-.49</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Anti-smoking attitudes</td>
<td>.37</td>
<td>.001</td>
</tr>
<tr>
<td>Smoking refusal ability</td>
<td>.26</td>
<td>.018</td>
</tr>
</tbody>
</table>

(Table cont.)
<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic performance</td>
<td>.24</td>
<td>.024</td>
</tr>
<tr>
<td>Living with Mother and Father</td>
<td>.22</td>
<td>.039</td>
</tr>
<tr>
<td>Gender</td>
<td>-.19</td>
<td>.057</td>
</tr>
<tr>
<td>Age</td>
<td>.17</td>
<td>.085</td>
</tr>
<tr>
<td>General Assertiveness</td>
<td>-.17</td>
<td>.088</td>
</tr>
<tr>
<td>Normative Beliefs about Adult Smoking</td>
<td>.15</td>
<td>1.09</td>
</tr>
<tr>
<td>Living with Mother</td>
<td>-.13</td>
<td>.137</td>
</tr>
<tr>
<td>Normative Beliefs about Peer Smoking</td>
<td>.13</td>
<td>.145</td>
</tr>
<tr>
<td>Socio-economic status</td>
<td>.05</td>
<td>.345</td>
</tr>
<tr>
<td>Participated in the substance abuse prevention program</td>
<td>-.02</td>
<td>.432</td>
</tr>
<tr>
<td>Living with Mother and Stepfather</td>
<td>.01</td>
<td>.465</td>
</tr>
</tbody>
</table>

**Note. n = 68**

*Interpretation was based on Davis’ Descriptors: .70 or higher = very strong association; .50 - .69 = substantial association; .30 - .49 = moderate association; .10 to .29 = low association; and .01 to .09 = negligible association.*

The next step in conducting the multiple regression analysis was to examine the independent variables to be included in the analysis and determine if any of these variables were collinear. There are several methods used to identify multicollinearity, however, Lewis-Beck (1980) indicated that the most powerful method for assessing multicollinearity is to “regress each independent variable on all the other independent variables” (p. 60). This method uses cumulative $R^2$ to examine the interrelationships of
each independent variable pair wise and in combination (Lewis-Beck, 1980). High
collinearity is present when cumulative $R^2$ approaches 1.0 (Lewis-Beck, 1980). In the
current study, the cumulative $R^2$ was examined for all the independent variables and no
cases of collinearity were found.

The results of the multiple regression analysis utilizing intention to smoke
cigarettes as the dependent variable are presented in Table 27. Examination of the
overall regression model reveals that a model was identified that explained a significant
amount of the variance in intention to smoke cigarettes ($F_{6,61} = 8.831, p < .001$). The
model summary presents the significant variables that entered the model at each step (block) of the multiple regression analysis.

In the first block of the regression analysis which examined demographic
measures, the variable “Academic Performance” entered the regression equation as a
significant explanatory variable. Considered alone, this variable explained 5.8 % of the
variance ($F = 4.061, p = .048$) in the dependent variable, intention to smoke cigarettes.
Academic performance, therefore, was found to be a significant contributor in explaining
the variance in intention to smoke cigarettes. The nature of the influence of this factor
was such that sixth grade African American students with higher academic performance
(as measured by self-reported grades) tended to have lower intentions to smoke

In the first block, one additional variable, “Living with Mother and Father”,
entered the regression equation as a significant explanatory variable. This variable
explained an additional 6.5% of the variance ($F = 4.800, p = .032$) in intention to smoke
cigarettes (See Table 27). Living with mother and father, therefore, was found to be a
significant contributor in explaining the variance in intention to smoke cigarettes. The nature of the influence of this factor was such that sixth grade African American students who live with their mother and father tended to have lower intentions to smoke cigarettes than those who did not live with their mother and father.

In the second block, which examined the six psychological measures included in the study, “Decision-Making Ability” was first to enter the regression equation as a significant explanatory variable. This variable explained an additional 18% of the variance ($F = 16.483, p < .001$) in intention to smoke cigarettes (See Table 27). Decision-making ability, therefore, was found to be a significant contributor in explaining the variance in intention to smoke cigarettes. The nature of the influence of this factor was such that sixth grade African American students with higher levels of decision-making ability tended to have lower intentions to smoke cigarettes.

In the second block, two additional variables entered the regression model as significant explanatory variables (See Table 27). These variables were “General Assertiveness Ability” and “Anti-Smoking Attitudes”. “General Assertiveness Ability” explained an additional 7.3% of the variance ($F = 8.173, p = .006$) in intention to smoke cigarettes. General assertiveness ability, therefore, was found to be a significant contributor in explaining the variance in intention to smoke cigarettes. The nature of the influence of this factor was such that sixth grade African American students with higher levels of general assertiveness ability tended to have lower intentions to smoke cigarettes. “Anti-Smoking Attitudes” also explained an additional 7.3% of the variance ($F = 7.353, p = .009$) in intention to smoke cigarettes. Anti-smoking attitudes, therefore, was found to be a significant contributor in explaining the variance in intention to smoke cigarettes.
The nature of the influence of this factor was such that sixth grade African American students with higher anti-smoking attitude scores tended to have lower intentions to smoke cigarettes.

In the last step “Whether or not the student participated in the school-based substance abuse prevention program” was entered into the regression analysis. This variable was not found to make a significant contribution to the explanatory model \( (F=1.912, p = .172) \). Additionally, when the variable was entered into the model, the amount of explained variable that it contributed was only 1.7%.

Therefore six variables that were included in the model “Academic Performance”, “Living with Mother and Father”, “Decision-Making Ability”, “Anti-Smoking Attitudes”, “General Assertiveness Ability” and “Whether or not the student participated in the school-based substance abuse prevention program” explained a total of 46.5% of the variance in the intention to smoke cigarettes among sixth grade African American students in Louisiana.

**TABLE 27**

*Multiple Regression Analysis of the Intention to Smoke Cigarettes on Selected Demographic and Psychological Characteristics of Sixth Grade African American Students in Louisiana*

<table>
<thead>
<tr>
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<th>df</th>
<th>MS</th>
<th>F-ratio</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
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<td>2.033</td>
<td>8.831</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Residual</td>
<td>61</td>
<td>.230</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>67</td>
<td></td>
<td></td>
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</table>

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(Table cont.)
<table>
<thead>
<tr>
<th>Variable</th>
<th>R</th>
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<th>R² Change</th>
<th>F Change</th>
<th>Sig. F Change</th>
<th>Beta</th>
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</thead>
<tbody>
<tr>
<td>Block 1</td>
<td></td>
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<tr>
<td>Academic Performance</td>
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<td>.058</td>
<td>.058</td>
<td>4.061</td>
<td>.048</td>
<td>.241</td>
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<tr>
<td>Living with Mother and Father</td>
<td>.350</td>
<td>.123</td>
<td>.065</td>
<td>4.800</td>
<td>.032</td>
<td>-.257</td>
</tr>
<tr>
<td>Block 2</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decision-Making Ability</td>
<td>.550</td>
<td>.302</td>
<td>.180</td>
<td>16.483</td>
<td>&lt; .001</td>
<td>-.479</td>
</tr>
<tr>
<td>General Assertiveness Ability</td>
<td>.669</td>
<td>.448</td>
<td>.073</td>
<td>8.173</td>
<td>.006</td>
<td>-.275</td>
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<tr>
<td>Anti-Smoking Attitudes</td>
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<td>.375</td>
<td>.073</td>
<td>7.353</td>
<td>.009</td>
<td>.278</td>
</tr>
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</tr>
<tr>
<td>Participated in the substance abuse prevention program)</td>
<td>.682</td>
<td>.465</td>
<td>.017</td>
<td>1.912</td>
<td>.172</td>
<td>.177</td>
</tr>
<tr>
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<tr>
<td>46.5% variance explained</td>
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</table>

Variables not in the Equation

<table>
<thead>
<tr>
<th>Variable</th>
<th>t</th>
<th>sig t</th>
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</thead>
<tbody>
<tr>
<td>Smoking refusal ability</td>
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<td>Age</td>
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<td>.461</td>
</tr>
<tr>
<td>Gender</td>
<td>.583</td>
<td>.562</td>
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</table>

(Table cont.)
An effect size was determined using the multiple regression coefficient, $R^2$ (Cumulative). The effect size was interpreted using a set of descriptors developed by Cohen (1988) where: (a) .2600 or higher = large effect size; (b) .1300 - .2600 = medium effect size; and (c) .0196 - .1300 = small effect size. The $R^2$ for the multiple regression analysis was .465 indicating a large effect size.

**Hypothesis One**

Hypothesis one was that sixth grade African American students in Louisiana who participate in the school-based substance abuse prevention program will report a lower extent of smoking behavior than sixth grade African American students who have not participated in the school-based substance abuse prevention program. This hypothesis was accomplished by comparing the self-reported extent of smoking among the subjects who participated in the school-based substance abuse prevention program (experimental group) ($n = 36$) with those who do not participate in the school-based substance abuse prevention program (control group) ($n = 32$). To maximize the accuracy of the comparison, the treatment groups were compared on their pretest scores to determine if there were any preexisting differences in the groups. When the groups were compared on
their pretest extent of smoking behavior scores, the difference between the mean value for the control group (\(M = 1.00, \text{SD} = 0.00\)) was significantly lower than the mean value for the experimental group (\(M = 1.26, \text{SD} = .61\)) (\(t_{61} = 2.224, p = .03\)). Therefore, the analysis of covariance (ANCOVA) procedure was utilized to compare the posttest measurements when controlling for pretest scores. The independent variable used was whether or not the students participated in the substance abuse prevention program. The dependent variable was the posttest measurement of the self-reported extent of smoking. The covariate used was the pretest scores.

Posttest scores comparing treatment groups on self-reported extent of smoking are presented in Table 28. The results from the ANCOVA (\(F_{1,60} = 1.049\)) indicated that the posttest scores were not different between the control and experimental groups when

**TABLE 28**

Comparison of Posttest Measurement of Self-Reported Extent of Smoking Behavior by Whether or Not Sixth Grade African American Students Participated in the School-Based Substance Abuse Prevention Program Controlling for Pretest Scores

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest (covariate)</td>
<td>9.439</td>
<td>1</td>
<td>15.978</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Treatment</td>
<td>.620</td>
<td>1</td>
<td>1.049</td>
<td>.310</td>
</tr>
<tr>
<td>Error</td>
<td>35.446</td>
<td>60</td>
<td>.591</td>
<td></td>
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</tbody>
</table>

Total 44.889 62

**Note.** Computed using \(\alpha = .05\). Posttest unadjusted means of control and experimental groups are: Control = 1.21 and Experimental = 1.23. Posttest adjusted means of control and experimental groups are: Control = 1.34 and Experimental = 1.13.
pretest scores were used as a covariate. When the groups were compared on their posttest extent of smoking behavior scores, the difference between the mean value for the control group (adjusted $M = 1.34$) and the experimental group (adjusted $M = 1.13$) was not found to be statistically significant ($p = .310$). Therefore, the hypothesis was not supported by the data.

**Hypothesis Two**

Hypothesis two was that sixth grade African American students in Louisiana who participate in the school-based substance abuse prevention program will report lower intention to smoke cigarettes than sixth grade African American students who have not participated in the school-based substance abuse prevention program. This hypothesis was accomplished by comparing the self-reported intention to smoke cigarettes among the subjects who participated in the school-based substance abuse prevention program (experimental group) ($n = 36$) with those who do not participate in the school-based substance abuse prevention program (comparison group) ($n = 32$). To maximize the accuracy of the comparison, the treatment groups were compared on their pretest scores to determine if there were any preexisting differences in the groups. When the groups were compared on their pretest intention to smoke cigarette scores, the difference between the mean value for the control group ($M = 1.32$, $SD = .905$) and the experimental group ($M = 1.29$, $SD = .622$) ($t_{61} = -.185$, $p = .854$) was not found to be statistically significant. Even with this non-significant difference, analysis of covariance (ANCOVA) procedure was utilized since any differences in pretest measurements, even those that were not significant, may have “tipped the statistical scales” (Kerlinger, 1986, p. 340) in favor of one of the groups being compared. The independent variable used was
whether or not the students participated in the substance abuse prevention program. The
dependent variable was the posttest measurement of the self-reported intention to smoke
cigarettes. The covariate used was the pretest scores.

Posttest scores comparing treatment groups on self-reported intention to smoke
cigarettes are presented in Table 29. The results from the ANCOVA ($F_{1,60} = .088$)
indicated that the posttest scores were not different between the control and experimental
groups when pretest scores were used as a covariate. When the groups were compared on
their posttest intention to smoke cigarette scores, the difference between the mean value
for the control group (adjusted $M = 1.28$) and the experimental group (adjusted $M = 1.23$)
was not found to be statistically significant ($p = .768$). Therefore, the hypothesis was not
supported by the data.

**TABLE 29**

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest (covariate)</td>
<td>3.522</td>
<td>1</td>
<td>9.450</td>
<td>.003</td>
</tr>
<tr>
<td>Treatment</td>
<td>.003</td>
<td>1</td>
<td>.088</td>
<td>.768</td>
</tr>
<tr>
<td>Error</td>
<td>22.363</td>
<td>60</td>
<td>.373</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>25.937</td>
<td>62</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note.** Computed using $\alpha = .05$. Posttest unadjusted means of control and experimental
groups are: Control = 1.29 and Experimental = 1.23. Posttest adjusted means of control
and experimental groups are: Control = 1.28 and Experimental = 1.23.
Hypothesis Three

Hypothesis three was that among sixth grade African American students, there was a negative relationship between self-reported extent of smoking behavior score and each of the following psychological characteristics (such that lower levels of self-reported smoking behavior was associated with higher measurements on each of the specified psychological characteristics):

a. Smoking refusal ability (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975)). The data analysis used to test this portion of the hypothesis included the calculation of a Pearson Product Moment correlation coefficient between the self-reported extent of smoking behavior score and the smoking refusal ability score of the study subjects.

At posttest, the relationship between the self-reported extent of smoking behavior score and the smoking refusal ability score indicated a negative relationship ($r = .36, p = .002$) (See Table 30). This relationship as characterized using Davis’ descriptors was a moderate association (Davis, 1971). The correlation between self-reported extent of smoking behavior and smoking refusal ability was found to be statistically significant. The results indicated that sixth grade African American students who had higher smoking refusal ability scores had lower extent of smoking behavior scores. For this instance a positive correlation is indicative of a negative relationship since lower values represented higher scores for “Smoking Refusal Ability” (e.g., Definitely would = 1, Definitely would not = 5. This portion of the hypothesis was supported by the data.
b. Decision-making ability (as measured by Botvin’s six item modified version (Botvin et al., 2001) of the Bugen and Hawkin’s Coping Assessment Battery (1981)). The data analysis used to test this portion of the hypothesis included the calculation of a Pearson Product Moment correlation coefficient between the self-reported extent of smoking behavior score and the decision-making ability score of the study subjects.

At posttest, the decision-making ability was found to be significantly related to self-reported extent of smoking behavior (See Table 30). The correlation between decision-making ability score and self-reported extent of smoking behavior score was $r = -0.34$ ($p = 0.004$) which indicated that sixth grade African American students who had higher decision making ability scores had lower extent of smoking behavior scores. This relationship as characterized using Davis’ descriptors was a moderate association (Davis, 1971). This portion of the hypothesis was supported by the data.

c. Anti-smoking attitudes (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Teenager’s Self-Test: Cigarette Smoking Scale (U.S. Public Health Service, 1974)). The data analysis used to test this portion of the hypothesis included the calculation of a Pearson Product Moment correlation coefficient between the self-reported extent of smoking behavior score and the anti-smoking attitudes score of the study subjects.

At posttest, the self-reported extent of smoking behavior score was found to be significantly related to the anti-smoking attitudes score (See Table 30). The relationship between the self-reported extent of smoking score and the anti-smoking attitude score indicated a negative relationship ($r = 0.26$, $p = 0.03$) which indicated that sixth grade African American students who had higher anti-smoking attitude scores had lower extent
of smoking behavior scores. In this instance a positive correlation is indicative of a negative relationship since lower values represented higher scores for “Anti-Smoking Attitudes” (e.g., Strongly Disagree = 1, Strongly Agree = 5). This relationship as characterized using Davis’ descriptors was a low association (Davis, 1971). This portion of the hypothesis was supported by the data.

d. General assertiveness ability (as measured by Botvin’s 10-item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975)). The data analysis used to test this portion of the hypothesis included the calculation of a Pearson Product Moment correlation coefficient between the self-reported extent of smoking behavior score and the general assertiveness ability score of the study subjects.

At posttest, the relationship between the self-reported extent of smoking behavior score and the general assertiveness ability score was \( r = .01 \) (\( p = .94 \)) (See Table 30). The correlation between self-reported extent of smoking behavior and general assertiveness ability not found to be statistically significant. This portion of the hypothesis was not supported by the data.

e. Normative beliefs about peer smoking (as measured by the subjects’ beliefs about the prevalence of smoking use among peers) (Botvin et al., 2001). The data analysis used to test this portion of the hypothesis included the calculation of a Pearson Product Moment correlation coefficient between the self-reported extent of smoking behavior score and the normative beliefs about peer smoking score of the study subjects.

At posttest, the relationship between the normative beliefs about peer smoking score and the self-reported extent of smoking behavior score was \( r = -.007 \) (\( p = .96 \)) (See Table 30). The correlation between normative beliefs about peer smoking and self-
reported extent of smoking behavior was not found to be statistically significant. This portion of the hypothesis was not supported by the data.

f. Normative beliefs about adult smoking (as measured by the subjects’ beliefs about the prevalence of smoking use among adults) (Botvin et al., 2001). The data analysis used to test this portion of the hypothesis included the calculation of a Pearson Product Moment correlation coefficient between the self-reported extent of smoking behavior score and the normative beliefs about adult smoking score of the study subjects.

At posttest, the relationship between the normative beliefs about adult smoking score and the self-reported extent of smoking behavior score was $r = .11$ ($p = .36$) (See Table 30). The correlation between normative beliefs about adult smoking and self-reported extent of smoking behavior was not found to be statistically significant. This portion of the hypothesis was not supported by the data.

The findings indicated that three of the seven examined relationships were significant and supported the hypothesis.

**TABLE 30**

The Relationship between Self-Reported Extent of Smoking Behavior and Selected Psychological Characteristics among Sixth Grade African American Students

<table>
<thead>
<tr>
<th>Variables</th>
<th>n</th>
<th>$r^2$</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking Refusal Ability</td>
<td>68</td>
<td>.36</td>
<td>.002</td>
</tr>
<tr>
<td>Decision-Making Ability</td>
<td>68</td>
<td>-.34</td>
<td>.004</td>
</tr>
<tr>
<td>Anti-Smoking Attitudes</td>
<td>68</td>
<td>.26</td>
<td>.03</td>
</tr>
<tr>
<td>General Assertiveness Ability</td>
<td>68</td>
<td>.01</td>
<td>.94</td>
</tr>
</tbody>
</table>

(Table cont.)
Normative Beliefs

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Peer Smoking</td>
<td>68</td>
<td>-.007</td>
</tr>
<tr>
<td>Adult Smoking</td>
<td>68</td>
<td>.11</td>
</tr>
</tbody>
</table>

Interpretation was based on Davis’ Descriptors: .70 or higher = very strong association; .50 - .69 = substantial association; .30 - .49 = moderate association; .10 to .29 = low association; and .01 to .09 = negligible association.

**Hypothesis Four**

Hypothesis four was that among sixth grade African American students, there was a negative relationship between self-reported intention to smoke cigarettes and each of the following psychological characteristics (such that lower levels of self-reported intentions to smoke cigarettes was associated with higher measurements on each of the specified psychological characteristics):

a. Decision-making ability (as measured by Botvin’s six item modified version (Botvin et al., 2001) of the Bugen and Hawkin’s Coping Assessment Battery (1981)).

The data analysis used to test this portion of the hypothesis included the calculation of a Pearson Product Moment correlation coefficient between the self-reported intention to smoke cigarettes score and the decision-making ability score of the study subjects.

At posttest, the self-reported intention to smoke cigarettes score was found to be significantly related to the decision-making ability score (See Table 31). The correlation between self-reported intention of smoking cigarettes and the decision-making ability score was $r = -.49 (p = < .001)$ which indicated that sixth grade African American students who had higher decision-making ability scores had lower intention to smoke cigarette scores. This relationship as characterized using Davis’ descriptors was a moderate association (Davis, 1971). This portion of the hypothesis was supported by the data.
b. Anti-smoking attitudes (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Teenager’s Self-Test: Cigarette Smoking Scale (U.S. Public Health Service, 1974)). The data analysis used to test this portion of the hypothesis included the calculation of a Pearson Product Moment correlation coefficient between the self-reported intention to smoke cigarettes score and the anti-smoking attitude score of the study subjects.

At posttest, the self-reported intention to smoke cigarettes score was found to be significantly related to the anti-smoking attitude score (See Table 31). The relationship between the self-reported intention to smoke cigarettes score and the anti-smoking attitude score indicated a negative relationship ($r = .38$, $p = .002$). This relationship as characterized using Davis’ descriptors was a moderate association (Davis, 1971). The results indicated that sixth grade African American students who had higher anti-smoking attitude scores had lower intentions to smoke cigarettes scores. In this instance a positive correlation is indicative of a negative relationship since lower values represented higher scores for “Anti-Smoking Attitudes” (e.g., Strongly Disagree = 1, Strongly Agree = 5). This portion of the hypothesis was supported by the data.

c. Smoking refusal ability (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975)). The data analysis used to test this portion of the hypothesis included the calculation of a Pearson Product Moment correlation coefficient between the self-reported intention to smoke cigarettes score and the smoking refusal ability score of the study subjects.

At posttest, the relationship between the self-reported intention to smoke cigarettes score and the smoking refusal ability score indicated a negative relationship
(r = .26, p = .04) (See Table 31). This relationship as characterized using Davis’ descriptors was a low association (Davis, 1971). The correlation between self-reported intention to smoke cigarettes and smoking refusal ability was found to be statistically significant. The results indicated that sixth grade African American students who had higher smoking refusal ability scores had lower intentions to smoke cigarettes scores. For this instance a positive correlation is indicative of a negative relationship since lower values represented higher scores for “Smoking Refusal Ability” (e.g., Definitely would = 1, Definitely would not = 5). This portion of the hypothesis was supported by the data.

d. General assertiveness ability (as measured by Botvin’s 10-item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975)). The data analysis used to test this portion of the hypothesis included the calculation of a Pearson Product Moment correlation coefficient between the self-reported intention to smoke cigarettes score and the assertiveness ability score of the study subjects.

At posttest, the relationship between the self-reported intention to smoke cigarette score and the general assertiveness ability score was r = -.17 (p = .18) (See Table 31). The correlation between self-reported intention to smoke cigarettes and general assertiveness ability was not found to be statistically significant. This portion of the hypothesis was not supported by the data.

e. Normative beliefs about peer smoking (as measured by the subjects’ beliefs about the prevalence of smoking use among peers) (Botvin et al., 2001). The data analysis used to test this portion of the hypothesis included the calculation of a Pearson Product Moment correlation coefficient between the self-reported intention to smoke cigarette score and the normative beliefs about peer smoking score of the study subjects.
At posttest, the relationship between the normative beliefs about peer smoking score and the intention to smoke cigarettes score was $r = -.28$ ($p = .22$) (See Table 31). The correlation between normative beliefs about peer smoking and the intention to smoke cigarettes score was not found to be statistically significant. This portion of the hypothesis was not supported by the data.

f. Normative beliefs about adult smoking (as measured by the subjects’ beliefs about the prevalence of smoking use among adults) (Botvin et al., 2001). The data analysis used to test this portion of the hypothesis included the calculation of a Pearson Product Moment correlation coefficient between the self-reported intention to smoke cigarette score and the normative beliefs about adult smoking score of the study subjects.

**TABLE 31**

The Relationship between Self-Reported Intention to Smoke Cigarettes and Selected Psychological Characteristics among Sixth Grade African American Students

<table>
<thead>
<tr>
<th>Variables</th>
<th>n</th>
<th>$r^a$</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decision-Making Ability</td>
<td>68</td>
<td>-.49</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Anti-Smoking Attitudes</td>
<td>68</td>
<td>.38</td>
<td>.002</td>
</tr>
<tr>
<td>Smoking Refusal Ability</td>
<td>68</td>
<td>.26</td>
<td>.04</td>
</tr>
<tr>
<td>General Assertiveness Ability</td>
<td>68</td>
<td>-.17</td>
<td>.18</td>
</tr>
<tr>
<td>Normative Beliefs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peer Smoking</td>
<td>68</td>
<td>-.28</td>
<td>.22</td>
</tr>
<tr>
<td>Adult Smoking</td>
<td>68</td>
<td>.13</td>
<td>.29</td>
</tr>
</tbody>
</table>

$^a$Interpretation was based on Davis’ Descriptors: .70 or higher = very strong association; .50 - .69 = substantial association; .30 - .49 = moderate association; .10 to .29 = low association; and .01 to .09 = negligible association.
At posttest, the relationship between the normative beliefs about adult smoking score and the intention to smoke cigarettes score was $r = .13 \ (p = .29)$ (See Table 31). The correlation between normative beliefs about adult smoking and intention to smoke cigarettes was not found to be statistically significant. This portion of the hypothesis was not supported by the data.

**Hypothesis Five**

Hypothesis five was that sixth grade African American students in Louisiana who have participated in the school-based substance abuse prevention program will exhibit higher levels of each of the following psychological characteristics than sixth grade African American students who have not participated in the school-based substance abuse prevention program:

a. Decision-making ability (as measured by Botvin’s six item modified version (Botvin et al., 2001) of the Bugen and Hawkin’s Coping Assessment Battery (1981)). This hypothesis was accomplished by comparing the overall decision-making ability score among the subjects who participated in the school-based substance abuse prevention program (experimental group) with those who do not participate in the school-based substance abuse prevention program (control group). To maximize the accuracy of the comparison, the treatment groups were compared on their pretest scores to determine if there were any preexisting differences in the groups. When the groups were compared on their pretest decision-making ability scores, the mean value for the control group ($M = 3.73, SD = .693$) was significantly higher than the mean value for the experimental group ($M = 3.21, SD = .663$) ($t_{63} = -3.05, p = .003$). Therefore, the analysis of covariance (ANCOVA) procedure was utilized to compare the posttest measurements when
controlling for pretest scores. The independent variable used was whether or not the students participated in the substance abuse prevention program. The dependent variable was the decision-making ability posttest scores. The covariate utilized was the pretest scores. Posttest scores comparing treatment groups on decision-making ability are presented in Table 32.

**TABLE 32**

Comparison of Posttest Measurement of Decision-Making Ability by Whether or Not Sixth Grade African American Students Participated in the School-Based Substance Abuse Prevention Program Controlling for Pretest Scores

<table>
<thead>
<tr>
<th>Source</th>
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<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest (covariate)</td>
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<td>1</td>
<td>29.939</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Treatment</td>
<td>.127</td>
<td>1</td>
<td>.302</td>
<td>.585</td>
</tr>
<tr>
<td>Error</td>
<td>25.343</td>
<td>60</td>
<td>.422</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>41.121</td>
<td>62</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. Computed using $\alpha = .05$. Posttest unadjusted means of control and experimental groups are: Control = 3.61 and Experimental = 3.16. Posttest adjusted means of control and experimental groups are: Control = 3.41 and Experimental = 3.31.

The results from the ANCOVA ($F_{1,60} = .302$) indicated that the posttest scores were not different between the control and experimental groups when pretest scores were used as a covariate. When the groups were compared on their posttest decision-making scores, the difference between the mean value for the control group (adjusted $M = 3.41$) and the experimental group (adjusted $M = 3.31$) was not found to be statistically significant ($p = .585$). Therefore, the hypothesis was not supported by the data.

b. General assertiveness ability (as measured by Botvin’s 10-item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975)).
This hypothesis was accomplished by comparing the overall general assertiveness ability score among the subjects who participated in the school-based substance abuse prevention program (experimental group) with those who do not participate in the school-based substance abuse prevention program (control group). To maximize the accuracy of the comparison, the treatment groups were compared on their pretest scores to determine if there were any preexisting differences in the groups. When the groups were compared on their pretest general assertiveness ability scores, the difference between the mean value for the control group ($M = 1.77$, $SD = .339$) and the experimental group ($M = 1.95$, $SD = .413$) was not found to be statistically significant ($t_{63} = 1.89$, $p = .064$). Even with this non-significant difference, analysis of covariance (ANCOVA) procedure was utilized since any differences in pretest measurements, even those that were not significant, may have “tipped the statistical scales” (Kerlinger, 1986, p. 340) in favor of one of the groups being compared. The independent variable used was whether or not the students participated in the substance abuse prevention program. The dependent variable was the general assertiveness ability posttest scores. The covariate utilized was the pretest scores.

Posttest scores comparing treatment groups on general assertiveness ability are presented in Table 33. The results from the ANCOVA ($F_{1,60} = 1.897$) indicated that the

**TABLE 33**

<table>
<thead>
<tr>
<th>Source</th>
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<th>df</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest (covariate)</td>
<td>.496</td>
<td>1</td>
<td>1.691</td>
<td>.198</td>
</tr>
</tbody>
</table>

(Table cont.)
Treatment | .556 | 1 | 1.897 | .174
Error | 17.587 | 60 | .293
Total | 18.961 | 62

Note. Computed using $\alpha = .05$. Posttest unadjusted means of control and experimental groups are: Control = 2.05 and Experimental = 2.28. Posttest adjusted means of control and experimental groups are: Control = 2.07 and Experimental = 2.27.

Posttest scores were not different between the control and experimental groups when pretest scores were used as a covariate. When the groups were compared on their posttest general assertiveness mean scores, the difference between the mean value for the control group (adjusted $M = 2.07$) and the experimental group (adjusted $M = 2.27$) was not found to be statistically significant ($p = .174$). Therefore, the hypothesis was not supported by the data.

c. Smoking refusal ability (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertiveness Inventory (1975)). This hypothesis was accomplished by comparing the overall smoking refusal ability score among the subjects who participated in the school-based substance abuse prevention program (experimental group) with those who do not participate in the school-based substance abuse prevention program (control group). To maximize the accuracy of the comparison, the treatment groups were compared on their pretest scores to determine if there were any preexisting differences in the groups. When the groups were compared on their pretest smoking refusal ability scores, the mean value for the control group ($M = 1.50$, $SD = 6.85$) was significantly lower than the mean value for the experimental group ($M = 2.15$, $SD = .90$) ($t_{63} = 3.167$, $p = .002$). Therefore, the analysis of covariance (ANCOVA) procedure was utilized to compare the posttest measurements when
controlling for pretest scores. The independent variable used was whether or not the
students participated in the substance abuse prevention program. The dependent variable
was the smoking refusal ability posttest scores. The covariate utilized was the pretest
scores.

Posttest scores comparing treatment groups on smoking refusal ability are
presented in Table 34. The results from the ANCOVA ($F_{1,60} = .052$) indicated that the
posttest scores were not different between the control and experimental groups when
pretest scores were used as a covariate. When the groups were compared on their posttest
smoking refusal ability scores, the difference between the mean value for the control
group (adjusted $M = 1.89$) and the experimental group (adjusted $M = 1.95$) was not found
to be statistically significant ($p = .821$). Therefore, the hypothesis was not supported by
the data.

**TABLE 34**

Comparison of Posttest Measurement of Smoking Refusal Ability by Whether or Not
Sixth Grade African American Students Participated in the School-Based Substance
Abuse Prevention Program Controlling for Pretest Scores

<table>
<thead>
<tr>
<th>Source</th>
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<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest (covariate)</td>
<td>.987</td>
<td>1</td>
<td>1.035</td>
<td>.313</td>
</tr>
<tr>
<td>Treatment</td>
<td>.005</td>
<td>1</td>
<td>.052</td>
<td>.821</td>
</tr>
<tr>
<td>Error</td>
<td>57.173</td>
<td>60</td>
<td>.953</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>58.572</td>
<td>62</td>
<td></td>
<td></td>
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</table>

*Note.* Computed using $\alpha = .05$. Posttest unadjusted means of control and experimental
groups are: Control = 1.83 and Experimental = 1.99. Posttest adjusted means of control
and experimental groups are: Control = 1.89 and Experimental = 1.95.
d. Anti-smoking attitudes (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Teenager’s Self-Test: Cigarette Smoking Scale (U.S. Public Health Service, 1974)). This hypothesis was accomplished by comparing the overall anti-smoking attitude score among the subjects who participated in the school-based substance abuse prevention program (experimental group) with those who do not participate in the school-based substance abuse prevention program (control group). To maximize the accuracy of the comparison, the treatment groups were compared on their pretest scores to determine if there were any preexisting differences in the groups. When the groups were compared on their pretest anti-smoking attitudes scores, the difference between the mean value for the control group ($M = 1.35$, $SD = .731$) and the experimental group ($M = 1.71$, $SD = .825$) was not found to be statistically significant ($t_{63} = 1.801$, $p = .077$). Even with this non-significant difference, analysis of covariance (ANCOVA) procedure was utilized since any differences in pretest measurements, even those that were not significant, may have “tipped the statistical scales” (Kerlinger, 1986, p. 340) in favor of one of the groups being compared. The independent variable used was whether or not the students participated in the substance abuse prevention program. The dependent variable was the anti-smoking attitudes posttest scores. The covariate utilized was the pretest scores.

Posttest scores comparing treatment groups on anti-smoking attitudes are presented in Table 35. The results from the ANCOVA ($F_{1,60} = 1.528$) indicated that the posttest scores were not different between the control and experimental groups when pretest scores were used as a covariate. When the groups were compared on their posttest anti-smoking attitudes scores, the difference between the mean value for the control
group (adjusted $M = 1.37$) and the experimental group (adjusted $M = 1.55$) was not found to be statistically significant ($p = .221$). Therefore, the hypothesis was not supported by the data.

**TABLE 35**

Comparison of Posttest Measurement of Anti-Smoking Attitudes by Whether or Not Sixth Grade African American Students Participated in the School-Based Substance Abuse Prevention Program Controlling for Pretest Scores

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest (covariate)</td>
<td>3.952</td>
<td>1</td>
<td>13.111</td>
<td>.001</td>
</tr>
<tr>
<td>Treatment</td>
<td>.461</td>
<td>1</td>
<td>1.528</td>
<td>.221</td>
</tr>
<tr>
<td>Error</td>
<td>18.086</td>
<td>60</td>
<td>.301</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>23.373</td>
<td>62</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Computed using $\alpha = .05$. Posttest unadjusted means of control and experimental groups are: Control = 1.31 and Experimental = 1.60. Posttest adjusted means of control and experimental groups are: Control = 1.37 and Experimental = 1.55

d. Normative beliefs about peer smoking (as measured by the subjects’ beliefs about the prevalence of smoking use among peers) (Botvin et al., 2001). This hypothesis was accomplished by comparing the overall normative beliefs about peer smoking score among the subjects who participated in the school-based substance abuse prevention program (experimental group) with those who do not participate in the school-based substance abuse prevention program (control group). To maximize the accuracy of the comparison, the treatment groups were compared on their pretest scores to determine if there were any preexisting differences in the groups. When the groups were compared on their pretest normative beliefs about peer smoking scores, the mean value for the control group ($M = 2.00, SD = .770$) was significantly lower than the mean value for the
experimental group ($M = 2.55$, $SD = 1.252$) ($t_{63} = 2.004$, $p = .05$). Therefore, the analysis of covariance (ANCOVA) procedure was utilized to compare the posttest measurements when controlling for pretest scores. The independent variable used was whether or not the students participated in the substance abuse prevention program. The dependent variable was the normative beliefs about peer smoking posttest scores. The covariate utilized was the pretest scores.

Posttest scores comparing treatment groups on normative beliefs about peer smoking are presented in Table 36. The results from the ANCOVA ($F_{1,60} = .844$) indicated that the posttest scores were not different between the control and experimental groups when pretest scores were used as a covariate. When the groups were compared on their posttest normative beliefs about peer smoking scores, the difference between the mean value for the control group (adjusted $M = 2.28$) and the experimental group (adjusted $M = 2.55$) was not found to be statistically significant ($p = .362$). Therefore, the hypothesis was not supported by the data.

TABLE 36

Comparison of Posttest Measurement of Normative Beliefs about Peer Smoking by Whether or Not Sixth Grade African American Students Participated in the School-Based Substance Abuse Prevention Program Controlling for Pretest Scores

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>F-ratio</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest (covariate)</td>
<td>7.68</td>
<td>1</td>
<td>6.181</td>
<td>.016</td>
</tr>
<tr>
<td>Treatment</td>
<td>1.049</td>
<td>1</td>
<td>.844</td>
<td>.362</td>
</tr>
<tr>
<td>Error</td>
<td>72.063</td>
<td>58</td>
<td>1.242</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>82.918</td>
<td>60</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Table cont.)
Note. Computed using $\alpha = .05$. Posttest unadjusted means of control and experimental groups are: Control = 2.18 and Experimental = 2.64. Posttest adjusted means of control and experimental groups are: Control = 2.28 and Experimental = 2.55.

f. Normative beliefs about adult smoking (as measured by the subjects’ beliefs about the prevalence of smoking use among adults) (Botvin et al., 2001). This hypothesis was accomplished by comparing the overall normative beliefs about adult smoking score among the subjects who participated in the school-based substance abuse prevention program (experimental group) with those who do not participate in the school-based substance abuse prevention program (control group). To maximize the accuracy of the comparison, the treatment groups were compared on their pretest scores to determine if there were any preexisting differences in the groups. When the groups were compared on their pretest normative beliefs about adult smoking scores, the difference between the mean value for the control group ($M = 3.61, SD = 1.13$) and the experimental group ($M = 4.00, SD = 1.00$) was not found to be statistically significant ($t_{63} = 1.438, p = .156$).

Even with this non-significant difference, analysis of covariance (ANCOVA) procedure was utilized since any differences in pretest measurements, even those that were not significant, may have “tipped the statistical scales” (Kerlinger, 1986, p. 340) in favor of one of the groups being compared. The independent variable used was whether or not the students participated in the substance abuse prevention program. The dependent variable was the normative beliefs about adult smoking posttest scores. The covariate utilized was the pretest scores.

Posttest scores comparing treatment groups on normative beliefs about adult smoking are presented in Table 37. The results from the ANCOVA ($F_{1,60} = 1.320$)
indicated that the posttest scores were not different between the control and experimental
groups when pretest scores were used as a covariate. When the groups were compared on
their posttest normative beliefs about adult smoking scores, the difference between the
mean value for the control group (adjusted $M = 3.51$) and the experimental group
(adjusted $M = 3.60$) was not found to be statistically significant ($p = .718$). Therefore,
the hypothesis was not supported by the data.

**TABLE 37**

*Comparison of Posttest Measurement of Normative Beliefs about Adults Smoking by* 
*Whether or Not Sixth Grade African American Students Participated in the School-Based* 
*Substance Abuse Prevention Program Controlling for Pretest Scores*

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest (covariate)</td>
<td>2.576</td>
<td>1</td>
<td>2.575</td>
<td>.114</td>
</tr>
<tr>
<td>Treatment</td>
<td>.132</td>
<td>1</td>
<td>1.320</td>
<td>.718</td>
</tr>
<tr>
<td>Error</td>
<td>58.024</td>
<td>58</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>61.049</td>
<td></td>
<td>60</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Computed using $\alpha = .05$. Posttest unadjusted means of control and experimental
groups are: Control = 3.46 and Experimental = 3.64. Posttest adjusted means of control
and experimental groups are: Control = 3.51 and Experimental = 3.60
CHAPTER 5
SUMMARY, CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

Summary

The primary purpose of this study was to examine the influence of a school-based substance abuse prevention program on reducing smoking behavior among sixth grade African American students in Louisiana. The objectives of the study were as follows:

1. Describe sixth grade African American students in Louisiana on selected demographic characteristics including age, gender, living arrangements, academic performance, and socio-economic status.

2. Describe sixth grade African American students in Louisiana on the following selected psychological characteristics: general assertiveness ability, smoking refusal ability, decision-making ability, anti-smoking attitudes, and normative beliefs about peer and adult smoking.

3. Describe sixth grade African American students in Louisiana on their self-reported extent of smoking behavior.

4. Describe sixth grade African American students in Louisiana on their self-reported intention to smoke cigarettes.

5. Determine if a model exists explaining a significant portion of the variance in self-reported extent of smoking behavior among sixth grade African American students in Louisiana from the following treatment, psychological, and demographic characteristics: (a) Whether or not the student participated in the school-based substance abuse prevention program; (b) Decision-making ability (as measured by Botvin’s six item modified version (Botvin et al., 2001) of the Bugen and Hawkin’s Coping Assessment
Battery (1981)); (c) General assertiveness ability (as measured by Botvin’s 10-item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975)); (d) Smoking refusal ability (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975)); (e) Anti-smoking attitudes (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Teenager’s Self-Test: Cigarette Smoking Scale (U.S. Public Health Service, 1974)); (f) Normative beliefs about peer smoking (as measured by the subjects’ beliefs about the prevalence of smoking use among peers) (Botvin et al., 2001); (g) Normative beliefs about adult smoking (as measured by the subjects’ beliefs about the prevalence of smoking use among adults) (Botvin et al., 2001); (h) Age; (i) Gender; (j) Living arrangements (as measured by three items regarding who the respondent lives with most of the time); (k) Academic performance (as measured by self-reported grades in school); and (l) Socio-economic status (as measured by whether or not students received free or reduced lunch in school).

6. Determine if a model exists explaining a significant portion of the variance in the intention to smoke cigarettes among sixth grade students African American in Louisiana from the following treatment, psychological, and demographic characteristics: (a) Whether or not the student participated in the school-based substance abuse prevention program; (b) Decision-making ability (as measured by Botvin’s six item modified version (Botvin et al., 2001) of the Bugen and Hawkin’s Coping Assessment Battery (1981)); (c) General assertiveness ability (as measured by Botvin’s 10-item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975)); (d) Smoking refusal ability (as measured by Botvin’s 5-item modified version (Botvin et al., 2001) of the
Gambrill and Richey Assertion Inventory (1975)); (e) Anti-smoking attitudes (as measured by Botvin’s 5-item modified version (Botvin et al., 2001) of the Teenager’s Self-Test: Cigarette Smoking Scale (U.S. Public Health Service, 1974)); (f) Normative beliefs about peer smoking (as measured by the subjects’ beliefs about the prevalence of smoking use among peers) (Botvin et al., 2001); (g) Normative beliefs about adult smoking (as measured by the subjects’ beliefs about the prevalence of smoking use among adults) (Botvin et al., 2001); (h) Age; (i) Gender; (j) Living arrangements (as measured by three items regarding who the respondent lives with most of the time); (k) Academic performance (as measured by self-reported grades in school); and (l) Socio-economic status (as measured by whether or not students received free or reduced lunch in school).

Based on the review of literature, the following hypotheses were established by the researcher.

1. Sixth grade African American students in Louisiana who participate in the school-based substance abuse prevention program will report a lower extent of self-reported extent of smoking behavior than sixth grade African American students who have not participated in the school-based substance abuse prevention program.

2. Sixth grade African American students in Louisiana who participate in the school-based substance abuse prevention program will report lower self-reported intention to smoke cigarettes than sixth grade African American students who have not participated in the school-based substance abuse prevention program.

3. Among sixth grade African American students, there will be a negative relationship between self-reported extent of smoking behavior score and each of the
following psychological characteristics (such that lower levels of self-reported smoking behavior was associated with higher measurements on each of the specified psychological characteristics):

a. Decision-making ability (as measured by Botvin’s six item modified version (Botvin et al., 2001) of the Bugen and Hawkin’s Coping Assessment Battery (1981)).

b. General assertiveness ability (as measured by Botvin’s 10-item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975)).

c. Smoking refusal ability (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975)).

d. Anti-smoking attitudes (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Teenager’s Self-Test: Cigarette Smoking Scale (U.S. Public Health Service, 1974)).

e. Normative beliefs about peer smoking (as measured by the subjects’ beliefs about the prevalence of smoking use among peers) (Botvin et al., 2001).

f. Normative beliefs about adult smoking (as measured by the subjects’ beliefs about the prevalence of smoking use among adults) (Botvin et al., 2001).

4. Among sixth grade African American students, there will be a negative relationship between self-reported intention to smoke score and each of the following psychological characteristics (such that lower levels of intentions to smoke was associated with higher measurements on each of the specified psychological characteristics):

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a. Decision-making ability (as measured by Botvin’s six item modified version (Botvin et al., 2001) of the Bugen and Hawkin’s Coping Assessment Battery (1981)).

b. General assertiveness ability (as measured by Botvin’s 10-item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975)).

c. Smoking refusal ability (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975)).

d. Anti-smoking attitudes (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Teenager’s Self-Test: Cigarette Smoking Scale (U.S. Public Health Service, 1974)).

e. Normative beliefs about peer smoking (as measured by the subjects’ beliefs about the prevalence of smoking use among peers) (Botvin et al., 2001).

f. Normative beliefs about adult smoking (as measured by the subjects’ beliefs about the prevalence of smoking use among adults) (Botvin et al., 2001)

5. Sixth grade African American students in Louisiana who have participated in the school-based substance abuse prevention program will exhibit higher levels of each of the following psychological characteristics than sixth grade African American students who have not participated in the school-based substance abuse prevention program:

a. Decision-making ability (as measured by Botvin’s six item modified version (Botvin et al., 2001) of the Bugen and Hawkin’s Coping Assessment Battery (1981)).

b. General assertiveness ability (as measured by Botvin’s 10-item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975)).
c. Smoking refusal ability (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Gambrill and Richey Assertion Inventory (1975)).

d. Anti-smoking attitudes (as measured by Botvin’s five item modified version (Botvin et al., 2001) of the Teenager’s Self-Test: Cigarette Smoking Scale (U.S. Public Health Service, 1974)).

e. Normative beliefs about peer smoking (as measured by the subjects’ beliefs about the prevalence of smoking use among peers) (Botvin et al., 2001).

f. Normative beliefs about adult smoking (as measured by the subjects’ beliefs about the prevalence of smoking use among adults) (Botvin et al., 2001).

The target population for this study was defined as sixth grade African American students in Louisiana. The accessible population was 68 sixth grade African American students currently enrolled in one middle school in South Central Louisiana. The sample was 100% of the defined accessible population.

Data was collected using a seven-part instrument which was comprised of the following: (a) selected demographic characteristics including age, gender, ethnicity, living arrangements, academic performance, and socio-economic status; (b) Botvin’s six item Decision-Making Scale (Botvin et al., 2001) (c) Botvin’s 10-item General Assertiveness Scale (Botvin et al., 2001); (d) Botvin’s five item Smoking Refusal Scale (Botvin et al., 2001); (e) Botvin’s five item Anti-Smoking Attitudes Scale (Botvin et al., 2001); (f) Normative beliefs about smoking among peers (as measured by the subjects’ beliefs about the prevalence of smoking use among peers) (Botvin et al., 2001); and (g) Normative beliefs about smoking among adults (as measured by the subjects’ beliefs about the prevalence of smoking use among adults) (Botvin et al., 2001).
The study was conducted in (6) sixth grade classes in which three classes were randomly assigned to the experimental group and three classes to the control group. One teacher was assigned to implement Botvin’s (2001) 18-lesson “Life Skills Training Program” curriculum (intervention) in 3 classes (experimental group). The students in the control group (3 classes) received no treatment. The teacher provided instructions and administered the self-reporting instrument during a regular 50-minute classroom period. The teacher taught the experimental group three lessons a week for six consecutive weeks during the months of January, February, and March, 2006. The subjects was pretested and posttested after the treatment was completed at the end of six weeks. A total of 68 sixth grade African American students completed the pretest and posttest.

The following is a discussion of the major findings of this study.

The demographic data showed that the mean age for the participants was 12.36 (SD = .87) and respondents’ ages ranged from 11.03 years to 14.65 years. Thirty-eight (55.9%) of the respondents were male, and 30 (44.1%) were female. Twenty-seven (39.7%) of respondents lived in single parent homes and of those respondents over one fifth (n = 14) lived with their mother. The greatest number of respondents reported that they mostly received grades of “C’s” (n = 24 or 35.3%) and “B’s” (n = 23 or 33.8%), and the majority of respondents (n = 62 or 91.2%) received free or reduced lunch at school.

The study found that sixth grade African American students in Louisiana have a relatively low prevalence of current smoking behavior (10.3%) and have low intentions to smoke cigarettes in the future (at posttest over 85% indicated “Definitely not” regarding intentions to smoke cigarettes). The findings also suggest that sixth grade
African American students in Louisiana have misconceptions about the prevalence of smoking among adults and adolescents. At posttest, over 80% of the students in the study believed that about half or more adults smoke cigarettes and 50% believed that about half or more of their peers smoke cigarettes. This is consistent with literature which found that adolescents overestimate smoking rates (Institute of Medicine, 1994).

In addition, the findings in this study are consistent with previous research (Botvin et al., 1999, 2001; Epstein et al., 1999) that found that specific psychosocial characteristics act as protective factors to prevent smoking among African American youth. The current study found that three psychological characteristics: smoking refusal ability, decision-making ability, and anti-smoking attitudes act as protective factors that help prevent underage smoking. The results indicated that sixth grade African American students who had high levels of these specified psychological characteristics are less likely to smoke and had lower intentions to smoke cigarettes in the future. The study also found demographic characteristics that were related to current smoking behavior and intentions to smoke cigarettes. The findings indicated that sixth grade African American students with high academic performance are less likely to smoke. This finding is supported by previous research which suggested that students with good grades and academic goals tend to smoke less (Pentz et al., 1989). In addition, results indicated that sixth grade African American students who lived with their biological parents had lower intentions to smoke cigarettes than students who did not live with their biological parents. Furthermore, the data indicated that sixth grade African American students who lived with their mother and stepfather had lower smoking rates. These finding are consistent
with the literature which indicates that living with two parents protects adolescents from substance abuse (Johnson et al., 1996).

The findings in the study showed that a model existed that explained 18.9% of the variance in the self-reported extent of smoking behavior among sixth grade African American students in Louisiana and two variables “Academic Performance” and “Smoking Refusal Ability” made significant contributions to the explanatory model. Furthermore, findings showed that a model existed that explained 46.5% of the variance in the self-reported intention to smoke cigarettes among sixth grade African American students in Louisiana and five variables: “Academic Performance”, “Living with Mother and Father”, “Decision-Making Ability”, “General Assertiveness Ability”, and “Anti-Smoking Attitudes” made significant contributions to the explanatory model. These findings provide additional support to previous research which concluded that certain psychosocial factors have an impact on the smoking behavior of adolescents (Botvin et al., 1990, 1992, 2001; Epstein et al., 1999, Griffin et al., 1998; Pentz et al., 1989, Sussman et al., 1993; Trudeau et al., 2003).

There were no significant differences found on self-reported extent of smoking behavior or self-reported intention to smoke cigarettes between the experimental group that participated in the school-based substance abuse prevention program and the comparison group that did not participate in the school-based substance abuse prevention program. In addition, the findings of the study indicated that sixth grade African American students in Louisiana who participated in the school-based substance abuse prevention program compared to sixth grade African American students who did not
participate in the school-based substance abuse prevention program did not exhibit higher levels of any of the selected psychological characteristics.

In summary, the findings of this study provides considerable evidence that there are several demographic and psychological characteristics which are associated with smoking behavior among sixth grade African American students in Louisiana. Previous research has found similar results for African American youth in other settings that indicate these psychosocial factors provide protection against the influence to smoke (Botvin et al., 1999, 2001; Epstein et al., 1999). Additional research is needed to better understand the role these factors and other variables play in preventing the onset of smoking and reducing smoking rates among African American youth.

**Limitations of the Study**

There are several limitations of this current study. First, in view of the fact that this study was conducted exclusively with African American students, findings from the study may not support generalizations to schools with multi-racial populations. Another limitation is related to geographical parameters. This study was conducted with African American students from a middle school in rural South Central Louisiana. A study conducted with schools in the inner city or in urban areas may not produce similar results to those found in this study. Over 90% of the students in this current study receive free or reduced lunches as well as nearly 40% of the students surveyed are from single-parent homes. Findings of this study may not support generalizations to other populations that have different demographic compositions. Furthermore, only sixth grade students (ages ranging from 11.03 years to 14.65 years) participated in the study. Therefore, generalizations are limited to only youth in this educational level.
There are several threats to internal validity that should be noted. First, experimental/comparison group cross-contamination is a threat to internal validity. Since a “within school” design was used, communication might have occurred between subjects in the experimental and comparison groups that could have affected the results. Secondly, the reliability of implementation procedures might have been jeopardized. The fidelity of the program might have been compromised since only one teacher taught the lessons. There was no oversight to determine if the lessons (treatment) were provided correctly. Finally, this study included a comparatively small sample from only one middle school. Low statistical power could be a threat to internal validity. The small sample size may have produced insufficient power to detect differences between the experimental group and comparison group when in fact differences really existed. Additional research studies are needed that involve more schools and larger samples to substantiate and improve upon the findings of this study.

**Conclusions, Implications and Recommendations**

Based on the findings of this study, the following conclusions, implications and recommendations were drawn by the researcher.

1. **Sixth grade African American students in Louisiana report “low intentions” to smoke cigarettes.** This conclusion is based on the following findings of the study: at posttest, over 85% of the sixth grade African American students indicated “definitely not” regarding their intention to smoke cigarettes.

   This conclusion is consistent with earlier research which found that if schools start smoking prevention programs in early adolescence, they have the best chance of preventing early onset and stopping experimental smokers from progressing to regular
smokers (Botvin et al., 1983, 1998, 2000; Sussman et. al., 1993). The results of this study are also consistent with the literature when they reveal low levels of smoking among this age group (LOPH, 2002). Research has also shown that the earlier adolescents begin smoking, the more likely they will become regular smokers and the greater risk of contracting a tobacco-related illness (Hegmann, et al., 1993).

Based on these findings and conclusions, this researcher recommends introducing a comprehensive school-based smoking prevention program at the beginning of middle school (sixth grade) when “intention to smoke” is still very low. The introduction of school-based smoking prevention programs during early adolescence or even pre-adolescence should afford the best opportunity in preventing smoking and reducing the health consequences associated with tobacco use.

The researcher also recommends that program developers design smoking prevention programs tailored to specific age groups. For instance, a prevention approach should be designed expressly for early middle school students (sixth grade) who still report “low intentions” to smoke, while another prevention program could target experimental smokers in which the goal would be to prevent these smokers from becoming regular smokers.

2. **Sixth grade African American students in Louisiana have misconceptions about how many people smoke cigarettes.** This conclusion is based on the following findings of the study: at posttest, 50% of the respondents indicated that they believed that about half or more of people their age smoke cigarettes, and over 80% believed that about half or more of adults smoke cigarettes.
This conclusion is supported by earlier research which indicated that adolescents tend to overestimate the smoking rates of their peers and adults (Institute of Medicine, 1994). On the other hand, no correlation was found between normative beliefs about peer and adult smoking and smoking behavior. This finding is inconsistent with previous research which found that adolescents who believe the majority of people smoke cigarettes will tend to see smoking as normal activity and, as a result, are more likely to smoke cigarettes (Botvin et al., 2001; Hansen & Graham, 1991).

Nevertheless, this study provides strong evidence that sixth grade African American students in Louisiana largely overestimate smoking rates. Based on this finding, this researcher recommends that school-based smoking prevention programs incorporate lessons that counter misconceptions about cigarette smoking. These lessons should teach students that the majority of teenagers and adults are not cigarette smokers, and that public attitude towards smoking has become increasingly negative and socially unacceptable. In addition, communities in their ongoing effort to reduce youth smoking rates should be encouraged to utilize the media (billboard advertising, print advertising, radio, internet, TV, etc.) to provide anti-smoking messages aimed at correcting misconceptions about smoking.

3. **Psychological characteristics including smoking refusal ability, decision-making ability, and anti-smoking attitudes are related to current and intended smoking behavior.** This conclusion is based on the following findings of the study. Results indicated that a significant correlation existed between extent of smoking behavior and each of the specified psychological variables. In addition, the study found that a significant correlation existed between intention to smoke cigarettes and each of
the specified psychological variables. These conclusions were supported by earlier research which found these psychological factors had an influence on smoking behavior (Botvin et al., 1990, 1992, 2001; Epstein et al., 1999; Griffin et al., 1998; Pentz et al., 1989; Sussman et al., 1993; Trudeau et al., 2003).

First, previous studies have found a correlation between youth smoking and smoking refusal ability (Botvin et al., 2001; Epstein et al., 1999; Trudeau et al., 2003). This is consistent with the results of the current study which found: (1) a significant correlation ($r = .36, p = .002$) between smoking refusal ability and extent of smoking such that sixth grade African American students with higher levels of smoking refusal ability tended to have lower extent of smoking behavior; and (2) a significant correlation ($r = .26, p = .018$) between smoking refusal ability and intention to smoke cigarettes such that sixth grade African American students with higher levels of smoking refusal ability tended to have lower intentions to smoke cigarettes.

Second, this study also found that sixth grade African American students with higher levels of decision-making ability tended to have lower extent of smoking behavior ($r = -.34, p = .002$) as well as lower intentions to smoke ($r = -.49, p = .002$). These conclusions are supported by earlier research which indicated that good decision-making skills act as protective factors that help prevent underage smoking (Botvin et al., 1990, 1992; Epstein et al., 1999; Pentz et al., 1989; Sussman et al., 1993). In addition, previous studies suggest that there is a positive correlation between good decision-making and the ability to refuse offers to smoke cigarettes (Botvin et al., 2001; Trudeau et al., 2003).

Finally, this study found that youth with higher anti-smoking attitude scores tended to have lower extent of smoking behavior ($r = .26, p = .017$) in addition to lower
intentions to smoke cigarettes ($r = .37$, $p = .001$). These conclusions are supported by earlier research which found that adolescents who express anti-smoking attitudes are less likely to smoke than adolescents who have favorable attitudes towards tobacco (Epstein et al., 1999; Griffin et al., 1998).

The researcher recommends that smoking prevention programs include components that teach good decision-making skills, improve refusal skills to resist pressure to smoke, and promote anti-smoking attitudes to prevent smoking.

These abovementioned variables should be further examined to determine their specific role in preventing smoking. Researchers should test these variables (decision-making, smoking refusal skills, anti-smoking attitudes) both alone and in combination to determine their importance in reducing and preventing smoking. The researcher recommends future research to determine the function and impact of other variables identified in previous research such as communication skills (Kumpfer et al., 1998), self-esteem (Botvin et al., 1992), stress management skills (Landrine & Klonoff, 1996), and problem-solving skills (Pentz et al., 1989) that may influence smoking initiation among teenagers.

Results from these studies could provide important information on how and why smoking prevention programs work. Moreover, the additional information could enable researchers to expand on the theoretical underpinnings of smoking prevention.

4. Sixth grade African American students in Louisiana who live in two-parent homes tend to have lower levels of smoking behavior. This conclusion is based on the following findings of the study. The correlation between “Living with Mother and Father” and intention to smoke cigarettes indicated that sixth grade African American
students who live with their mother and father tend to have lower intentions to smoke cigarettes. Similarly, a correlation was found between “Living with Mother and Stepfather” and extent of smoking behavior such that sixth grade African American students who live with their mother and stepfather are less likely to smoke. This conclusion is consistent with the literature which indicates that living with both parents protects adolescents from substance abuse (Johnson et al., 1996). In addition, previous studies found family influences, such as parental involvement and supervision, are related to underage smoking (Kumpfer et al., 1998, Richardson et al., 1993). Earlier research found that intact families (those in which children are living with their natural parents) have higher levels of supervision than single–parent families (Cookston, 1999). Research has also found that adolescents from single-parent homes are at greater risk to become smokers (DHHS, 1994). This becomes of particular importance in the current study since nearly 40% of respondents indicated that they lived in single-parent homes.

The researcher recommends that a parent component be included in smoking prevention programs. This component should teach parenting skills such as how to monitor your child’s behavior, how to be a good role model, how to set rules about smoking, and how to improve family communication. As children move into adolescence, providing parenting skills training courses that emphasize appropriate supervision and committed parental involvement can be vitally important in preventing underage smoking.

5. Sixth grade African American students in Louisiana with high “academic performance” are less likely to smoke cigarettes. This conclusion is based on the following findings of the study. The correlation between “Academic Performance”
and extent of smoking behavior indicated that those with higher academic performance (as measured by self-reported grades) tended to have lower extent of smoking behavior. In addition, the correlation between “Academic Performance” and intention to smoke cigarettes indicated that those with higher academic performance (as measured by self-reported grades) tended to have lower intentions of smoking cigarettes. This conclusion is consistent with previous research which found that academic performance and academic goals act as protective factors to prevent underage smoking (Pentz et al., 1989). Children who receive good grades, participate in school activities, and have educational aspirations are less likely to smoke (Pentz et al., 1989).

The researcher recommends that “academic performance” be used with other possible risk factors identified in previous research, such as socioeconomic status (Kropp, 1997), parental smoking (Taylor et al., 1999), and/or friends smoking (Sussman, et al., 1993), to identify young adolescents or pre-adolescents who are at risk to smoke cigarettes. This smoking assessment tool could be used by Local Education Authorities (LEAs) or the State Department of Education (DOE) to determine which students are more at risk. These at-risk students could then be assigned to smoking prevention classes to teach them the skills to resist offers to smoke.

6. **A model exists that explains “extent of smoking behavior” among sixth grade African American students in Louisiana.** This conclusion is based on the following findings. The results of the multiple regression analysis indicated that the model explained a total of 18.9% of the variance in the extent of smoking behavior among sixth grade African American students in Louisiana with two variables, “Academic
Performance” and “Smoking Refusal Ability,” contributing significantly to the model.

Although “Academic Performance” and “Smoking Refusal Ability” explains only a moderate amount of variance in self-reported extent of smoking, these findings suggest that sixth grade African American students in Louisiana who have good grades and high levels of smoking refusal ability are less likely to smoke cigarettes.

In view of the fact that this model explains less than 20% of the variance in the extent of smoking behavior, the researcher recommends further research to study other variables identified in previous research, for instance, self-esteem (Botvin et al., 1992) communication (Kumpfer et al., 1998), and/or problem-solving skills (Pentz et al., 1989) that could be included in the explanatory model. This model could then be used as an assessment tool to identify children that are at risk to smoke.

7. **A model exists that explains “intention to smoke cigarettes” among sixth grade African American students in Louisiana.** This conclusion is based on the following findings. The results of the multiple regression analysis indicated that the model explained a total of 46.5% of the variance in the intention to smoke cigarettes among sixth grade African American students in Louisiana with five variables “Academic Performance”, “Living with Mother and Father”, “Decision-Making Ability”, “Anti-Smoking Attitudes”, and “General Assertiveness Ability” contributing significantly to the model. These findings suggest that sixth grade African American students in Louisiana who live with their mother and father, maintain good grades, and have high levels of decision-making ability, anti-smoking attitudes, and general assertiveness ability would be less likely to smoke cigarettes in the future.
Since this model has been found to explain almost 50% of the variance in the intention to smoke cigarettes among sixth grade African American students in Louisiana, one can be reasonably confident that a model containing these demographic and psychological factors would be successful in identifying youth who are at the greatest risk of becoming smokers.

The researcher recommends that this model be utilized at elementary and middle schools as an assessment tool to identify students who are at-risk for smoking. Once these students are identified as potential smokers they could be placed in specialized classes that provide lessons on smoking prevention. In addition, additional research should be conducted to further refine this model and to determine if there are other variables identified in previous research such as communication skills (Kumpfer et al., 1998), self-esteem (Botvin et al., 1990), and/or stress management skills (Landrine & Klonoff, 1996) that could be included in the model to identify who are most at risk of becoming smokers.

Previous research has found that African American teenagers are more likely to start smoking at age 14 compared to White teenagers who are more likely to start smoking at age 12 (Headen et al, 1991). Given that African American teenagers tend to start smoking later in middle school and the prevalence of smoking in this study was so low (10.3%), perhaps a more accurate measure than “extent of smoking behavior” to gauge the viability of the substance abuse prevention program might be “intention to smoke cigarettes”. However, future long-term research would be needed to validate the use of “intention to smoke cigarettes” as a reliable indicator of future smoking behavior. The researcher recommends a follow-up study be conducted in high school to determine
how many sixth grade students in this study who indicated “Definitely not” on their “intention to smoke cigarettes” have remained non-smokers.

8. **Differences were not found between the students in the experimental group (those that received the substance abuse prevention program) and those in the control group.** This conclusion is based on the following findings of the study. The difference in the mean extent of smoking score was not significant ($p = .310$).

The above mentioned finding is inconsistent with earlier research that found that middle school students (sixth grade) who received the school-based substance abuse prevention program reported less smoking relative to controls (Botvin et al., 1990, 2001; Zollinger et al., 2003).

Several explanations for this inconsistency are possible including:

a. **The intervention was not implemented properly.** If the intervention is not implemented correctly it may influence the effectiveness of the program. In this study it is impossible to determine if the intervention was implemented thoroughly since an assessment of implementation fidelity was not performed. Since there was only one teacher responsible for the delivery of the lessons and she was not monitored, it is quite possible that the quality of program implementation was lower than in past studies.

The researcher recommends that in future research a “process evaluation” be conducted to determine the completeness of program implementation and that the full scope and sequence of the lessons is being taught.

b. **The sample size is too small to detect differences.** The sample size ($n = 68$) in this study was perhaps insufficient to achieve adequate power to detect
significant differences. A Type II error might have occurred in which the null hypothesis was really false, but the statistical test failed to reject it (Rubin & Babbie, 2001). The researcher recommends that larger studies be conducted to further test the efficacy of this substance abuse prevention program. The researcher recommends that future research use larger samples by either choosing a larger middle school or including additional middle schools.

c. **There is a possibility of cross-condition contamination whereby students may have shared smoking knowledge acquired in the experimental group with students in the control group.** This study utilized a “within-school” design to determine the influence of a school-based substance abuse prevention program on smoking habits and there is a chance that cross-condition contamination could have altered the findings. The alternative design choice was to use the “across-school” design (comparing two schools). However, a major concern with the “across-school” design was that possible differences in the populations of the two schools might affect the outcomes. For instance, the “across-school” design could introduce a “school effect” problem in which differences in the populations at the two schools develop because of differences in school histories (i.e., different attitudes and rules about smoking).

d. **Smoking prevalence is too low to detect differences.** Perhaps this prevention program was not effective in reducing smoking, because the prevalence of smoking among the sixth grade students was so low. Differences between the experimental group and control group might become evident if the subjects in the study were re-tested after one or two years.
REFERENCES


Dear Student and Parents,

We would like to thank you for participating in the nationally recognized Life Skills Training (LST) school-based substance abuse prevention program! Because of your commitment to this program, you are building and acquiring life skills that can help you become healthy, successful adults.

Because of your active participation in the LST program, you have been identified to participate in a very important study. This study will examine the influence of a school-based substance abuse prevention program in preventing and reducing smoking among sixth grade students in Louisiana. The study will be conducted with 6th grade students at Clinton Middle School in the East Feliciana School District. We need your help to better learn how effective our program is with helping youth your age develop healthy life skills that enable them to resist smoking behaviors. You are very important to us and we value your opinion.

Each student will be given a survey questionnaire that will be administered by Mr. Alan Nichols, MSW, LCSW. Mr. Nichols can be reached by phone at (225) 933-3296 - Monday through Friday - between the hours of 8:30 am and 4:30 pm. Mr. Nichols is a social worker affiliated with the LSU School of Social Work. The survey is confidential and your name will not appear anywhere on the survey. The survey includes questions about attitudes toward smoking and smoking habits, decision making skills, assertiveness, and general information about you. Please remember this is NOT a test and there is no right or wrong answer.

Participation in this study is on a voluntary basis. You have the right to refuse to participate. If you agree to participate, you may withdraw from this study at any time.

By signing below you agree to participate in the study described above and will be provided with a signed copy of this consent form. Also, you may ask the researcher any additional questions you have about the study. And, if you or your parents have any questions or concerns about this study, you may contact Robert C. Mathews, Chairman, Institutional Review Board at (225) 578-8692.

Thank you for helping us with this important study.

Signature(s):

Student____________________________________________ Date:____________

Parent/Guardian_______________________________________ Date:____________
APPENDIX B

STUDENT ASSENT FORM
Dear Student,

Thank you for participating in the Life Skills Training program! By taking part in this program you are helping yourself and fellow students develop positive life skills.

You have been chosen to participate in a very important study about the Life Skills program. We need your help to learn how this program is helping students your age to resist smoking. You can help us by answering the following questions. YOU are very important to us and we would like to hear your opinions.

This is a survey. It is NOT a test and there is no right or wrong answer. The survey is divided into 5 parts: general information about you, how you think and feel about smoking, how you make decisions, how you stand up for yourself, and smoking habits.

This is Confidential and your name will not appear anywhere on the survey. We will look at all the responses together in order to find out what you will learn from participating in the Life Skills program.

We look forward to your responses and thank you for your help with this important study. Please sign below to state your agreement to participate in this study.

Sincerely,

Alan J. Nichols, MSW, LCSW

Signature:

Student____________________________________________ Date:____________
APPENDIX C

QUESTIONNAIRE
QUESTIONNAIRE

This survey is designed to give us information about your health knowledge, attitudes and behaviors.

Please answer all of the questions honestly.

For Research Use Only:

Student Code # ______________  Pretest/Posttest (Circle One)
## Part I

### Birth Date

<table>
<thead>
<tr>
<th>Month</th>
<th>Day</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>[0 ]</td>
<td>[0 ]</td>
</tr>
<tr>
<td>Feb</td>
<td>[1 ]</td>
<td>[1 ]</td>
</tr>
<tr>
<td>Mar</td>
<td>[2 ]</td>
<td>[2 ]</td>
</tr>
<tr>
<td>Apr</td>
<td>[3 ]</td>
<td>[3 ]</td>
</tr>
<tr>
<td>May</td>
<td>[4 ]</td>
<td>[4 ]</td>
</tr>
<tr>
<td>Jun</td>
<td>[5 ]</td>
<td>[5 ]</td>
</tr>
<tr>
<td>Aug</td>
<td>[7 ]</td>
<td>[7 ]</td>
</tr>
<tr>
<td>Sep</td>
<td>[8 ]</td>
<td>[8 ]</td>
</tr>
<tr>
<td>Oct</td>
<td>[9 ]</td>
<td>[9 ]</td>
</tr>
<tr>
<td>Nov</td>
<td>[   ]</td>
<td>[   ]</td>
</tr>
<tr>
<td>Dec</td>
<td>[   ]</td>
<td>[   ]</td>
</tr>
</tbody>
</table>

### Directions:
Please fill in the circle to indicate your response for each of the questions.

1. Are you:
   - O Male
   - O Female

2. Choose the category which best describes you. (Pick only one.)
   - O Hispanic
   - O Black/African American
   - O Asian
   - O Native American
   - O White (Non-Hispanic)
   - O Other (Please specify)

3. Who do you live with most of the time?
   - O Mother and father
   - O Mother only
   - O Mother and stepfather
   - O Father only
   - O Stepmother and father
   - O Other (Please specify)

4. What grades do you generally get in school?
   - O Mostly A's (90-100)
   - O Mostly B's (80-90)
   - O Mostly C's (70-80)
   - O Mostly D's (60-70)
   - O D's or lower (60 or lower)

5. During the current school year, do you qualify for a free or reduced price school lunch?
   - O Yes
   - O No
Part II

Directions: Read the statement below and fill in the circle to indicate your response.

<table>
<thead>
<tr>
<th>When I have a problem or need to make an important decision I:</th>
<th>Never</th>
<th>Almost Never</th>
<th>Sometimes</th>
<th>Almost always</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Get the information needed to make the best choice.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>7. Stop before doing anything to be sure I understand what the problem or decision is.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>8. Think of as many possible choices or ways of solving the problem as I can.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>9. Think about what will happen for each choice before doing anything.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>10. Make the best choice and then do it.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>11. I compromise to get something positive from the situation</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>
Part III

Directions: Please fill in the circle to show how likely you would be able to handle these situations in this way.

<table>
<thead>
<tr>
<th>How likely would you be to do the following things?</th>
<th>Definitely would</th>
<th>Probably would</th>
<th>Not sure</th>
<th>Probably would not</th>
<th>Definitely would not</th>
</tr>
</thead>
<tbody>
<tr>
<td>12. Tell someone if they give you less change (money) than you're supposed to get back after you pay for something.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>13. Say &quot;no&quot; to someone who asks to borrow money from you</td>
<td>O</td>
<td>O</td>
<td>0</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>14. Tell someone to go to the end of line if they try to cut in line ahead of you</td>
<td>O</td>
<td>O</td>
<td>0</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>15. Tell people your opinion, even if you know they will not agree with you.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>16. Ask someone for a favor.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>17. Start a conversation with someone you would like to know better.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>18. Return defective merchandise to a store.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>19. Ask someone out for a date.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>20. Tell people when you feel they have done something that is unfair to you.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>21. Request the return of a borrowed item.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>
Part III (cont.)

Directions: Please fill in the circle to show how likely you would be able to handle these situations in this way.

<table>
<thead>
<tr>
<th>If someone asked you to smoke:</th>
<th>Definitely would</th>
<th>Probably would</th>
<th>Not sure</th>
<th>Probably would not</th>
<th>Definitely would not</th>
</tr>
</thead>
<tbody>
<tr>
<td>22. Tell them &quot;no&quot; or &quot;no thanks.&quot;</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>23. Tell them not now.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>24. Change the subject.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>25. Tell them you don't want to do it.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>26. Make up an excuse and leave.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

Part IV

Directions: Please fill in the circle to show how much you agree or disagree with each statement.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree Nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>27. Smoking cigarettes makes you look cool.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>28. Smoking cigarettes is a good way of dealing with your problems</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>29. Kids who smoke cigarettes are more grown-up.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>30. Kids who smoke cigarettes have more friends.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>31. Smoking cigarettes lets you have more fun.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>
Part V

Directions: Read the statements below and fill in the circle to indicate your response.

<table>
<thead>
<tr>
<th>How many people your age do you think:</th>
<th>None</th>
<th>Less than Half</th>
<th>About Half</th>
<th>More than Half</th>
<th>All or Almost All</th>
</tr>
</thead>
<tbody>
<tr>
<td>32. Smoke Cigarettes</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How many adults do you think:</th>
<th>None</th>
<th>Less than Half</th>
<th>About Half</th>
<th>More than Half</th>
<th>All or Almost All</th>
</tr>
</thead>
<tbody>
<tr>
<td>33. Smoke Cigarettes</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Part VI

Directions: Fill in the circle under the column heading to tell us how often (if ever) you generally do or have done the following thing. Please be honest.

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>A few times but NOT in the past year</th>
<th>A few times a year</th>
<th>Once a month</th>
<th>A few times a month</th>
<th>Once a week</th>
<th>A few times a week</th>
<th>Once a day</th>
<th>More than once a day</th>
</tr>
</thead>
<tbody>
<tr>
<td>34. Smoke Cigarettes</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Part VII

Directions: Read the statements below and fill in the circle to indicate your response

<table>
<thead>
<tr>
<th>Do you think you will use the following within the next two years?</th>
<th>Definitely not</th>
<th>Probably not</th>
<th>Maybe</th>
<th>Probably will</th>
<th>Definitely will</th>
</tr>
</thead>
<tbody>
<tr>
<td>35. Cigarettes</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

THANK YOU FOR COMPLETING THIS SURVEY.
APPENDIX D

DESCRIPTION OF THE LIFE SKILLS TRAINING PROGRAM
## DESCRIPTION OF THE LIFE SKILLS TRAINING PROGRAM
(Middle School Level 1 – Grade 6)

<table>
<thead>
<tr>
<th>Topics</th>
<th>Material covered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking and Biofeedback</td>
<td>Information on physiological effects of smoking</td>
</tr>
<tr>
<td>Smoking: Myths and realities</td>
<td>Common attitudes and beliefs about smoking; prevalence of smoking, reasons for and against smoking, the process of becoming an addicted smoker, and the decreasing social acceptability of smoking.</td>
</tr>
<tr>
<td>Self-image and self-improvement</td>
<td>Self-image and how it is formed, the relationship between self-image and behavior, the importance of a positive self-image, and ways of improving self-image.</td>
</tr>
<tr>
<td>Decision making</td>
<td>A general decision-making strategy, decision making and sources of influence affecting decisions, resisting persuasive tactics, and the importance of independent thinking.</td>
</tr>
<tr>
<td>Advertising</td>
<td>Use and function of advertising, ad techniques, identifying ad techniques used in cigarette advertising and how they are designed to affect consumer behavior, and alternative ways of responding to these ads.</td>
</tr>
<tr>
<td>Coping with anxiety</td>
<td>Situations causing anxiety, demonstration, and practice of techniques for coping with anxiety</td>
</tr>
<tr>
<td>Communication skills</td>
<td>Verbal and nonverbal communication and techniques for avoiding misunderstandings</td>
</tr>
<tr>
<td>Social skills</td>
<td>Making social contacts, basic conversational skills, giving and receiving compliments, listening skills, and making introductions</td>
</tr>
<tr>
<td>Assertiveness</td>
<td>Differences between assertion and aggression, standing up for one’s rights, common situations calling for an assertive response and responding to peer pressure to smoke</td>
</tr>
<tr>
<td>Violence Prevention</td>
<td>Analyzing conflict resolution choices, resistance to media messages, learning techniques to control anger</td>
</tr>
<tr>
<td>Alcohol and Marijuana: Myths &amp; Realities</td>
<td>Information about alcohol and marijuana to counter misconceptions</td>
</tr>
</tbody>
</table>

(Botvin et al., 1980, p. 138)  
(Botvin, G., 2006)
VITA

Alan Jay Nichols was born May 23, 1947, in Los Angeles, California. He graduated from the University of California at Los Angeles (UCLA) in 1974 with a Bachelor of Arts degree in psychology. He later obtained a Master in Counseling Psychology degree from National University in Irvine, California, in 1991. After moving to Louisiana in 1994, he attended Louisiana State University (LSU) where he obtained a Master in Social Work degree in 1996. He received his clinical social work license (LCSW) in August 2000, and he will be awarded the Doctor of Philosophy degree in Social Work from LSU in December 2006. He has worked in the areas of adolescent substance abuse and mental health treatment for over 15 years. In 1999, he founded School District Alliance, a non-profit organization located in Baton Rouge, Louisiana. He is the executive director of that agency which is involved in community collaborative development and implementation of prevention programs in schools throughout Louisiana.