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Adolescents and Marijuana Use:
The Affects of Peer and Parent Relationships
And Substance Abuse Education

A thesis
presented to
The faculty of the Department of Criminal Justice
East Tennessee State University

In partial fulfillment
of the requirements for the degree
Master of Arts in Criminal Justice and Criminology

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August 2007

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ABSTRACT

Adolescents and Marijuana Use:
The Affects of Peer and Parent Relationships,
And Substance Abuse Education

by

Samuel J. Cosimano, Jr.

The purpose of this study was to analyze gender, race, substance abuse programs such as Drug Abuse Resistance Education (D.A.R.E.), parents, and peers and their ability to influence or predict adolescents and their decisions to use marijuana. All of the variables used for this study came from secondhand data collected by Esbensen and Osgood (1999), Gang Resistance Education and Training (G.R.E.A.T.). The analysis revealed that males are more likely to have ever used marijuana, that mixed race adolescents have a higher rate than other races to have ever used marijuana, that when adolescents complete the substance abuse program, D.A.R.E. have a lower rate than those who did not complete the program, adolescents are less likely to have ever used marijuana when their parents know where they are, and adolescents are more likely to have ever used marijuana when they have friends who use marijuana.

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CHAPTER 1

INTRODUCTION

The young adolescents of the past and present have been affected or are currently being affected by marijuana use. Experimentation with drugs among American adolescents is on the rise and has become of concern in today's society. This type of activity has grabbed the attention of the general public because it has put society at risk indirectly and directly. The consequences for drug use may be patterns of delinquency and even continued use in later stages of development. For this reason it is important to examine the risk factors that initially cause adolescents to use marijuana. The family and peer groups are two domains in particular that have gained attention in predicting drug use. Prior research has shown that parental supervision and peers have had a direct affect on the adolescent's use of marijuana. For instance, close parental supervision is strongly associated with less marijuana use. Numerous studies have shown that the close bonds between a child and his or her parent or parents are associated with less drug use (Brook et al., 1998).

Monitoring is a form of parental attachment. This refers to parents knowing where their children are and what they are doing.

“Monitoring is a method that may help to ensure that rules are followed and that opportunities for deviance are limited. Discipline is generally used when these rules are not obeyed, and the consistency of discipline is believed to increase the likelihood that the child will learn to obey such rules” (Kung & Farrell, 2000, pg 510).

When monitoring is properly implemented, parents are aware of behaviors that occur inside and outside the home. If the child oversteps any boundary, the parent or parents

will be able to intervene and administer proper and consistent punishment. This type of action serves as a deterrent for the child.

Parents need to be trained and educated by programs provided by local communities on how to effectively communicate with their children and monitor their children's behavior to reduce the risk of first-time drug use. Communities need to take a stand and help troubled parents with their children because ultimately the community is being directly affected. Monitoring is a good prevention tool for parents and the community. Poor monitoring and inconsistent discipline lead adolescents to be more likely to become marijuana users. Monitoring is so important because it has a positive influence on the development of an adolescent, which will in turn reduce the chance of marijuana use.

An adolescent's living conditions also play a significant role in predicting marijuana use. Damage to a parent-child relationship such as divorce is seen as a form of family disruption. Adolescents residing in single-parent homes have fewer opportunities for a parent to get involved in their lives. Some studies show that when an adolescent lives with both natural parents, versus an adolescent who lives with only one parent or in a step-parent home, he or she is less likely to use marijuana. A step-parent entering a youth's home ultimately breaks the current parent-child relationship and increases a child's likelihood of turning to peers for the attention that has been lost. Family relations are seen to provide some restraint on adolescent marijuana use, but most research indicates that peer associations have a stronger influence on this form of behavior (Hoffmann, 1994).

If there is a poor relationship between the parent and child, this will increase the chance for an adolescent to associate with deviant peers. Peers who use drugs may appear as role models and reinforce drug use amongst their peers. “Drug use may be the result of social modeling by a person or group that the person views as an authority or inspiration” (Allen et al., 2003, p. 168). Typically, adolescents who use drugs have friends who are users themselves. Some researchers have said that adolescents seek out drug-using friends because adolescents already use drugs and seek others who share the same ideas; this is referred to as peer selection. Peers can identify with each other and serve to establish the attitudes, beliefs, and group norms for drug behavior. The social learning theory states that delinquent and criminal behavior is learned through association with others. If you associate with delinquent peers, the odds are that you will learn delinquent behavior. On the other hand, adolescents who do not have drug-using friends are much less likely to use drugs themselves. Allen and his associates have found in their study that peers have a greater influence on substance use than parents.

Biological factors are also said to determine whether an adolescent will use drugs or not. Studies have shown that race and gender play roles in an adolescent’s substance abuse. Gender studies, such as the one conducted by Kosterman, Hawkins, Guo, Catalano, and Abbott (2000), have shown that males are more likely than females to use drugs; however, the exact reason for that remains greatly disputed. Race and drug use studies, such as the one conducted by Bachman (1991), have also shown that Native Americans are more likely than and any other race to use drugs.

Purpose of the Current Study

Experimentation with drugs among American adolescents is on the rise. This type of activity has grabbed the attention of the general public because society as a whole has been put at risk indirectly and directly. The result of drug use may be patterns of delinquency and continual use in later stages of development. For this reason it is important to examine the risk factors that initially cause adolescents to use marijuana. Prior research has shown that parent-child relationships and peers have had a direct effect on the adolescent's use of marijuana. A strong parent-child attachment is strongly associated with less marijuana use. Numerous studies have shown that the close bonds between a child and his or her parent or parents are associated with less drug use. The purpose of this study was to analyze gender, race, substance abuse programs such as Drug Abuse Resistance Education (D.A.R.E.), parents, and peers and their ability to influence or predict adolescents and their decisions to use marijuana. If they are proven to have a relationship, the next question is which one is significantly stronger. The next step is to explore issues with the researchers' claims and how their claims can be used in real life settings to prevent adolescent drug use. The final step is to determine if biology plays a factor such as race and gender.

Hypotheses

There are five specific research hypotheses in this study to help determine not only if there is a relationship between parent-child attachment, peer relations, substance abuse programs, gender, and race with drug use but also which one is a stronger predictor at a significant level.

H1: Adolescents with a strong parent-child attachment are less likely to use marijuana than those with a weak parent-child attachment. .

H2: Adolescents are more likely to use marijuana when their friends use marijuana.

H3: Substance abuse programs do not reduce marijuana use by adolescents.

H4: Male adolescents are more likely than female adolescents to use marijuana.

H5: Black adolescents are more likely than white, Hispanic, American Indian, Asian, other, and mixed race adolescents to use marijuana.

CHAPTER 2

REVIEW OF PRIOR RESEARCH

There has been an extensive amount of research done on risk factors and marijuana use. Among adolescents the vast majority of the research has identified five major risk factors associated with adolescent marijuana use, family relations (parent-child attachment), peer associations, substance abuse programs, gender, and race. Some researchers have found that the family is the best predictor of adolescent marijuana use, while others claim that peer associations are predictors of adolescent marijuana use. Others believe that substance abuse programs are the key to deterring adolescent drug use. The final groups of researchers believe gender and race are the underlining predictors. The following studies will give a quick overview of the prior research on risk factors and adolescent marijuana use.

Parent-Child Attachment

According to Hoffmann (1993) adolescents who suffer from a parental death or divorce are likely to turn to marijuana to help cope with the stress that has been created. A death or divorce is extremely detrimental to adolescents because it hinders them from creating or continuing a bond with their family. A strong family relationship rarely affects adolescent behavior after a negative event like this occurs. Because attachment has been weakened by a big event, it is very difficult to regain the family connectedness that was lost. Consequently, children turn to their peers for support and comfort. Hoffmann also says there is a need for more research that focuses on non-intact families because there were only a few cases like this presented in his study. If adolescents who

come from disrupted families are more likely to use drugs, society needs to provide marriage counseling and other programs that will prevent future broken homes.

According to Hoffmann (1994), marijuana use during adolescence varies by age. Family disruptors such as divorce and remarriage also have particular influences on drug use. Older adolescents are greatly affected by divorce and remarriage because the family structure has changed. This tends to make older adolescents look for support systems outside the home. The effects of the change can cause adolescents to seek out positive or negative relationships with peers. Younger adolescents are less affected by family disruptors because they do not have the same opportunities or freedom to look outside the home for support, as do older adolescents (Hoffmann).

Hoffmann (1994) states the bond between a step-parent and a child is unlikely to be as strong as the relationship was with the child and his or her natural parents; especially among older adolescents because they are less likely to identify with the new step-parents. Furthermore, the belief is that family relations in the form of attachment and involvement continue to affect associations with peers. As adolescents get older peers tend to have a lesser affect. Other additional factors need to be addressed if we want to better explain marijuana use among older adolescents. Overall, strong family relations between parents and adolescents will ultimately weaken associations with drug-using peers and lower marijuana use for both younger and older adolescents (Hoffmann).

In another study by, Steinberg, Fletcher, and Darling (1994), show that parental monitoring does deter drug use in girls and boys. Overall, parental monitoring was found to be a greater influence on girls, while boys who used drugs were more influenced by

drug-using peers than their parents. When a strong bond is not prevalent between children and their parents, drug use is more likely to occur.

It is very important for parents to get involved in their children's lives. Parents who are not involved in their children's lives are plain ignorant and have no excuse for their children's behavior. Parents need to stop blaming society for their children's problems and step up to the plate and take some responsibility. Communities can help teach parents proper parenting skills through classes and programs, but parents have to have the need and want to learn. The only way that things are going to change is by taking the appropriate action to correct the current problem for each adolescent (Steinberg, Fletcher, & Darling, 1994).

During the adolescence stage many children go through numerous changes. "Peer relationships become very important during this time, and friends may exert more influence than parents and other adults" (Gordon, 2003, p. 25). Individuals between the ages of 15 and 19 make up the largest group of new drinkers. "Fifty percent of adolescents who use marijuana say they first used it when they were 13 years old or younger" (Gordon, p. 26). This comes as no surprise because adolescence is a time for experimentation with alcohol and drugs.

As noted by Gordon (2003), there are "two major conditions necessary for drug and alcohol use, 'availability' and 'acceptability'" (p. 26). It is found that peers and older role models are strong influences on whether a teen will experiment with/or continue to use drugs on a regular basis. Once drug use has been started, individuals then seek out peer groups who accept and embrace the same ideas. This type of behavior can be prevented if parents teach their children at a young age that drugs and alcohol are

unacceptable behaviors and will only lead to trouble. Parents also need to know who their children's friends are and the whereabouts of their children at all times. Research has found that children who are not supervised after school and do not attend an after-school program are more likely to smoke, drink, and use drugs. Other strong indicators for adolescence drug use are poor parent-child communication skills that ultimately lead to a loss of trust and when there are little or no religious connections. The community as a whole needs to become more involved in children's lives which would in turn help society as a whole.

Peer Association

Hussong and Hicks (2003) examined the idea that peers have a greater influence on adolescent substance use than parental attachment. Other prior studies did not look into how the strength of peer relationship affects drug use. Depending on how close the bond is between an adolescent and his or her friends will greatly affect the amount of drug use one experiences. Hussong and Hicks defines differential association as the priority, duration, frequency, and intensity of patterns of interactions with others. Best friend's substance use was said to be the strongest predictor for adolescent substance use. Adolescents who have very close friends who use drugs are more very likely to have strong positive emotions about drug use. The reason behind this link may be due to them wanting to be accepted by their close friends and-or strengthen relationships. On the other hand, adolescents who do not have friends who use drugs will have negative emotions about drug use. The findings indicate that drug use is directly related to the strength of the relationship.

Hoffmann (1993) focused on the indirect and direct family effects on adolescent drug use. He found peer association is clearly the strongest predictor for adolescent drug use. Peers provide opportunities and reinforcements for drug-using behavior. However, we should not count out family influence because it does directly affect peer associations as well. In turn, the peer association greatly impacts drug use. The family provides the ability to help control behaviors through attachment and involvement. When adolescents are less involved with their family they become more at risk for marijuana use. Low family involvement also directly increases the number of peers one has who uses drugs.

Many teens tend to go along with the crowd because they are desperate to make friends and scared of becoming the social outcast. Ultimately, young teens engage in risky behavior and do not think twice about the harmful consequences because they want to fit in at all cost. “Teens are not the only ones experiencing peer pressure. Adults feel it too, but teens are particularly vulnerable to feeling pressure from their peers” (Fanning, 2003, p. 8). The parent-attachment is quickly eroding away while teens are joining peer groups where they have the ability to try out new things, develop new social skills, and become more independent in search of self-identity. With these types of attributes teens can easily slip into the grips of a bad crowd and pick up terrible habits such as using drugs, smoking, drinking, violence, lying, cheating, stealing, and engaging in sexual activity. It is very difficult for teens to back out of a bad running peer group because they do not want to lose any of their current friends and be left alone (Fanning).

Parent-Child Attachment and Peer Association

A study was conducted in Colombia, South America that focused on identifying risk factors in adolescents for marijuana use. Brook et al. (1998) concluded that the

family and peer factors had a direct effect on marijuana use. The overall purpose of the study was developed because society continues to suffer from adolescent marijuana use and delinquent behavior such as theft and vandalism. Unlike many prior studies in the United States, families in Colombia, South America were found to have the greatest impact on adolescent marijuana use. It appears family bonds are of higher significance to individuals in Columbia, South America than they are to Americans in the United States (Brook et al.,1998).

Brook and her associates conducted a follow-up study in 2001 that looked at the same risk factors, family attachment and peer associations, for adolescent marijuana use across different cultures and across time. Data integrated from three different longitudinal studies: “Childhood Etiologic Determinants of Adolescent Drug Use” (Childhood Etiologic Study), “Drug Use and Problem Behaviors in Minority Youth” (Minority Youth Study), and “Drug Use And Problem Behavior Among Colombian Adolescents” (Colombian Youth Study), were used to determine if the risk factors are accurate predictors of adolescent drug use across different cultures.

The Childhood Etiologic Study focused on Caucasian adolescents from the northeastern part of the United States. Secondly, the Minority Youth Study involved minority adolescents from the East Harlem section of New York City. The third and final study, Colombian Youth Study, looked at Colombian adolescents from two cities in Colombia, South America. All three studies showed that family attachment and peer association were both strong predictors of adolescent drug use. This is the first study that has examined different psychosocial risk factors for marijuana use in two different

countries. In Columbia it can be said that family relationships are held to a higher degree than in America. (Brook et al., 2001).

Kosterman et al. (2000) explain that marijuana use causes serious health and behavior problems for adolescents. They have identified several risk factors that increase the likelihood of marijuana use. Two major risk factors that Kosterman has identified are parent-child attachment and peer influence. A poor parent-child relationship results in poorly monitored adolescents. Ultimately poor attachment and poor monitoring increase the risk for early initiation. The other risk factor describes substance-using peers and their ability to influence other young adolescents to become drug users. The sayings, one bad apple ruins the whole bunch or birds of a feather flock together, have been used to describe this theory. The results of the study also say that males are more likely to become drug users than females. Marijuana use was found to be higher in African Americans than any other ethnic group. A child's age is also a strong predictor of the onset of marijuana use. Marijuana use became more prevalent in adolescents after the age of 13. Overall, early marijuana use can be prevented with proactive parents who are involved in their children's lives.

A study conducted by Morojele and Brook (2001) focused on the adolescent psychosocial risk factors for marijuana use on adolescents between the ages of 17 and 22. The study used longitudinal data. The subjects used were first measured between the ages of 1 to 10 years of age and later measured on four other different occasions between 1983 and 1997. This was done to better understand and predict the risk factors that contribute to the marijuana use for different age levels. The risk factors were broken

down into three separate domains: personality, parent-child relationship, and peers. The purpose of the study was to see what type of factors initiates drug use in adolescents.

Their findings indicated that personality, parental, and peer association affected the use of marijuana in adolescents. Children are said to learn and demonstrate the values and beliefs of their parents, which has an effect on the relationship between children and their parents. If the bond is weak, the child is likely to engage in drug activity. In turn, the personality of the individual is developed with certain morals and values. The peer domain is directly affected by the parent-child relationship and the personality. This is said to indirectly affect marijuana use. When adolescents hang around other drug-using adolescents they are at a higher risk to use drugs themselves. Morojele and Brook (2001) stated that all three domains would be good candidates for intervention. Programs and educational classes need to be provided for parents to strengthen the relationship between the parents and their children. If these programs were implemented and properly used statistics for adolescent drug use would fall (Morojele & Brook, 2001).

Substance Abuse Programs

One of the top school-based drug education programs used today across the United States is the Drug Abuse Resistance Education (D.A.R.E. program). The well-known drug prevention program has expanded its horizon into more than 40 other countries and has ultimately reached over 25 million young children since the program has been established. In 1983, D.A.R.E. was developed as a joint venture of the Los Angeles Police Department and the Los Angeles Unified School District. In today's society children are subject to many stresses and faced with many decisions long before coping and decision-making skills have been fully developed. Lacking these skills, a

child can make unhealthy decisions under pressure from peers. The primary focus for D.A.R.E is to teach children and young adults to say “NO” to alcohol, drugs, and violence. Through its program individuals are able to learn the coping skills necessary for managing personal and peer pressures that can untimely lead to drug and alcohol experimentation (Rosenbaum, 1998).

The D.A.R.E curriculum teaches basic life skills that enable students to make good decisions about anything they consider doing, not just drugs or violence. They develop skills in decision-making, conflict resolution, and risk assessment. It gives them a logical sequence to follow to solve common problems in a positive and effective way. The program builds interpersonal and communication skills with children at the elementary school level. The program also teaches the student about personal responsibility and the importance of self-esteem (Rosenbaum, 1998).

A unique aspect about D.A.R.E. is that it incorporates police officers as instructors. Officers are selected from police departments based on their human relation and communication skills. After selection, they receive intensive training to enable them to effectively teach in the classroom. Workshops have also been set up for parents and teachers in hope that the curriculum will be embraced not only at school but at home as well (Rosenbaum, 1998).

Many people have questioned the true effectiveness of the D.A.R.E. program and its ability to combat drug use because the nation’s current drug use trend has been on the rise for many years now. After large declines in drug use in the 1980s, the national trend began to reverse in the early 1990s: The percentage of high school seniors who reported using illegal drugs “during the past year” increased from 22% in 1992 to 35% in 1995, a

59% increase (Johnston, O'Malley, & Bachman, 1988). Marijuana is responsible for the increase because it is cheap, readily available, and many think that you cannot get addicted.

In Illinois, a randomized field experiment with one pretest and multiple posttests was set up to evaluate and assess the state's D.A.R.E program. Rosenbaum (1998) identified and evaluated 36 elementary schools located in urban, suburban, and rural areas throughout Illinois. For each particular area 12 schools were selected and were closely matched by type, ethnic composition, number of students with limited English proficiency, and the percentage of students from low-income families. The 24 elementary schools from the urban and suburban areas had never received any drug prevention program, such as D.A.R.E prior to research. One school from each of the matched schools from the urban and suburban areas was randomly selected to receive the D.A.R.E program while the remaining schools made up the control group. In addition, six "treatment" schools from rural areas where the D.A.R.E program was already in place were used and an additional six schools were selected from a near-by county to represent the same characteristics as the "treatment" schools.

The number of schools that were evaluated grew from 36 to 150 so that individuals could be followed as they left elementary school and entered middle school. Eventually, the study covered a sample size that fluctuated between 150 and 300 schools to cover students that moved, transferred, and-or graduated. At the start of the study about two thirds of the students were in sixth grade and more than half of the students indicated that they were living with both parents. By the time the study was completed many of the students had reached high school (Rosenbaum, 1998).

Rosenbaum (1998) collected data over a 6-year period from two types of surveys: one for students and one for specific teachers. The student survey was to measure D.A.R.E.'s overall effects on the students' drug use behavior, alcohol use, general attitudes towards drugs, attitudes toward the use of specific drugs, perceived benefits and costs of using drugs, perceptions of media's influences on smoking and beer drinking, self-esteem, attitudes toward police, peer resistance skills, school performance, and delinquent and violent behavior. On the other hand, the teacher survey was used to obtain additional information about students and their exposure to post-D.A.R.E drug prevention programs for every academic year.

A random-effects ordinal regression model was used through two programs called MIXOR and MIXREG that allowed relationships between D.A.R.E. and individual-level outcomes to be examined while controlling for random effects. The pretest and all of the posttests were entered and the results provided no support that D.A.R.E. possessed any long-term affects on a wide range of drug use measures, nor did it have much effect on short-term. These results may show that peer pressure has a greater effect in and outside the classroom. The classroom is a controlled environment, but once one steps foot out of the classroom he or she is immediately hit with the pressures of the real world (Rosenbaum, 1998).

An additional study by Thombs (2000) examined the collegiate level to see if the widely exposed drug prevention program, D.A.R.E., actually has a long-term effect. The study assessed the relationship between college students who participated in the program while in high school versus those who never received any exposure to the program. A sample of 781 students from a large public university in Ohio were randomly selected

and asked to respond to an anonymous questionnaire. The majority of the students who participated in the study were between the ages of 18-24, totaling 630.

The study covered four major areas: D.A.R.E. participation, cigarette use, alcohol use, and other drug use. Students were asked to answer all of the questions honestly and to the best of their ability. The first section, D.A.R.E. participation, asked students if they have gone through the school-based D.A.R.E. program as a child or teen. The answers were scored as follows: 1 for yes, 2 for no, and 3 for uncertain. The second section, cigarette use, asked students have they smoked based on a four-point scale. The answers were scored as follows: 1 for non-smoker, 2 for former smoker and experimental smoker, 3 for occasional smoker – smoked at least 100 cigarettes, and 4 for daily smoker. The third section, alcohol use, asked students about the frequency of their alcohol consumption based on a nine-point scale ranging from never to seven times a week. A second part of this section also asked the number of drinks one has during one occasion based on a 10-point scale ranging from I do not drink alcohol to 12 or more drinks. A third part of this section asked individuals how often they drive drunk based on a nine-point scale ranging from never to four or more times a week. The fourth section, other drug use, asked students if they ever used marijuana, LSD, hallucinogenic mushrooms, cocaine, MDMA, or GHB based on a four-point scale. The answers were scored as follow: 1 for never used, 2 for used, but not in the past 12 months, 3 for used but not in the past 30 days, and 4 for used in the past 30 days (Thombs, 2000).

Thombs (2000) preformed a multiple discriminate function analysis that covered all of the data provided by the university students. The findings indicated that there were no short-term and long-term effects of D.A.R.E participation. The pressures of college

life may cause young adults to stray off the beaten path: they are free of parent-attachment, and succumbing to peer pressure becomes a way of life. For these reasons there is a strong need for better evidence-based prevention programs because the United States government spends more than \$750 million annually on a program that seems to be broke. The world's drug problem has continued to rapidly increase and will not be left unforgotten due to the vast amount of media coverage and political finger pointing. If teachers and police officers cannot change the minds of young individuals, it is difficult to say who can. Everyone is looking for the answer and will continue till the issue has been properly addressed (Thombs, 2000).

Bond (2004) in a research paper published by the Journal of School Health examined the impact of a school-based prevention intervention, Gatehouse Project, on cannabis use in adolescences and the ability to deter drug using behavior. "The intervention uses a multilevel strategy to promote change in the social and learning environments of the school as well as promoting change at an individual level" (Bond, 2004, p. 28). Twelve schools in Melbourne, Australia were randomly selected to implement the Gatehouse curriculum in the study. Students were asked to participate in a 40-minute self-reporting computerized survey twice during the first year of the program and once annually for 2 years. The initial survey results show that teenagers who came from broken homes and/or have friends who used drugs were increasingly prone to report that they have used drugs themselves. Follow up surveys report that there was a 20% to 30% reduction in drug use for students who were exposed to the curriculum. In addition, nonsmoking students had even greater reduction in drug use of 46%.

Overall, the study indicated substance use among adolescent drug users could be affected by an altered multilevel school-based curriculum that focuses on the individual. Even though the Gatehouse Project holds potential for reducing substance use, more research is required to help identify the on-going health risk behaviors and how they can be prevented. When time and the proper education are implemented anything is possible.

“Drug prevention programs in schools are a critical element of the anti-drug effort, yet only 9% of school districts are using programs whose effectiveness has been demonstrated through rigorous research” (Ellickson, 2004, p. 1830). Project ALERT is another well-known drug prevention curriculum that was specifically designed to target middle school children between the ages of 11 and 14 from widely diverse backgrounds and communities. The program has proved itself to be one of the most successful evidence-based programs in the nation that reduces both the onset of substance abuse and regular use (Ellickson).

Ellickson (2004) conducted a study that evaluated the Project ALERT curriculum which is said to help children understand the consequences of using drugs, develop reasons not to use, understand the benefits of being drug free, recognize that most people do not use drugs, identify and counter pro-drug pressures, resist advertising appeals, support others in their decisions not to use, learn how to quit, communicate with parents, and recognize alternatives to substance use. Students who participated in the study were exposed to 11 core lessons while in the seventh grade and then received an additional three lessons in the eighth grade. Parental involvement and home learning opportunities were also implemented and have been made readily available to parents to help reinforce the curriculum in a controlled environment for the child.

The study was comprised of 4,276 students from 55 middle schools across South Dakota. Out of the 55 middle schools tested 34 received the revised curriculum and 21 were assigned to the control group. Students completed surveys before they were exposed to the curriculum and then again after graduation from the program. The data collected were from questionnaires that asked students to self-report about their personal experiences and frequency of drug and alcohol over the course of a lifetime (Ellickson, 2004).

The results indicated that students from the schools that received the Project ALERT curriculum showed lower rates of current and regular marijuana use compared with the control group. Project ALERT curbed cigarette initiation and reduced cigarette use by 19% for new smokers. Initiation rates for students exposed to Project ALERT were 25.5% compared to those who did not participate increased to 31.6% by the eighth grade. In addition, Project ALERT curbed marijuana initiation and reduced marijuana use by 24% for new users. Initiation rate for students exposed to Project ALERT were 13% compared to those who did not participate who had an initiation rate of 17%. There were not any significant findings for that of alcohol use between ALERT schools and control schools (Ellickson, 2004).

The overall results showed there to be a true promise in reducing unhealthy behavioral risks in adolescences when the proper educational skills are implemented. Continued research is needed to further our educational based programs because many programs have shown far less impressive results.

CHAPTER 3

METHODOLOGY

The purpose of this study was to analyze psychosocial predictors that affect marijuana use among adolescents. Factors such as parental attachment, peer association, substance abuse programs such as D.A.R.E, gender, and race were used to run statistical tests. These tests were used to analyze and determine what relationship these factors had on the use of marijuana by adolescents. It was predicted that adolescents who have a strong parent-child attachment are less likely to use marijuana than those with a weak parent-child attachment. Secondly, it was predicted that adolescents who have friends who use marijuana have a greater chance of using marijuana themselves. Thirdly, substance abuse programs were not predicted to reduce adolescent marijuana use. Fourthly, male adolescents are more likely than female adolescents to use marijuana. Finally, black adolescents are more likely than white, Hispanic, American Indian, Asian, other, and mixed race adolescents to use marijuana. Some research declared that peer associations have a greater impact while other research stated that the parent-child relationship has a greater impact on marijuana use. On the other hand, effective drug prevention based programs have been said to be the most effective way to deter adolescent marijuana use.

Data

The study sample was based on secondary data prepared and collected by Esbensen and Osgood in 1995. The participants of the study came from different areas of the United States where the Gang Resistance Education and Training (GREAT) program was being used (Las Cruces, NM; Omaha, NE; Phoenix, AZ; Philadelphia, PA; Kansas

City, MO; Milwaukee, WI; Orlando, FL; Will County, IL; Providence, RI; Pocatello, ID; and Torrance, CA). The GREAT program is a 9-week program that teaches students about conflict resolution skills, cultural sensitivity, and the negative aspects of gang life. The two main objectives of the GREAT program are: “to reduce gang activity and to educate a population of young people as to the consequences of gang involvement” (Esbensen & Osgood, 2005, pg. 198). Gangs are prone to drugs and all types of criminal activity.

A total of 5,935 eighth grade students were used in the study, a majority of whom were 13 and 15 year olds who attended public schools. In total 42 schools that fell within 11 different jurisdictions were represented. The jurisdictions included large urban areas, medium-sized cities, small cities, and rural communities. Because the various jurisdictions included so many different areas, Esbensen and Osgood (2005) were able to insure that individuals from all racial backgrounds were included.

Variables

This section provides a description of the independent and dependent variables used to analyze the hypotheses for this study.

Dependent Variable

The dependent variable assessed marijuana use among adolescents. Adolescent students were asked if they had ever used marijuana, which was represented as (1, no; 2, yes). The dependent variable was measured at a nominal level where the answers have no actual value in themselves.

Independent Variables

There were five independent variables examined in this study. The independent variables in the study represented predictors of marijuana use among adolescents. The first independent variable was the family (parent-child attachment), which was shown through the following likert scale measuring: Parents Know Where I Am, (1, strongly disagree; 2, disagree; 3, neither agree nor disagree; 4, agree; 5, strongly agree). The second independent variable, peer association, reflected the following variable: Friends Use Marijuana, (1, none of them; 2, few of them; 3, half of them; 4, most of them; 5, all of them). The third independent variable, substance abuse education, reflected the following variable: Completion of D.A.R.E, (1, yes; 2, no). The fourth independent variable was gender and represented by the following, (1, male; 2, female). Finally, race was represented by the following, (1, White-Anglo, Not Hispanic; 2, Black-African-American; 3, Hispanic-Latino; 4, American Indian; 5, Asian; 6, other; 7, mixed).

Analytic Strategy

Multiple statistical tests of significance were conducted and evaluated on the dependent variable and independent variables to test the hypotheses in this study. At the univariate level, frequency and descriptive statistics were used to describe the basic features of the data in the study. They provided summaries of the sample including frequency, percentage, standard deviation, range, mean, and mode for each variable.

At the bivariate level, several tests were constructed and computed to analyze the correlation between adolescent marijuana use and all of the independent variables. A Pearson's Correlation matrix was used to compare ever used marijuana between the overall variable categories gender, race, completed D.A.R.E, parents know where I am,

and friends use marijuana. In addition, Chi-Square tests were independently ran against each of the variables that were represented through contingency tables. The test was used to compare adolescent marijuana use between gender, which was measured as males, and females. Adolescent marijuana use was then compared to race which was measured as white, black, Hispanic, American Indian, Asian, other, and mixed race. It was then used to compare adolescent marijuana use between and completion of D.A.R.E., which was measured as no, and yes. Also, Chi-Square was used to compare adolescent marijuana use to parents know where I am which was measured as strongly disagree, disagree, neither agree nor disagree, agree, and strongly agree. Finally, Chi-Square was used to compare adolescent marijuana use to friends use marijuana which was measured as none of them, few of them, half of them, most of them, and all of them. The last bivariate level test that was conducted was Cramer's V which also compared the relationships between adolescent marijuana use and the five independent variables.

At the multivariate level, linear regression was used to analyze multiple independent variables' affect on the dependent variable. This test evaluates the significance of the individual variables while controlling for all of the independent variables. Ultimately, linear regression provides the probability of predicting adolescent marijuana use against each of the independent variables.

CHAPTER 4

RESULTS

The purpose of this study was to look at the adolescent marijuana use and the effects that gender, race, completion of D.A.R.E., parents know where children are, and friends that use marijuana on adolescents who have used marijuana or those who have not used marijuana. It was predicted that adolescents with a strong parent-child attachment would be less likely to use marijuana than those with a weak parent-child attachment. Furthermore, it was predicted that adolescents would be more likely to use marijuana when their friends use marijuana. Next, it was predicted that substance abuse programs would not reduce marijuana use by adolescents. Moreover, it was predicted that male adolescents would be more likely than female adolescents to use marijuana. Finally, it was predicted that black adolescents would be more likely than white, Hispanic, American Indian, Asian, other, and mixed race adolescents to use marijuana.

Detailed results for all of the statistical tests that were conducted for this study are in this section. The results of this study are presented in text and tables. There are nine tables discussed in this section. The first table consists of analysis of the data at the univariate level, and the final eight tables present analysis of the data at the bivariate and multivariate levels.

Summary Statistics

Descriptive statistics are used to describe the characteristics of a sample or a population. These outputs contain several pieces of information that can be useful to understand the descriptive qualities of the data.

Table 1 represents the summary statistics for all the variables used in this current research. This table shows the number of adolescents who have ever used marijuana and those who have not ever used marijuana, the adolescent's gender, race, their responses toward whether they completed the D.A.R.E drug abuse prevention program, parents know where they are, and friends who use marijuana. The current study showed that there were 5,803 adolescents who indicated whether or not they had ever used marijuana. Of those, 70.5% reported that they had not ever used marijuana and 29.5% reported that they have used marijuana. Gender was made up of 5,884 respondents. Of those, 51.9% were females and the remaining 48.1% were males. There were 5,832 of the respondents who indicated their race. Of those, 40.4% were White, 26.5% were Black, 18.8% were Hispanic, 2.3% were American Indian, 5.9% were Asian, 1.7% were Other, and 4.4% were Mixed. There were 5,862 adolescents who answered the question, did they complete the D.A.R.E program. Of those, 15.3% reported that they had not completed the program, while 84.7% reported that they did complete the program. Fifthly, there were 5,882 adolescents who responded to the question, parents know where they are. Of those, 4.9% strongly disagree, 13.3% disagree, 17.1% neither agree nor disagree, 40.7% agree, and 24.1% strongly agree. Finally, there were 5,789 adolescents who responded to the question whether their friends use marijuana. Of those, 46.1% stated none of them, 22.7% few of them, 9.4% half of them, 11.5% most of them, and 10.3% all of them.

Table 1
Descriptive Statistics for All Variables

	<u>Frequency</u>	<u>%</u>
Ever-Used Marijuana		
No	4091	70.5
Yes	1712	29.5
Gender		
Male	2830	48.1
Female	3054	51.9
Race		
White	2355	40.4
Black	1544	26.5
Hispanic	1098	18.8
American Indian	134	2.3
Asian	346	5.9
Other	97	1.7
Mixed	258	4.4
Complete D.A.R.E.		
No	894	15.3
Yes	4968	84.7
Parents Know Where I Am		
Strongly Disagree	287	4.9
Disagree	782	13.3
Neither Agree nor Disagree	1003	17.1
Agree	2393	40.7
Strongly Agree	1417	24.1
Friends Use Marijuana		
None of Them	2666	46.1
Few of Them	1315	22.7
Half of Them	546	9.4
Most of Them	667	11.5
All of Them	595	10.3

Correlation Between Variables

Table 2 indicates the Pearson's correlation coefficients (Pearson's r) between the dependant variable of ever-used marijuana and all of the independent variables. The

statistics came from the Correlation Matrix, which is based on the correlation coefficient, a number between 1.0 and -1.0. If there were perfect positive linear relationship between two variables, the correlation would be 1.0. If there were a perfect negative linear relationship between the two variables, the correlation coefficient would be -1.0. A correlation coefficient of zero means that there is no linear relationship between the variables.

The relationship between friends who use marijuana and who have ever used marijuana was the strongest positive correlation ($r=.669$) and followed by race ($r=.047$). Both sets of variables were significant at the .01 alpha level. Furthermore, the relationship between parents who know where I am and ever used marijuana was the strongest negative correlation ($r=-.236$) and followed by sex ($r=-.071$). Both sets of variables were also significant at the .01 alpha level. Finally, the relationship between completed D.A.R.E. and ever-used marijuana had a negative correlation of ($r=-.033$), which was significant at the .05 alpha level. Overall, these findings supported the hypothesis that adolescents are more likely to use marijuana when they have friends who use marijuana.

Table 2

Pearson's Correlation Between Adolescent Marijuana Use and Independent Variables

	<u>Ever Used Marijuana</u>
Sex	-.071**
Race	.047**
Complete D.A.R.E.	-.033*
Parents Know Where I Am	-.236**
Friends Use Marijuana	.669**

* Correlation is significant at the .05 level.

** Correlation is significant at the .01 level.

Crosstabulations

Table 3 shows a crosstabulation where the dependent variable ever used marijuana was run directly against the independent variable gender. When gender was placed in the row while the dependent variable ever used marijuana was placed in the column. The results of the test revealed that 67.1% of the males did not use marijuana while 73.6% of the females did not use marijuana. This is a difference of 6.5% between male and female adolescents marijuana use. Moreover, 32.9% of male adolescents are using marijuana. In relation, 26.4% of females are using marijuana. Pearson's Chi-Square was also computed for this test and revealed a 29.292 value, which was significant at the .01 alpha level. Overall, these findings supported the hypothesis that male adolescents are more likely to use marijuana than female adolescents.

Table 3
Crosstabulation of Gender by Marijuana Use

	<u>Never Used Marijuana</u>		<u>Has Used Marijuana</u>		Total	%
	N	%	N	%		
Male	1851	67.1%**	906	32.9%**	2757	100%
Female	2208	73.6%**	790	26.4%**	2998	100%
Total	4059	70.5%	1696	29.5%	5755	100%

Significant at the .01 level**

In Table 4's crosstabulation the dependent variable, ever-used marijuana, was run directly against the independent variable race. When race was placed in the row while the dependent variable ever used marijuana was placed in the column, the results of the test revealed that 76.2% of White adolescents have not used marijuana followed by Black (65.1%), Hispanic (63.4%), American Indian (61.8%), Asian (88.9%), Other (63.2%), and Mixed (60.4%). Moreover, 23.8% of white adolescents have used marijuana followed by Black (34.9%), Hispanic (36.6%), American Indian (38.2%), Asian (11.1%), Other (36.8%), and Mixed (39.6%). Pearson's Chi-Square was also computed for this test and revealed a 158.177 value, which was significant at the .01 alpha level. Overall, these findings failed to support the hypothesis that black adolescents are more likely than white, Hispanic, American Indian, Asian, other, and mixed adolescents to use marijuana.

Table 4
Crosstabulation of Race by Marijuana Use

	<u>Never Used Marijuana</u>		<u>Has Used Marijuana</u>		Total	%
	N	%	N	%		
White	1771	76.2%**	554	23.8%**	2325	100%
Black	974	65.1%**	522	34.9%**	1496	100%
Hispanic	678	63.4%**	392	36.6%**	1070	100%
American Indian	81	61.8%**	50	38.2%**	131	100%
Asian	305	88.9%**	38	11.1%**	343	100%
Other	60	63.2%**	35	36.8%**	95	100%
Mixed	151	60.4%**	99	39.6%**	250	100%
Total	4020	70.4%	1690	29.6%	5710	100%

Significant at the .01 level**

Table 5 shows crosstabulation where the dependent variable ever used marijuana was run directly against the independent variable completion of D.A.R.E. When tested completion of D.A.R.E. was placed in the row while the dependent variable ever used marijuana was placed in the column. The results of the test revealed that adolescents who did not complete the D.A.R.E. program were 66.9% to have never used marijuana compared to adolescents who reported completion of the D.A.R.E. program were 71.1% to have never used marijuana. On the other hand 33.1% of adolescents who did not complete the D.A.R.E. program have used marijuana compared to adolescents that reported completion of the D.A.R.E. program 28.9%. Pearson's Chi-Square was also computed for this test and revealed a 6.317 value, which was significant at the .05 alpha

level. Overall, these findings failed to support the hypothesis that substance abuse programs will not reduce marijuana use by adolescents.

Table 5
Crosstabulation of Completion of D.A.R.E. by Marijuana Use

	<u>Never Used Marijuana</u>		<u>Has Used Marijuana</u>		Total	%
	N	%	N	%		
Did Not Complete D.A.R.E.	579	66.9%**	287	33.1%**	866	100%
Did Complete D.A.R.E.	3462	71.1%**	1408	28.9%**	4870	100%
Total	4041	70.4%	1695	29.6%	5736	100%

Significant at the .01 level**

Table 6 was a crosstabulation where the dependent variable ever used marijuana was run directly against the independent variable parents know where I am. When parents know where I am was placed in the row while the dependent variable ever used marijuana was placed in the column. The results of the test revealed that adolescents who have never used marijuana and responded strongly disagreed that their parents knew where they were (45.4%) followed by disagree (56.3%), neither agree nor disagree (61.9%), agree (73.8%), and strongly agree (83.7%). On the other hand, the following results are for those who have used marijuana: strongly disagree (54.6%), disagree (43.7%), neither agree nor disagree (38.1%), agree (26.2%), and strongly agree (16.3%). Pearson's Chi-Square was also computed for this test and revealed a 323.561 value, which was significant at the .01 alpha level. When adolescents strongly agree that their parents know where they are marijuana use is significantly decreased. Overall, these

findings supported the hypothesis that adolescents with a strong parent-child attachment are less likely to use marijuana than those with a weak parent-child attachment.

Table 6
Crosstabulation of Parents Know Where I Am by Marijuana Use

	<u>Never Used Marijuana</u>		<u>Has Used Marijuana</u>		Total	%
	N	%	N	%		
Strongly Disagree	127	45.4%**	153	54.6%**	280	100%
Disagree	429	56.3%**	333	43.7%**	762	100%
Neither Agree Nor Disagree	604	61.9%**	372	38.1%**	976	100%
Agree	1731	73.8%**	615	26.2%**	2346	100%
Strongly Agree	1169	83.7%**	227	16.3%**	1396	100%
Total	4060	70.5%	1700	29.5%	5760	100%

Significant at the .01 level**

Table 7 was a crosstabulation where the dependent variable ever used marijuana was run directly against the independent variable friends use marijuana. When tested friends use marijuana was placed in the row while the dependent variable ever used marijuana was placed in the column. The results of the test revealed that adolescents who have never used marijuana and responded none of their friends use marijuana (97.7%) followed by few of them (72.1%), half of them (46.0%), most of them (28.4%), and all of them (12.9%). On the other hand, the following results are for those who have used marijuana: none of them (2.3%), few of them (27.9%), half of them (54.0%), most of them (71.6%), and all of them (87.1%). Pearson's Chi-Square was also computed for this

test and revealed a 2580.148 value, which was significant at the .01 alpha level. The more friends' adolescents have that use marijuana the statistical rate for their own marijuana use is directly affected and increases. Overall, these findings supported the hypothesis that adolescents will be more likely to use marijuana when their friends use marijuana.

Table 7
Crosstabulation of Friends Use Marijuana by Marijuana Use

	<u>Never Used Marijuana</u>		<u>Has Used Marijuana</u>		Total	%
	N	%	N	%		
None of Them	2574	97.7%**	61	2.3%**	2635	100%
Few of Them	935	72.1%**	362	27.9%**	1297	100%
Half of Them	249	46.0%**	292	54.0%**	541	100%
Most of Them	186	28.4%**	470	71.6%**	656	100%
All of Them	76	12.9%**	511	87.1%**	587	100%
Total	4020	70.3%	1696	29.7%	5716	100%

Significant at the .01 level**

Cramer's V

Table 8 indicates the Cramer's V value between the dependent variable of ever-used marijuana and all of the independent variables. The strongest relationship was friends use marijuana and it had a strong Cramer's V at .672. The relationship between the dependent variable ever-used marijuana and the independent variable friends use marijuana was significant at the .01 alpha level. The test shows that friends who use marijuana are the most significant factor contributing to adolescent marijuana use.

Again, this test reinforces the hypothesis that adolescents will be more likely to use marijuana when their friends use marijuana.

While friends who use marijuana remained the strongest independent variable, sex and race were also significant at the .01 alpha level. The completion of D.A.R.E variable was significant at the .05 alpha level. The second independent variable sex had a Cramer's V value of .071. The third independent variable race had a Phi value of .166 and a Cramer's V value of .166. The fourth independent variable parents know where I am had a Cramer's V value of .237. The final independent variable complete D.A.R.E. had a -.033 and a Cramer's V value of .033.

Table 8
Cramer's V for Variables Predicting Adolescent Marijuana Use

<u>Variable</u>	<u>Cramer's V</u>
Sex	.071**
Race	.166**
Complete D.A.R.E.	.033*
Parents Know Where I Am	.237**
Friends Use Marijuana	.672**

Relationship is significant at the .05 level*

Relationship is significant at the .01 level**

Regression Analysis

Table 9 represents the summary of the regression analysis for the variables predicting marijuana use by adolescents. After linear regression was run on all of the variables and friends that use marijuana had the largest regression coefficient (Beta) of .656, which was significant at the .01 alpha level. This indicates that friends who use

marijuana have the greatest influence on predicting adolescent marijuana use. At the same time every one-unit increase in friends who use marijuana the probability of an adolescent using marijuana increases by .656. Furthermore, independent variables of sex (-.028) and parents know where I am (-.062), were significant at the .01 alpha level. Two independent variables, race and complete D.A.R.E did not produce regression coefficients that were significant at the .01 or .05 alpha level.

Table 9
Summary of Regression Analysis for Variables Predicting Adolescent Marijuana Use

Variable	B	t	Beta
Sex	-.026	-2.818	-.028*
Race	.002	.769	.008
Complete D.A.R.E.	.016	1.274	.013
Parents Know Where I Am	-.025	-5.991	-.062*
Friends Use Marijuana	.217	63.775	.656*

Significant at the .01 level*

CHAPTER 5

DISCUSSION

The purpose of this study was to examine the influence of gender, race, completion of D.A.R.E, parent-child attachments, and friends who use marijuana on adolescent marijuana use. Previous studies indicated that both parental supervision and peer associations have a significant relationship with adolescent marijuana use. The study tried to decipher which factor was the best predictor. In this study it was predicted in hypothesis 1 that adolescents with a strong parent-child attachment are less likely to use marijuana than those with a weak parent-child attachment. Hypothesis 2 stated that adolescents are more likely to use marijuana when their friends use marijuana. Hypothesis 3 stated that substance abuse programs do not reduce marijuana use by adolescents. Hypothesis 4 stated that male adolescents are more likely than female adolescents to use marijuana. Finally, hypothesis 5 stated that black adolescents are more likely than white, Hispanic, American Indian, Asian, other, and mixed adolescents to use marijuana.

Hypothesis 1

The first hypothesis predicted adolescents with a strong parent-child attachment would be less likely to use marijuana than those with a weak parent-child attachment. Research statistics did support this hypothesis. Perason's Correlation matrix was constructed to test the relationship between adolescent marijuana use and all of the independent variables (see Table 2). The results revealed that a strong parent-child attachment was associated with lower adolescent marijuana use. Furthermore, the relationship was significant at the .01 alpha level with the strongest negative correlation

value ($r=-.236$). The most significant independent variable in the Pearson's correlation was friends who use marijuana which had a strong positive correlation value ($r=.669$).

Further testing was completed to determine the results between adolescent marijuana use and the individual categories within parent-child attachment. The particular test that was run was the Chi-Square crosstabulations (see Table 6).

Adolescents who never used marijuana and answered strongly disagree to parents know where they are had a percentage of 45.4% versus those who have used marijuana at 54.6%. Adolescents who never used marijuana and answered strongly agree to parents know where they are had a percentage of 83.7% versus those who have used marijuana at 16.3%. Pearson's Chi-Square value of 323.561, which was significant at the .01 alpha level.

The last test that was run for this hypothesis was linear regression (see Table 9). This was run to determine the probability of predicting adolescent marijuana use. Parent-child attachment had a weak probability of predicting adolescent marijuana use with a Beta value of $-.062$ that was significant at the .01 alpha level.

Hypothesis 2

The second hypothesis predicted that adolescents would be more likely to use marijuana when their friends use marijuana. The hypothesis was supported by the research statistics. The Pearson's Correlation matrix (see Table 2) results revealed that adolescent marijuana use would be associated with having one or more friends who use marijuana. Furthermore, friends marijuana use was the most significant independent variable in the Pearson's correlation with a positive correlation ($r=.669$).

Further testing was completed to determine the results between adolescent marijuana use and the individual categories within friends use marijuana. The particular test that was run was the Chi-Square crosstabulations (see Table 7). Adolescents who never used marijuana and answered none of them to friends who use marijuana had a percentage of 97.7% versus those who have used marijuana at 2.3%. Adolescents who never used marijuana and answered all of them to friends who use marijuana had a percentage of 12.9% versus those who have used marijuana at 87.1%. Cramer's V (table 8) also showed that friends who use marijuana had the strongest relationship, which had a value of .672 and was significant at the .01 alpha level.

The last test that was run for this hypothesis was linear regression (see Table 9). Friends who use marijuana had the greatest probability of predicting adolescent marijuana use with the largest Beta value of .656 that was significant at the .01 alpha level.

Hypothesis 3

The third hypothesis predicted that substance abuse programs would not reduce marijuana use by adolescents. Research statistics did not support this hypothesis. The Pearson's Correlation matrix (see Table 2) results revealed that the completion of D.A.R.E would be slightly associated with less adolescent marijuana use. Furthermore, the relationship had the weakest negative correlation value ($r=-.033$) significant at the .05 alpha level.

Further testing was completed to determine the results between adolescent marijuana use and the individual categories within completion of D.A.R.E. The particular test that was run was the Chi-Square crosstabulations (see Table 5).

Adolescents who did not complete the D.A.R.E. program and used marijuana were 33.1% compared to adolescents who reported completion of the D.A.R.E. program 28.9%.

Pearson's Chi-Square had a 6.317 value, which was significant at the .05 alpha level.

The last test that was run for this hypothesis was linear regression (Table 9). Completion of D.A.R.E. did not produce regression coefficients that were significant at the .01 or .05 alpha level.

Hypothesis 4

The fourth hypothesis predicted that male adolescents would be more likely than female adolescents to use marijuana. Research statistics did support this hypothesis. The Pearson's Correlation matrix (see Table 2) results revealed that adolescent males used marijuana more than females. Furthermore, the relationship between gender and marijuana use had a weak negative correlation value of ($r=-.071$) significant at the .01 alpha level.

Further testing was completed to determine the results between adolescent marijuana use and the individual categories within gender. The particular test that was run was the Chi-Square crosstabulations (see Table 3). Males who used marijuana were 32.9% compared to females who reported 26.4%. Pearson's Chi-Square was also computed for the test and revealed a 29.292 value, which was significant at the .01 alpha level.

The last test that was run for this hypothesis was linear regression (see Table 9). Gender had a weak probability of predicting adolescent marijuana use with a Beta value of $-.028$ that was significant at the .01 alpha level.

Hypothesis 5

The fifth and final hypothesis predicted that black adolescents would be more likely than white, Hispanic, American Indian, Asian, other, and mixed race adolescents to use marijuana. Research statistics did not support this hypothesis. The particular test that was run was the Pearson's Correlation Matrix (see Table 2). The relationship between race and marijuana use had a weak positive correlation of ($r=.047$) significant at the .01 alpha level.

Further testing was completed to determine the results between adolescent marijuana use and the individual categories within race. The Chi-Square crosstabulations (Table 4) results revealed that black adolescents were not the most likely to use marijuana. Rather the results indicated: mixed, 39.6%; American Indian, 38.2%; other, 36.8%; Hispanic, 36.6%; black, 34.9%; white, 23.8%; and Asian 11.1% have used marijuana. Pearson's Chi-Square value of 158.177, which was significant at the .01 alpha level.

The last test that was run for this hypothesis was linear regression (see Table 9). Race did not produce regression coefficients that were significant at the .01 or .05 alpha level.

Limitations

The study had several limitations within itself. Our data was secondary and collected by Esbensen and Osgood before 1999, over seven years ago. The main reason researchers use secondary data is to save time and money. Ultimately, the data are limited by the sample, variables, and data collection methods used by the original researcher. Other concerns arise when validity of the data is questioned. Individuals may

have responded differently to questions they are asked simply based on their race or even where they are from. Only 11 different United States cities or counties were used to form the sample.

There are several other restrictions within the study itself. One problem with the study was that the data focused only on a posttest comparison between students who participated in the GREAT program versus students who did not. That left no room for random selection to occur. Because there was no pretest, it is difficult to determine the actual change between the two comparison groups. Another problem that occurred with the data was based on self-reports by individuals, which could possibly create data variation by not getting either a true or an accurate response.

When the study was designed it did not include age as a factor. Past studies have shown that youth have a tendency to out-grow deviant behaviors such as using marijuana. Age is also a concern when it comes to the accuracy of peer associations because when children are young they do not have the opportunity to hang out with their peers as often and in an unsupervised setting. Then when the adolescents get older what their friends consider right or wrong and cool seems to be less important to them.

Not only were there design problems with the data but there were missing data as well. The research only included students who were present on the day that the questionnaires were given out. "Attendance rates varied from a low of 75 percent at one Kansas City middle school to a high of 93 percent at several schools in Will County and Pocatello" (Esbensen & Osgood 1999, pg. 201). Not every student was accounted for which could possibly skew the data.

Implications

Future research needs to be conducted to better explain the risk factors for adolescent marijuana use. The current study only indicated a moderate relationship between peer associations and adolescent marijuana use. Also, as noted previously many design and data issues arose in the final analysis of the study.

However, it still appears that both parent-child attachment and peer associations are determining elements that affect an individual's choice on whether to use marijuana. The results have shown us that both variables play hand in hand. Society can take this information and use this to help develop and implement educational programs for parents and adolescents to prevent future drug use.

There are a few community programs currently in place that address these issues. One such program is the Boys and Girls Club of America; the program itself cannot strengthen a parent-child attachment; however, it does help the child form an attachment with other adults. This attachment in turn prevents children from using marijuana because they are being watched over during prime hours (after school). Another program is Moral Combat, which consists of several classes with the goal to teach parents how to effectively form a bond and parent their child. After-school activities such as basketball, soccer, and ballet help children form bonds with other peers that keep them busy after school. Busy youth have fewer opportunities to use drugs and more opportunities to make peer associations with those who do not value deviant activities.

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