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Pathways to Drug Use among Rural and Urban African American Adolescents: The
Mediating and Moderating Effects of Parent and Peer Influences

A dissertation submitted in partial fulfillment of the requirements for the degree of
Doctor of Philosophy at Virginia Commonwealth University.

by

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Abstract

PATHWAYS TO DRUG USE AMONG RURAL AND URBAN AFRICAN
AMERICAN ADOLESCENTS: THE MEDIATING AND MODERATING EFFECTS
OF PARENT AND PEER INFLUENCES

By Trenette T. Clark, Ph.D.

A dissertation submitted in partial fulfillment of the requirements for the degree of
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Major Co-Director: Dr. Melissa Abell
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African American adolescents have traditionally engaged in drug use at disproportionately lower rates than youth of other ethnic groups. Nonetheless, African American youth and adults suffer disproportionately higher rates of drug-related consequences. This paradox is a health and social disparity that has been given fair attention but needs additional culturally intelligent theoretical and empirical explanations. Research that targets African American adolescent drug use has emerged but has failed to fully or moderately explain this paradox. The purpose of this study was to fill a gap in the literature by helping to explain the first part of the paradox, African American adolescent drug use. More specifically, this study examined the role of parents and peers in drug use among African American adolescents that live in rural and urban settings. To achieve the goals of the present study, a cross sectional design was used. A purposive

sample of 567 African American adolescents completed a paper-and-pen survey.

Findings of this study indicate that parental monitoring and peer risky behavior completely mediated the relationship between parental attitudes toward drug use and drug refusal efficacy and partially mediated the relationship between parental attitudes toward drug use and current alcohol use. Only peer risky behavior mediated the relationships between parental attitudes toward drug use and current tobacco and marijuana use. This study also sought to determine the manner by which parenting variables interact with peer risky behavior to influence adolescent drug use. Although parental monitoring was not found to moderate the relationship between peer risky behavior and drug refusal efficacy, it moderated the relationship upon the drug use variables. This study also examined the interaction of demographic characteristics and peer risky behavior upon adolescent drug use. Gender moderated the relationship between peer risky behavior and current marijuana use. Age moderated the relationship between peer risky behavior and current tobacco use.

This research helps to explain the process by which parental attitudes toward drug use influence drug refusal efficacy and use. The results suggest that parental attitudes toward drug use has a direct effect on adolescent drug use independent of peer influence. In addition, the results suggest that parents are influential and may be a protective mechanism against the strong influence of risky peers.

CHAPTER 1: INTRODUCTION

Statement of the Problem

Despite national campaign efforts to reduce and prevent adolescent drug use, tobacco, alcohol, marijuana, and other drug use among adolescents persist at disturbing rates. Similarly, drug use continues to have a disproportionately negative impact on the African American community. The Urban League wrote in a 1998 Annual Report on the State of Black America that drug abuse was the single major social, economic, and public health problem in the African American community (Dei, 2002). The prevalence and consequences of drug involvement among African Americans and other ethnic groups affect all members of American society directly or indirectly. As a result, the federal government requested a call for action. In its call for action, Healthy People 2010, eliminating racial and ethnic health disparities was named one of two goals with a specific and notable focus on drug abuse.

The purpose of this study was to highlight the intersection of context and behavior. Specifically, this study examined the role of parent and peer contexts on drug use among African American adolescents that live in rural and urban communities. Using an adolescent drug use developmental theory and social work framework, the pathways to adolescent drug use beginning with parental attitudes toward drug use through to drug refusal efficacy and drug use were examined. The primary goal of this study was to explore the parent-adolescent relationship, parental monitoring, and peer influence jointly and generate findings that could contribute to a viable research, practice, policy, and programming agenda across rural and urban settings for African American adolescents.

This dissertation chapter focuses on the prevalence and consequences of African American adolescent drug use. The chapter commences with succinct definitions of drug use and is followed by discussions that define and clarify the term “gateway drugs” and present an overview of the drug use continuum. The next section defines the term “African American” and provides a brief synopsis of the African American population in the United States (U.S.). Next, an overview of the age of drug initiation and prevalence and ethnic differences in adolescent tobacco, alcohol, and marijuana use are provided. A review of the consequences of adolescent drug use and of cigarette, alcohol, and marijuana/illicit drug use among African Americans is presented next. Attention is then given to describing the trajectory of drug use among African Americans and the “cross-over effect.” A comprehensive overview of African American families to include family structure forms the next section. This chapter concludes with a discussion of the significance of the study to include its primary contributions to research, policy, and programming; relevance to the social work profession; and an overview of the proposed study.

Definitions of Drug Use

Drug use refers to “the use of selected substances including alcohol, tobacco, drugs, inhalants, and other substances that can be consumed, inhaled, injected, or otherwise absorbed into the body with possible detrimental effects” (Centers for Disease Control and Prevention, CDC, 2007c). Licit or legal drug use refers to the use of legal drugs, such as tobacco and alcohol. However, although licit drugs are legal, their use by individuals under 21 years of age is illegal. Illicit or illegal drug use refers to the use and misuse of illegal and controlled drugs (CDC, 2007b). Examples of illicit drugs are

heroin, cocaine, and methamphetamine. Licit drugs are referred to as “soft” drugs, while illicit drugs are referred to as “hard” drugs. Drug abuse refers to the use of a substance to modify or control mood or state of mind in a manner that is illegal or harmful to oneself or others (NIDA, 2005). Drug dependence is defined by the DSM-IV-TR (2000) as a maladaptive pattern of drug use that leads to clinically significant impairment or distress. The next section briefly describes the connection and paths between soft drugs and experimentation with hard drugs, abuse, and dependence.

Gateway Drugs

“The first step toward addiction may be as innocent as a boy’s puff on a cigarette in an alleyway,” as stated by the U.S. Supreme Court in *Robinson v. California*, 370 US 660, 670; 82 S Ct 1417; 8 L Ed 2d 758 (25 June 1962).

There is a developmental sequence to multiple drug use where individuals first experiment with softer drugs than those that follow (Golub & Johnson, 2001; Kandel, 1975). Initially, “gateway drugs” referred to tobacco and alcohol (Dupont, 1984). Some researchers have expanded the classification of gateway drugs to include marijuana (Goode, 1974; Johnson, 1973). The gateway hypothesis suggests that adolescents first experiment with drugs that are legal for adults, such as tobacco and alcohol. It is expected that these softer drugs might be followed by marijuana experimentation and subsequently, hard drugs, such as methamphetamine and cocaine. Youth typically begin experimenting with gateway drugs because these are socially acceptable and easily accessible. Adolescents tend to progress to harder drugs after initiation and maintenance of gateway drugs.

Youth who engage in tobacco, alcohol, and marijuana use are more likely to use illicit drugs than youth who do not consume these drugs. Experimenting with gateway drugs reduces barriers to other illicit drugs and increases opportunities for exposure to these drugs. Gateway drug use is considered a risk factor for later drug use, abuse, and dependence. In a study of 27,616 current and former drinkers, Grant and Dawson (1998) examined the relationship between age at first use of alcohol and the prevalence of lifetime alcohol abuse and alcohol dependence among adults at least 18 years of age. They found that adults who started to smoke or drink during early adolescence were three to four times more likely to develop drug problems in later life, than those who began smoking or drinking in later adolescence. For instance, the rates of lifetime drug abuse declined from approximately 11% among those who initiated drinking at ages 16 or younger to approximately 4% among those whose onset of alcohol use was at ages 20 or older. Similarly, the rates of lifetime drug dependence declined from approximately 40% among individuals who initiated drinking at ages 14 or younger to approximately 10% among those whose onset of alcohol use was at ages 20 and older. In a similar study, Grant (1998) examined the relationship of early onset smoking with lifetime drinking and the subsequent development of DSM-IV alcohol abuse and dependence. He found that early onset smoking was a significant predictor of lifetime drinking and lifetime alcohol abuse and dependence. Early onset smoking was also positively associated with more excessive alcohol consumption and more severe alcohol use disorders compared to late onset smokers and nonsmokers. More recently, Hingson, Heeren, and Winter (2006) examined the relationship of early onset drinking with age of alcohol dependence and chronic relapsing dependence. Hingson and colleagues found that adults who initiated

alcohol use before age 14 years were more likely to experience alcohol dependence and within 10 years of onset of alcohol use compared to adults who began drinking at 21 years or older. These early initiators more often experienced past-year drug dependence and multiple chronic dependence episodes. These findings support the need to implement policies and prevention programs that delay gateway drug consumption. Gateway drug use among African American adolescents is the focus of this dissertation.

Drug Use Continuum

"In addition to the life-death cycle basic to nature, there is also an unnatural living death: human life which is denied its fullness..." Freire, P.

Although youth tend to initiate drugs using gateway drugs, drug use is a multistage phenomenon that may severely increase such that it ultimately becomes destructive and debilitating. Adolescent drug use is a problem because if it is maintained it may lead to drug abuse or dependence, and its victims may experience "an unnatural living death." The characteristics of an unnatural living death specific to drug abuse and dependence may include inability to maintain employment, family isolation, and depression. Social work pioneer, Jane Adams argued that "of all the aspects of social misery nothing is so heartbreaking as unemployment..." (Adams, 1910, p. 253). Unemployment is only one of the possible negative consequences of drug abuse and dependence. Moreover, given the potential negative consequences of drug abuse and dependence, it is imperative to prevent adolescent drug use.

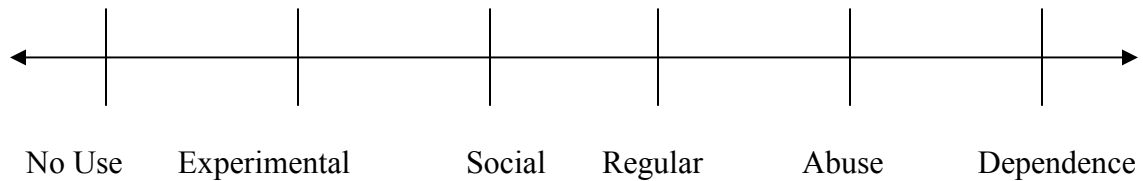
A universally accepted drug use continuum does not exist. Some continua, such as the abstinence model (ETR Associates, 2007) are dichotomous and are composed only of "no use" and "drug use." Other continua exclude "no use" as a stage (King County,

2008), while others include “drug misuse” midway in the continua (Health Canada, 2007). In general, there are 5-6 drug use stages ranging from “no use” to “dependence.”

The stages described next are based on several continua (e.g., ETR Associates, 2007; Health and Welfare Canada and Addiction Research Foundation, 1991; King County, 2008; Medline Plus, 2008) (see Figure 1). The first stage, “no use” refers to individuals who do not engage in tobacco, alcohol, marijuana or other drug use. The second stage, “experimental use,” refers to individuals who experiment with a drug once or twice. These individuals may or may not continue to engage in drug use. The third stage, “social, recreational, or occasional use,” refers to individuals who use drugs in a frequency that is not harmful to themselves or others. For example, adults who consume a glass of alcohol after dinner or while attending parties would meet the criteria of this stage. The fourth stage, “regular use,” refers to individuals who have a predictable pattern of drug use that tends to be frequent (e.g., one time per week). These individuals may use drugs to cope with their problems. And, although regular drug users typically feel in control of their drug use, they are at risk of developing physical and psychological dependence. The fifth stage, “harmful use or drug abuse,” refers to individuals who experience negative consequences related to drug use. The frequency of use varies. The sixth stage, “dependence,” refers to individuals who are psychologically or physically dependent on their drug(s) of choice. These individuals use drugs excessively despite the negative consequences. As individuals move toward the final stage, drug dependence, there is less control of their drug use and more experienced drug-related consequences.

Figure 1

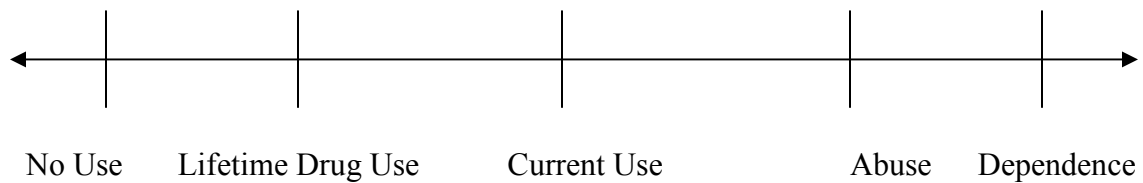
Continuum of Drug Use



In general, younger individuals progress through the drug use continuum more rapidly than adults. Moreover, it is important to highlight the drug use continuum in adolescent drug use research given the ultimate and distinctive consequences of drug use. For instance, whereas social use may not be problematic for adults, it may be problematic for youth given the rate of progression and drug related consequences, particularly among African American adolescents. Further, the drug use continuum provides consistency in the terminology used in the literature that is helpful for comparing results across studies. It is important to mention that the stage labeled “experimentation” in the drug use continuum is typically labeled “lifetime drug use” in the adolescent drug use literature (e.g., Mandara & Murray, 2006; Sullivan, Kung, & Farrell, 2004; Wallace, Brown, Bachman, & Laveist, 2003b). Similarly, the two stages labeled “social use” and “regular use” in the drug use continuum are often combined and typically classified as “current use” or “past 30 day use” in the adolescent drug use literature (e.g., Graves et al., 2004; Oman et al., 2004; Wright & Fitzpatrick, 2004). In addition, when labeled, “past 30 day use” is typically labeled as “current use” (e.g., Ellickson, McCaffrey, Ghosh-Dastidar, & Longshore, 2003; Kandel, Adler, & Sudit, 1981; Saint-Jean & Crandall, 2004) (see Figure 2). Given that drug experimentation/lifetime drug use is a normative

Figure 2

Continuum of Adolescent Drug Use



phenomenon, many studies of adolescent drug use examine social use or current use because it may be more indicative of risky behavior. Following the patterns of the drug use literature, this dissertation focuses on social use. In an effort to keep terminology consistent with the adolescent drug use literature, social use will be referred to as past 30 day use or current use.

Who are African Americans?

The term “race” represents shared biological or genetic heritage based on external physical features, such as skin color and hair texture (Thomas & Sillen, 1972). On the other hand, “ethnicity” is distinguished from “race” in that it implies common values, beliefs, and practices based on common ancestry and/or common immigration experiences (Sollors, 1996). The terms “Black” or “African American” refer to people having origins in any of the Black race groups of Africa (McKinnon, 2001). Therefore, these terms are representative of race and not necessarily ethnicity. Although an individual may self-identify as Black or African American, it does not determine their ethnicity, which varies within the African American population. The term African American will be used in this dissertation.

According to the U.S. Census Bureau, in 2000, African Americans constituted the second largest minority group in the U.S. (McKinnon, 2001). The Census 2000 revealed

that African Americans comprised 12.9 percent (36.4 million) of the U.S. population (McKinnon). Of these, .6 percent (1.8 million) self identified as being bi-racial, that is African American and at least one other race (e.g., White, Asian) (McKinnon). It is projected that the African American population will increase to 14 percent of the total population by 2025 (U.S. Bureau of the Census, 2003).

According to the U.S. Census 2000, African American youth (including biracial youth) under age 18 comprised 32.5 percent (11,845,257) of African Americans (McKinnon, 2001). Of these, 50.8 percent (6,012,924) were male and 49.2 percent (5,832,333) were female (U.S. Census Bureau, 2004b). Of the total African American youth population, the largest proportion were youth in late childhood and early adolescence between the ages of 5 to 13 (6,186,738) and the next largest developmental group were youth in middle and late adolescence between the ages of 14 to 17 (2,491,660). For both age groups, there were a fairly equal number of males and females. For example, there were 3,137,477 males and 3,049,261 females in the 5 to 13 age group and 1,268,291 males and 1,223,269 females in the 14 to 17 age group (U.S. Census Bureau, 2004b). The next section provides an overview of age of drug initiation among African Americans, the prevalence of drug use, and ethnic differences in adolescent tobacco, alcohol, and marijuana use.

African American Adolescent Drug Use

Age of Initiation

Generally, drug experimentation occurs before high school, with the average age of initial illicit drug use for African American youth being age 12 (Townsend & Belgrave, 2000; Vega, Gil, & Zimmerman, 1993). Although drug initiation for African

American youth tends to begin later than for White American youth, some African American youth have experimented with marijuana as early as age eight, and alcohol and tobacco as early as age five (Okwumabua, Okwumabua, Winston, & Walker, 1989; Townsend & Belgrave). The findings from these studies suggest that alcohol and drug experimentation may begin early with onset taking place around ages 11 and 12 (Townsend & Belgrave).

Prevalence of Adolescent Tobacco, Alcohol and Marijuana/Illicit Drug Use among Different Ethnic Groups

The National Survey on Drug Use & Health (NSDUH) is one of the most widely known national studies of drug use. It provides information on the prevalence of tobacco, alcohol, and illicit drug use. It is a national sample of the civilian non-institutionalized population ages 12 and older that provides data on patterns of drug use among different age, gender, and ethnic groups (Substance Abuse and Mental Health Services Administration, SAMHSA, 2007b).

Tobacco Use

According to SAMHSA (2007b), in 2006, among all youth ages 12 to 17, 3.3 million (12.9 percent) reported that they used tobacco at least once during the past month. Of these, 2.6 million (10.4 percent) reported smoking cigarettes. The prevalence of current cigarette smoking declined in 2006 to 10.4 percent from 13.0 percent in 2002. Among youth ages 12 to 17, the prevalence of current cigarette smoking was slightly higher for females (10.7 percent) than males (10.0 percent) in 2006. However, these rates did not differ significantly. The rate of current cigarette use for both males and females

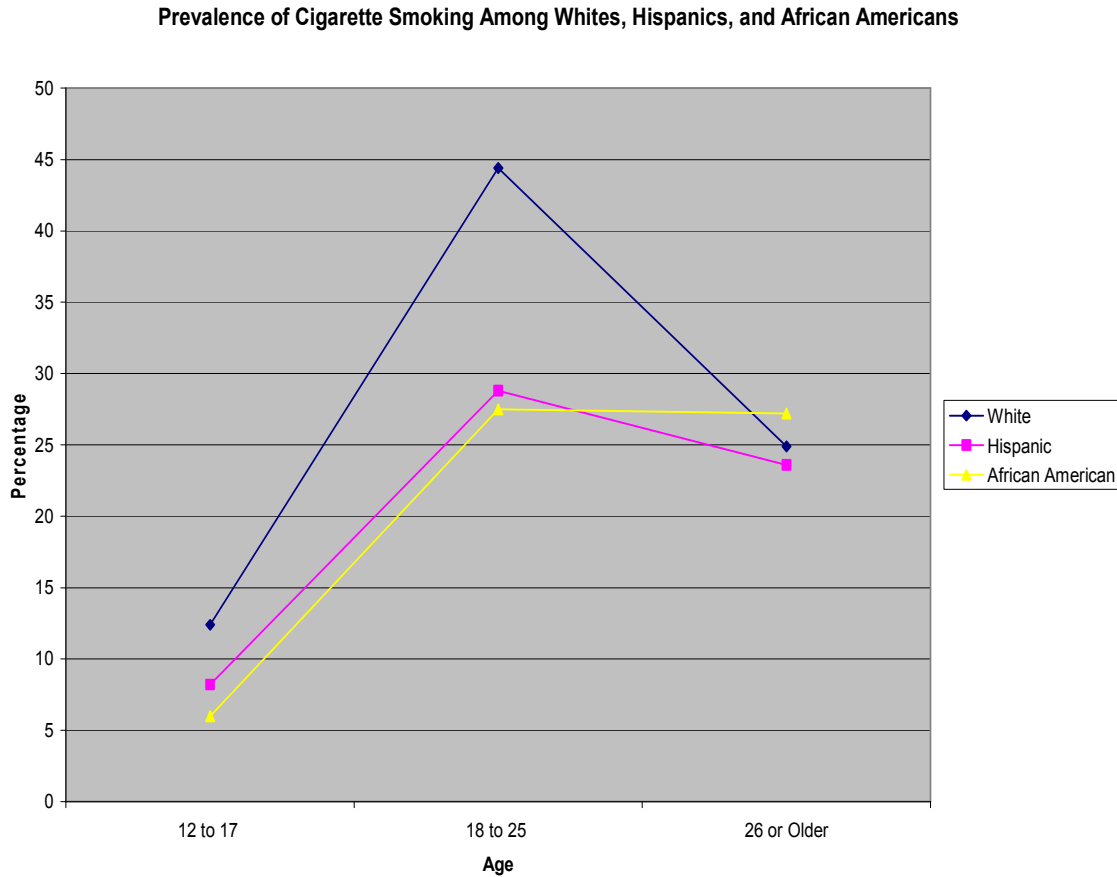
declined from 2002 when the prevalence of cigarette use was 12.3 and 13.6 percent, respectively (SAMHSA).

In 2006, current cigarette smoking among youth ages 12 to 17 and young adults ages 18 to 25 was more prevalent among White and Hispanic youth than African American youth (12.4 and 8.2 vs. 6.0 percent for youth and 44.4 and 28.8 vs. 27.5 percent for young adults) (SAMHSA, 2007b). However, among adults ages 26 or older, the prevalence of cigarette use among Whites, Hispanics, and African Americans was about the same (24.9, 23.6, and 27.2 percent, respectively), with African Americans using cigarettes slightly more (SAMHSA). This trend is illustrated in Figure 3.

Alcohol Use

In 2006, among all individuals ages 12 or older living in the U.S., approximately 125 million people or slightly more than half (50.9 percent) reported current alcohol use (SAMHSA, 2007b). Approximately 10.8 million individuals (28.3 percent of this age group) ages 12 to 20 reported that they were currently drinking alcohol. Among this age group, more males (29.2 percent) than females (27.4 percent) reported current alcohol use. For youth, rates of current alcohol use was 3.9 percent among individuals ages 12 and 13, 15.6 percent among individuals 14 and 15, 29.7 percent among 16 and 17 year olds, 51.6 percent among young adults ages 18 and 20, and 68.6 percent among individuals ages 21 to 25 years of age (SAMHSA). These findings suggest that age is associated with alcohol use. Among youth ages 12 to 17, the rates of alcohol use among males (16.3 percent) were similar to females (17.0 percent) (SAMHSA).

Figure 3



Among individuals 12 to 20, past month alcohol use rates were highest among Whites and lowest among African Americans. Among this age group, current alcohol use was 32.3 percent among Whites, 31.2 percent among American Indians or Alaska Natives, 27.5 percent among individuals reporting two or more races, 25.3 percent among Hispanics, 19.7 percent among Asians, and 18.6 percent among African Americans (SAMHSA, 2007b).

Illicit Drug Use

NSDUH includes six categories of illicit drug use: marijuana, cocaine, heroin, hallucinogens, inhalants, and the non-medical use of prescription-type pain relievers

(tranquilizers, stimulants, and sedatives). According to SAMHSA (2007b), in 2006, 9.6 percent of youth ages 12 to 17 reported using illicit drugs. The prevalence of illicit drug use increased with age. Illicit drug use was reported by almost 4 percent (3.9 percent) of youth ages 12 to 13, 9.1 percent of 14 and 15 year olds, 16.0 percent of youth ages 16 to 17, 22.2 percent among individuals ages 18 to 20. Illicit drug use was lower among individuals ages 21 to 25 at 18.3 percent than individuals ages 18 to 20 (SAMHSA). Therefore, it seems that illicit drug use increases with age until individuals reach young adulthood (ages 21 and older).

Among youth ages 12 to 17 that reported using illicit drugs, 6.7 percent used marijuana, 3.3 percent misused prescription-type pain relievers, 1.3 percent used inhalants, 0.7 percent used hallucinogens, and 0.4 percent used cocaine (SAMHSA, 2007b). Among these youth, the types of drugs used varied by age group. For example, the drugs most commonly used by 12 to 13 year olds were prescription-type pain relievers (2.0 percent), followed by inhalants (1.2 percent), and marijuana (.9 percent). However, marijuana was the dominant drug used by 14 and 15 year olds (5.8 percent), followed by prescription-type pain relievers (3.1 percent), and inhalants (1.7 percent). Marijuana was also the most commonly drug used among 16 to 17 year olds (13.0 percent), followed by prescription-type pain relievers (4.7 percent), hallucinogens (1.3 percent), inhalants (1.1 percent), and cocaine (0.8 percent).

Male and female adolescents had similar rates of current marijuana use (6.8 and 6.4 percent, respectively). The prevalence of current marijuana use among youth ages 12 to 17 declined from 8.2 percent in 2002 to 6.7 percent in 2006. Current marijuana use among male adolescents declined from 9.1 percent in 2002 to 6.8 percent in 2006. It also

slightly declined among female adolescents from 7.2 percent in 2002 to 6.4 percent in 2006 (SAMHSA, 2007b).

In 2006, among youth ages 12 to 17, the prevalence of current illicit drug use was 18.7 percent among American Indians or Alaska Natives, 11.8 percent among youths reporting two or more races, 10.2 percent among African Americans, 10.0 percent among Whites, 8.9 percent among Hispanics, and 6.7 percent among Asians (SAMHSA, 2007b). Among young adults ages 18 to 25, current illicit drug use rates were 28.5 percent among American Indians or Alaska Natives, 22.7 percent among Whites, 17.3 percent among African Americans, 13.9 percent among Hispanics, and 9.0 percent among Asians (SAMHSA).

In summary and in order, adolescents tend to consume alcohol, cigarettes, and marijuana most frequently. The rates of use of these drugs have declined since 2002 and each of these drugs is consumed at comparable rates across gender. In general, Whites tend to use tobacco and alcohol most frequently and by contrast, African Americans consume these drugs least frequently. Whites and African Americans report comparable rates of marijuana use. The consequences of adolescent drug use are discussed next.

The Consequences of Adolescent Drug Use and Other Problem Behaviors

The consequences of drug use have been documented in previous studies (e.g., Boyd, Ashcraft, & Belgrave, 2006; Jordan & Lewis, 2005). For example, according to the CDC (2000) and Kandel, Chen, Warner, Kessler, and Grant (1997), it is estimated that about one-half of youth ages 10-17 engage in problem behaviors such as drug use, delinquency, and other risky behaviors. However, although some of these behaviors decrease as age increase, some, such as drug use are initiated during adolescence and

continue to increase into adulthood. If drug use is maintained, it could lead to more serious drug behaviors, such as drug abuse and dependence (Kandel, 1980)

Drug use is a significant public health problem that affects society on a micro and macro level. On a micro level, drug use affects the brain and is associated with social, psychosocial, academic, mental health, and health consequences. First, drug use among adolescents is associated with social consequences. Particularly, it is correlated with deviant behavior, including juvenile delinquency (Jordan & Lewis, 2005), unprotected sexual activity (Boyd, Ashcraft, & Belgrave, 2006), adolescent pregnancy, violence and homicide, motor vehicle accidents and injury related to impaired driving (Wu & Khan, 2005), and later unemployment (Brook, Adams, Balka, & Johnson, 2002). Adolescent drug use may lead to drug use during adulthood (Kandel & Chen, 2000; Newcomb & Bentler, 1988). Second, drug use and abuse is correlated with adverse psychosocial consequences to include disruption of family life and suicide (Emshoff, Avery, Raduka, & Anderson, 1996; Ensminger & Slusarcick, 1992; Segal & Stewart, 1996). Third, adolescent drug use is correlated with academic consequences, such as school failure and poorer school adjustment (Hays & Revetto, 1990). Fourth, drug use at an early age has been correlated with negative adverse mental health outcomes. These include impaired developmental and mental health functioning (Anthony & Petronis, 1995; Belenko, Sprott, & Petersen, 2004; Choi, Harachi, Gillmore, & Catalano, 2005). Fifth, adolescent drug use is associated with negative health outcomes. These include physical, social, and occupational functioning (Anthony & Petronis; Belgrave, Chase-Vaughan, Gray, Addison, & Cherry, 2000; Choi, Harachi, Gillmore, & Catalano), and other health risks

(Drug Control Strategy, 1994). In 2000, approximately 460,000 deaths were due to illicit drug abuse and smoking (National Institute on Drug Abuse, 2005).

Adolescent drug use is also associated with another health problem, HIV/AIDS. The spread of HIV/AIDS due to intravenous (IV) drug use, the sex-for-drugs exchange, and transmission via heterosexual contact with an IV drug-using partner continues to be unique contributors to HIV among African Americans (CDC, 2006). Drug use increases the likelihood that adolescents will engage in unprotected sex regardless of whether they are engaging in sex-for-drugs trades. Adolescents who engage in sexual intercourse are more likely than their counterparts to use tobacco, alcohol, marijuana, and other illicit drugs (Shrier, Emans, Woods, & DuRant, 1997; Yan, Chiu, Stoesen, & Wang, 2007). Drug use may also lead to missed doses of anti-HIV medications (New Mexico AIDS Info Net, 2001).

Drug use, abuse, and dependence also impact society on a macro level. Drug abuse costs the U.S. over \$484 billion annually through its effects on the criminal justice and social service systems (National Institute on Drug Abuse, 2005). These costs include drug treatment; the costs to house inmates; welfare stipends and other support, such as housing; and care for children whose parents are drug abusers. The annual cost of drug abuse to the U.S. (\$484 billion) is significantly more than cancer (\$171.6 billion) and diabetes (\$131.7 billion).

The Consequences of African American Adolescent Drug Use

The consequences of drug use, abuse, and dependence among African American youth are more adverse than for most other ethnic groups. For example, findings suggest that African American youth experience a higher prevalence of drug-related social

problems than Whites, despite higher drug use among White youth (Barnes & Welte, 1986; Wallace & Muroff, 2002). In addition, Wallace and Muroff found that higher rates of juvenile detention and incarceration, school failure, and employment problems are associated with drug use among African American adolescents. These increased problems may be due to fewer prevention programs, treatment services, and interventions located in African American communities.

Drug use, abuse, and dependence are major contributors of new HIV infections (New Mexico AIDS Info Net, 2001). By the end of 2004, African Americans accounted for 49 percent of all HIV cases, even though they make up only 13 percent of the U.S. population (Centers for Disease Control and Prevention, 2006). African Americans account for 43 percent of all AIDS cases diagnosed compared to 35 percent of Whites, 20 percent of Hispanics, and less than one percent of American Indians/Alaska Natives and Asians/Pacific Islanders.

The consequences of drug use among African Americans differ greatly according to the drug(s) used. Therefore, the next sections provide an overview of the consequences of cigarette, alcohol, and marijuana/illicit drug use.

Consequences of cigarette use for African Americans. The consequences of smoking cigarettes are well documented. Smoking increases the risk of lung cancer and cardiovascular disease, including hypertension, stroke, and heart attacks (CDC, 2004). Each year, more African Americans die of lung cancer than any other cancer (CDC MMWR Weekly, 2002). Further, although African Americans smoke less than Whites, the consequences may be more severe for African American smokers. For instance, according to CDC MMWR Weekly, smoking-related health problems are 20 – 40 percent

higher for African Americans than Whites. Industrial exposure, urban environmental influences (Axelson, Davis, Forestiere, Schneirderman, & Wagener, 1990; Schniederman, Davis, & Wagener, 1989), and mentholated cigarette use (Herbert & Kabat, 1988; Sidney, Tekawa, & Friedman, 1989) may explain the increased smoking-related health problems among African Americans.

Smoking mentholated cigarettes likely contributes to increased smoking-related health problems because at least among African Americans, menthol flavored cigarettes are more difficult to quit than non-menthol cigarettes (Kabat, & Hebert, 1991; Kiefe, Williams, Lewis, Allison, Sekar, & Wagenknecht, 2001). In 2005 and 2006, African American adults ages 26 to 34 reported the highest rate of mentholated cigarette use (89.6 percent) among African Americans and African American youth ages 12 to 17 reported the lowest rate (70.4 percent) (SAMHSA, 2007a). In 2005, Harvard School of Public Health released a press release that aimed to gather evidence implicating menthol in health disparities between White and African American smokers. They reported that mentholated cigarettes account for approximately one quarter of all cigarette sales in the U.S. In addition, they reported that mentholated cigarettes are consumed disproportionately by African American smokers such that 70 percent of African American smokers primarily smoke mentholated cigarettes. Because of preference for mentholated cigarettes, African American smokers have more difficulty quitting cigarette smoking than other ethnic groups (Kabat, & Hebert; Kiefe et al.; SAMHSA).

Consequences of alcohol use for African Americans. Although African Americans consume less alcohol, alcohol advertising occurs more frequently in African American communities compared to other communities (The Center on Alcohol

Marketing and Youth at Georgetown University, 2008). Alcohol advertisement in African American communities is a concern because youth who are exposed to alcohol marketing are more likely to drink and drink heavily (Ellickson, Collins, Hambarsoomians, & McCaffrey, 2005; Snyder, Fleming Milici, Slater, Sun, & Strizhakova, 2006).

There are notable consequences of alcohol use for African American adolescents. Alcohol use among African American youth is the third leading cause of their deaths because of motor vehicle accidents (CDC, 2005). This cause of deaths is related to adolescents drinking alcohol and driving and riding with peer drivers who consumed alcohol shortly before driving. Additionally, for every ounce of alcohol consumed by African American youth, they experience increasingly more social and academic problems when compared to White youth (Barnes & Welte, 1986; Welte & Barnes, 1987). For example, in a representative sample of 27,335 7-12th graders, Welte and Barnes found that African Americans that used drugs reported more drug use related problems such as, problems with their teachers, friends, and police, and attending school drunk. Specifically, African American adolescents who used drugs reported 5.9 alcohol related problems per month, West Indian adolescents reported 3.8 problems per month, and Whites experienced only 2.2 problems per month. These findings were particularly concentrated among females.

Consequences of marijuana/illicit drug use for African Americans. There is less research that focuses specifically on the consequences of marijuana for African Americans. In spite of this, illicit drug use such as marijuana and crack cocaine contributes to higher rates of incarceration of African American men and women,

especially those in young adulthood. For example, the U.S. Congress passed the Anti-Drug Abuse Act of 1986 that resulted in large sentencing discrepancies for possession and distribution of crack as opposed to cocaine (King & Mauer, 2006). For instance, an individual could possess 100 times the amount of cocaine as crack (sometimes referred to as the “100-to-1 Sentencing Disparity”) and receive the same mandatory five-year minimum sentence (King & Mauer). This drug policy was considered unjust by advocates because African Americans are more likely than Whites to possess crack rather than the powder form of the drug (King & Mauer). The harsh sentence for crack cocaine has contributed to higher rates of incarceration of African Americans. This drug policy remained despite numerous calls for an appeal and over 33,000 letters sent to government officials arguing that the policy was the product of racial bias (King & Mauer). Twenty-one years later, in December 2007, the U.S. Supreme Court ruled in a 7-2 vote that the disparity in sentencing of crack and cocaine offenders is unjust (King & Mauer). This ruling permits judges’ discretion to impose lenient and more fair sentences than recommended by federal guidelines in the 1986 law.

Trajectory of African American Drug Use

Across most types of drugs and age categories, a smaller percentage of African American than White youth consume drugs. This gap is most notable in the 12-17 and the 18-25 year old age groups. More Whites than African Americans in these age groups smoke cigarettes and drink alcohol. However, by age 26, African Americans consume more drugs than Whites, and, as they grow older, increase their drug use and experience more drug-related consequences (SAMHSA, 2007b).

African American Drug Use over the Life Course: Catch-up and Crossover Patterns

In spite of being less likely to engage in drug use as youth, African-American drug use rates increase as they grow older and their rates of some drugs are higher than their counterparts once they reach adulthood. Age of initiation is associated with rates of progression through the drug use continuum (Sandberg, 1996). In general, individuals who initiate drug use later in adolescence are less likely to become drug dependent during adulthood than those with earlier ages of onset (Kandel, 2006). However, for African Americans, later onset of some drugs predicts drug dependency in later life. For instance, later onset of tobacco use in adolescence is associated with increased tobacco use during adulthood among African Americans (Kandel). This phenomenon is known as the “cross-over effect” (Geronimus, Neidert, & Bound, 1993). The next section presents a concise overview of the African American culture and their families. This section is presented to provide a foundation for understanding African American adolescent drug use.

African American Families

African Americans have a unique culture that is rooted in their involuntary transition from Africa to America. Culture refers to learned behavior patterns and a way of life that a group of people share, including social norms, family roles, beliefs, and values that are transmitted intergenerationally (Rohner, 1984). African American culture is shaped by historical events, such as slavery and oppression, as well as current realities, such as racism and sexism (Boyd, 2003). Many values and beliefs held by African Americans stem from those held prior to coming to America. Because of assimilation, these values and beliefs are now mixed with White American culture.

There has been some divergence regarding beliefs, however, there remain a core common group of beliefs, including spirituality, communalism, harmony, and orality within most African American families (Belgrave, Townsend, Cherry, & Cunningham, 1997; Davis-Russell, 2002). These characteristics have been referred to as Africentric beliefs and values. These beliefs and values are strengths within the African American family and are believed to buffer against stressful life events. Therefore, it is important to acknowledge the role of culture in African American adolescent drug use and to study drug use in a cultural group that is racially/ethnically determined.

African American Families Defined

Conceptualizations of the family system are divergent and continue to adjust and emerge. Over one-half century ago, Murdock (1949) defined family as a social group characterized by common residence, reproduction, and economic cooperation. He suggested that the family includes two adults of both genders who have a sexual relationship and one or more biological or adopted children. Fundamentally, a family, according to Murdock, consisted of a married man and woman and their children. This traditional definition does not describe contemporary U.S. families. Similarly, the U.S. Census Bureau (2004b) defined family as a group of two or more people who are related by birth, marriage, or adoption and reside together. Whereas this definition is possibly the most frequently cited definition of family, it excludes subfamilies or secondary families who are unrelated but function as a family. Perhaps, one of the most comprehensive definitions of the African American family was provided by Hill (1998). Hill defined the African American family as a household related by blood, marriage, or function that provides basic functions to its members, such as providing clothing, shelter

and food. Hill also suggested that the African American family is characterized as an extended family. That is, individuals may live in different households but function as a family. Moreover, Hill's definition of the African American family is described here because it is preferable for work with African Americans since it is culturally relevant. The present study uses the traditional U.S. Census Bureau definition. This definition is only used because it is rather reductionistic and the present study seeks to only examine the impact of parents on their adolescent children, not the impact of African American families on adolescent children's behaviors.

African American Family Structure

Barnes (2001) proposed three family structures for African Americans: nuclear, single-parent, and augmented. A nuclear family consists of a father, mother, and children (Harris & Graham, 2007). In 1890, 80 percent of African American children lived in two-parent households, although many had started life in forced family separation under slavery (Billingsley, 1992). Presently, 35 percent of African American families are two-parent married households (U.S. Census Bureau, 2007). There is a general consensus that two-parent families usually have more financial and emotional resources and time for sharing meals, playing, and helping their children with homework (Seccombe, 2000).

Single-parent families consist of a female or male parent who does not live with a spouse (U.S. Census Bureau, 2004a). Single-parent families have increased over the years. In 1960, 67 percent of African American children lived in homes with both parents, while only 20 percent lived in mother-headed households (U.S. Census Bureau, 2006). In 1970, 58 percent of African American children lived in homes with both parents, while only 30 percent lived in mother-headed households (U.S. Census Bureau,

2006). During the 1980s, the African American family structure shifted from primarily two parent-households to mostly single-female-headed households. In 1980, 42 percent of African American children lived in two-parent homes and 43 percent lived in mother-headed households (U.S. Census Bureau, 2006). This number significantly increased by 1990 when 37 percent of African American children lived in two-parent households and 51 percent lived in mother-headed households (U.S. Census Bureau, 2006). Presently, forty-eight percent of African American children live in mother-headed households. Some children live in father-headed single parent households. In 2004, 5.8 percent of African American children resided in father-headed households, compared with 4.4 percent of White children and 4.4 percent of Hispanic children (U.S. Census Bureau, 2006). This is an increase from 4.4 percent in 2000, 3.5 percent in 1990, 1.6 percent in 1980, and 1 percent in 1970.

Augmented families are defined as families in which other relatives or unrelated friends reside in the home and care for the children (Barnes, 2001; White & Parham, 1990). For African American families, augmented families are often those in which grandparents are the heads of household. Grandparents have assumed caregiving roles in the lives of African American children and these household structures are more common than father-headed households. Presently, 9 percent of African American children live in grandparent headed households (U.S. Census Bureau, 2006). About half of these children's mothers or fathers also live in their households. The prevalence of children living in grandparent headed-households has decreased from 12 percent in 1990 and 9.5 percent in 1960 (U.S. Census Bureau).

In summary, many African American children live in mother-headed households, 35 percent in two parent married households, 9 percent in grandparent headed households (approximately half of these live with neither parent), 5.8 percent in father-headed households, and the remaining two percent in other households (e.g., other relative, foster home) (U.S. Census Bureau, 2006). Brewer (1988) suggested that the increase of African American children living in mother-headed households is due to the increase in divorce rates and the number of children born out of marriage.

Family Structure and African American Adolescent Drug Use

Research on the role of family structure (e.g., single parent vs. two-parent families) and adolescent drug use is equivocal for African Americans. Although family structure may be salient for many ethnic groups, the nature of family relationships is more important than family structure and marital status in predicting African American adolescent drug use (Friedman, Terras, & Glassman, 2000). Family relationships are particularly important for deviant and delinquent African American males (Friedman, Terras, & Glassman; Zimmerman, Khoury, Vega, Gil, & Warheit, 1995). Friedman and colleagues found that none of six family structure measures (i.e., single parent vs. two-parent families) predicted drug use among African American adolescent males compared with 5 of 33 family relationship measures (i.e., parent-adolescent communication, conflict, consistent parenting, parental care and support, parental control). Despite the assumption that two-parent households may serve as a buffer for adolescent drug use, some research suggests that drug use among African American adolescents is not greater in one versus two-parent households (e.g., Amey & Albrecht, 1998). Belgrave and colleagues suggested that it may not be marital status or single parent vs. two-parent

family structure per se that impacts African American adolescent drug use (Belgrave, Townsend, Cherry, & Cunningham, 1997). It may be whether there is more than one adult in the household. This adult might be a second parent but can also be a grandparent, other relative, or close friend.

Significance of the Study

Primary Contributions

Research

This investigation builds on earlier studies and extends previous research in several salient ways, and therefore, makes a contribution to the adolescent drug use field. First, a more complete set of parental variables are examined than has been studied in previous drug use research. Darling and Steinberg (1993) suggested that to move the socialization literature forward, researchers must begin to consider both parenting style and parenting practices jointly when examining their effects on youth. In this study, the direct and indirect effects of three parental characteristics on adolescent drug refusal efficacy and use are examined. Second, previous studies have examined peer influences as a mediator (a variable that accounts for the relationship between the independent variable and dependent variable) in the parenting-adolescent drug use relationship. However, there has been less research on parenting practices as a moderator (a variable that explains the conditions by which a relationship exists) of the relationship between peer influence and drug refusal efficacy and use (e.g., Dishion, Capaldi, Spracklen, & Li, 1995; Kung & Farrell, 2000). This study will examine whether parent-adolescent relations and parental management moderate the risky peers-adolescent drug refusal efficacy and use relationships. Third, most studies that focus on the additive effects of

parenting styles and practices and adolescent drug use do so with a singular substance or do not examine the different substances used by adolescents (Anderson & Henry, 1994; Duncan et al., 1995). This study will distinguish which parent-adolescent relations and parental management styles are risk or protective factors for different drugs. Fourth, this study also examines the relationship between parental characteristics and adolescent drug refusal efficacy as a second dependent variable. Drug refusal efficacy is considered a proximal variable for drug use. Fifth, few studies that focus on the additive effects of parent-adolescent relations and parental management and drug refusal efficacy and use have been conducted with African American adolescents, as this study does. This is an important contribution as some studies have suggested that effective parenting strategies may differ according to ethnic background (McLoyd, Kaplan, Hardaway, & Wood, 2007; Smith & Krohn, 1995). Sixth, progress has been made in the last decade in the study of rural youth. However, rural adolescent drug use continues to be an understudied phenomenon. In regard to adolescent drug use, few, if any studies, have examined whether parent-adolescent relations and parental management differ according to community type, and whether or not community type is a risk or protective factor for drug use. These relationships will be examined in this study.

Policy

National efforts to curb adolescent drug use have existed for over a century. Criminal justice and law enforcement remain the central theme in the U.S.' drug policies. Findings from the present study may help to promote national drug policies that are based on empirical science and that pay attention to social justice issues. Specifically, this study's findings may help to address discrepancies, such as the Anti-Drug Abuse Act of

1986 that contributed to higher incarceration of African Americans. In addition, policies may develop that will recognize the influential role of parents and therefore, may incorporate parent responsibility as a means to reduce adolescent drug use as well as promote policies that reduce drug-related prison sentences for parents. Convicted drug offenders may experience long term consequences that include difficulty accessing public housing and acquiring loans for college. Their children are also impacted by their drug convictions. The present study may help to promote policies that recommend treatment instead of incarceration for non-violent drug possession offenses committed by parents. According to Rydell and Everingham (1994), treatment is 10 times more cost effective than prohibition in reducing the use of drugs. Finally, the findings of this study may present implications for prevention policy such that it may influence the types of prevention programs that should be funded, such as those that consider and incorporate parent and peer contextual factors.

Programming

Findings from this study may help to tailor programs specifically for African American adolescents living in rural and urban communities. It is assumed that the family is particularly salient during African American adolescence. Therefore, this study's findings may help to suggest how African American families can be incorporated into drug prevention programs as adolescents age into young adulthood.

This study's findings may highlight the importance of considering the role of developmental changes on adolescent drug use in prevention programs. For instance, given this study's attention to developmental influences, the findings may indicate the developmental period (i.e., early childhood, middle adolescence) in which adolescents

should first be targeted. Thus, the findings may suggest how programs should differ according to developmental stage.

The most effective prevention interventions for reducing drug use among African Americans consider culture and context. In this study, context is considered as it focuses on adolescent drug use across both rural and urban settings as well as the role of parents and peers in adolescent drug use. Therefore, it is expected that the findings of this study will suggest areas in which to focus prevention interventions.

Relevance to Social Work

The present study's primary goals are to develop knowledge that will contribute to the adolescent drug use literature and ultimately, empower and enhance the well being of all Americans. According to the National Association of Social Workers (NASW) Code of Ethics (1997), "the primary mission of the social work profession is to enhance human well-being and help meet the basic human needs of all people, with particular attention to the needs and empowerment of people who are vulnerable, oppressed, and living in poverty" (p. 1). The present study focuses on African American adolescents living in rural and urban areas, and thus it targets individuals whom are considered vulnerable, whom have been historically oppressed, and are living in poverty. Ergo, clearly, this study is relevant to the social work profession.

One of the goals of *Healthy People 2010* is "to eliminate health disparities," which includes differences that occur according to gender, race or ethnicity, geographic location, education or income, disability, or sexual orientation. According to the CDC (2007a), race and ethnicity correlate with increasing health disparities among U.S. populations. Findings from this study should support the government's efforts to

eliminate health disparities among individuals according to gender, race/ethnicity, and geographic location as it focuses on African American males and females across rural and urban settings. This study adheres to the NASW Code of Ethics and supports the goals of Healthy People 2010. It contributes to the profession of social work by seeking to understand the adolescent drug use phenomenon across community type and address structural injustices.

It is also important to note social work scholars that have contributed to the field of adolescent drug use. Some of these individuals are: Mark Fraser (e.g., Fraser, 1987; Terzian & Frazier, 2005), Jeffrey M. Jenson (e.g., Jenson, Anthony, Howard, 2006; Jenson, 2004), Flavio F. Marsiglia (e.g., Marsiglia, Kulis, Nieri, Parsai, 2005; Marsiglia, Miles, Dustman, & Sills, 2002), Jordana Rae Muroff (e.g., Wallace & Muroff, 2002), Matthew O' Howard (e.g., Howard, Balster, Cottler, Wu, & Vaughn, 2007; Howard & Jenson, 1999), Antionette Rodgers-Farmer (e.g., Rogers-Farmer, 2000), John Wallace (e.g., Wallace, Bachman, O'Malley, Schulenberg, Cooper, & Johnston, 2003a; Wallace, Brown, Bachman, & Laveist, 2003b), and novice researcher, Trenette T. Clark (e.g., Clark, 2008; Clark, Belgrave, & Nasim, 2008).

Overview of Proposed Study

Research has consistently shown that African American youth, relative to youth from other ethnic groups, are less likely to engage in drug use. This phenomenon exists even though African American youth tend to be disproportionately exposed to contextual risk factors that are associated with adolescent drug use (Wallace & Muroff, 2002).

Family Interactional Theory: The Developmental Model (FITTDM) (Brook, Brook, & Pahl, 2006) is the primary theory used in this study. It emphasizes the parent-adolescent

relationship and postulates that adolescent drug use is influenced by interrelationships between adolescents' personalities, previous drug use, parental characteristics (e.g., parental warmth, drug use), quality of relationships with their family members, and the environment (e.g., neighborhood characteristics).

Peer factors have consistently been found to be a strong predictor of adolescent drug use. However, Wallace and Muroff (2002) found that when peer and family influence on drug use are considered jointly, African American adolescents may be less peer-oriented and more parent-oriented than White adolescents. These researchers have postulated that the family may be the most salient protective and protective-protective factor (an enhancer of other protective factors) for African American adolescents, which may explain their lower drug use during adolescence. This suggests that perhaps parental influences lessen as African American adolescents enter young adulthood, which may explain the underlying cause of the cross-over effect.

Exploring various dimensions of parenting style (e.g., warmth, communication) and practices (e.g., monitoring, supervision) are considered important. However, most empirical studies that examine adolescent drug use only focus on one or two dimensions of parenting (Gray & Steinberg, 1999). Recently, more studies have focused on the interactive effects of parent-adolescent relations (e.g., support, warmth) and parental management (e.g., control, monitoring) on adolescent drug use (Blokland, Hale, Meeus, & Engels, 2007; Huver, Engels, Van Breukelen, De Vries, 2007). Recent studies indicate that high levels of parent-adolescent relations and adequate parental management are associated with less drug use. Some investigators have suggested that parent-adolescent relations and parental management may be important in protecting against peer influence,

and have found that parental influences are mediated by peer influences on drug use (Bahr, Hoffman, & Yang, 2005; Kung & Farrell, 2000). Additionally, a few recent studies have examined parenting practices as a moderator of the peer-drug use relationship (e.g., Mounts, 2002).

The proposed study focuses on African American adolescents in rural and urban settings. It examines the role of parenting and peer influences on adolescent drug use across these contexts. It takes into account the impact of adolescent development on drug use. The study also focuses specifically on tobacco, alcohol, and marijuana use as these are the most commonly used drugs during adolescence (Johnston, O'Malley, & Bachman, 2002).

According to Baron and Kenny (1986), a mediating effect occurs when the effect of an independent variable on a dependent variable can be accounted for by an indirect effect that includes a mediating variable. Baron and Kenny explained that a moderator variable is a variable that affects the direction and/or strength of the relationship between the independent and dependent variables. Direct relationships, moderating effects, and mediating effects are included to provide a more complete picture of the role of perceived parent-adolescent relations, parental management, and risky peer affiliation on drug use. Also, gender, community type, and developmental differences will be examined.

Aims of the Study

The specific aims of this study are to:

1. investigate the relationships between adolescent report of a.) parental attitudes toward drug use, b.) parent-adolescent relations and management, c.) peer

- influence, and d.) drug refusal efficacy and use among African American adolescents;
2. examine if parent-adolescent relations and management moderates the relationship between peer risky behavior and drug refusal efficacy and use among African American adolescents;
 3. examine if community type moderates the relationship between peer risky behavior and drug refusal efficacy and use among African American adolescents;
 4. examine if gender moderates the relationship between peer risky behavior and drug refusal efficacy and use among African American adolescents.
 5. examine if age moderates the relationship between peer risky behavior and drug refusal efficacy and use among African American adolescents.

CHAPTER 2: LITERATURE REVIEW

This chapter is organized to guide the reader from the theoretical framework through to the study's primary research questions and hypotheses. The first section presents an overview of the primary theoretical framework guiding this study, *Family Interactional Theory: The Developmental Model* (FITTDM). The second section provides an outline of the parameters of the current study and describes the adapted FITTDM. The third section reviews biological and developmental factors and gender and developmental differences in youth drug use. The fourth section entails a historical and current review of rural and urban communities, provides a discussion of the influence of contextual factors on adolescent drug use, and presents the findings of a series of studies that have focused on drug use among youth across rural and urban settings. The next several sections offer empirical findings of previous studies that have examined the relationships between parent-adolescent relationship and parental management, peer influences, and adolescent drug refusal efficacy and use. Finally, this chapter concludes with a brief summary linking these constructs using the primary theory and the specific research questions and hypotheses to be investigated. Also, drug use among African American youth specifically, is integrated throughout this chapter.

Theoretical Framework

Drug experimentation during adolescence is common (Kaplow, Curran, & Dodge, 2002). Drug experimentation as a normative phenomenon may not be associated with other problem behaviors. However, there can be serious short and long term consequences of current adolescent drug use, abuse, and dependence, particularly for African American youth.

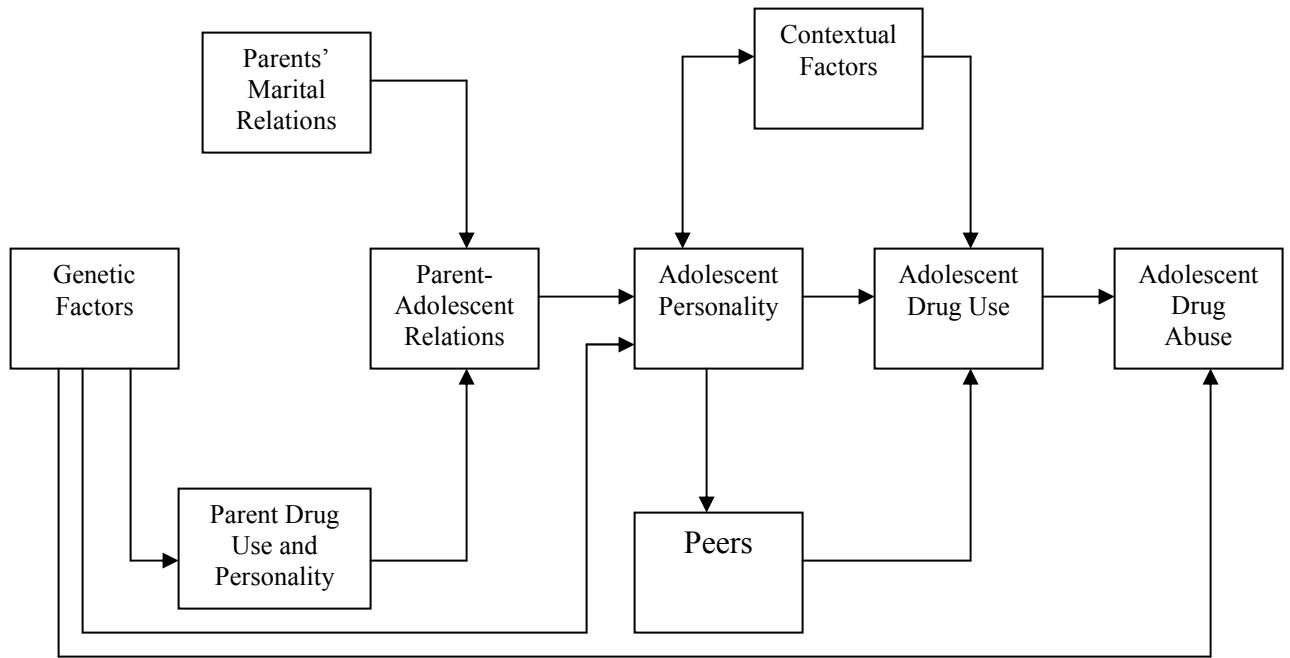
Several theories have been used to promote understanding of adolescent drug use. To date, there is not a single theory that dominates the adolescent drug use literature, and extensive reviews of the primary theories used to foster understanding of adolescent drug use have been provided by other researchers (e.g., Petraitis, Flay, & Miller, 1995; Ramussen, Benson, & Mocan, 1998). Also, there is not a single factor that fully explains adolescent drug use, but instead, several factors. Consequently, recently, there has been growing interest and calls for theories that connect biological and environmental influences to explain youth drug use and other problem behaviors. Hence, a shift has occurred transitioning from unidimensional theories (e.g., Oetting & Beauvais, 1986) toward multiple dimensional theories such as biopsychosocial theories (e.g., Brook, Brook, & Pahl, 2006). The biopsychosocial theory used as the guiding framework of this study is FITTDM.

Family Interactional Theory: The Developmental Model

In their theoretical exposition on adolescent drug use, Brook, Brook, and Pahl (2006) theorized that adolescent drug use is determined by the interrelationships between factors in multiple psychosocial domains (see Figure 4). In FITTDM, individual level factors include the adolescent's personality (e.g., ego integration) and previous drug use. It includes parental characteristics (e.g., personality, drug use) and the quality of the relationship between the adolescent and his family members at the parent and family levels. It also includes contextual factors (e.g., neighborhood characteristics) at the macro level (Brook et al.).

FITTDM uses a pathway approach to conceptualize adolescent drug use such that it assumes that its preceding variables (e.g., genetic factors, parent drug use) cause

Figure 4: *Family Interactional Theory: The Developmental Model* (Brook, Brook, & Pahl, 2006)



subsequent variables (e.g., adolescent drug use, adolescent drug abuse) in a linear manner. Brook et al. (2006) propose that the pathways to adolescent drug use are: (1) the parent internalizes society's values and the absence of parental drug use creates a warm and conflict-free parent-child relationship that leads to the adolescents' identification with their parents, which in turn, leads to a high quality relationship between parents and children; (2) subsequently, the child internalizes the conventional parts of the parent's personality, attitudes, and behaviors that leads to a conventional personality during adolescence; and (3) accordingly, the adolescent's conventional personality is therefore expressed in attitudes and behaviors that limit deviant peer affiliations and supports the adolescent's own attitudes towards conventional behaviors. Thus, presumably, these adolescents are less likely to engage in drug use.

FITTDM assumes that pathways to drug use originate in childhood. It also assumes that childhood dispositions, family experiences, and environmental factors influence the formation of conventional or non-conventional personalities for youth (Brook, Brook, & Pahl, 2006). Conventional personalities are defined as personal characteristics and attitudes that conform to traditional standards and practices established by the majority group while nonconventional personalities are those that do not conform to these standards. The formation of non-conventional personalities are often related to later non-conventional behaviors, such as drug use and delinquency (Brook et al.). For example, several childhood problem behaviors and psychiatric disorders, such as aggression and major depressive disorder have been found to be predictors of adolescent drug use (Brook, Whiteman, Finch, & Cohen, 1998; Capaldi & Stoolmiller, 1999). On the other hand, childhood problem behaviors could also contribute to or reinforce nonconventional personalities and attitudes.

FITTDM: Biological Factors

FITTDM includes biological and genetic risk factors for adolescent drug use with a primary emphasis on genetic vulnerability to drug use. In this model, Brook and colleagues acknowledge both the importance of and difficulty in distinguishing between genetic and environmental factors. In a study of adopted children, Cadoret, Troughton, O’Gorman, and Heywood (1995) found that there are two possible pathways from parental alcohol use to their children’s drug use, one genetic and the second, modeling. Similarly, Tsuang, Bar, Harley, and Lyons (2001) focused on the relationship between genetics, parental modeling, and adolescent drug use. Tsuang and colleagues found that biological children of alcoholics who were raised by non-alcoholic parents were shown to

have a three-to fourfold increased risk for alcohol abuse than adoptee children whose biological parents were not alcoholics.

FITDM: Family Factors

Within the family domain, the developmental model emphasizes parental modeling and the parent-child relationship. In particular, it focuses on the parent-child bond or attachment, non-conflictual parent-child relations, and adolescents' identification with their parents (Brook, Brook, & Pahl, 2006). Brook and colleagues describe the manner in which parental factors influence adolescent behavior through socialization and modeling to include parental drug use, personality, and marital relationship.

Parents' and families' previous and current drug use is associated with their children's drug use. They influence their children's drug use via genetic or biological factors and/or modeling drug use behaviors. Parental personality also influences youth drug use. For example, children of parents who portray conventional attitudes may be less likely to use drugs.

Marital conflict is also associated with youth drug use such that it interferes with the development and quality of parent-child attachment (Brook, Brook, & Pahl, 2006). Specifically, marital conflict reduces parents' opportunities to model and teach their children conventional behaviors. It is likely that marital conflict leads to parental and adolescent stress that may contribute to adolescent drug use. Marital conflict may be a stronger risk factor for adolescent drug use than parental absence (Farrington, 1991).

The developmental model acknowledges the role of parental discipline in shaping adolescent behavior (Brook, Brook, & Pahl, 2006). Parents control nonconventional behavior through discipline, which buffers against adolescent drug use (Kandel &

Andrews, 1987). Studies have found that an authoritative parenting style where the parents are warm and supporting, but also firm regarding their children's behavior is the most effective in preventing adolescent drug use (Lamborn et al., 1991; Mounts & Steinberg, 1995). On the other hand, authoritarian parents who are demanding and controlling, but not warm and supportive is associated with adolescent drug use. Similarly, indulgent parents, who are warm and supportive, but less demanding and controlling than authoritative parents is associated with adolescent drug use. And, children of neglectful parents, who are not warm and supportive or demanding and controlling are the most at risk of engaging in drug use.

To summarize, some family factors, such as marital conflict and parental drug use contribute to drug use. While other family factors such as positive parent-adolescent relations and medium and high levels of parental monitoring may be associated with decreased or no drug use.

FITTDM: Peer Factors

Deviant peers are the most significant factor in the initiation and maintenance of drug use (Brook, Brook, & Pahl, 2006). Brook, Brook, Zhang, Cohen, and Whiteman (2002a) and Farrell and White (1998) found that peer drug use was directly related to drug use among African American adolescents. The peer domain is included in the developmental model and focuses on the influence of deviant or "risky" peers on adolescent drug use (Brook et al., 2006). Risky peers may be defined as peers that engage in deviant behaviors, such as truancy, fighting, and drug use. Deviant or troubled adolescents are more likely to associate with risky peers. FITTDM describes the process of risky peer selection and explains how these relationships influence adolescent drug

use. The process of risky peer selection and the method by which risky peer affiliation influences adolescent drug use are explicated later in the *peer influences* section of this chapter.

FITDM: Contextual Factors

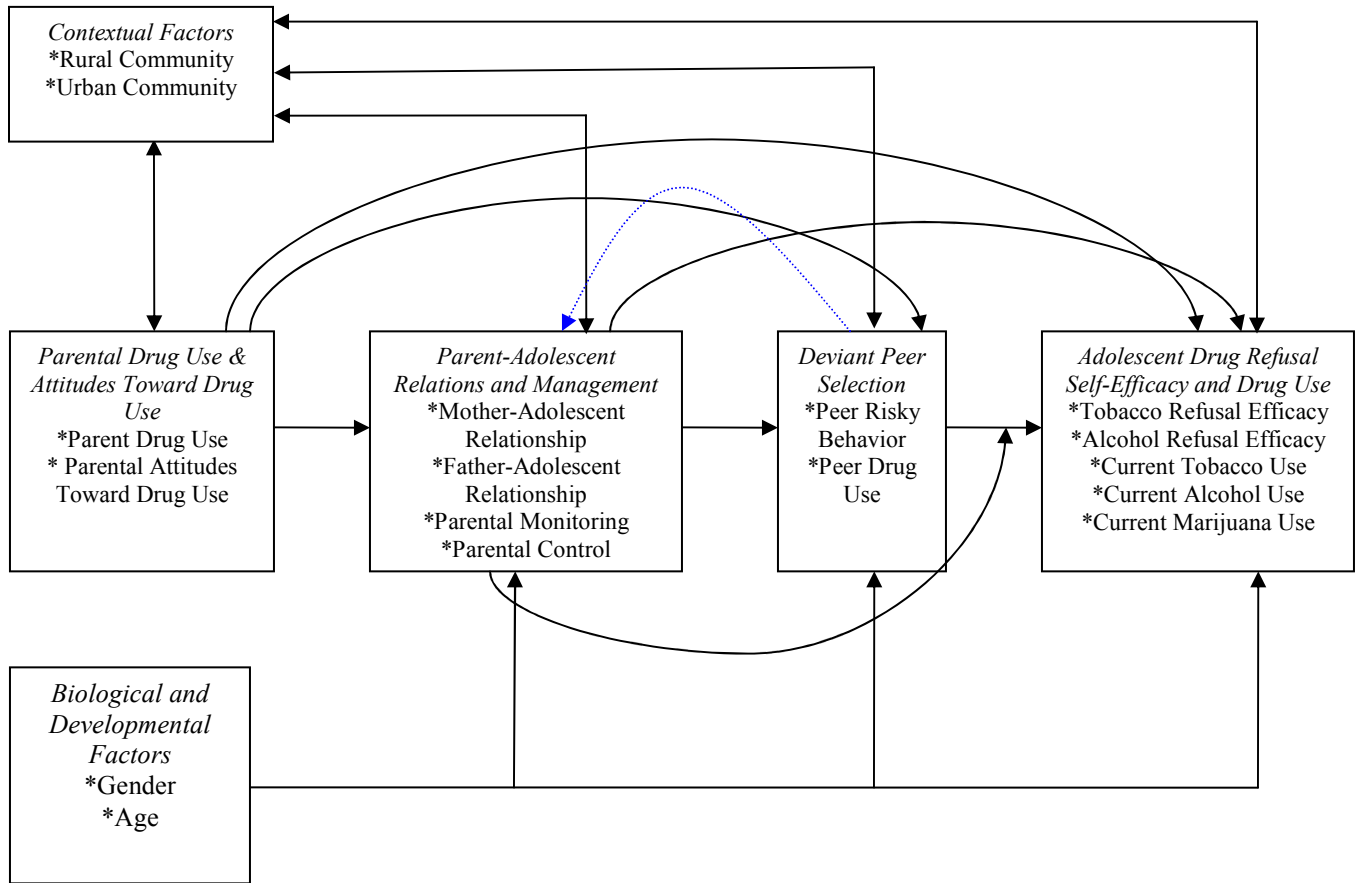
The developmental model also highlights the role of the larger context in determining adolescent drug use (Brook, Brook, & Pahl, 2006). The larger context includes environmental factors, the media, and social policies (Brook et al.). Environmental factors, such as drug availability and neighborhood disorganization (e.g., street gangs, public drug trafficking) are linked to adolescent drug use and other risky behavior. These macro factors indirectly influence adolescent drug use and are sometimes partially mediated by family and peer factors. That is, it is expected that macro factors, such as community and neighborhood disorganization may indirectly influence adolescent drug use by directly impacting the family and peer domains. Thus, its effects are transmitted to adolescents via family and peers.

It is expected that other macro factors, such as the media may directly influence adolescent drug use. This is particularly true when the media directs messages to African American youth that reinforces the notion that using drugs is normative and “cool.” For example, some have suggested that “Kool” cigarettes, a mentholated cigarette brand manufactured by RJ Reynolds Tobacco Company were implicitly directed to African American youth and young adults. This argument was made because during Kool cigarettes introduction to the American population, the term “cool” was among the most popular words in the African American community.

Focus of Proposed Study

The purpose of the proposed investigation was to examine the relationship between a set of parenting and peer variables and adolescent drug refusal efficacy and use. The FITTDM was adapted to examine the role of parental attitudes toward drug use, the parent-adolescent relationship (mother-adolescent relationship), and parental management (parental monitoring) from the adolescent's perception (see Figure 5). This was done to understand their contribution to adolescent drug refusal efficacy and use. Specifically, this study examined the impact of peer risky behavior on adolescent drug refusal efficacy and use. It also examined whether parent-adolescent relations and management mediated the relationship between parental attitudes toward drug use and drug refusal efficacy and use. Additionally, this study examined whether risky peers mediated the relationship between parent-adolescent relations and parental management and drug refusal efficacy and use. It also examined whether parent-adolescent relations and management and risky peers mediated the relationship between parental attitudes toward drug use and drug refusal efficacy and use. This study also investigated whether the parent-adolescent relationship and parental management moderated the risky peers-adolescent drug refusal efficacy and use relationship. Finally, this study examined whether and how these relationships differ according to gender, developmental differences, and community type (rural, urban). Further details regarding the precise method of adapting the FITTDM is presented later in the chapter. Prior to a discussion of adolescent drug use, "normal" adolescent development is examined in the next section.

Figure 5: *Adapted conceptual model of adolescent drug use*



Biological and Developmental Factors in Adolescence

In order to better understand drug use among African American youth in early, middle, and late adolescence, biological aspects of adolescent development and gender are discussed. Puberty and gender role orientation are discussed because drug use differs according to these factors.

Adolescent Development

Adolescence is a natural developmental process that occurs after childhood but prior to adulthood. It is a period of human development that includes biological/physical, cognitive, and psycho-social growth. During adolescence, youth negotiate puberty and the completion of physical growth, expand their cognitive skills and capabilities, develop

a clearer sense of personal and sexual identity, and gradually develop emotional and financial independence from their parents (Christie & Viner, 2005). The age range classified as early adolescence, middle adolescence, and late adolescence is subject to debate. However, generally, adolescence is categorized into three developmental periods, involving early adolescence (ages 10-13), middle adolescence (ages 14-17), and late adolescence (age 18 until the early twenties) (Smetana, Campione-Barr, & Metzger, 2006). Developmental tasks differ according to developmental period and tasks need to be completed prior to successful advancement into the next developmental stage. There are physical, cognitive, and social changes during adolescence and these are discussed next.

Physical Development

Adolescence is a time of physical and sexual maturation. Physical development includes gains in height and weight, puberty, and continued brain development (Huebner, 2000). These developmental factors may be indirectly related to adolescent drug use and are discussed next.

Weight and height gain. According to Huebner (2000), during a one-year span, boys and girls can grow an average of 4.1 and 3.5 inches, respectively. Because of the rapid change in height and weight, some adolescents, particularly girls may become sensitive about their physical changes. In 2005, the prevalence of being overweight was higher among male (16.0 percent) than female (10.0 percent) students (Youth Risk Behavior Surveillance System (YRBSS) of the Centers for Disease Control and Prevention, 2006). Yet, more females than males (61.7 vs. 29.9 percent, respectively) reported that they were currently trying to lose weight.

During this period of development, adolescents tend to compare themselves physically to their peers. Consequently, the desire to be a lower weight, which seems to be especially desirable in the U.S., could lead to unhealthy strategies to lose weight (e.g., vomiting, taking laxatives), such as anorexia nervosa, bulimia, and smoking. These unhealthy strategies are more common among females than males.

There are ethnic differences in weight gain. Among African American students, the prevalence of being overweight was higher among African American (16.0 percent) than White (11.8 percent) students (YRBSS, 2006). However, the prevalence of trying to lose weight was higher among White (45.9 percent) than African American (38.9 percent) students. In addition, the prevalence of healthy strategies to lose weight, such as exercising was higher among White and Hispanic females (69.8 percent and 68.9 percent, respectively) than African American females (56.5 percent). Further, eating less food, fewer calories, or foods low in fat to lose weight was higher among White (42.4 percent) and Hispanic (42.2 percent) than African American (31.1 percent) students (YRBSS).

To summarize, African American adolescents are more likely to be both at risk of being overweight and actually being overweight than White and Hispanic students. In addition, African American females are more likely to be at risk of being overweight than African American males and White and Hispanic females. Although African American females are more likely to be overweight, they are less likely than their White and Hispanic counterparts to employ healthy or nonhealthy strategies to lose weight.

Few studies have examined the relationship between obesity and drug use. However, it seems that this relationship may be bi-directional. Binge drinking during early adolescence is associated with obesity in young adulthood (Hawkins & Catalano,

2004). This may be due to binge drinkers adopting other unhealthy behaviors that together contribute to obesity. Also, the psycho-social consequences of being overweight, such as stress, contribute to adolescent drug use (Hoffman, Cerbone, & Su, 2000). Adolescents who experience stress as a result of being overweight may be more likely to self medicate by using drugs.

Puberty. Puberty is the development of secondary sex characteristics. Primary sex characteristics are those directly related to the reproductive organs and external genitalia, such as penis and scrotum growth for boys and growth of ovaries, uterus, vagina, clitoris, and labia for girls (Craig & Dunn, 2007). For girls, secondary sex characteristics typically include (1) breast development, (2) growth of pubic hair, (3) growth of underarm hair, (4) body growth, (5) menarche, (6) increased production of oil and sweat glands, and (7) the beginning of acne (Craig & Dunn; Huebner, 2000). For boys, these characteristics include, (1) growth of testes and scrotal sac, (2) growth of pubic hair, (3) facial and underarm hair growth, (4) body growth, (5) penis growth, (6) voice changes, (7) first ejaculation of semen, (8) increased production of oil and sweat glands, and (9) the beginning of acne (Craig & Dunn; Huebner).

For girls, puberty is marked by menarche, the first menstrual period. According to Frisch (1988), menarche usually occurs when a girl reaches approximately 100 pounds. In the U.S., menarche usually occurs between the ages of 9 ½ and 16 ½, with the average age being 12 ½ (Craig & Dunn, 2007). In the U.S., the average age of menarche for White girls is 12 ½ (Chumlea et al., 2003). However, it occurs 3 to 6 months earlier for African American and Hispanic girls. Seiffge-Krenke (1988) found that only 23 percent of girls reported positive attitudes about menarche. This low percentage of positive

attitudes could be related to the accompanying symptoms of menarche, such as cramps and bloating. During puberty, girls' self esteem may be lower because of their physical changes and consequently, they may be more likely to engage in drug use. Girls are also more likely to become depressed during puberty. Adolescents experiencing depression because of puberty or other stressors may be more likely to use drugs as a coping mechanism.

For boys, puberty is marked by spermarche, the first emission of semen that contains viable sperm cells (Craig & Dunn, 2007). In the U.S., the first emission of semen usually takes place between the ages of 11 and 16. Typically, boys mature two years later than girls. There are conflicting findings concerning racial differences in puberty timing for African American and White boys. For example, some research suggests that African American boys experience puberty prior to White boys, whereas other findings differ (Biro, Lucky, Huster, & Morrison, 1995; Harlan, Grillo, Cornoni-Huntley, & Leaverton, 1979). The timing of puberty has implications for drug use and these are described in the next two sections that describe the varied experiences of early and late maturers.

Early and late girl maturers. Early maturing girls may experience social and psychological stressors because they may be taller and heavier than their peers (Ge, Conger, & Elder, 1996). As a result, they may have higher levels of deviant behavior, such as drug use and risky sexual behavior (Sussman, Dorn, & Schiefelbein, 2003). For example, early maturing girls may be pressured into early sexual behavior because they look older (Craig & Dunn, 2007). However, as early girl maturers grow older, physical development may be viewed more positively because they may feel more attractive and

be more likely to date (Craig & Dunn). Late maturing girls typically fall into a similar maturing pattern as boys that may lead them to have similar interests as boys during the same time period (Craig & Dunn).

Pubertal timing is associated with drug use initiation. Chung, Park, and Lanza (2005) found that among 12 year old females who do not use drugs, those who have gone through puberty are three times more likely to engage in drugs than those who have not experienced puberty. This is also true among older female adolescents. Among adolescent girls ages 12-15, those who have gone through puberty are more likely to engage in drug use than those who have not (Chung, Park, & Lanza). Overall, late maturing girls are less likely to engage in drugs compared to early maturing girls.

Early and late boy maturers. Early maturation may be problematic for boys because they may be expected to act as an adult, and therefore may not experience a complete period of adolescence (Craig & Dunn, 2007). Early maturing boys are more likely to associate with older boys, which place them at higher risk of becoming involved in delinquency and drug use (Feldman, 2003). In addition, as is the case with girls, boys who mature earlier have earlier onset of sexual activities (Craig & Dunn). Overall, early maturing boys are more likely to engage in drug use and other risky behaviors because they are more likely to affiliate with older boys who are more likely to engage in these behaviors. Late maturing boys are the last to develop muscles, which means that they may be less likely to play sports. In addition, they may be viewed by parents and adults as a younger child, and may respond to this by behaving as a child, and at other times, rebelling by behaving aggressively (Craig & Dunn). Later maturing boys may be less likely to associate with older boys; therefore, they may be less likely to use drugs than

early maturing boys. However, because later maturing boys may be less popular, they may be more likely to be influenced by their peers to engage in drug use because of their desire to be socially accepted.

Pubertal stage, age, and grade level are independently associated with higher rates of drug use and abuse (Patton et al., 2004). Early maturers are at increased risk of drug use because they enter into a risky developmental period at an earlier point than late maturers (Patton et al., 2004; Patton, Hibbert, Carlin et al., 1996). Adolescents in later stages of pubertal development are more likely to report having more peers that use drugs (Patton et al., 2004). Overall, drug use is associated with early pubertal development, later stage of puberty across gender, age, and grade level.

A study of testosterone level and sexual maturation provides evidence of the relationship between physical maturation and adolescent drug use (i.e., Reynolds et al., 2007). In a study of 178 boys, Reynolds et al. investigated whether high testosterone level and sexual maturation influenced unconventional behavior that led to drug use disorder. Findings were that pubertal processes in early adolescence (ages 12-14) influenced the risk of substance use disorder in later adolescence. Further, affiliation with deviant peers (at age 16) mediated the association between testosterone (at ages 12 to 14) and use of illicit drugs (at age 19). To summarize, illicit drug use progressed via a pathway in which the effects of testosterone were mediated by affiliation with risky peers.

Costello, Sung, Worthman, and Angold (2007) found that early pubertal maturation predicted alcohol use for both boys and girls, and it predicted alcohol abuse in girls. Girls with the highest risk for alcohol use were early maturers with conduct

disorder who affiliated with deviant peers. In addition, in this study, inadequate supervision predicted alcohol use in early maturing girls, while family problems and poverty were predictive of alcohol use for early maturing boys.

Brain development. Up until the mid-1990s, it was believed that brain development was complete during adolescence (Craig & Dunn, 2007). However, research on brain development shows that brain maturation is not complete in adolescence (Cauffman & Steinberg, 2000). In fact, recent findings suggest that the connections between neurons that affect emotional, physical, and mental abilities in adolescents are incomplete (Huebner, 2000). Findings from several studies indicate that advanced decision making does not emerge until the middle twenties, which may be related to brain maturation (e.g., Cauffman & Steinberg; Steinberg & Cauffman, 1996). Brain development and decision making skills influence adolescents' abilities to make logical decisions concerning drug use and other behaviors.

Brain development is conceptualized as a part of physical development whereas cognitive development is considered a separate developmental component. Still, these two concepts are closely related and cognitive development is described below and the implications for drug use are presented.

Cognitive Development

Cognitive development refers to levels of intellectual adaptation (Lehalle, 2006). Adolescents gradually begin to develop cognitive abilities beyond those of childhood and these skills increase into adulthood. Specific cognitive abilities include decision making and reasoning skills, abstract thinking capabilities, and "metacognition."

Decision-making and reasoning skills. During adolescence, youth tend to develop enhanced decision-making and reasoning skills (Craig & Dunn, 2007). Decision making skills include recognizing and exploring multiple options. Reasoning skills are the ability to think logically and consider hypothetical situations. These skills are particularly important aspects of adolescent development as this is also the period when adolescents become less dependent upon parents for judgments and decisions (Craig & Dunn). Adolescents who lack decision-making and reasoning skills may be more likely to engage in drug use because they may not consider the positive and negative consequences of drug use or recognize ways of saying no to drugs. Younger adolescents may be more likely to have inadequate decision making and reasoning skills and therefore, may be more susceptible to using drugs.

Concrete vs. abstract thinking. During childhood, youth are typically concrete thinkers. Concrete thinking can be defined as focusing only on things that are real and definite instead of things that are vague. As youth mature into adolescence, they begin to develop abstract thinking. Abstract thinking involves generalizations. It includes thinking about things that cannot be seen, heard, or touched, such as spirituality, faith, and trust (Huebner, 2000). Concrete thinkers generally have either a black or white view of the world, whereas abstract thinkers are able to view and analyze black, white, as well as gray areas. Abstract thinkers think analytically, which supersedes a linear worldview, such as X causes Y. An example of concrete thinking is a teen who says, “There are numerous drug campaigns that say that ‘drugs kill.’ Yet, both my seventy-nine year old grandmother who has smoked cigarettes since she was thirteen and my brother who routinely smokes marijuana are alive.” Teens that have this perspective may be more

likely to use drugs because of their inability to connect the short and long term consequences to drug use. By contrast, an adolescent with abstract thinking skills might say, “Drug campaigns say that ‘drugs kill.’ Although my grandmother who has smoked cigarettes since age thirteen and my brother who smokes marijuana are still living, I think it’s only because of God’s grace that they are living. Further, eventually it will catch up with them because their smoking behaviors are gradually worsening their health.”

Adolescents who have the latter perspective may be more likely to not engage in drug use because of their ability to think analytically about drug use and other nonconventional attitudes and behaviors. Thus, abstract thinkers may be less likely to use drugs because they may be less naïve and able to understand the short and long term negative consequences of drug use.

Metacognition. During adolescence, youth develop the ability to think using metacognition. Metacognition is the knowledge that people have about their own thinking processes, and their ability to monitor their cognition (Feldman, 2003). Metacognition allows adolescents to assess their attitudes and behaviors that lead to the initiation or maintenance of conventional or nonconventional attitudes and behaviors (Craig & Dunn, 2007). Metacognition is a reflexive skill that is rarely utilized, particularly among youth. Reflexive refers to individuals’ abilities to question their own attitudes and behaviors. Adolescents who have successfully developed the ability to think using metacognition may be less likely to use drugs because of their ability to reflect on their conventional and/or nonconventional attitudes and behaviors. Subsequently, these youth are expected to make desirable changes to decrease nonconventional attitudes and behaviors. For instance, drug prevention programs may

incorporate metacognition by having participants reflect on their drug use attitudes and behaviors. In doing so, adolescents may recognize their unconventional attitudes and faulty thinking.

Psycho-Social Development During Adolescence: Theories of Self and Identity

There are five psychosocial milestones that adolescents must achieve: (1) establish an identity, (2) establish autonomy, (3) establish intimacy, (4) become comfortable with one's sexuality, and (5) achievement (Huebner, 2000). The primary psychosocial goal during adolescence is to establish an identity. Several theorists have proposed self or identity developmental stages, such as Erik Erikson (1968), Jean Piaget (1950; 1970), and Lawrence Kohlberg (1976; 1981; 1984).

Erik Erikson built on Sigmund Freud's work on adolescent behavior to propose eight stages of psychosocial development (Erikson, 1968). According to Erikson, the individual must master the requirements of each developmental stage prior to advancing to the next stage. Erikson's fifth stage, identity versus role diffusion occurs during adolescence. Prior to the fifth stage, adolescents hold numerous roles, such as friend, student, and sibling; however, it is during this fifth stage that they must combine these roles into a single role and find their place in the world through self-identity. Therefore, the developmental task of the identity versus role diffusion stage seeks to support identity formation and a coherent sense of identity. The family plays a significant role in determining how well the child develops throughout the proposed stages (Erikson, 1964). Families' influence on identity development is related to families' ability to shape their children's attitudes.

Jean Piaget viewed the development of thought as proceeding through four periods: sensorimotor in infancy, preoperational in early childhood, concrete operational in late childhood, and formal operational in adolescence (11 or 12 years and older) (Piaget, 1950; 1970). During the formal operational stage, adolescents are expected to think systematically about numerous possibilities and propose logical solutions (Piaget). Also during this stage, adolescents are expected to achieve the ability to ask and answer questions, such as, who am I and what if? (Piaget).

Lawrence Kohlberg expanded Jean Piaget's two-stage theory of moral development to propose three broad levels of moral development: preconventional morality, conventional morality, and postconventional morality (Kohlberg, 1976; 1981; 1984). The two stages included in the first level, preconventional morality, are to obtain rewards and moral reasoning and obey laws to avoid punishment. The two stages in the second level, conventional morality, are moral reasoning and conforming to win the approval of others and avoid disapproval by others. The two stages in the third and final stage, postconventional, are moral reasoning and abiding by both society's laws and universal ethical principals that may be conflictual. According to Kohlberg, although adolescents may become capable of achieving postconventional morality, many do not progress past the second stage of conventional morality (Kohlberg).

Racial and Cultural Theories

It is important to highlight theories that have focused specifically on identity development among African Americans. Prior to the late 1960s and early 1970s, there were no theories that focused on African American identity formation (Helms, 1990). Most theories that were applied to African Americans and other minorities viewed their

development as deficient (Cross, 1991). For example, Carl Jung, father of “transpersonal psychology” asserted that certain American psychological disorders were due to White Americans “living together with lower races, more particularly the Negroes” (Jung, 1950, p. 29). Dalal (1988) maintained that Jung considered African Americans to be inferior to other races rather than different. Despite Erikson’s earlier thoughts and negative comments regarding African American development and behavior, he later acknowledged that African American behavior is imperative for their survival (Erikson, 1968). He also pointed out that African American history, such as slavery and the Jim Crow laws, for example, impacts identity development among minorities and suggested that theories be inclusive and incorporate history and cultural values, such as religion and ethnic identity.

Since the 1970s, theories have developed that take into account the culture and history of the African American experience and their impact on identity development among African American youth (e.g., Baldwin, 1981; Cross, 1991; Semaj, 1981). Cross’ (1991) seminal work is one of the most frequently cited theories of African American identity. Cross developed the Nigrescence Model of Black Identity to explain the transformation of African Americans from “Negroes” to “Blacks.” Cross’ theory is used to explain “the combination of individual and group identity development” among African Americans. Cross postulated that the theory of Nigrescence or “the process of becoming Black” goes through five stages that include preencounter, encounter, immersion, emersion, and internalization. First, during the preencounter stage, the individual is unaware of race and its implications. Later in this stage, he is aware of race, but identifies with the White culture and rejects his own culture. During the second

stage, encounter, the African American child or adolescent is treated differently because of his race. He therefore rejects previous identification with the White culture.

Immersion, the third stage, is when the individual becomes completely immersed with his culture and takes on the characteristics of his race. During emersion, the fourth stage, the individual becomes less immersed in his culture and becomes open to taking on characteristics from other cultures and developing and maintaining relationships with people of other races. The fifth and final stage, internalization, is a stage of balance where the individual is comfortable with his race and the race of others. Individuals may revisit these stages throughout the lifespan, which will allow them to further develop their identity and reevaluate their opinions about the social world, race, and racism (Cross).

Racial and cultural theories are applicable and useful to understand drug use among minority adolescents. These theories take into account the often neglected history and cultural values of minorities, and theories that do not consider these constructs may be less effective in explaining behavior among minority populations. Cross' Nigrescence Model of Black Identity provides a tool that can be used to understand African American identity development. For instance, pre-encounter attitudes have been linked with high levels of anxiety and depression (Carter, 1991; Parham & Helms, 1985) as well as low self-esteem and low self-regard (Parham & Helms). Thus, youth who use drugs in this stage may do so to cope with anxiety, depression, low self-esteem, and other psychological disorders. Minority youth in this stage may unconsciously prefer White teachers, social workers, and other professionals instead of minority leaders. This information is useful for the development of interventions and research studies with minority youth.

Also, the immersion stage, which posits that individuals take on the characteristics of their race, could serve as a risk or protective factor for adolescent drug use. Specifically, adolescents that adopt positive characteristics of their race, such as ethnic identity and religion may be less likely to use drugs because these characteristics may buffer against adolescent drug use. On the other hand, those who develop more negative characteristics that are perceived to be representative of their race, such as engaging in truancy or juvenile delinquency may be more likely to engage in drug use. In general, the Nigrescence Model of Black Identity suggests that there are distinct stressors that occur during the cycle of identity and these stressors may lead to psychological disorders and indirectly contribute to adolescent drug use.

These cultural models may help to provide insight regarding the dynamics in the relationship between parents and adolescents. For example, most African American parents are aware of the stages of identity, even if informally. Therefore, parents may strive to reduce their children's exposure to racism, prejudice, and the denigration of their "Blackness." Increasingly, many African Americans are explicitly encouraging their children to hold cultural attitudes and values and have ethnic pride. These experiences may impact the quality of the relationship between parents and their children and their monitoring and control of their children's activities and peers.

To summarize, theories of self identity propose that the primary goal of adolescence is to develop a sense of identity. Erikson and Piaget suggest that it is during this developmental period that individuals begin to ask questions, such as who am I and what if. These self identity theories' tenets are similar to the developmental literature. Specifically, to ask the question of who am I suggests that adolescents must have gained

metacognition skills. To ask the question of what it suggests that adolescents have gained decision making and reasoning skills. Adolescents that develop these skills and ask these questions may be more likely to think analytically about the consequences of drug use and not use them.

Kohlberg's second level of development is conventional morality. He suggests that during this stage, adolescents are able to reason about morals and conform to normative behaviors to win the approval of some individuals and disapproval of others. This is a critical stage because it is during adolescence that youth begin to become less parent oriented. Therefore, adolescents may be more likely to conform to their peers' norms to win their approval. Thus, if adolescents affiliate with drug-using peers, they may also engage in drug use. In addition, adolescents who have weak or strained attachment to their parents may deliberately engage in nonconventional behaviors because they seek their parents' disapproval. On the other hand, if parents have strong attachment to their children, their adolescents may be more likely to not use drugs because they do not want to disappoint their parents. The influence of the quality of relationship between parents and their children as it relates to adolescent drug use is discussed later in this chapter.

Cross' Nigrescence Model of Black Identity suggest that minority youth follow a marginally linear path to complete self identity that includes experiencing racism as a key component. This theory helps to provide a better understanding of identity development that is unique to minorities. It also helps to provide a clearer picture of the impact that self identity may have directly on youth and indirectly via parents anticipating these

experiences and endeavoring to buffer against racism and allow for a smoother transition through the stages of identity development.

More studies are needed to better understand the relationship between identity and drug refusal efficacy. However, it is expected that these two constructs are connected and positively correlated. Brewer (1991) asserted that personal identity is generated within the individual by considering one's own unique background and experience, rather than being constructive relative to another group (group identity) or based on a specific role (role identity). Ethnic identity is defined as a strong attachment to one's own ethnic group. Self-efficacy is defined as one's personal capabilities (Bandura, 1977). It is expected that one's sense of self (self-identity) influences one's efficaciousness (self-efficacy). In recent years, there have been numerous studies that examined the role of ethnic identity. Several studies have found that higher ethnic identity among African American adolescents is associated with higher sexual refusal efficacy (Corneille & Belgrave, 2007) and academic self-efficacy (Phillips Smith, Walker, Fields Brookins, & Seay, 1999). It is presumed that higher self identity and ethnic identity is associated with higher drug refusal efficacy.

Physical, cognitive, and social development differ according to the developmental stage of adolescence. The developmental milestones for early, middle, and late adolescents are discussed next.

Early Adolescence

Physical maturation. Youth in this age group are generally ages 10-13. There are several biological, psychological, and social tasks to achieve during early adolescence. Puberty begins, and for girls, there is a redistribution of weight and the onset of a growth

spurt (ages 10-12) (Newman & Newman, 1999). In addition, among girls, breasts (ages 11-12) and pubic hair (age 12) begin to develop (Newman & Newman). This developmental period also marks the onset of menarche and underarm hair (ages 12-13) (Newman & Newman). There is increased oil and sweat glands for boys and girls at approximately 11 years of age (Newman & Newman). Boys experience a growth spurt (ages 11-12), testicular enlargement, the beginning of genital growth, and the development of pubic hair (ages 12-13) (McIntosh, Helms, & Smyth, 2003; Newman & Newman). Physical development influences psychological and social development because it impacts adolescents' ability to perform tasks (i.e., taller or heavier youth can perform different tasks than shorter or lighter youth), alters how youth are perceived by others, and impacts adolescents' perceptions of themselves (Newman & Newman). As a result, physical development may indirectly impact drug use. The influence of physical development on drug use may be mediated by factors, such as stress and depression.

Psychological maturation. Psychologically, early adolescents continue to use concrete thinking but begin to develop early moral concepts (McIntosh, Helms, & Smyth, 2003). They further develop their sexual orientations and reassess their body images (McIntosh, Helms, & Smyth). Youth become more self-conscious, idealistic, and critical (Berk, 2007). Additionally, metacognition and cognitive self-regulation improve (Berk). Memory strategies of rehearsal, organization, and elaboration become more effective, such that they can apply several of these strategies simultaneously (Berk). Because early adolescents can apply these strategies concurrently, these youth may benefit from prevention programs that focus on metacognition and also use cognitive behavioral

techniques, such as role play and modeling to increase adolescents' chances of refusing drugs.

Social maturation. Typically, early adolescence is the period of human development when peers begin to exert a significant influence on adolescent behavior (Steinberg & Silverberg, 1986). Socially, youth begin to separate from their parents emotionally and develop stronger peer connections (McIntosh, Helms, & Smyth, 2003). During this stage, adolescents can better understand individual rights as well as link moral rules and social conventions (Berk, 2007). This is also the period in which adolescents begin to experiment with problem behaviors, such as drug use (McIntosh, Helms, & Smyth). Because this is the period when youth begin to separate from their parents, prevention programs that target youth during early adolescence should focus on incorporating the family, similar to the Strengthening Families Program. This recommendation is based on the notion that if the family's influence maintains or strengthens during adolescence as it does during childhood, drug use may decrease among adolescents and young adults.

Early Adolescence and Drug Use. Physical, psychological, and social changes during early adolescence may directly and indirectly influence adolescent drug use (Ge et al., 2006). In a longitudinal study of 870 African American adolescents, Ge et al. found that during the transition from late childhood to early adolescence, the risk of engaging in drug use increased. According to Ge and Colleagues, as children reach early adolescence, their attitudes regarding drug-using peers become more favorable. They also begin to consider drug users as popular and cooler than non-drug users. This finding was particularly true for early adolescent girls. Ge and colleagues also found that as

adolescents age, they reported having more drug-using friends and their own drug use increased.

Middle Adolescence

Physical maturation. Youth in this age group are generally ages 14-17. Biologically, girls are in middle to late puberty and have experienced menarche (Norman & Norman, 1999). By age 14, these girls are able to have a normal pregnancy (Norman & Norman). By ages 15 and 16, they are at the end of their growth spurt, have fully developed breast, and are developing a female body shape (McIntosh, Helms, & Smyth, 2003; Norman & Norman).

By age 14, boys' voices are beginning to change. In addition, these middle adolescent boys are generally in the middle of puberty, spermarche and nocturnal emissions are occurring, and they are developing facial and underarm hair (ages 15-16) (McIntosh, Helms, & Smyth, 2003; Norman & Norman, 1999). While girls in this age group are nearing the end of their growth spurt, their male counterparts are just beginning their growth spurt (McIntosh, Helms, & Smyth).

Psychological maturation. Psychologically, middle adolescents are increasing their vocabulary and developing basic abstract skills. They may still view themselves as invincible as they did during childhood (McIntosh, Helms, & Smyth, 2003). Their decision making skills continue to improve (Berk, 2007). These adolescents are less self-conscious and self-focused (Berk). Adolescents in this age group also begin to associate law with morality (McIntosh, Helms, & Smyth), as suggested by Kohlberg (1976; 1981; 1984). This period also marks the beginning of ideology, such as religious and political thought (McIntosh, Helms, & Smyth). Additionally, metacognition and scientific and

systemic reasoning continue to improve (Berk). Although this is the period of development where abstract skills, decision making, and metacognition improve, this is also the period in which adolescents begin to experiment with drugs (McIntosh, Helms, & Smyth). Prevention programs should seek to strengthen these developmental skills and enhance drug refusal skills.

Social maturation. Socially, these youth continue to separate from their parents and develop stronger connections with their peers (McIntosh, Helms, & Smyth, 2003). Although middle adolescents become more autonomous and less dependent on their parents, they also relate more positively to their parents (Berk, 2007). During later middle adolescence, conformity to peer pressure may decrease (Berk). During this developmental period, adolescents are likely to begin constructing an identity (Berk) and should be in the identity versus role confusion stage according to Erickson's theory (Erikson, 1968). Middle adolescents also begin to become interested in romantic relationships (McIntosh, Helms, & Smyth). Additionally, these youth begin to develop ideas about future vocational and educational plans (McIntosh, Helms, & Smyth). Youth in middle adolescence are at increased risk of engaging in problem behaviors (McIntosh, Helms, & Smyth). Because adolescents in this period relate more positively to their parents, if there are strong parent-adolescent relationships, youth may be less susceptible to peer pressure, and less likely to engage in drug use. Prevention programs should aim to foster healthy parent-adolescent relationships as this may buffer against adolescent drug use.

Late Adolescence or “Emerging Adulthood”

Until recently, most of the research on adolescent development has focused on early and middle adolescence with less research concentrating on late adolescence (Smetana, Campione-Barr, & Metzger, 2006). Transitions out of adolescence and into adulthood have been historically defined sociologically by marriage and family formation, completion of education, and entrance into the labor force (Smetana et al.). However, the recent trend is that these social transitions are occurring at later ages. Moreover, whereas earlier researchers defined late adolescence as 16-18 years (Berk, 2007), late adolescence is now defined as ages 18 until the early twenties (Arnett, 2000; Smetana et al.). Research on adolescent brain development shows that brain maturation is not complete during adolescence and new research indicates that mature decision making does not emerge until the middle twenties (Cauffman & Steinberg 2000). These findings have the potential to reshape definitions of adolescence and young adulthood and impact the construction of research studies. For example, Arnett proposed that the period between ages 18 and 25 should be treated as a separate developmental period, called “emerging adulthood.”

Physical maturation. Biologically, puberty ends for boys during late adolescence and these boys continue to increase in muscle and body hair (McIntosh, Helms, & Smyth, 2003). Late adolescent boys continue to gain in motor performance (Berk, 2007). Girls are usually fully developed and their growth spurt has ended by late adolescence (McIntosh, Helms, & Smyth). Because adolescents in this period are almost fully developed and accustomed to their physical changes, they may be less likely to be depressed because of puberty. However, obesity may continue to be a factor that

indirectly impacts adolescent drug use. Thus, throughout the trajectory of drug use, physical changes may play a role in drug use.

Psychological maturation. Psychologically, late adolescents develop complex abstract thinking skills (McIntosh, Helms, & Smyth, 2003). These adolescents also begin to be mature and have more thoughts on morality. They are also capable of distinguishing between law and morality (McIntosh, Helms, & Smyth; Norman & Norman, 1999). Generally, adolescents have increased impulse control during this developmental period (McIntosh, Helms, & Smyth). Sense of self and independent thinking are further developed. For example, during this period many adolescents decide whether to accept or reject religious and political ideologies (McIntosh, Helms, & Smyth). During late adolescence, these individuals should have developed complex abstract thinking, impulse control, metacognition, and independent thinking. Therefore, these adolescents should be the least likely adolescent group (e.g., early, middle, late) to engage in drug use given their advanced psychological skills. Yet, the drug use trajectory indicates that this is not true for African Americans. In fact, it is during this period of development that African Americans' drug use rates increase such that it becomes comparable to most of their ethnic group counterparts. Research that examines this pattern is inadequate and further research is necessary.

Social maturation. Individuals in this age group develop social and psychological autonomy from parents (Norman & Norman, 1999). Likewise, cliques and crowds become less important (Berk, 2007). These adolescents continue to construct their identities (Berk) including further development of gender identity (Norman & Norman). During this period, adolescents begin intimate relationships (McIntosh, Helms, & Smyth,

2003), and these relationships last longer (Berk). Finally, these individuals develop vocationally and become financially independent (McIntosh, Helms, & Smyth; Norman & Norman). Individuals in late adolescence have become autonomous from their parents, but are also less peer oriented. Because of reduced peer interaction, these adolescents should be less likely to use drugs than those in early and middle adolescence. However, the drug use trend is reverse, particularly among African Americans. Late adolescence is a period of increased drug use.

To summarize, drug use occurs at every stage of development, early, middle, and late. During adolescence, drug use increases with age (Kandel, 1996; SAMHSA, 2007). It is during early adolescence that drug use experimentation and separation from parents commences. Middle adolescents are at increased risk of drug use, but tend to relate more positively to their parents than during childhood and early adolescence. Late adolescents have typically become autonomous from their parents and are less peer-oriented than in early stages of development.

Physical changes due to puberty and weight gain occur at all stages of adolescent development. Consequently, adolescents are at risk of engaging in drug use and other risky behavior due to physical development. Socially, the stages of peer and family orientation change throughout the life course. If healthy relationships between parents and their children are maintained throughout adolescent development, it could influence selection of pro-social peers and buffer against other risk factors. Psychologically, metacognition, decision-making skills, cognitive self-regulation, memory strategies, scientific and systematic reasoning, and other psychological concepts improve with age. Thus, older adolescent should have developed abstract skills and be the least likely to

engage in drug use. However, this is not the case for African Americans. More research is needed to investigate this reverse trend.

Developmental Changes, School Transition, and Youth Drug Use

Youth experience stressors partially due to developmental changes, which typically coincide with their transition from elementary school to middle school, middle school to high school, and high school into college or a vocation. Puberty and school transition usually occur simultaneously for girls and both may produce stressors that contribute to the onset of adolescent drug use (Khoury, 1998; Petersen, Sarigiani, & Kennedy, 1991). School transition stress may be related to adolescents having to become acclimated to a new school system and meet new friends, teachers, and administrators. Petersen, Sarigiani, and Kennedy found that transition from a relatively safe and closely monitored elementary school environment into a larger, less intimate middle school in sixth grade may be stressful. Multiple stressors that co-occur with school transitions may lead to drug use, particularly among adolescents who lack adequate coping skills. Now, having reviewed normal development, the next section describes developmental differences in drug use among boys and girls.

Gender Role Orientation: Are Girls and Boys Different?

Gender refers to an individual's sense of being male or female. Gender roles vary according to culture, as one's environment and culture prescribes which characteristics are generally associated with a specific gender. From the moment that parents learn the sex of their child, gender role expectations commence. If parents expect a boy, they will likely have a blue colored baby shower, whereas if a girl is expected, parents may have a pink colored baby shower. These and other differences continue from pre-birth

throughout the lifespan. Gender role socialization refers to the social messages that a child receives about the characteristics associated with being male or female (Corneille & Belgrave, 2007). By adolescence, an individual has received many socialization messages about what it means to be male or female (Bem, 1993).

Women are socialized to display feminine or expressive traits, such as being nurturing, gentle, sensitive, and humble, while men are socialized to hold masculine or instrumental traits, such as being self-reliant, assertive, or even aggressive. Androgynous gender role orientations are both instrumental and expressive traits (Craig & Dunn, 2007). By adulthood, females are more androgynous than males, and this pattern commences during middle childhood (ages 5-11) (Serbin, Powlishta, & Gulko, 1993). This pattern may be related to the stereotypes and socialization messages received by children that suggest that it is acceptable for girls to display masculine behaviors (these girls may be labeled “tomboys”) more so than boys to display feminine behaviors (these boys may be labeled “sissies”). Consequently, girls are more likely than boys to be androgynous.

African American girls (compared to girls from other ethnic groups) are generally socialized to hold both masculine and feminine traits (Belgrave et al. 2000; Davis-Russell, 2002; Whaley, 2001). African American males are also more likely to be androgynous than males from other ethnic groups. Harris (1996) found that African American men and women were equally likely to report holding masculine traits. The fact that African Americans are more androgynous than individuals from other ethnic groups is likely due to differences in socialization experiences.

Androgynous gender role beliefs among adolescents are associated with several positive attitudes and behaviors (Lombardo & Kemper, 1992). These include high self-worth and positive interactions with parents (Hackett, 1995; Hall & Haberstadt, 1980). These relationships suggest that androgynous gender role beliefs may be related to drug-refusal efficacy through its positive influences on adolescent self-worth and the quality relationship between parents and their adolescent children that reinforces feelings of efficacy.

Gender Differences in Youth Drug Use

Over the past 30 years, there has been an increasing drug use convergence among boys and girls with the prevalence rates for females becoming comparable or in some instances, higher than for males (Johnston, O'Malley, Bachman, & Schulenberg, 2005; National Center on Addiction and Substance Abuse at Columbia University, 2005). For instance, in 2004, more girls than boys reported that they initiated use of cigarettes, alcohol, and marijuana, and girls surpassed boys in their misuse of prescription drugs (SAMHSA, 2005). One explanation that accounts for the increase in female drug use is the changing roles of females in the U.S. More women reject traditional feminine roles for androgynous gender roles, are entering the work force, and are more likely to remain single or divorce than in the past (Robbins & Martin, 1993). Single and divorced women are also more likely to encourage their daughters to reject traditional masculine gender roles (Barber & Eccles, 1992).

Miller and Stiver's (1997) relational theory can be used to understand gender differences in motivation to use drugs. Relational theory emphasizes the importance of others in the development of self for females. The assumption is that adolescent girls

initiate and maintain drug use within the context of relationships with their family and peers. Boys are less relationally oriented and therefore may be less susceptible to peer pressure when compared to girls. For example, adolescent girls are more likely than adolescent boys to drink alcohol to fit in with their friends, while boys typically drink for other reasons and subsequently, select friends that also drink (Donovan, 1996).

Research indicates that once girls begin to use drugs, they are more likely to become drug dependent and do worse in drug treatment (Moochan & Schroeder, 2004; Rowe, Liddle, Greenbaum, & Henderson, 2004). This may be related to girls being more likely to be depressed than boys, which may co-occur with drug use. Furthermore, girls compared to boys also suffer disproportionately from drug use consequences, such that they are more likely to experience poor nutrition, risky sexual behavior, pregnancy, and domestic violence (U.S. Department of Health and Human Services, 1994). Nearly one quarter of sexually active adolescent boys and girls and young adult men and women reported having unprotected sex because they were using drugs at the time (Kaiser Family Foundation, 2002).

Few studies have focused on gender role beliefs and drug use among African American adolescents. In a study of African American girls, Townsend (1998) examined the relationship between gender role beliefs and drug use. She found that feminine gender role orientation was a strong predictor of drug use. Further studies are warranted to help tailor drug prevention interventions according to gender. For example, prevention interventions for girls may focus on increasing drug refusal efficacy because girls are more relational and may be more likely to engage in drug use to fit in with drug-using peers and family. Along with gender differences, this dissertation focuses on adolescents

across rural and urban settings. Life experiences and drug use in these communities are described next.

Contextual Factors

Adolescents are influenced by a variety of contexts, including family, peer, school, and community. These are the contexts in which adolescents' physical, psychological, and social development unfold. This study, which aims to be ecologically sensitive, focuses on these multiple contexts. This section gives attention to the urban and rural communities in which African American adolescents live. Chaskin and Richman (1992) provided an insightful definition of community as:

the local context in which people live. It is referred to by its geographic identity, but its place on the map is only one of its attributes. It is a place of reference and belonging, and the community includes dimensions of space, place, and sentiment as well as of action. It is defined by a dynamic network of associations that binds (albeit loosely) individuals, families, institutions, and organizations into a web of interconnections and interaction (p. 11).

Ecological models emphasize the importance of multiple contexts for understanding youth development (Bronfenbrenner, 1986; Gonzales & Kim, 1997; Jessor, 1992, 1993). According to Bronfenbrenner and Mahoney (1975), much of what happens to children and families is determined by the ecology of the community (e.g., rural community, urban community) in which they live. However, other researchers disagree. Zahner, Jacobs, Freeman, and Trainor (1993) argued that findings regarding the role of geographic locale and emotional/behavioral problems in children are inconclusive with such variations possibly associated with economic and cultural differences rather

than geographic locale. Nonetheless, it is important to understand both the role of geographic locale and economic and cultural differences to better understand the life experiences of adolescents and how it influences their decisions to engage in drug use. This study focuses on the ecological niches in which youth develop. Two distinctive ecological niches are that of African American youth growing up in rural and urban communities. This study focuses on rural and urban settings because there are variations in lived experience across these contexts, and presumably risk and protective factors for adolescent drug use. This study should help to distinguish among the multiple psychosocial factors in the family and peer domains that are specific to these ecological niches and may explain how they vary. Definitions of rural and urban are provided next.

Rural and Urban Defined

There are varying definitions of the terms “rural” and “urban.” For some researchers, these terms are subjective and ontologically exist within one’s mind, while others view them objectively as being constructs that can be quantified. Many researchers define rural via exclusion, by equating it to being nonurban. However, this dichotomous definition of rural communities does not effectively speak to the texture of rural communities or demonstrate the presence of a rural-urban continuum.

In 2002, the U.S. Bureau of the Census established new criteria for defining rural and urban areas based on the Census 2000 results. According to this revised definition, “rural consists of all territory, population, and housing units located outside of urbanized areas and clusters” (U.S. Census Bureau, 2002a). Urban consists of all territory, population, and housing units located within an urbanized area or urban cluster (U.S. Census Bureau, 2002a). An urbanized area and urban cluster include “core census block

groups or blocks that have a population density of at least 1,000 people per square mile and surrounding census blocks that have an overall density of at least 500 people per square mile” (U.S. Census Bureau, 2002a). Historically, the U.S. Census Bureau included in its definition of an urbanized area a requirement of 50,000 or more people in a city (U.S. Census Bureau, 1995). This part of the definition was excluded in 2002 and urban is now defined solely based on population density per square mile.

This dissertation uses the U.S. Bureau of the Census (2002a) definitions of rural and urban areas. These definitions are used because they are typically used in the literature and should allow for more efficient comparison of findings across studies. In addition, these definitions have fewer categories and allow for easier classification of towns and cities as rural or urban. A historical and current perspective of rural and urban populations is presented next.

A Historical Perspective of Rural and Urban Populations

Since the first decennial census of the nation, the population consistently increased by 7,215 percent from 3.9 million in 1790 to 281.4 million people in 2000 (Gibson & Jung, 2002). Historically, the U.S. rural population was significantly larger than the populations of urban areas. For example, in 1790, 95 percent of the U.S. population lived in rural areas (Gibson & Jung). However, during the early 1900s, a shift led to the greatest proportion of U.S. residents living in urban areas. The urban population first exceeded the rural population in 1920 when almost 49 percent of the U.S. population lived in rural areas compared to over 51 percent who lived in urban areas (Gibson & Jung). Today, urban areas continue to grow at a much faster rate than rural areas. For example, during the last century, the urban population increased 736 percent,

while the rural population only increased 128 percent (Gibson & Jung). Today, 79 percent (222,360,539) of the U.S. population lives in urban areas and 21 percent (59,061,367) lives in rural areas (Gibson & Jung). An overview of rural communities follows.

Rural Communities

Rural communities are generally characterized as having low population density and dense social networks, but they have many strengths to include strong family relationships, parent interactions and styles, adult networks, and community ties. Rural residents tend to be more family centered and rely more heavily on family members for help and support during times of need than urban residents (Coleman, Ganong, Clark, & Madsen, 1989; Conger, 1997). Families in rural areas may be more involved with their adolescent children and concerned about them staying within the normative bounds of behavior as prescribed by the community (Scheer, Borden, & Donnermeyer, 2000). Rural families have stronger religious values and higher levels of self-sufficient attitudes (Weinert & Long, 1990) that may help to buffer against adolescent drug use.

The relationship between parents and their children likely differ across rural and urban settings due to the differences in contexts. Because rural youth live in sparse neighborhoods, they typically spend more time interacting with their parents than urban youth (Coleman, Ganong, Clark, & Madsen, 1989). By contrast, urban youth typically interact with their peers more than rural youth. Although rural youth may spend more time interacting with their parents, because many rural parents work far away from their homes, their children may receive inadequate adult monitoring. Moreover, the quality of

the parent-adolescent relationship may be more important among rural youth than urban youth given that they spend more time interacting.

Parenting styles likely differ across rural and urban settings. Rural parents tend to emphasize academic achievement and emotional expressiveness more than urban parents, which contribute to pro-social adolescents (Coleman, Ganong, Clark, & Madsen, 1989). Overall, rural communities are relatively safe because of the close relationships among neighbors. As a result, rural parents may be more encouraging of their children interacting with their neighbors, while urban parents may teach their children to be more cautious and reserved of others (Coleman et al.).

Although rural communities may have stronger community ties, few studies have described the connection of adult and intergenerational networks to adolescent drug use in rural communities. Therefore, the literature is less clear concerning the degree to which adult networks within these communities are associated with adolescent drug use. However, adult and intergenerational networks are assumed to help buffer adolescent drug use. According to Conger (1997), smaller communities often demonstrate greater unity and support among adults in the community than is typical in large population centers. These adult networks are an effective means for reducing the initiation and use of drug use among adolescents and young adults (Conger).

Despite their strengths and protective factors, risk factors are also prevalent in rural communities. In 2005, 15 percent (15.1) of the rural population were poor compared to 12.5 percent of the urban population (Jensen, 2006). Unlike the urban poor who are racially diverse, the rural poor are primarily Whites (66.3 percent) (Jensen). Nonetheless, rural minorities experience higher rates of poverty than urban minorities.

The reasons for poverty in rural communities differ from those in urban communities. The primary reasons for poverty that are unique to rural communities are lower educational levels, lack of economic diversity, and isolation and sparse populations (Jensen, 2006). The quality of education in rural communities is typically substandard compared to education in other communities (Jensen). In addition, few adults in rural communities have college degrees (Jensen). Taken together, lower quality of education and fewer college educated adults along with lack of public transportation and information technology limit economic diversity (Jensen). These factors lead to a larger number of families living in poverty. Overall, from 1970 to 2000, more rural counties (18 percent) experienced “persistent poverty,” defined by poverty rates of 20 percent or higher compared to urban counties (4 percent) (Rural Poverty Research Center, 2007). Youth who live in persistent poverty counties experience increased problems and these problems differ according to community type. For example, the most important community problems in persistent poverty rural counties are 1) drugs, 2) unemployment, 3) education, 4) taxes, and 5) infrastructure (Gibbs, 2004). By contrast, the most important community problems in persistent poverty urban counties are 1) crime, 2) drugs, 3) education, 4) problems with youth, and 5) infrastructure (Gibbs). These findings indicate that poverty in rural and urban settings contributes to numerous negative outcomes that differ across contexts. Poverty is most closely related with drug use in rural communities and crime in urban communities.

Another limitation of rural communities is limited youth activities and programs. Dukes and Stein (2003) reported that rural areas may not have a strong web of assets for young people. Similarly, Brown and Waite (2005) reported that the lack of funds for

rural communities may make it more difficult to sponsor programs to facilitate activities for teens. In their study of rural African American youth, Brown and Waite found a lack of summer programs, camps, Boys and Girls Clubs, limited library resources, and culturally relevant programs. Other studies have similarly found a lack of recreational activities for rural youth (Adimora, Schoenbach, Martinson, Donaldson, Fullilove, & Aral, 2001; Edwards, 1997). Brown and Waite argued that the lack of youth activities in rural areas might lead to boredom that may contribute to experimentation with drugs.

Urban Communities

Most (86.5 percent) African Americans live in metropolitan communities with approximately 53 percent living in central cities and 34.9 percent living in suburban communities (Iceland, Weinberg, & Steinmetz, 2002). Urban communities have many strengths that may serve as protective factors against adolescent drug use. Strengths that may be particularly relevant to adolescents are parental management, schools, community programs, and after school and summer activities. Given the increased environmental stressors in urban environments, urban parents may teach their children to be more reserved and cautious, while rural parents may teach their children to be friendlier and open (Coleman, Ganong, Clark, & Madsen, 1989). African American parents who live in urban communities may perceive more environmental risks than rural parents and consequently provide higher levels of parental monitoring (Coleman et al.). Higher levels of parenting monitoring are associated with better outcomes among urban adolescents, but not rural adolescents (Coleman et al.). These findings suggest that parents modify their parenting styles according to community type, whereby parental monitoring may be more important among urban youth than rural youth.

Schools, community programs, and after school and summer activities are important strengths for urban communities. Schools are strengths for urban communities because they may be safe havens for students who live in violent homes or communities. Schools also provide structured and supervised time that limits opportunities for deviant behavior. Youth typically engage in drugs, crime, and other delinquent behaviors between 3-6 PM. Community, after school, and summer programs provide opportunities for adolescents to engage in supervised constructive activities when school is not open. Community, after school, and summer resources may help to limit unsupervised time and reduce adolescents' chances of engaging in drug use.

Urban communities also have many limitations that may contribute to adolescent drug use. Urban youth are exposed to many more environmental stressors than their rural counterparts. Youth residing in low-income urban areas are at increased risk of experiencing stressors due to poverty (Bennett & Miller, 2006; Turner & Avison, 2003). These stressors include financial hardships, dilapidated housing, eviction and residential mobility, environmental toxins, inadequate healthcare, and poor schools (Conger, Ge, Elder, Lorenz, & Simons, 1994; Crnic & Greenberg, 1990; Evans & English, 2002; Greene, 1993; Fischer, 2002; Johnson, 1999; Kotlowitz, 1991; Straus & Gelles, 1986). Urban poverty is associated with disproportionate exposure to community violence, compared with rural and suburban communities (Kliewer, Parrish, Taylor, Jackson, Walker, & Shivy, 2006; McCart, Smith, Saunders, Kilpatrick, Resnick, & Ruggiero, 2007; Morales & Guerra, 2006). Poverty is related to problem behaviors to include adolescent drug use and higher rates of crime.

Urban youth are also more likely to witness a crime or be a victim in a crime. As exposure to environmental stressors increases, such as crime, so does the risk for negative adolescent outcomes, such as drug use (Morales & Guerra, 2006). The average crime rate in urban areas is 74 percent higher than in rural areas and 37 percent higher than suburban areas (Bureau of Justice Statistics, 2000).

Academic achievement is also problematic for urban adolescents. The graduation rate for youth in central cities is only 57.5 percent compared with 72.7 percent in the suburbs, 69.1 percent in towns, and 71.9 percent in rural areas (Orfield, Losen, Wald, & Swanson, 2004). The consequences of academic failure are well documented. Students who fail academically are more likely to select peers who are failing in school, truant, or engaging in other risky behaviors. As a result of deviant peer selection, these youth are more likely to use drugs. In addition, individuals, especially females, who fail to complete high school have lower employment rates than graduates (Blau & Kahn, 2000; Holzer & Lalonde, 1999; Sum & Taggart, 2001). For example, individuals who fail to complete high school comprise almost half of the head of households on welfare (Focus Adolescent Services, 2000). Above and beyond individual level economic costs for students who do not complete high school are costs to society. Adolescents who do not complete high school comprise almost half the prison population (Focus Adolescent Services). Over a 25-30 year time period, one high school dropout can cost the U.S. approximately \$500,000 in public assistance, health care, and incarceration (Indiana's Education Roundtable, 2003).

In summary, rural communities have many strengths that include strong family relationships, parent relationships, adult networks, and community ties. However, rural

communities also have contextual factors that limit youth growth and development. These factors include sparse neighborhoods, poverty, lower quality of education, fewer adults with college degrees, lack of economic diversity, and a lack of strong resources and activities for adolescents. These contextual factors may directly or indirectly impact adolescent drug use via other mechanisms, such as the family and school systems.

Urban communities also have strengths that include community resources and parental management. However, like rural communities, urban communities have limitations. These include poverty, crime, exposure to community violence, and academic failure. These contextual factors may influence adolescent drug use either directly or indirectly via other mechanisms (e.g., parents, school) that may transmit their influences.

Drug Use Among Rural and Urban Adolescents

Fourteen million children live in rural America (Mather, 2004). Historically, there seems to have been an assumption among funders and policymakers that rural communities have fewer youth related problems, such as drug use. This assumption has contributed to less research on rural adolescent drug use. Despite popular belief, rural youth (includes completely rural and less urbanized nonmetropolitan areas) use select drugs, such as cigarettes and certain illicit drugs more often than their urban counterparts (includes urbanized nonmetropolitan areas, small metropolitan areas, and large metropolitans) (SAMHSA, 2007).

Adolescent Cigarette Use

Higher rates of adolescent cigarette use are associated with rural-like settings (SAMHSA, 2007). In 2006, 30.1 percent of individuals ages 12 and older that lived in

completely rural counties reported current cigarette smoking, compared with 29.3 percent in less urbanized nonmetropolitan areas, 26.6 percent in urbanized nonmetropolitan areas, 26.3 percent in small metropolitan areas, and 23.3 percent in large metropolitan areas. Current cigarette use among individuals ages 12 and older that lived in completely rural nonmetropolitan counties increased from 23.3 percent in 2005 to 30.1 percent in 2006. This rate increase is largely attributable to persons 18 or older whose rate of current smoking increased from 24.2 percent in 2005 to 32.2 percent in 2006.

Adolescent Alcohol Use

Alcohol use is higher among urban than rural adolescents. In 2000, past month alcohol use in large metropolitan areas was higher (53.5 percent) than in small metropolitan areas (49.6 percent) and nonmetropolitan areas (45.0 percent) among individuals ages 12 and older (SAMHSA, 2007). The percentage of past month heavy alcohol use in large metropolitan areas increased slightly from 6.1 percent in 2005 to 6.7 percent in 2006. Binge drinking rates were equally prevalent in small metropolitan and nonmetropolitan areas at 7.1 percent (SAMHSA).

Adolescent Marijuana Use

Findings concerning urban and rural marijuana use differ according to the source. Some studies suggest that rural youth smoke marijuana more often than urban and other studies suggest the opposite. For example, the National Court Appointed Special Advocate Association (2000) conducted an analysis using 1999 Monitoring the Future data. They found that eighth graders in rural America compared to urban America were 34 percent more likely to have used marijuana in the past month than their urban peers and 26 percent more likely to have used it during the past year. However, recently,

SAMHSA (2007) found that the rate of past month illicit drug use (includes marijuana use) was slightly higher in metropolitan areas (8.7 percent in large metropolitan counties and 8.3 percent in small metropolitan counties) than in nonmetropolitan areas (7.1 percent in urbanized counties, 6.5 percent in less urbanized counties, and 7.8 percent in completely rural counties). It could be argued that past 30 day marijuana use is comparable or higher among rural adolescents than urban adolescents.

Adolescent Other Drug Use

Over the past decade, findings from most studies suggest that rural youth use illicit drugs (illicit refers to drugs that are considered illicit for adults), such as cocaine and methamphetamines at a higher rate than urban youth. The rate of past month illicit drug use among individuals ages 12 and older in completely rural counties in 2006 (7.8 percent) was similar to the rate in 2002 (6.7 percent), but higher than the rates in 2005 (5.1 percent), 2004 (4.6 percent), and 2003 (3.1 percent) (SAMHSA, 2007). Atav and Spencer (2002) found that more than 14 percent of students in rural areas reported frequent use of illicit drugs compared with 8 percent of suburban and 7.2 percent of urban students.

In summary, recently, researchers have begun to examine the factors that contribute to adolescent drug use across rural and urban settings. Although findings differ somewhat, the majority of the findings from recent studies indicate that drug use among rural adolescents is more prevalent than in urban and suburban communities (National Center on Addiction and Substance Abuse, 2000; SAMHSA, 2007). Rural youth typically report higher rates of cigarette, marijuana, and illicit drug use, and sometimes higher alcohol use.

The increase in rural drug use rates may be due to rural communities becoming more similar to urban communities. These similarities may be the result of the modern interstate highway system that makes it easier to transport drugs between urban and rural communities (Conger, 1997). Still, rural communities provide a context for development that is distinct from urban communities because each community's strengths and limitations differ significantly. For example, rural communities have dense neighborhoods and strong community and family ties that vary from inner city neighborhoods where people live in very close proximity and may not know their neighbors because of frequent residential mobility. Because these contexts differ, risk and protective factors in rural and urban communities likely differ. More research is warranted in rural communities to determine the cause of the increase in youth drug use and the differences in contexts that might contribute to or buffer against adolescent drug use. The influence of parental drug use and attitudes toward drug use on adolescent drug use attitudes and behaviors are discussed next.

Parental Drug Use and Attitudes Toward Drug Use

Many substance-abusing parents say they had loveless childhoods, believing that their parents had little time for them or actively rejected them. . . the abuse of drugs or alcohol is seen as a way of trying to escape feeling alone and unloved and even unlovable (Howe 2005, p. 184).

Parents play a vital role in the development of their children through parental modeling, styles, and practices. Social cognitive theory (Bandura, 1977; 1986) has demonstrated utility in research with African American parents and children (DiIorio, McCarty, & Denzmore, 2006; Teitelman, Ratcliffe, & Cederbaum, 2008) and can be used

to understand parents' influence on adolescent behavior. The basic assumption of social cognitive theory is that human behavior is learned during interactions with other individuals and the social environment. It posits that parents are influential role models for their children and that via modeling, they transmit values, attitudes, and behaviors to their children. Through attention, retention, reproduction, and motivation, children tend to imitate their parents' behaviors. For example, first, an adolescent observes and gives attention to his mother smoking a cigarette. Next, he acquires and retains knowledge of his mother smoking behavior to include her taking the cigarette out of the packet, lighting, smoking, and discarding it. At a later point, he is able to reproduce what he has observed. Subsequently, he chooses whether to accept his mother's smoking behavior as a guide to follow. His decision is largely determined by the perceived consequences of cigarette smoking. Finally, if he perceives minimum to no negative consequences, he will likely be motivated to model his mother's smoking behavior by experimenting with smoking a cigarette. However, if he perceives significant negative consequences, he will likely abstain from cigarette smoking.

Children whose parents model drug use are more likely to engage in drug use. Several studies have examined the relationship between parental drug use and adolescent drug use. In studies of African American youth, researchers have found that parental drug use contributes to children's own drug use (Brook, Whiteman, Balka, & Cohen, 1997; Dawkins, 1988; Peterson, Hawkins, Abbott, & Catalano, 1995). The impact of parent drug use on adolescent drug use varies according to parents' choice of drug (e.g., cigarette, alcohol, marijuana) (Bailey, Hill, Oesterle, & Hawkins, 2006; White, Johnson,

and Buyske, 2000). A discussion of the impact of parental cigarette, alcohol, and marijuana use on adolescent drug use follows.

Parental Cigarette Use

Adolescent cigarette smoking is correlated with parental smoking (Andrews, Hops, & Duncan, 1997; Bailey, Ennett, & Ringwalt, 1993; Chassin, Presson, Rose, Sherman, & Prost, 2002). In a study examining drug use across three generations, Bailey, Hill, Oesterle, and Hawkins (2006) found that there was intergenerational continuity only in cigarette smoking and not use of other drugs. By contrast, White, Johnson, and Buyske (2000) did not find a relationship between adolescent and parental smoking. Likewise, in a longitudinal study of 232 adolescents, White, Johnson, and Buyske found that parent cigarette smoking did not predict adolescent cigarette smoking for males or females.

Parental Alcohol Use

Research on the relationship between alcohol use and adolescent problem behavior has generally indicated that parental alcohol use is positively associated with adolescent alcohol use (Engels, Knibbe, & Drop, 1999; White, Johnson, & Buyske, 2000). Van Zundert, Van Der Vorst, Vermulst, and Engels (2006) found that adolescents' alcohol use was stronger when their mothers and fathers consumed alcohol. They found that this was most likely due to more alcohol availability in the home. White, Johnson, and Buyske found that parents' alcohol consumption rather than parent styles (e.g., warmth, hostility) predicted heavy drinking among their children. Mothers' drinking was a slightly better predictor to children's drinking than fathers' drinking. Further, excessive use of alcohol by parents is associated with numerous problem

behaviors (e.g., oppositional disorders) in school age children (Kuperman, Schlosser, Lidral, & Reich, 1999; Reich, Earls, Frankel, & Shayka, 1993). In a study of 9,220 young African American, Hispanic, and White adults, Windle (1996) found that youth from families in which the mothers, fathers, and grandparents were heavy alcohol drinkers were more likely to use marijuana.

Parental Marijuana Use

Children of parents who smoke marijuana are more likely to use marijuana (Andrews, Hops, & Duncan, 1997; Merikangas & Avenevoli, 2000). Several researchers have found a relationship between parental illegal drug use and adolescent drug use and delinquency among various ethnic groups (Brook, Brook, DeLa Rosa, Whiteman, Johnson, & Montoya, 2001; Brook, Brook, Gordon, Whiteman, & Cohen, 1990; Duncan, Duncan, Hops, & Stoolmiller, 1995). After controlling for parent and adolescent sociodemographic characteristics, Kandel, Griesler, Lee, Davies, and Schaffsan (2001) found that adolescents whose parents used marijuana during their lifetime were three times more likely to have ever used marijuana than adolescents whose parents never used marijuana. Among parents who were currently using marijuana and those who had stopped, their children used marijuana at similar rates (Kandel et al.). This study also found that the impact of parental marijuana use on adolescent lifetime marijuana use was similar for mothers and fathers and daughters and sons. In addition, parental influence on adolescent marijuana use did not differ according to race/ethnicity (Kandel et al.). Parents' attitudes toward drug use is reviewed next.

Parental Attitudes Toward Drug Use

The role of parental attitudes toward adolescent drug use has been studied by many researchers (e.g., Brook & Brook, 1987; Wen, Tsai, Cheng, Hsu, Chen, & Lin, 2005). Ary, Duncan, Duncan, and Hops (1999) conducted a longitudinal study of 173 families with two or more children to explore the influence of parent, sibling, and peer modeling on attitudes toward drug use. In this study, both parents' attitudes (e.g., if the parent felt it was a serious problem if his or her adolescent consumed alcohol) toward youth alcohol use and parental modeling were positively correlated with adolescent alcohol use. Yu (2003) found that adolescents' perceptions of their parents' attitudes toward underage drinking influenced their lifetime drinking, but not current drinking or initiation of alcohol. According to SAMHSA (2005), adolescents who felt that their parents did not strongly disapprove of their marijuana use were six times as more likely to use marijuana than adolescents who felt their parents disapproved. McDermott (1984) found that perceived parental drug attitudes had stronger effects on adolescent drug use than parental drug use. These findings support social cognitive theory that suggests that parental modeling of attitudes and behaviors are related to their children's own attitudes and behaviors.

Social cognitive theory posits that youth may develop perceptions of their parents' attitudes toward adolescent drug use through their parents' implicit or explicit behaviors (Bandura, 1977; 1986). Implicit behaviors may include observing parental drug use, while explicit behaviors may include discussing and rule setting about drug use. Overt parental disapproval of drug use has been found to be associated with lower drug use and may serve as a protective factor (Welte, Barnes, Hoffman, & Dintcheff, 1999).

In a cross-sectional study, Van der Vorst, Engels, Meeus, Deković, and Van Leeuwe (2005) found a strong association between applying strict rules about alcohol use and adolescents' alcohol consumption. However, having strict rules did not predict alcohol use one year later (Van der Vorst, Engels, & Meeus, 2006). Other cross-sectional and longitudinal studies have found that parents who permitted their children to drink alcohol at home were more likely to have alcohol-using children two years later (e.g., Hyatt & Collins, 2000; Jackson, Henriksen, & Dickinson, 1999). Similarly, Wood, Read, and Mitchell (2004) found that children whose parents allowed heavy drinking had a higher alcohol consumption. A discussion of parent-adolescent relations and parental management is provided next.

Parent-Adolescent Relations and Management

Parent- Adolescent Relations

Unconventional behaviors, such as adolescent drug use, are related to an individual's bond or attachment to pro-social institutions (Hirschi, 1969). Implicit in social cognitive theory is the assumption that adolescents would engage in drug use if not for pro-social bonds with families and other social support groups. Thus, adolescents that are moderately or highly attached to their parents may be less likely to engage in drug use because of their desire to please their parents by upholding conventional attitudes and behaviors. Parental attachment or bond is the amount of closeness that adolescents feel toward their parents (Barber, 1997). A close, loving, and affectionate relationship between parents and adolescents is an important factor in protecting adolescents from drug use (Brook, Brook, Gordon, Whiteman & Cohen, 1990; Stewart, 2002). Specifically, a close parent-adolescent relationship directly inhibits drug use and

indirectly influences peer selection (Bahr, Maughan, Marcos, & Li, 1998; Sokol-Katz, Dunham, & Zimmerman, 1997). A few researchers have found weak or no relationship between quality of family relationships and adolescent drug use (e.g., Bahr, Marcos, & Maughan, 1995; Hoffmann & Su, 1998). However, most research supports a negative association between the two. Moreover, recently, studies have begun to conceptualize parent attachment and bond separately, as attachment to mother and attachment to father (e.g., Dorius, Bahr, Hoffmann, & Harmon, 2004). Some of these studies are presented next.

Mother-Adolescent Relationship

Almost half of African American youth live in single mother households. To date, there is a dearth of literature that focuses on the relationship between quality of the mother-adolescent relationship and adolescent drug use, particularly among African American adolescents. The mother-adolescent relationship, such as frequent contact with the child and comfortability of the child with discussing personal things with her parents, play an important role in adolescent development (Boyd, Aschraft, & Belgrave, 2006).

The quality of the mother-adolescent relationship is associated with adolescent drug use. Bahr, Hoffman, and Yang (2005) found that weak attachment to mother significantly predicted cigarette, alcohol, marijuana, and illicit drug use. Castro, Brook, Brook, and Rubenstone (2006) found that low maternal affection at Time 1 was related to adolescent drug use for boys and girls at Time 2, one year later. Shedler and Block (1990) found that mothers that were perceived as nonresponsive and cold were more likely to have children that used drugs.

Findings from other studies regarding the association between mother-adolescent relationship and adolescent drug use are inconsistent. Bahr, Marcos, and Li (1998), for example, found that mother-adolescent bonding had modest and indirect effects on adolescent drug use. Boyd, Aschraft, and Belgrave (2006) did not find a significant relationship between mother-daughter relationship and drug refusal efficacy among urban African American girls. They did find a significant relationship between father-daughter relationship and drug refusal efficacy. This relationship is discussed next.

Father-Adolescent Relationship

There is limited research that examines the relationship between African American paternal involvement and adolescent drug use. However, this body of literature is growing. Although significantly fewer African American adolescents live with their fathers than with their mothers, many maintain contact with their fathers.

The father-adolescent relationship is a unique bond and attachment (Mackey, 2001). It is just as important as the mother-adolescent relationship and can be one of the most salient and influential relationships in a child's life (Rohner & Veneziano, 2001). Fathers play a significant role in their children's socialization, as they serve as both a role model and a guide for their children's internalization of normative behavior, including the use or non-use of drugs (Jersild, Brook, & Brook, 1978).

The quality of the father-adolescent relationship is significantly associated with adolescent drug use. Bahr, Hoffman, and Yang (2005) found that attachment to father significantly predicted cigarette, alcohol, binge drinking, and illicit drug use, but not marijuana use. Castro et al. (2006) found that father-adolescent relationship at Time 1 was related to adolescent drug use one year later. They suggested that the father-

adolescent relationship may be especially influential for African American and Hispanic adolescents, more so than for White youth (Castro et al.), who tend to be more peer-oriented than parent oriented (Frauenglass, Routh, Pantin, & Mason, 1997; Wallace & Muroff, 2002). In a study of 431 adolescent boys and girls (ages 15-17), Jiménez, Musitu, and Murgui (2006) found that high levels of fathers' support predicted low levels of drug consumption. By contrast, other studies have found weak or no effect between father-adolescent relationship and adolescent drug use. For instance, Bahr et al. (1998) found that father-adolescent bonding had weak effects on adolescent drug use.

Some studies have focused specifically on the father-daughter relationship. In a study of African American urban girls (ages 11-14), Boyd, Ashcraft, and Belgrave (2006) found that the father-daughter relationship significantly predicted drug refusal efficacy. Ary, Duncan, Duncan, and Hops (1999) concluded that the quality of the father-daughter relationship may reduce adolescents' risk of engaging in drug use behaviors by buffering deviant social and peer influence, thus reducing risky-peer selection.

Parental Management

Parental Monitoring and Supervision

“Parental monitoring” and “parental supervision” have been used interchangeably, and “parental monitoring” will be used in this study to refer to parents' knowledge of children's activities and associations (Stattin & Kerr, 2000). Dishion and McMahon (1998) defined parental monitoring as parenting behaviors involving both awareness of children's activities and communication to the child about activities that concern them. More recently, Stattin and Kerr offered an alternative definition of parental monitoring after concluding that previously, parental monitoring had been

assessed by questioning parental knowledge of activity rather than parental supervision efforts. Stattin and Kerr's definition includes focusing on child disclosure, parental solicitation, and parental control, with child disclosure being considered the most important contributor to parental monitoring. Within this definition, child disclosure is conceptualized as children telling their parents what they did during their free time without solicitation (Stattin & Kerr).

Although definitions of parental monitoring differ, the findings from studies that examine this construct are consistent with regard to drug use. Adequate parental monitoring and supervision of adolescents' behaviors is negatively associated with drug use (Barrera, Biglan, Ary, & Li, 2001; Miller & Volk, 2002). High levels of supervision are positively associated with disapproval of drug use among African American youth (Wallace & Fisher, 2007). Adolescents who receive inadequate monitoring are more likely to report drug use than adolescents who are monitored adequately (Barrera, Biglan, Ary, & Li, 2001; Miller & Volk). Flannery, Williams, and Vazsonyi (1999) found that adolescents who received poor parental monitoring or adult supervision were four times more likely to engage in drug use during their lifetime than those who received adequate parental monitoring and supervision. In another study, positive parental monitoring by fathers decreased the likelihood that their children would engage in drug use (Brook, Brook, Arenciba-Mireles, & Whiteman, 2001).

Parental monitoring may be especially important for low-income African American families living in urban communities (Galambos & Maggs, 1991; Lamborn, Dornbusch, & Steinberg, 1996). Parental monitoring in these communities may help to

protect adolescents from dangerous neighborhood influences, such as neighborhood disorganization and drug activities.

Parental monitoring is also a protective factor among adolescents living in rural areas. Using a sample of 826 African American adolescents (ages 14-19) living in low-income rural Southern communities, Stewart (2002) found that parental monitoring buffered against adolescent drug use for alcohol, marijuana, and cocaine. The effects of parental monitoring was significant across gender.

The next several sections focus on the relationships among the study's parenting constructs. First, the relationship between parental drug use and parent-adolescent relations is described. Next, the relationship between parental drug use and parental management is discussed. Finally, the additive effects of parent-adolescent relations and management are described.

Parental Drug Use and Parent-Adolescent Relations

Research concerning the relationship between parental drug use and parent-adolescent relations (e.g., quality of relationship, warmth) is both sparse and inconclusive. However, the literature that exists suggests that parental drug use influences the parent-adolescent relationship and indirectly effects adolescent drug use. For example, Engels, Vermulst, Dubas, Bot, and Gerris (2005) found that parents who abuse alcohol were less supportive than parents who do not.

Regardless of whether parents are involved in deviant behavior, strong bonds and attachment to parents serve as a protective factor for adolescent deviance (Hirschi, 1969). In a study of 550 high school students, Jensen and Brownfield (1983) found that attachment to parents reduced drug use among children whose parents did not use drugs.

Attachment to parents had no effect or a significant positive effect on drug use among children of drug-using parents.

Conversely, the social development model posits that parental deviance is related to the parent-adolescent relationship such that it increases their adolescent children's deviant behavior (Catalano & Hawkins, 1996). Specifically, the model hypothesizes that interactions with and reinforcement from drug-using parents promote stronger attachments to children that lead to drug use initiation and maintenance (Catalano & Hawkins). Data support this hypothesis. In a study of 685 adolescents ages 12-14 (of whom 24 percent were African American), Foshee and Bauman (1992) found that strong attachment to a parent who smoked significantly increased adolescent smoking, but that weak attachment to a parent who smoked had no effect on the youth's smoking behavior.

Parental Drug Use and Parental Management

Parental drug use impacts both parents' ability to monitor and supervise their children and their own attitudes toward drug use. Parental drug use is associated with poor supervision and monitoring and inconsistent parental discipline (Barnow, Schuckit, Lucht, John, & Freyberger, 2002; Mayes & Tuman, 2002). Chassin, Presson, Todd, Rose, and Sherman (1998) suggested that maternal smoking may lead to less communication about smoking with their children and less punishment for adolescent smoking when it occurs. Engels, Vermulst, Dubas, Bot, and Gerris (2005) found that parents who abused alcohol provided less structure than parents who were nonalcoholic. Fals-Stewart et al. (2004) found that fathers who used drugs excessively or abused drugs endorsed more negative disciplinary practices and provided less monitoring than non-drug abusing fathers.

Additive Effects of Parent-Adolescent Relationship and Parental Management

Taken together, high levels of parent-adolescent relations and parental management buffer against adolescent drug use. A combination of low levels of parental caring along with high levels of control is associated with adolescent drug use (Clausen, 1996). Mounts (2002) examined the relationship between two dimensions of parenting, parenting style (e.g., warmth, control) and practices (e.g., monitoring, involvement). These constructs were highly correlated. The findings of a confirmatory factor analysis indicated that the two dimensions of parenting were empirically distinct given the low absolute values (mean of .17) found for the two constructs. In this dissertation, parent-adolescent relations and parental management are conceptually distinct from one another. Parent-adolescent relations focus on the quality of the relationship and attachment between parents and their children. Parental management focuses on parents' supervision and management of their children when they are apart.

Parenting management of peer relationships influence adolescent drug use. Bahr, Hoffman, and Yang (2005) examined the relationship between peer risk, six family factors, and adolescent drug use. They found that parental monitoring, attachment to mother, and attachment to father had statistically significant effects on adolescent drug use. The effects were relatively small. Specifically, they found a negative association between parental monitoring and drug-using friends and also between attachment to parents and drug-using friends. That is, those adolescents who reported high levels of parental monitoring were less likely to have friends who used drugs and those who reported strong attachment to their parents were also less likely to have friends who used

drugs. Thus, adolescents with both high levels of parental monitoring and attachment may be least likely to associate with drug-using peers.

Parenting styles can be categorized to better understand the interactive effects of the parent-child relationship and parental management. Lamborn, Mounts, Steinberg, and Dornbusch (1991) extended Baumrind's (1971) seminal work. Parental styles identified by Lamborn et al. are authoritative (warm, supportive, encouraging, but firm and provides clear standards to their children), authoritarian (demanding and controlling, but not responsive or warm), indulgent (responsive and warm, but lenient and nonconfrontational), and neglectful (neither warm or responsive or demanding or controlling). Adalbjarnardottir and Hafsteinsson (2001) used Lamborn et al.'s work to examine longitudinally the relationship between parenting style and drug use among adolescents ages 14 to 17. They found that 14-year-olds who perceived their parents as authoritative were less likely than those who perceived their parents as neglectful to engage in drug use concurrently and longitudinally. Adolescents who perceived their parents as authoritarian were more likely to use drugs than adolescents who perceived their parents as authoritative. Adalbjarnardottir and Hafsteinsson's findings indicate that the children of parents who are warm, supportive, and encouraging, but firm and who provide clear standards to their children are the least likely to engage in drug use.

Other studies have found that one dimension of parenting may be associated with adolescent drug use, while other dimensions may not. Den Exter Blokland, Hale, Meeus, and Engels (2007) investigated the relationship between parental support and control and early adolescents' smoking initiation, increase, continuation, and cessation. They found

that only low parental control predicted adolescent smoking initiation. However, neither parental control nor support predicted adolescent smoking increase and continuation.

In summary, parent-adolescent relations and management, when adequate, may buffer against adolescent drug use. Risky peer affiliation is a strong predictor of adolescent drug use. However, parent-adolescent relations and management may moderate and lessen the effects of risky peer influence. Risky peers are discussed next.

Peer Influences

Risky Peers

Peer influence is a primary predictor of adolescent drug use (Bahr, Hoffman, & Yang, 2005; Reinherz, Giaconia, Carmola Hauf, Wasserman, & Paradis, 2000). The percentage of variance in drug use contributed by peer factors exceeds that of all other interpersonal and intrapersonal factors (Kandel, 1996). Peer influence is a stronger predictor of drug use among older (e.g., high school students) than younger adolescents (e.g., middle school students) regardless of race/ethnicity (Windle, 1996).

Affiliation with peers that engage in risky behaviors, such as drug use and truancy, increases the likelihood of an adolescent engaging in drug use (Beauvais & Oetting, 2002; Gil, Vega, & Turner, 2002; Hawkins, Catalano, & Miller, 1992). This is true for most drugs. Peer alcohol use is associated with adolescents' own alcohol use (Hawkins, Catalano, & Miller, 1992). Likewise, peer cigarette and illicit drug use are associated with adolescent cigarette and illicit drug use (Lynskey, Fergusson, & Horwood, 1998).

Farrell and White (1998) found that both peer pressure and peer drug use were related to the frequency of drug use in an African American sample. However, other

investigators have found that peer influence is not as strong a predictor of drug use among African American youth as for youth of other ethnic groups (e.g., Wallace & Muroff, 2002). Affiliation with youth who engage in pro-social behaviors may lead to positive outcomes. For example, African American youth who affiliate with achievement oriented peers are less likely to use drugs (Brook, Gordon, Brook, & Brook, 1989).

The strong association between peer influence and adolescent drug use may be related to a combination of selection and socialization effects. Selection occurs when adolescents affiliate with peers who share similar attitudes and behaviors (Fisher & Bauman, 1988). On the other hand, socialization, commonly referred to as peer pressure or peer influence refers to adolescents whose behaviors conform to their peers' behaviors (Simons-Morton & Chen, 2006). Selection explanations include: 1) adolescents select peers that have similar personalities and other characteristics (e.g., Bauman & Ennett, 1994; Kandel, 1996), and 2) drug using adolescents pursue drug using peers (e.g., Farrell, 1994). Socialization explanations suggest that adolescents who have drug-using peers are more likely to use drugs because their peers are likely to implicitly or explicitly encourage drug use and youth will want to conform (e.g., Dishion, Capaldi, Spracklen, & Li., 1995; Oetting & Beauvais, 1986, 1987). Some researchers have suggested that the relationship between adolescent drug use and peer drug use may be attributed to extraneous variables (e.g., rebelliousness) (e.g., Curran, Stice, & Chassin, 1997).

Findings from studies on selection and socialization effects on drug use are equivocal. For example, in a longitudinal study, Wills and Clearly (1999) found a socialization effect but not a selection effect on drug use among Hispanic and White 6th and 7th graders. By contrast, Iannotti, Bush, and Weinfurt (1996) found a selection effect,

but not a socialization effect on drug use among African American 4th and 5th graders over a four year period. These findings suggest that perhaps selection and socialization effects vary according to ethnic group and other cultural characteristics. The relationship between risky peers and parent-adolescent relations and management is discussed next.

Risky Peers and Parent-Adolescent Relations and Management

Parenting factors, such as the parent-adolescent relationship are associated with peer risk factors. The impact of peer influences on adolescent drug use is most significant when parent-adolescent relationships are weak (Catalano, 2002; 2004). Guo, Hill, Hawkins, Catalano, and Abbott (2002) examined the effects of sociodemographic, family, and peer factors on illicit drug initiation among youth ages 12-21. They found that high family conflict, low family bonding, and affiliation with risky peers predicted higher likelihood to engage in drug use.

Parental management, such as monitoring and supervision may buffer against peer risk factors. Girls are more likely than boys to be closely monitored by parents. Boys are more likely than girls to be exposed to deviant peers (Svensson, 2003). Adolescents with inadequate parental monitoring are more likely to associate with drug-using peers, and thus, are more likely to engage in drug use (Bahr, Hawks, & Wang, 1993; Dishion, Capaldi, Spracklen, & Li, 1995). Caldwell and Darling (1999) found that adolescents with low levels of parental monitoring and affiliation with drug-using peers were more likely to use drugs. In a study of 443 urban African American seventh graders from low-income families, Kung and Farrell (2000) found that for both boys and girls, peer pressure was more strongly related to drug use than was parental monitoring and discipline. By contrast, with a sample of African American and White adolescents,

Wallace and Muroff (2002) suggested that parental influence may be a stronger determinant of adolescent drug use than peer influence. Further, adolescents who perceive their parents as restrictive and as asserting too much power have higher levels of peer orientation (Fuligni & Eccles, 1993).

In summary, research suggests that risky peers may be the strongest influence on adolescent drug use and other risky behaviors. Parenting factors, such as quality of the parent-adolescent relationship and monitoring may moderate the effects of risky peers on adolescent drug use (Allen, Donohue, Griffin, Ryan, & Mitchell-Turner, 2003). Bahr, Hoffman, and Yang (2005) found that parental drug attitudes, sibling drug use, and adult drug use (any adult that affiliates with the adolescent) had significant direct and indirect effects on adolescent drug use, but that these effects were mediated by peer drug use. Family influence was mediated by peers by approximately 50 percent. Bahr et al.'s findings indicate that family variables have significant direct effects on adolescent drug use independent of peer influence.

Drug Refusal Efficacy

Self Efficacy Theory

Efficacy will be used in this study as a proximal factor for drug use. Drug use varies among youth and is relatively low among African American youth. Therefore, beliefs about whether one feels capable to refuse drugs will be used as an additional dependent variable.

A sense of self-efficacy or personal competence underlies many behavioral phenomena (Bandura, 1986). Initially, Bandura defined self-efficacy as an expectancy about beliefs in one's ability to perform a specific behavior required to produce an

outcome (1977). This definition was later expanded to refer to people's beliefs about their capabilities to control situations in their lives (Bandura, 1990).

Individuals' perceptions of their own feelings of effectiveness determine how easily changes in behavior are achieved and maintained (Bandura, 1977; 1986). Self efficacy begins in infancy and is fostered by responsive parents, who react to the communicative behavior of their babies and provide enriched environments that allow their babies to see that their actions in the environment can be efficacious. Self-efficacy can vary in different areas of an individual's life (e.g., work, school). For example, an adolescent can have high efficacy in sports, but low drug refusal efficacy.

Self Efficacy Theory and Drug Refusal Efficacy

Self-efficacy theory is useful in understanding adolescent drug use. Relying on its concepts and propositions helps us to understand the ways in which modeling and drug refusal efficacy are related to drug use. Drug refusal efficacy refers to an individual's beliefs that she has the ability to refuse drugs. High personal efficacy is likely to mitigate peer pressure and reduce the likelihood that adolescents will engage in drug use (Bandura, 1986).

Self-efficacy is the product of the interaction of information from several sources (Bandura, 1977; 1986). Sources for self-efficacy are enactive attainments, vicarious experiences, verbal persuasion, and physiological state/level of emotional arousal. The weight or contribution of each source of efficacy varies for each person as well as the influence of each source (Bandura, 1977; 1986).

Enactive attainments are the most powerful regulators of self-efficacy. These are a person's behavioral efforts. Success or failure of individual efforts become instructive

in future efforts. For example, an adolescent who successfully refuses drugs that are offered to her by a friend will have increased self-efficacy and will be more likely to refuse drugs in the future. Successful drug refusal is defined here as one's ability to consistently refuse drugs during one setting. For example, an adolescent is successful when she is able to refuse drugs while at a party despite the number of people that offer or times she is offered drugs. If she resists drugs when asked, but later engages in drug use while at the party, this is considered unsuccessful drug refusal.

Vicarious experiences are derived from watching another person's efforts succeed or fail. For instance, an adolescent who observes her friend successfully refuse drugs may increase her self-efficacy for drug refusal. Conversely, an adolescent who observes her peers buy and inhale marijuana can provide adolescents with the necessary knowledge and skills to obtain and smoke marijuana.

Verbal persuasion is the least powerful source of self-efficacy. It occurs when someone is told that she can master a given task. An example is when an adolescent is told by her parent that she is capable of refusing drugs.

Physiological state/level of emotional arousal is another source for efficacy. Tasks performed under conditions of anxiety will undermine efficacy. On the other hand, tasks performed under relaxed and comfortable conditions will enhance efficacy. For instance, if an adolescent is offered drugs and the situation causes anxiety, her drug refusal efficacy will be lower than if she did not experience anxiety.

Self-efficacy varies along three dimensions: magnitude, strength, and generality (Bandura, 1977, 1986). Magnitude of self-efficacy refers to the degree of difficulty of a task or situation that an individual believes she is capable of performing (Bandura, 1986).

For example, an adolescent may believe that she can abstain from drug use when she is not stressed and when she is not in the presence of others using drugs (Prochaska & DiClemente, 1986). Strength of self efficacy refers to persistence in the face of frustration, pain, and barriers (Bandura, 1986). An example of high strength of self-efficacy is when an individual is very confident that she can abstain from drugs, no matter the circumstances. Generality of self-efficacy refers to the extent to which successes or failures on some areas influence self-efficacy in an unrelated area, and whether changes in self-efficacy extend to similar behaviors and contexts (Bandura, 1986). An example is when adolescent drug refusal efficacy is extended to sexual refusal efficacy.

Individuals must feel efficacious in order to put forth effort into refusing drugs (Corneille & Belgrave, 2007). Drug refusal efficacy is negatively associated with drug use among African American youth (Botvin, Baker, & Goldberg, 1992; Nasim, Utsey, Corona, & Belgrave, 2006). Therefore, drug refusal efficacy is important to consider in drug research as it appears to be predictive of drug use (Scheier, Botvin, Diaz, & Griffin, 1999).

Chapter Summary

During adolescence, many youth experiment with drugs, while others abstain from drugs. Drug use among African American adolescents continue to be lower than that of most other ethnic groups. Nevertheless, drug use among African Americans is of concern because of the associated negative consequences.

This dissertation examines the multiple factors that influence adolescent drug use. FITTDM provides the theoretical framework for this research. Consistent with this

theory and the adapted model, the impact of parental attitudes toward drug use upon adolescent drug use is mediated by other parenting factors. Specifically, parental attitudes toward drug use influences parent-adolescent relationships (warmth, attachment) and parenting management (monitoring, supervision). In addition, parental attitudes toward drug use and the parent-adolescent relationships interact such that adolescents with strong attachment and bonds with parents who hold favorable attitudes toward drugs may also engage in drug use. Further, parental attitudes toward drug use and parental management interact such that parents with favorable attitudes toward drugs may be more likely to provide poor management and supervision. A combination of strong attachment to parents, high levels of monitoring, and perception of parental disapproval of drug use may predict non drug use among adolescents.

The parent-adolescent relationship and parental management are directly related to adolescent drug use but also mediated by risky peers. Weak parent attachment and bonding is associated with selection of risky peers. Additionally, adolescents who are poorly monitored are more likely to associate with risky peers and thus, are more likely to engage in drug use. Therefore, adolescents who have weak parent attachment and are inadequately monitored and supervised may be more likely to engage in drug use than adolescents who have strong parent attachment and are adequately monitored.

The adapted conceptual model is a modified version of FITTDM (Brook, Brook, & Pahl, 2006). It differs from the theory in several ways. First, it does not include genetic factors, parents' marital relations, adolescent personality, and adolescent drug abuse. Parents' marital relation is not included because studies indicate that it is not a consistent predictor of drug use among African American youth. Adolescent drug abuse

is not included because the focus of the present study is on adolescent drug use and not abuse. Although the study does not include genetic factors, it attends to biological factors, such as puberty, as well as developmental differences. Second, a few domains were renamed to clearly reflect the variables of interest in this study. FITTDM labels “parental attitudes toward drug use” as “parent personality.” In the adapted model, this construct is labeled “parental attitudes toward drug use.” FITTDM includes parent-adolescent relations and parental management in one domain, it is labeled as “parent-adolescent relations.” In the adapted model, this domain is labeled, “parent-adolescent relations and management.” Also, the theory labels the peer domain “peers.” In the adapted model, this domain is labeled “deviant peer selection.” Third, the adapted model includes drug refusal efficacy as a proximal factor for drug use because drug refusal efficacy is associated with reduced drug use. Fourth, FITTDM suggests that contextual factors bi-directionally impact adolescent personality and directly impacts adolescent drug use, but no other variables. The adapted model suggests that contextual factors bi-directionally impacts each domain, parental drug use and attitudes toward drug use, parent relations and management, deviant peer selection, and adolescent drug refusal efficacy and drug use, excluding the biological and developmental factors domain. Fifth, FITTDM illustrates that genetic factors directly impact the parent drug use and personality, adolescent personality, and adolescent drug abuse domains, and indirectly impacts the parent-adolescent relations domain. In the adapted model, biological and developmental factors directly impact parent relations and management, deviant peer selection, and adolescent drug refusal efficacy and drug use.

Although the aforementioned constructs have been linked and explained linearly here, this is done to reduce the complexity of the model and promote clarity concerning the multiple pathways to drug use. Because drug refusal efficacy is predictive of drug use, it is presumed that the pathways to drug use are also the paths to drug refusal efficacy.

Research Questions and Hypotheses

Building on previous research, this study seeks to address the following questions:

Research Question 1: How do parenting relations and management and deviant peer selection operate together to predict adolescent drug refusal efficacy and drug use?

- Hypothesis 1: Parental attitudes toward drug use, parent-adolescent relations and management (mother-adolescent relationship, parental monitoring), and peer risky behavior will have direct and indirect effects on adolescent drug refusal efficacy and use. Parental attitudes toward drug use will have a direct effect on parent-adolescent relations and management, which will have a direct effect on peer risky behavior, which will have a direct effect on drug refusal efficacy and use.

That is, 1) parent-adolescent relations and management will partially mediate the relationship between parental attitudes toward drug use and peer risky behavior and, 2) peer risky behavior will partially mediate the relationship between parent-adolescent relations and management and adolescent drug refusal efficacy and use and, 3.) parent-adolescent relations and management and peer risky behavior will partially mediate the relationship between parental attitudes toward drug use and adolescent drug refusal efficacy and use.

Research Question 2: Does parent-adolescent relations and management moderate the relationship between peer risky behavior and drug refusal efficacy and use?

- Hypothesis 2: It is expected that when parent-adolescent relations and management are strong, the relationship between risky peers and drug use will not be as strong as when adolescent-parent relations and management are weak.

Research Question 3: Does community type moderate the relationship between peer risky behavior and drug refusal efficacy and use?

- Hypothesis 3: It is expected that peer risky behavior will differ among rural and urban adolescents. Peer risky behavior will be more strongly related to adolescent drug use in urban communities.

Research Question 4: Does gender moderate the relationship between peer risky behavior and adolescent drug refusal efficacy and use?

- Hypothesis 4: It is expected that peer risky behavior and drug use will differ according to gender. Peer risky behavior will be more strongly related to drug refusal efficacy and use for boys than girls.

Research Question 5: Does age moderate the relationship between peer risky behavior and adolescent drug refusal efficacy and use?

- Hypothesis 5: It is expected that high levels of peer risky behavior may reduce adolescent drug refusal efficacy and increase drug use more for older than younger adolescents.

CHAPTER 3: METHODOLOGY

Overview and Research Design

This explanatory study titled, “Pathways to Smoking among African American Adolescents: Family, Contextual, and Cultural Factors” is designed to determine the pathways through which cultural factors influence adolescent cigarette smoking including initiation, experimentation, intermittent use, and current use among African Americans. It is funded by the Virginia Tobacco Settlement Foundation and is a partnership among Virginia Commonwealth University (VCU), Virginia State University (VSU), and several Virginia public school districts. A longitudinal design is used, two waves of data are collected at three assessment points, baseline is collected at Time 1, six months later at Time 2, and twelve months later at Time 3. Time 1 of the second wave of data is collected during the same time period as Time 3 of the first wave of data. This is a cohort study that examines fifth, eighth, and twelfth grade students over time. This dissertation uses a cross-sectional design of data collected from all three cohorts at Time 1. This study relies on self-report questionnaires.

Human Research Subjects Protection

Prior to beginning, this study was reviewed and approved by the Institutional Review Boards (IRBs) at VCU and VSU to ensure the protection of human subjects. The primary responsibility of IRBs is to ensure that research studies follow federal guidelines regarding ethical treatment of human research subjects. Both VCU and VSU IRBs approved the study’s research design, consent and assent forms, participant contact forms, flyers, and survey instruments. All researchers and research assistants completed the Collaborative Institutional Training Initiative web-based educational training in the

protection of human subjects and ethical research. Researchers were two graduate students in the Department of Psychology and School of Social Work at VCU. They held active leadership roles in the study. For example, they helped to conceptualize and implement the study, identified measures, developed data collection protocols, and supervised data collection. Research assistants were undergraduate and graduate students in the Department of Psychology. Research assistants participated in the study primarily by assisting with data collection. Given that the study focuses on the smoking behaviors of individuals under age 18, which is illegal, strict protocol was followed and confidentiality was maintained. This included providing verbal and written information about the nature of the study prior to consent and assent and maintaining the confidentiality of responses.

Sample

Sample Description

The sample consisted of three cohorts of fifth, eighth, and twelfth grade students. Wave one respondents were recruited from two public school systems. These included two rural elementary schools, one rural middle school, and one rural high school, and three urban elementary schools, three urban middle schools, and two urban high schools in southeastern U.S. Wave two respondents were recruited from two public school systems. These included one rural elementary school, one rural middle school, and one rural high school, and three urban elementary schools, three urban middle schools, and three urban high schools in southeastern U.S.

Study Inclusion/Exclusion Criteria

Students were eligible to participate in the study if they were: (1) African American or bi-racial with one parent identifying as African American; (2) in fifth, eighth, or twelfth grades; (3) did not have a diagnosis of major emotional or behavioral disturbance (as identified by school staff); and (4) received parental consent. Since recruitment was done via classes and not individually, students who did not self-identify as African American or bi-racial were allowed to complete the questionnaire if they chose and if the other three conditions were met. However, data for these students were not included in the analyses.

Sampling

Sample Size

The proposed model is a parsimonious model as it includes only four independent variables. To obtain a reliable regression equation, the recommended ratio of subjects to independent variables is 15 to 1 (Stevens, 1992). Therefore, relying on Stevens' recommendation, the total sample size needed was 60. Green (1991) as cited in Tabachnick and Fidell (2001) suggested that the simplest rules of thumb regarding sample size are $N \geq 50 + 8m$ (where m is the number of IVs) for testing the multiple correlation/regression and $N \geq 104 + m$ for testing individual predictors. This rule of thumb assumes a medium-size relationship between the independent and the dependent variables, $\alpha = .05$, and $\beta = .20$. Following Green's guidelines, the total sample would need to be 108 ($104 + 4$) to test individual independent variables. Green also pointed out that a higher cases-to-independent variable ratio is needed when the dependent variable is skewed, a small effect size is anticipated, or substantial measurement error is expected

from less reliable variables. I expected this study's dependent variables to be skewed, such that the majority of the sample would report not using drugs. Therefore, a more conservative ratio that requires a higher cases-to-independent variable ratio was used as Green recommended. Using Green's conservative rule of thumb, a sample size of 111 was expected to be adequate.

However, as models become more complex with more parameters being estimated, sample size requirements go up (Cudek & Henly, 1991). This study examined mediator and moderator effects among categorical and continuous variables. Aguinis (2004) noted that a sample size of at least 200 is needed to have reasonable power to detect moderator effects when at least one of the variables is continuous. A sample size of 225 is double the conservative estimate of 108 (original proposed sample size) and ensures a large enough sample to test mediator and moderator effects.

Participating Schools

Several steps were taken to involve schools. The principle investigator, Faye Z. Belgrave, Ph.D. and the project director, Deborah Butler, M.S. initially met with the Associate Superintendents of the urban and the rural school systems. They also met with the Director of Evaluation and Research in the urban school system. During these introductory meetings, the study's purpose, rationale, measures, and consenting process were reviewed. In the case of the urban school system, an Institutional Research Protocol was also written and approved.

These administrators assisted in identifying elementary, middle, and high schools and in contacting the principals at these schools. To reduce attrition, efforts were made to select middle and high schools that students from feeder elementary and middle schools

attended. Having feeder schools in the sample would make it easier to track students during their transition from elementary to middle school, middle to high school, and high school into the vocational world.

After this study was approved by the appropriate individual or office for each school system (i.e., superintendent, Office of Research and Evaluation), letters were sent to principals (Appendix A) and subsequently, the project director and/or researchers met with school principals. During these meetings with principals, an overview of the study was provided, the school's participation in the study was discussed, and a request was made to appoint a liaison to assist with implementing the study. This meeting was followed by a meeting with the designated school liaison to further discuss the study, his/her role in the study, and to schedule dates and times for consent distribution and data collection. The liaisons were usually teachers, but also school nurses and counselors. The liaisons' primary roles were to (1) identify students who met the study criteria; (2) collect and secure consent forms until they were collected by researchers; (3) provide replacement consent forms; (4) coordinate data collection dates, times, and locations; and (5) educate other teachers in the school about the project. Liaisons were given a modest stipend for their assistance with the study.

Sample Recruitment

Recruitment involved researchers meeting with students within each grade level. Initially, students within each grade level were brought together in a large setting such as an auditorium or cafeteria for recruitment purposes. However, using this strategy did not result in as successful recruitment as using a classroom-by-classroom strategy. Therefore, we recruited via a classroom-by-classroom method. Although it took longer

to recruit in each individual classroom, this strategy was used, and substantially more students were recruited.

During recruitment meetings, the researchers provided an overview of the study and reviewed the consent and assent forms. Students were given cover letters (Appendix B) and consent (Appendices C and D) and assent forms (Appendices E and F) to take home and review with their parents. An alternative consent form was given to students who were at least 18 years old, if they provided valid identification to verify their age (Appendix D). The principal investigator and project director's names and telephone numbers were on the consent form and cover letter so that parents could call if they had questions or concerns.

Students returned their consent and assent forms to the school liaisons. Parents who did not provide consent wrote a sentence on the consent form stating that their children could not participate in the study. Forms were collected by a researcher prior to data collection to ensure that the forms were completed accurately. All students who returned consent forms signed by their parents, regardless of whether their parents consented for them to participate, received a small token (lanyard with the study's name). The token was provided to encourage students to give the cover letter and consent form to their parents. A researcher was in contact with the liaison at least weekly during recruitment and data collection periods to assess progress and inquire about any problems or concerns.

Data Collection Procedures

A data collection protocol was developed to ensure consistency in data collection at all sites. The investigators and researchers trained research assistants prior to data

collection. They were provided with the data collection protocol to ensure that fidelity in data collection was adhered to across all sites.

Data were collected during school hours. At least one researcher and two or more research assistants were present during data collection. Participants were officially enrolled in the study upon consent from parents and after providing their assent. The questionnaire was administered in a designated area that was usually the cafeteria, but sometimes, a media room, auditorium, multi-purpose room, or private classroom. Researchers seated students far enough apart to ensure privacy. In general, the ratio of researchers to students was no more than 1:4 at the elementary level and 2:10 at the middle and high school levels. The number of participants per initial data collection session ranged from 10 to 29 for elementary students, 17 to 28 for middle-school students, and 5 to 45 for high school students. During any one session, data were collected from a maximum of 45 participants to ensure that the researchers were responsive to students' questions. Fifth graders were organized into small groups of 5-6.

Researchers introduced themselves, provided a succinct review of the study, and informed participants of their rights. Participants were informed that they were not required to complete the questionnaire or to answer any question that they did not want to answer. They were instructed to place an asterisk next to any question that they intentionally skipped. Participants were informed that their responses could not be accessed by school officials, parents, or friends, and that their responses would be kept confidential. Researchers encouraged participants to ask questions if they were unsure about the meaning of terms. They were also instructed not to write their names anywhere on the questionnaire. Researchers read the questionnaire aloud to fifth grade students and

used a developmentally appropriate glossary of terms that was developed by the researchers to respond to participants' questions.

When students finished the questionnaires, they were reviewed for completion. Participants were not required to answer all questions if they did not want to; however, sometimes, students unintentionally skipped several questions or entire pages. Therefore, reviewing the form for completion gave students the opportunity to complete the questionnaire in its entirety if questions had been unintentionally left unanswered.

Because the larger study is a longitudinal study, contact forms were completed so that project staff could track and contact participants for the next data collection. It was especially important to obtain contact information for high school students who were graduating and relocating. It was also important to have contact information for other cohorts because of relocation or enrollment into unexpected schools (e.g., private school). Contact forms were kept separate from the survey to ensure confidentiality. Students completed the contact form that included their physical and mailing address, phone number, e-mail address, and the names and contact information of three adults that know them. Fifth grade students completed a reduced version of the contact form that requested contact information of only one adult.

After completing the questionnaires and contact forms, students were given an incentive(s). Eighth and twelfth grade students were provided a \$10 Wal-Mart gift card. Upon receipt of the gift card, participants initialed a form confirming that they received the gift card. Fifth graders did not receive gift cards, but instead received several small incentives. For example, fifth grade girls received body wash, lip gloss, and lotion. Fifth grade boys received shower gel and two packs of sports cards. For eighth and twelfth

graders, data collection took approximately 50 minutes including completing the contact forms and distributing incentives. Data collection for fifth graders took approximately 1 hour and 15 minutes. Researchers completed follow-up data collection at schools in which students were absent on the day of data collection and when consent forms were returned after data collection.

Students were assigned a personal ID number that was linked to the questionnaire. A master list of students' names and their matching ID numbers was kept separately from the questionnaires. Questionnaires are kept in a locked file cabinet with only the principal investigator and project coordinator having access.

Instrumentation

This section describes the measures used including their psychometric properties beginning with the independent variables. Criteria considered in the selection of measures were: (1) public access and use of the measure; (2) reliability and validity; (3) developmental and cultural appropriateness; (4) whether the measure could be used across all developmental levels (5th, 8th, and 12th grade students); and (5) number of items on the measure with fewer items considered desirable. Given the different developmental ages of the participants, two different versions of the survey were developed. Fifth grade students received a questionnaire with fewer items than 8th and 12th grade students.

Independent, Mediation, and Moderation Variables

Parental Attitudes Toward Drug Use

The Parental Attitudes Toward Drug Use Measure was used to assess youth's perception of their parents' attitudes about their own drug use (Springer, Sale, Hermann, Sambrano, Kasim, & Nistler, 2004). This measure has been used in several studies of

urban youth including African American youth (e.g., Arthur, Hawkins, Pollard, Catalano, & Baglioni, 2002; Springer et al.). The measure has three items and uses a 4 point Likert scale that range from “not wrong at all” to “very wrong” (Appendix G). Scores could range from 3 to 12 with higher scores indicating the perception that parents would consider it wrong for them to use drugs. An example of an item is, “How wrong do your parents feel it would be for you to drink beer, wine, hard liquor (for example, vodka, whiskey or gin)?” Participants were instructed to respond regarding the behaviors of the parent(s) that they identified earlier in the questionnaire as the person who they “see as a mother/father.” Internal consistency of this scale in a sample of African American youth ages 11-18 was .78 (Arthur et al.).

Parent-adolescent Relations

The *Network of Relationship Inventory* (NRI) was used to assess adolescents’ perceptions of their relationships with their mothers and fathers, or guardians (Furman & Buhrmester, 1992). The NRI consists of 20-items and was used to specifically assess the mother and father-adolescent relationship (Appendix H). The NRI has demonstrated satisfactory validity and reliability. Cronbach alpha is typically a mean average of .80 (Furman & Buhrmester, 1985; Furman & Buhrmester, 1992). The NRI is developmentally appropriate and has been used with students in second grade through college (Furman & Buhrmester, 1985; Furman & Buhrmester, 1992). Three sample items are “How much does your father love you,” “How often do you talk about personal things with your mother,” and How satisfied (happy) are you with your relationship with your mother?” The items were rated on a 4-point Likert scale with responses that ranged from “not at all” to “a lot,” “not a lot” to “all the time,” and “not at all happy” to “very

happy,” respectively. Participants’ scores could range from 20 to 80. Higher scores indicate a positive mother-adolescent and father-adolescent relationship. If a student did not have a person they considered mother or father, they were instructed to write “N/A” by items that were not applicable.

Parental Management

Participants completed a modified version of Silverberg’s *Parental Monitoring Scale* (PMS) (Silverberg & Small, 1991). The PMS assesses parental monitoring by asking whether youth perceive their parents or guardians as usually aware of their activities after school. Participants were instructed to respond regarding the behaviors of the parent(s) that they identified earlier in the questionnaire as the person who they “see as a mother/father.” The original PMS has 6 items. In this study, a modified 4-item version of the PMS was used (Li, Stanton, & Feigelman, 2000) with a 3 point Likert scale with response choices ranging from “never” to “always” (Appendix I). Participants’ scores could range from 4 to 12. Higher scores indicate a higher level of perceived parental monitoring. An example of an item is, “When you go out, how often do your parents know where you are going?” Psychometric properties of the modified scale are strong across several assessments, ranging from Cronbach’s alphas of .87 to .94 (e.g., Li et al.; Wu et al., 2003).

Peer Risky Behavior

The eight-item *Peer Problem Behavior Scale* (John Snow, Incorporated, 2000a; 2000b) was used to measure affiliation with risky peers. Participants responded to twelve items that assessed the type of peers with whom they affiliate. Two examples of items are, “How many of your friends get suspended from school?” and “How many of your

friends get good grades?” This measure also includes peer drug use (i.e., marijuana use, other drug use). The measure uses a 5 point Likert scale with responses: “none,” “a few,” “some,” “most,” and “all” (Appendix J). Scores could range from 8 to 40. Higher scores indicate risky peer affiliation.

Dependent Variables

Past 30 Day Drug Use

Scales from the Center for Substance Abuse Prevention’s Government Performance and Results Act (GPRA) Participant Outcome Measure were used as the primary measures for cigarette, alcohol, and marijuana use (Center for Substance Abuse Prevention, 2005). There are both youth (ages 12-17) and adult (ages 18 and older) versions of the GPRA and the scales are valid, reliable, and culturally and developmentally appropriate (Brenner, Kann, McManus, Kinchen, Sundberg, & Ross, 2002). Measures from GPRA have been used in hundreds of studies with thousands of youth and adults (Cervantes, Kappos, Duenas, & Arellano, 2003; Nasim, Belgrave, Jagers, Wilson, & Owens, 2007). In this study, we used the youth version of the GPRA that assesses 30-day cigarette, alcohol, and marijuana use with an ordinal scale. Past 30-day cigarette use was measured by a single item, “During the past 30 day, on how many days did you smoke cigarettes?” Participants could provide a range of seven responses from “0 days” to “all 30 days.” Past 30-day alcohol use was measured by a single item, “During the past 30 day, on how many days did you have a least one drink of alcohol?” Past 30-day marijuana use was measured by the following item, “During the past 30 day, how many times did you use marijuana?” Participants could provide a range of responses for past 30 day alcohol and marijuana use that were similar to cigarette use responses.

Drug Refusal Self-Efficacy

The *Specific Event Drug and Alcohol Refusal Efficacy Scale* (SEDARE) was adapted from a measure developed by Conners, Bradley, Whiteside-Mansell, and Crone (2001). Conners et al. developed a measure to assess youth, ages 8 and older, ability to resist alcohol and other drugs. The utility of this measure has been previously examined in studies with urban African American youth (Belgrave, Reed, Plybon, & Corneille, 2004). The SEDARE was adapted in this study such that participants were asked about tobacco and alcohol use, rather than alcohol and other drugs. This adaptation was done so that the drug refusal efficacy measure would relate to the study's dependent variables, tobacco, alcohol, and marijuana use. Items addressing refusal efficacy for tobacco and alcohol use were compiled into a single scale. Participants responded to nine items that inquired about whether they would be tempted to smoke (cigarettes) or drink (alcohol) during certain potentially stressful or pressured events. Two sample items are "I would feel tempted to smoke if some one made fun of me for not doing it" and "If my boyfriend/girlfriend wanted me to drink, I would feel tempted." The scale uses a 7-point Likert type scale that ranges from 1 "not true" to 7 "very true" (Appendix K). Participants' scores could range from 7 to 49 with higher scores indicating low drug refusal efficacy. The original measure contained 19 items and was scored on a 3 point scale (yes = 0, not sure = 1, no = 2). Conners et al. reported internal consistency reliability with an alpha of 0.89. Convergent validity was found as this scale was significantly correlated with a measure of drug use ($r = -.20, p < .01$) (Belgrave, Reed, Plybon, & Corneille, 2004).

Data Analysis Plan

The Statistical Package of the Social Sciences (SPSS) 16.0 was employed to create the data set and conduct all analyses. Data were entered by a trained research assistant and verified by a researcher. Descriptive statistics were calculated across all variables. Pearson product correlations were computed to examine the significance and direction of relationships among the independent and dependent variables. The data analytic plan is organized according to the study's research questions and hypotheses.

Pre-Analysis Screening

Exploratory data analytic procedures were performed to ensure that the data met the appropriate assumptions necessary for conducting multivariate analyses. These assumptions included proper specification of the model, continuous data, missing data, linearity, no outliers, absence of perfect multicollinearity, homoscedasticity, and normally distributed residual error. If there were any problems observed during the routine pre-analysis screening, appropriate actions to correct them were taken. The methods used to pre-screen the data are discussed in chapter four.

Multivariate Analyses

This investigation examined the relationship between family and peer influences on drug refusal efficacy and use among African American adolescents who live in rural and urban communities. This study examined main order, mediating, and interaction effects. Given the complex relationships examined and interactions tested, steps were taken to maximize power to detect true relationships and reduce nonessential multicollinearity among the interaction variables. Statistical adjustments and efforts made to enhance the rigor of this study are described in the next two sections.

Maximizing Power to Detect Interactions

Statistical power is needed to detect interactions, if they exist. There are several strategies that may be used to increase power that include adjusting the alpha level and decreasing the standard deviation of the sampling distribution. This study used an alpha level of .05 which is acceptable and increases power (Tabachnick & Fidell, 2007).

Another strategy is to decrease the standard deviation of the sampling distributions (Tabachnick & Fidell). This was done in this study by increasing sample size.

Several other factors impact the power of tests of interactions. These factors include effect size, equal sample size, measurement error, and scale coarseness.

Effect Size

Effect size is a measure of strength between two variables. Interactions are best detected when the effect size is larger. Most researchers tend to rely on Cohen's (1992) conventions of effect size. Cohen's definition of effect size posits that a small effect size is .1, medium is .3, and large is .5. Cohen's guidelines can be problematic because of the subjective and biased method used to develop these rules. Effect size differs but the average effect size is typically .20, which is smaller than Cohen's conventions (Aguinis, 2008). It was expected that the effect sizes in this study would meet the typical effect size of .20.

Equal Sample Size

Unequal sample sizes across groups of categorical variables decrease statistical power (Aguinis, 1995; Aguinis & Stone-Romero, 1997). Regardless of whether there is a large sample size, as sample size proportions drift from 50%/50%, power decreases. It was expected that there would be unequal groups when the categorical variables were not

manipulated (i.e., gender, community type) (Frazier, Tix, & Barron, 2004). As expected, there were unequal sample sizes across gender, such that there were more females than males, and community type, such that there were more urban than rural adolescents. Unequal sample sizes contributed to decreased statistical power.

Measurement Error

The other two factors that impact power relate to measurement. First, measurement error in independent and moderator variables substantially reduces the reliability of the interaction term constructed from these variables (Aguinis, 1995; Aguinis et al., 2001). Measures are not precise and result in measurement error. The more errors in a measure, the more difficult it is to detect interactions.

In general, a measure with a coefficient alpha of .80 is considered to have good reliability. Many of the measures used in this study met this conventional standard. However, because the reliabilities of the measures are not perfect (Cronbach alpha = 1.00), it was impossible to predict 100 percent of the variance. For example, the *Network of Relationship Inventory (NRI) Mother-Adolescent Relationship* subscale was used to assess adolescents' perceptions of their relationships with their mothers or guardians. Cronbach alpha for the *NRI Mother-Adolescent Relationship* subscale was .76 in this study. Thus, no more than 76 percent of the variance could be explained. Aiken and West (1991) found that the power of the test of the interaction is reduced by up to 50 percent when the reliabilities are .80 rather than 1.00. Measurement error led to decreased statistical power.

Scale Coarseness

When a construct is continuous but is measured by a measurement scale that uses items that collapse true scores into a category (e.g., Likert scales), the scale is considered coarse (Aguinis, Pierce, & Culpepper, in press). That is, scales are coarse when dependent variables are measured using scales that do not have sufficient response options to reflect the interaction. Consequently, nonlinear and systematic error are introduced because continuous constructs are collapsed (Bollen & Barb, 1981) and power is lost (Russell & Bobko, 1992). Although coarse scales are common, they are undesirable because they do not allow an understanding of the true relationships among variables.

Dependent variables should have as many response options as the product of the response options of the independent and moderator variables. For example, hypothesis 2 suggests that parent-adolescent relations and management will moderate the peer risky behavior-adolescent drug refusal efficacy and use relationship. For illustration of this concept, this hypothesis is simplified. Parental monitoring will moderate the peer risky behavior-adolescent drug use relationship. Parental monitoring is measured with a 3-point Likert scale and risky peers is measured with a 5-point Likert scale. The product of the independent and moderator variables is 15 (3 X 5). As a result, the dependent variable should have at least 15 response options to capture the true interaction effect. Because the dependent variable only has 7 responses instead of 15, this measure is too coarse and power is lost.

Due to scale coarseness, the r value reported in Pearson's product correlation is underestimated. The r value reported in Pearson's product correlation is a correlation

among the measures not constructs. As a result, the reported r needs to be corrected. The corrected r is a correlation among the constructs, the value that would have been computed had a continuous scale been used. The Pearson's product correlation (r) was corrected in this study and a table in chapter four presents the corrected r value.

Centering

Several authors (e.g., Aiken & West, 1991; Darlington, 1990; Judd & McClelland, 1989) have argued that when testing interactions, the independent variables and moderators should be centered. Variables are centered by subtracting the mean score (or some other value) from all observations, making the mean equal to 0. Although the independent and moderator variables are transformed to have a value of zero, this is not problematic because it is extremely rare that zero is a possible value for these variables (Meyers, Gamst, & Guarino, 2006).

Centering variables may eliminate or mitigate multicollinearity problems because the correlation among variables may be reduced. Centering does not change the assessment of the significance of an independent variable, but may change that variable's correlations with others (Garson, 2008). The product of uncentered independent and moderator variables with interactions is highly correlated with the first order independent and moderator variables (Tabachnick & Fidell, 2007). Given that interaction terms are prone to multicollinearity, centering is appropriate (Garson).

Although centering may help to reduce multicollinearity, its primary function is to increase the interpretability of the interaction (Aiken & West, 1991). Interpretation is easier when the reference point is meaningful. For example, before centering, the intercept is the value of the dependent variable expected when the independent variable's

value is 0 (Tabachnick & Fidell, 2007). However, after centering, the intercept is the value of the dependent variable expected when the independent variable's value is at the mean (e.g., age = 15).

Although the practice of centering variables is common practice in some disciplines, other authors have argued that centering is not useful (Kromrey & Foster-Johnson, 1998). Still, it is generally agreed that centering does not affect the statistical analysis (Meyers, Gamst, & Guarino, 2006) and is useful given the possibility of reducing multicollinearity and making interpretation less complicated. All variables in this study were mean-centered to reduce nonessential multicollinearity and improve the interpretability of findings.

Hypotheses Testing: Multivariate Analyses

The overall purpose of the present study was to ascertain the direct and indirect effect of parenting and peer influences on adolescent drug refusal efficacy and use. Therefore, it was appropriate to use multiple regression as the multivariate analysis in this study because its primary purpose is to develop an equation that can be used for predicting values on a dependent variable (Mertler & Vannatta, 2005). These predictions are explained in the hypotheses below. Regression analysis determined the amount of variance explained by the parenting and peer variables in drug use and drug refusal self efficacy and assessed the relative contribution of each predictor variable. In addition, it permitted an estimation of the strength and direction of changes in the dependent variable that were associated with changes in the combined independent variables. Hierarchical multiple regression also referred to as sequential multiple regression was used because it allowed me to specify the order in which to enter the independent variables. Order of the

variables entered was based on the literature and conceptual model. Control variables of age and gender were loaded into the first block of each mediation and moderation analysis. In the final mediation analysis testing the full model, age and gender were loaded into the first block. Parental attitudes toward drug use was loaded into the second block. Parent-adolescent relations and management was loaded into the third block. Deviant peer selection was loaded into the fourth block.

Multiple regression was used to test the interactive effects proposed in hypotheses 1 through 5. Hypothesis 1 proposed mediator effects and Hypotheses 2, 3, 4, and 5 proposed moderator effects. Baron and Kenny (1986) defined a mediator variable as a variable that accounts for the relationship between the independent variable and dependent variable. A mediator variable explains the mechanisms through which an independent variable explains a dependent variable. Mediators address “why” or “how” an independent variable predicts a dependent variable (Frazier, Tix, & Barron, 2004). It answers the question, “why does an independent variable (e.g. parent-adolescent relations) effect a dependent variable (e.g. drug use)?” For example, in this study, it was hypothesized that risky peers would mediate the relationship between parenting influences and adolescent drug use. Thus, risky peers was expected to explain how parent-adolescent relationship and parental monitoring are related to adolescent drug use.

Hypothesis 1: Parental attitudes toward drug use, parent-adolescent relations and management (mother-adolescent relationship, parental monitoring), and peer risky behavior will have direct and indirect effects on adolescent drug refusal efficacy and use. Parental attitudes toward drug use will have a direct effect on parent-adolescent relations and management, which will have a direct effect on peer risky behavior, which will have

a direct effect on drug refusal efficacy and use. That is, 1) parent-adolescent relations and management will partially mediate the relationship between parental attitudes toward drug use and peer risky behavior, 2) peer risky behavior will partially mediate the relationship between parent-adolescent relations and management and adolescent drug refusal efficacy and use, and 3.) parent-adolescent relations and management and peer risky behavior will partially mediate the relationship between parental attitudes toward drug use and adolescent drug refusal efficacy and use.

To test the mediated model in hypothesis 1, for example, three regression equations were performed for each dependent variable. In the first equation, the independent variables (parent-adolescent relations and parental management) must affect the dependent variables (drug refusal efficacy and drug use). Second, the independent variables must affect the mediator variable (risky peers). Third, the mediator must affect the dependent variables while controlling for the independent variables. If a mediation effect was present, the effect of the independent variable on the dependent variable was less in the third equation than in the second (Baron & Kenny, 1986). This process was followed three times in order to test the full mediation model. A more conservative mediator test, the Sobel test was also performed to test mediator effects in hypothesis 1 and is described and reported in chapter four.

Baron and Kenny (1986) defined a moderator variable as a variable that affects the direction and/or strength of the relationship between an independent variable and dependent variable. A moderator variable can be defined as a variable that explains the conditions by which a relationship exists. Moderators address “when” or “for whom” a variable most strongly predicts a dependent variable (Frazier, Tix, & Barron, 2004). A

moderator variable describes a contingent relationship such that the relationship between the independent and dependent variable depends on a third variable, the moderator. The value of the moderator effects the strength and direction of the relationship. Specifically, it is expected that as the moderator variable changes, the relationship between the independent and dependent variables will vary (i.e., increases, decreases). For instance, in the relationship between neighborhood disorganization and adolescent drug use, parental monitoring may be a moderator variable such that its impact may weaken the strength of neighborhood disorganization on adolescent drug use.

Cohen et al. (2003) described three types of interactions among continuous independent and moderator variables: enhancing interactions, buffering interactions, and antagonistic interactions. Enhancing interactions are those in which the independent and moderator variables affect the dependent variable in the same direction. Together, these interactions' effects are stronger than an additive effect (Cohen et al.). For example, non-risky (or conventional) peers and parent-adolescent relations and management will both lessen the likelihood of adolescent drug use and the interaction of the two will be stronger than the sum of the two. Buffering interactions are those in which the moderator variable weakens the effect of the independent variable on the dependent variable (Cohen et al.). For example, parent-adolescent relations and management is expected to weaken the effect of risky peers on drug use. Antagonistic interactions are those in which the independent and moderator variable have the same effect on the dependent variable, but the interaction is in the opposite direction (Cohen et al.). To clarify this interaction pattern, parent-adolescent relations will be used as an independent variable and parental management will be introduced as a moderator variable. It would be expected that low

levels of parent-adolescent relations and high levels of parental management would both lessen the likelihood of drug use.

Analytic procedures to test the moderator models in hypotheses 2, 3, 4, and 5 will vary according to the level of measurement of the independent and moderator variables. According to Baron and Kenney (1986), these techniques vary according to whether: (1) both moderator and independent variables are categorical; (2) the moderator is categorical and the independent is continuous; (3) the moderator is continuous and the independent is categorical; and (4) both moderator and independent variables are continuous. For example, to test hypothesis 4, a specific technique for a categorical moderator (i.e., gender) and continuous independent variable (peer risky behavior) was used. Specifically, multiple regression was used to determine moderation. Prior to analysis, an interaction term was created of the independent variable by the moderator variable (e.g., peer risky behavior X gender). In hierarchical regression, the main effect of the independent variable was entered first. Secondly, the main effect of the moderator variable was entered. The interaction term was loaded third. If the relationship was significant, it was further examined using the split-half function in SPSS.

Hypothesis 2: It is expected that parent-adolescent relations and management will moderate (a buffering interaction) the peer risky behavior-adolescent drug refusal efficacy and use relationship.

Hypothesis 3: It is expected that community type will moderate the relationship between peer risky behavior and adolescent drug refusal efficacy and use.

Hypothesis 4: It is expected that gender will moderate the relationship between peer risky behavior and drug refusal efficacy and use.

Hypothesis 5: An enhancing interaction is expected such that age will moderate the relationship between peer risky behavior and adolescent drug refusal efficacy and use.

CHAPTER 4: RESULTS

This chapter presents study findings in six sections. The description and rationalization of the data analysis strategy are presented first. The second section details data entry, cleaning, and pre-screening. The third section presents univariate statistics of the background and demographic characteristics of the sample. The fourth section describes tabulation and analyses of the measures to include internal consistency reliability and measures of central tendency and dispersion. The fifth section presents the results of bivariate analyses of relationships among the independent, moderator, mediator, and dependent variables. Lastly, multivariate analyses testing the five hypotheses form the final section of this chapter.

Data Analysis Strategy

Descriptive statistics to include measures of central tendency and dispersion were computed for all variables. Bivariate relationships were conducted among 1) demographic moderator variables; 2) independent, moderator, and mediator variables; 3) dependent variables; and 4) independent, moderator, mediator, and dependent variables. These analyses provided a preliminary understanding of the relationships among the study variables. Next, separate multiple hierarchical regression models were examined for each dependent variable. These regression models were used to test whether parenting and peer factors were predictive of scores on drug refusal efficacy and past 30 day tobacco, alcohol, and marijuana use. Multiple regression analyses were performed to examine first order, mediating, and moderating effects.

Data Screening

Data Entry and Cleaning

Data were entered in the Statistical Package of the Social Sciences (SPSS) 16.0 by a trained undergraduate research assistant and research associate. A research assistant pre-screened surveys for completed Personal Identification Numbers (PINs). Surveys that did not have completed PINs were returned to the project director. The project director and research assistants reviewed and resubmitted the surveys with accurate PINS. Data from surveys with completed PINs were entered in SPSS 16.0. Surveys were verified for accuracy using a randomized selection procedure. Specifically, every third or seventh survey was pulled and verified for data entry accuracy. In the event that an error in data entry was discovered more than two times, data entry was halted and the investigators provided a brief re-training of the undergraduate research assistant.

Pre-Screening and Transformation

Prior to analysis, the assumptions for conducting multiple regression were explored. Important assumptions of multiple regression are proper specification of the model, continuous data, no influential cases, normality, linearity, missing data, absence of perfect multicollinearity, homoscedasticity, and normally distributed residual error. These assumptions are discussed next.

Proper Specification of the Model

Proper specification of the model or “independent variables measured without error” refers to the inclusion of relevant variables and exclusion of irrelevant variables in the model. The variables in the regression model were selected based upon the empirical

and theoretical literature. It was reasonably expected that the model was properly specified.

Continuous Data

Regression assumes continuous data. Specifically, it requires interval or ratio level data. The data in this study are mostly ordinal. Although this assumption was violated, it is common to use ordinal data in regression models (Garson, 2008). Also, nominal variables were dummy coded.

Influential Cases

Influential cases or “outliers” are cases that exceed the mean by three standard deviations (Sincich, 1986) or four standard deviations (Younger, 1979). Influential cases can affect multivariate analyses by distorting, exaggerating, and attenuating relationships. Extreme values may cause invalid results. The three primary reasons for influential cases are data entry errors, the subject is not a member of the population, or the subject is different from the sample (Tabachnick & Fidell, 1996). Other common reasons for influential cases include illiteracy, lack of comprehension, and random measurement error.

Screening. The data were screened for influential cases using several statistical and graphical methods. These include the Mahalanobis distance, box plots, the extreme values command (includes 5 highest extreme values, 5 lowest extreme values, and 5% trimmed mean for each item), and stem-and-leaf plots. Influential cases were identified and recorded if they were more than three standard deviations away from the mean (Sincich, 1986). Using this rule, influential cases were identified. There were influential cases for each of the dependent variables and four independent and mediator variables.

The number of influential cases on the dependent variables ranged from 11 (1.9%) to 21 (3.7%). *Past 30 day tobacco use* had 17 (3%) influential cases. *Past 30 day alcohol use* had 21 (3.7%) influential cases. *Past 30 day marijuana use* had 13 (2.3%) influential cases. *Tobacco refusal efficacy* had 11 (1.9%) influential cases. *Alcohol refusal efficacy* had 12 (2.1%) influential cases. The number of influential cases on the independent and mediator variables ranged from 0 to 7. *Mother-adolescent relationship* had 7 (1.2%) influential cases. *Peer risky behavior* had 5 (.9%) influential cases. *Peer drug use* had 1 (.2%) influential case. *Parental monitoring* did not have any influential cases.

Handling Influential Cases. Consideration was given to determine how to best handle influential cases. Given the data entry, verification, and cleaning procedures used, it was unlikely that influential cases were due to data entry error. It was also presumed that the influential cases were not related to measurement error. Also, it was unlikely that the subjects belonged in a different population. Therefore, a decision was made to run two sets of bivariate analyses, one with the influential cases and the other without the influential cases (Altman, 1991; Stevens, 1992). There was convergence between the two sets of findings (see Table 1). The results of the analysis with the influential cases revealed a more pronounced effect with a more linear trend than the findings without the influential cases. The influential cases were not deleted from the study and were considered interesting cases. Also, most of the influential cases with extremely high values (i.e., frequent drug use, high levels of peer drug use) were responses from twelfth graders and most of the influential cases with extremely low values (i.e., low levels of peer risky behavior) were from fifth graders. Therefore, it is likely that these influential cases are factual responses.

Table 1

Bivariate Correlations With and Without Outliers/Influential Cases

CORRELATIONS WITH OUTLIERS	CORRELATIONS WITHOUT OUTLIERS
Past 30 Day Tobacco Use	
Parental Attitudes Toward Drug Use (-.317**)	Parental Attitudes Toward Drug Use (-.116*)
Parent Drug Use (-.109**)	Parental Monitoring (-.140)
Parental Monitoring (-.216**)	Peer Drug Use (.187**)
Parental Control (-.135)	
Peer Drug Use (.343**)	
Peer Risky Behavior (-.130*)	
Past 30 Day Alcohol Use	
Parent Drug Use (-.108*)	Parent Drug Use (.091*)
Mother-Adolescent Relationship (-.104)	Parental Attitudes Toward Drug Use (-.244**)
Parental Monitoring (-.292**)	Father-Adolescent Relationship (-.123*)
Parental Control (-.246**)	Parental Monitoring (-.206**)
Peer Drug Use (.425**)	Parental Control (-.167**)
Past 30 Day Marijuana Use	
Parental Attitudes Toward Drug Use (-.201**)	Parental Attitudes Toward Drug Use (-.135**)
Peer Drug Use (.316**)	Parental Monitoring (-.207)
Parental Monitoring (-.178**)	Parental Control (-.136)
Parental Control (-.140**)	Peer Drug Use (.255)
Tobacco Refusal Efficacy	
Parental Attitudes Toward Drug Use (-.111**)	Parental Attitudes Toward Drug Use (-.142**)
Parent Drug Use (-.085*)	Mother-Adolescent Relationship (-.118**)
Mother-Adolescent Relationship (-.103*)	Parental Monitoring (-.207**)
Parental Monitoring (-.216**)	Parental Control (-.142**)
Parental Control (-.163)	Peer Drug Use (.155**)
Peer Drug Use .248**	
Alcohol Refusal Efficacy	
Parental Attitudes Toward Drug Use (-.095*)	Parent Drug Use (-.98*)
Parental Monitoring (-.182**)	Parental Attitudes Toward Drug Use (-.179**)
Parental Control (-.151**)	Mother-Adolescent Relationship (-.99*)
Peer Drug Use (.229**)	Father-Adolescent Relationship (-.107*)
	Parental Monitoring (-.216**)
	Parental Control (-.131**)
	Peer Drug Use (.194)

In addition, given the demographic similarity of these influential cases, it is suspected that these values are legitimate and represent common lived experiences. For example, there were 17 influential cases for past 30 day tobacco use. Fifteen of these 17 cases were exclusively urban twelfth graders from two high schools.

Normality

Multivariate normality is an assumption of regression that refers to the extent to which all observations for all combinations of variables are normally distributed (Mertler & Vannatta, 2005). Prior to assessing multivariate normality, univariate normality must be examined. Univariate normality refers to the extent to which all observations for a given variable are normally distributed (Mertler & Vannatta).

Screening. Univariate and multivariate normality were assessed using graphical and statistical procedures, namely, histogram with normal curve overlays, normal probability plot, and skewness and kurtosis coefficients. Skewness is a quantitative measure of the degree of symmetry of a distribution around the mean and kurtosis refers to the degree of peakness of a distribution (Mertler & Vannatta, 2005). When there is a normal distribution, skewness and kurtosis equal 0. If there is a positive distribution, there is a clustering of cases to the left and the right tail is extended with only a few cases (Mertler & Vannatta; Tabachnick & Fidell, 2001). By contrast, if there is a negative skewed distribution, there is a clustering of cases to the right and the left tail is extended with only a few cases (Mertler & Vannatta; Tabachnick & Fidell). Kurtosis values that are positive indicate that the distribution is too peaked and those that are negative indicate that the distribution is too flat (Mertler & Vannatta).

Visual inspection of the histograms and normal probability plots indicated that the drug use dependent variables were highly peaked and that all of the independent and dependent variables were abnormally peaked and skewed. Examination of the skewness and kurtosis coefficients provided results that were consistent with the visual inspection of the histograms and normal probability plots. Consistent with the adolescent drug use literature, the kurtosis for past 30 day tobacco, alcohol, and marijuana use were extremely peaked. Kurtosis values for the drug use values were 24.628 for *past 30 day tobacco use*, 12.630 for *past 30 day alcohol use*, and 27.875 for *past 30 day marijuana use*. The other two dependent variables, *tobacco* and *alcohol refusal efficacy* also had high kurtosis of 4.001 and 6.152, respectively. There was a moderately wide range of positive and negative kurtosis values for the independent variables. Of the independent variables, *mother-adolescent relationship* (.955), *parental monitoring* (-.490), *peer risky behavior* (1.226), and *peer drug use* (-.052), yielded normal kurtosis. *Parental attitudes toward drug use* had a peaked kurtosis with a value of 3.990.

As was expected, all three drug use dependent variables were highly skewed towards report of “no drug use.” Specifically, the skewness values were 4.806 for *past 30 day tobacco use*, 3.287 for *past 30 day alcohol use*, and 4.988 for *past 30 day marijuana use*. Of the other two dependent variables, *tobacco refusal efficacy* (1.988) and *alcohol refusal efficacy* (2.274) were positively skewed. Of the independent variables, *mother-adolescent relationship* (-1.03), *parental monitoring* (-.494), *peer risky behavior* (-.534), and *peer drug use* (.832) approached a normal distribution. However, *parental attitudes toward drug use* (-1.949) was skewed.

Transformation. When the sample size is large, the Central Limit Theorem applies, and it is safe to assume a normal distribution regardless of the distributions of variables (Healey, 2005; Tabachnick & Fidell, 2007). Healey defined a "large" sample size as at least 100. The sample size of this study was 567. Accordingly, the Central Limit Theorem applies and untransformed variables were used in this study. Further, the nonnormal statistical distributions of the drug use variables were expected given the age of the sample, and are theoretically normal.

Data transformations were run on variables with high skewness and kurtosis only to examine and indicate the impact that transformation would have had on these distributions. These transformed variables were not used in the study. Transformations were employed given the severity of kurtosis and skewness associated with *past 30 day tobacco use, past 30 day alcohol use, past 30 day marijuana use, tobacco refusal efficacy, alcohol refusal efficacy, and parental attitudes toward drug use*. Several transformations were performed across each dependent variable and *parental attitudes toward drug use* to generate a symmetrical distribution with a normal skewness and kurtosis. Specifically, a square root transformation (\sqrt{X}), log transformation ($\log(X_i)$), and reciprocal "inverse" transformation ($1/X$) were used to transform the data.

The drug use dependent variables were positively skewed and tended to zero representing "no drug use." As a result, for log transformation and reciprocal transformation, a constant was added to all data prior to transformation. *Parents' attitudes toward drug use* was negatively skewed. Therefore, this variable was reflected prior to transformation.

Of the transformations conducted, square root transformation, log transformation, and reciprocal transformation, square root transformation was the most useful transformation. As shown in Tables 2 and 3, after the variables were transformed, there were less skewness and kurtosis, with the exception of parents attitudes toward drug use.

Homoscedasticity

Homoscedasticity assumes that variability in scores for one continuous variable is approximately the same at all values of another continuous variable (Mertler & Vannatta, 2005). If the assumption of homoscedasticity holds, it can be presumed that other regression assumptions are not influential. However, violations of homoscedasticity suggest violations of other assumptions.

Screening. Multivariate homoscedasticity of the untransformed variables was assessed by examining Box's M test for equality of variance-covariance matrices. Results indicated that the covariance matrices for the dependent variables (past 30 day tobacco use, past 30 day alcohol use, past 30 day marijuana use, tobacco refusal efficacy, drug refusal efficacy) were not equivalent ($p < .01$). The null hypothesis that the covariances are equal was rejected.

The Box's M test is sensitive to non-normality (Mertler & Vannatta, 2005), and was examined using untransformed variables that were found to be nonnormal (see preceding section). Moreover, it is likely that the null hypothesis that the covariance matrices are equal is rejected due to a lack of multivariate normality and not due to the covariance matrices being different (Stevens, 1992). Data were not transformed.

Table 2

Results of the Data Transformation to Correct Skewness

Variable	Original Skewness Value	Square Root Value	Log Value	Reciprocal Value
<u>Dependent Variables</u>				
Past 30 Day Tobacco Use	4.806	3.502	3.664	-3.122
Past 30 Day Alcohol Use	3.287	1.925	2.109	-1.672
Past 30 Day Marijuana Use	4.988	3.431	3.637	-3.076
Tobacco Refusal Efficacy	1.988	1.513	1.209	-0.759
Alcohol Refusal Efficacy	2.274	1.582	1.175	-0.625
<u>Independent and Mediator Variables</u>				
Parental Attitudes Toward Drug Use	-1.949	1.300	.859	-0.441

Table 3

Results of the Data Transformation to Correct Kurtosis

Variable	Original Kurtosis Value	Square Root Value	Log Value	Reciprocal Value
<u>Dependent Variables</u>				
Past 30 Day Tobacco Use	24.628	11.732	13.079	8.317
Past 30 Day Alcohol Use	12.630	2.620	3.646	1.131
Past 30 Day Marijuana Use	27.875	11.362	13.184	8.058
Tobacco Refusal Efficacy	4.001	1.679	0.468	-0.884
Alcohol Refusal Efficacy	6.152	2.363	0.623	-1.046
<u>Independent and Mediator Variables</u>				
Parental Attitudes Toward Drug Use	3.990	.900	-0.557	-1.602

Linearity

Multiple regression assumes linearity. Linearity presupposes that there is a straight line between two variables (Mertler & Vannatta, 2005).

Screening. Linearity was assessed between each independent and dependent variable relationship (every XY relationship) using scatter plots and interactive graphs. Examination of the scatter plots and interactive graphs revealed that all relationships were nonlinear. However, the relationships between parental attitudes toward drug use and alcohol refusal efficacy, mother-adolescent relationship and alcohol refusal efficacy, and peer drug use and alcohol refusal efficacy approached linearity. Nonlinear relationships between the independent and dependent variables may be due to the violation of the continuous variable assumption. Specifically, the responses of the drug use dependent variables are not continuous or consecutive and equally distanced. Instead, the responses are 1) I did not drink alcohol during the past 30 day, 2) 1 or 2 days, 3) 3 to 5 days, 4) 6 to 9 days, 5) 10 to 19 days, 6) 20 to 29 days, and 7) All 30 days, for example. Data were not transformed.

Missing Data

Screening. When running multiple regression, it is important to first examine missing data and missing data was assessed for all variables. There was less than one percent of missing data for the dependent variables. There was no missing data for *past 30 day tobacco use*, .5% (N=3) for *past 30 day alcohol use*, .2% (N=1) for *past 30 day marijuana use*, .7% (N=4) for *tobacco refusal efficacy*, and .7% (N=4) for *alcohol refusal efficacy*. Given that there was little or no missing data for the dependent variables, this assumption was not violated. There was also limited missing data for the independent

variables. Missing data accounted for 1.2% (N=7) of *parental attitudes toward drug use*, 3.4% (N=19) of *mother-adolescent relationship*, .4% (N=2) of *parental monitoring*, 1.1% (N=6) of *peer risky behavior*, and 1.6% (N=9) of *peer drug use*. In general, if a variable has less than 5% missing data, it is not problematic during analysis (Little & Rubin, 1987). It is also not necessary to determine whether the missing data are “missing completely at random,” “missing at random,” or “missing not at random.” Further, it is not feasible to conduct a “t” test in SPSS with less than 5 percent of missing data.

Handling Missing Data. To obtain an unbiased estimate of parameters for the missing data, various substitution strategies were considered. These include listwise deletion, regression substitution, and replacing missing values with the mean. If there is less than five percent missing data, data can be replaced with the mean (McDermeit, Funk, & Dennis, 1999). Given that most variables had less than 5% missing data, the missing values were replaced with the mean using the “series mean” method. Overall, replacing 15% or less of the missing data with the mean has little effect on the results of the analyses (Mertler & Vannatta, 2005). Replacing missing values with the mean is a conservative procedure given that the overall mean does not change by replacing the mean value for a case. However, the drawback of this procedure is that the variance is reduced since the “real” value would have been different than the mean (Mertler & Vannatta). Still, this is not a serious problem when there are not numerous missing values (Mertler & Vannatta).

Absence of Perfect Multicollinearity

Multicollinearity is the amount of overlap between independent variables and exists when there is a strong correlation ($r > .80$) between two or more independent

variables. When there is high multicollinearity, two or more measures tap the same underlying construct. Multicollinearity can be problematic because the more independent variables are highly correlated, the larger the difference between R^2 and Adjusted R^2 . R^2 will not increase if the independent variables are redundant. Still, as the number of predictors increase, the standard error of estimate increases. Therefore, redundant variables do not provide additional unique variance, but lead to increased standard error of estimate that contributes to reduced statistical power. Three consequences of multicollinearity are lack of new information provided, lowered R^2 , and unstable coefficients. Perfect multicollinearity exists when at least one independent variable is a perfect linear combination of another independent variable ($r = 1$) (Field, 2005).

Screening. Multicollinearity can be assessed by reviewing a correlational matrix to determine if variables are strongly correlated. This is a fairly good method but it does not detect subtle forms of multicollinearity (Field, 2005). Variance Inflation Factor (VIF) is a diagnostic tool that captures subtle multicollinearity. VIF predicts whether a predictor has a strong linear relationship with the other predictors (Field). VIF rules vary. Myers (1990) suggested that a VIF value of 10 is problematic. Bowerman and O'Connell (1990) argued that a VIF that is substantially greater than 1 suggests that multicollinearity is biasing the regression model.

Initially, perfect multicollinearity was screened by reviewing a correlation matrix. The findings revealed that there was no multicollinearity among the independent variables. VIF was also computed to determine multicollinearity. The VIF value computed among the independent variables for each dependent variable remained the same for each drug use variable and differed only slightly for drug refusal efficacy. The

VIF values ranged from 1.027 to 1.544 indicating that multicollinearity did not exist using this method.

Normally Distributed Residual Error

Normally distributed residual error was examined across all variables. The histogram of standardized residuals illustrated a relatively normal curve that suggested that the error terms are distributed normally. In addition, the normal probability plot illustrated that the error terms are reasonably distributed normally, demonstrated by a line that approaches 45-degrees. Review of the scatter plots supported the findings of the histogram of standardized residuals and normal probability plots.

Sample Characteristics

The sample came from two waves and three cohorts of fifth, eighth, and twelfth grade students (N= 660). This study uses data collected at Time 1, although data were collected at three assessment points (Time 1, Time 2, and Time 3). Descriptive statistics on the sample are shown in Table 4. Eighty-six percent (N= 567) of the sample identified themselves as African American/Black, 8.8% identified as Biracial/Mixed, 2.7% identified as White, 1.4% identified as Latino American/Hispanic, .8% identified as Native American/Indian, and .3% identified as Asian American/Asian. Only data from African American participants were used in the analyses (N= 567). The mean age of the participants was 15.27 years ($sd = 2.902$), with a range of 9 to 21 years. Sixty-five (65.1) percent of the sample were females and 34.9% were males. Sixty (59.9) percent of the sample lived in urban areas and 40.1% of the sample lived in rural areas. Twenty-five (25.1) percent of the participants were in elementary school, 34.1% were in middle school, and 40.8% were in high school.

Table 4

Sample Demographic Characteristics

Variable	Category	<i>N</i>	%	<i>M</i>	<i>SD</i>
N= 567					
Age (years)				15.27	2.90
	9-11	99	17.5%		
	12-14	161	28.4%		
	15-17	82	14.5%		
	18-21	224	39.6%		
Gender	Male	197	34.9%		
	Female	367	65.1%		
Community Type	Rural	227	40.1%		
	Urban	340	59.9%		
School Cohort	Elementary	142	25.1%		
	Middle	193	34.1%		
	High	232	40.9%		
Grade Cohort	Fifth	142	25.0%		
	Eighth	192	33.9%		
	Ninth	4	0.7%		
	Tenth	2	0.4%		
	Eleventh	5	9.0%		
	Twelfth	222	39.2%		
Grades	Mostly As	89	15.8%		
	Mostly Bs	162	28.7%		
	Mostly Cs	168	29.7%		
	Mostly Ds	96	17.0%		
	Mostly Fs	50	8.8%		
Parents' Marital Status	Married	217	38.5%		
	Not Married	347	61.5%		
Household Structure	Mothers and Fathers	223	39.3%		
	Mothers and Step-fathers	77	13.6%		
	Fathers and Step-mothers	20	3.5%		

	Mothers only	140	24.7%
	Fathers only	6	1.1%
	Grandparents	89	15.8%
	Foster parents	2	0.4%
	Spouse	1	0.2%
Mother Employment	Mother Work Full Time	476	84%
	Did Not Work Full Time	69	12.2%
	Do Not Know	16	2.8%
	N/A	5	0.9%
Father Employment	Father Work Full Time	425	75.0%
	Did Not Work Full Time	43	7.6%
	Do Not Know	64	11.3%
	N/A	30	5.3%
Mother Education	Some Education	62	12.9%
	High School Graduates	177	36.8%
	Some College	99	20.6%
	College Graduates	143	29.7%
Father Education	Some Education	65	17.5%
	High School Graduates	161	43.4%
	Some College	48	12.9%
	College Graduates	97	26.1%

Twenty-five percent of the participants were in fifth grade, 33.9% were in eighth grade, .7% were in ninth grade, .4% were in tenth grade, 9% were in eleventh grade, and 39.2% were in twelfth grade. Participants reported that their grades were: 15.8% mostly As, 28.7% mostly Bs, 29.7% mostly Cs, 17% mostly Ds, and 8.8% mostly Fs.

Nearly thirty-nine (38.5) percent reported that their parents were married and 61.5% reported that their parents were not married. Thirty-nine percent reported living with their mothers and fathers, 13.6% lived with their mothers and step-fathers, 3.5% lived with their fathers and step-mothers, 24.7% lived only with their mothers (excluding adult siblings), and 1.1% lived only with their fathers (excluding adult siblings). Household structure is presented in table four. Most (84%) participants reported that their mothers/step-mothers worked full time or part time. Seventy-five percent reported that their fathers/step-fathers worked full time or part time. The highest percentage of participants reported their parents' highest level of education as high school graduates for mothers (36.8%) and fathers (43.4%) (see table 4).

Rural Participants

The mean age of rural participants was 15.83 years with a range of 11 to 21 years (see Table 5). Sixty-three (63.4) percent of the rural sample were females and 36.6% were males. Twenty (20.3) percent of the rural participants were in elementary school, 27.3% were in middle school, and 52.4% were in high school. Twenty (20.3%) percent of the rural participants were in fifth grade, 26.9% were in eighth grade, 1.8% were in ninth grade, .9% were in tenth grade, 1.3% were in eleventh grade, and 48.9% were in twelfth grade. Grades reported by the rural participants were: 13.7% mostly As, 29.5% mostly Bs, 32.2% mostly Cs, 17.6% mostly Ds, and 7% mostly Fs.

Table 5

Demographic Characteristics of Rural and Urban Sample

Variable	Category	Rural		Urban	
		N	%	N	%
		N= 227		N= 340	
Rural Age (years)	15.83 (mean) 2.84 (s.d.)				
Urban Age (years)	14.89 (mean) 2.89 (s.d.)				
	9-11	56	16.0%	43	19.8%
	12-14	99	28.3%	62	28.4%
	15-17	54	15.5%	28	12.8%
	18-21	140	40.2%	84	38.5%
Gender	Male	82	36.6%	115	33.9%
	Female	142	63.4%	225	66.2%
School Cohort	Elementary	46	20.3%	96	28.3%
	Middle	62	27.3%	131	38.6%
	High	119	52.4%	113	33.2%
Grade Cohort	Fifth	46	20.3%	96	28.3%
	Eighth	61	26.9%	131	38.6%
	Ninth	4	1.8%	0	0%
	Tenth	2	0.9%	0	0%
	Eleventh	3	1.3%	2	0.6%
	Twelfth	111	48.9%	111	32.6%
Grades	Mostly As	31	13.7%	58	17.2%
	Mostly Bs	67	29.5%	95	28.1%
	Mostly Cs	73	32.2%	95	28.1%
	Mostly Ds	40	17.6%	56	16.6%
	Mostly Fs	16	7.0%	34	10.1%
Parents' Marital Status	Married	108	47.8%	109	32.2%
	Not Married	118	52.2%	229	67.8%
Household Structure	Mothers and Fathers	123	54.2%	100	29.4%
	Mothers and Step-fathers	28	12.3%	49	14.4%
	Fathers and Step-mothers	8	3.5%	12	3.5%
	Mothers only	38	16.7%	102	30.0%

	Fathers only	2	0.9%	4	1.2%
	Grandparents	27	11.9%	62	18.3%
	Foster parents	1	0.4%	1	0.3%
	Spouse	0	0%	1	0.3%
Mother Employment	Mother Work Full Time	195	85.9%	281	82.9%
	Did Not Work Full Time	29	12.8%	40	11.8%
	Do Not Know	2	0.9%	14	4.1%
	N/A	1	0.4%	4	1.2%
Father Employment	Father Work Full Time	181	79.7%	244	72.0%
	Did Not Work Full Time	15	6.6%	28	8.3%
	Did Not Know	23	10.1%	41	12.1%
	N/A	7	3.1%	23	6.8%
Mother Education	Some High School	21	10.6%	41	14.5%
	High School Graduates	97	49.0%	80	28.3%
	Some College	25	12.6%	74	26.1%
	College Graduates	55	27.8%	88	31.1%
Father Education	Some High School	26	11.5%	39	18.8%
	High School Graduates	76	33.5%	85	40.9%
	Some College	15	6.6%	33	15.9%
	College Graduates	46	20.3%	51	24.5%

Nearly forty-eight (47.8) percent reported that their parents were married and 52.2% reported that their parents were not married. Fifty-four percent reported living with their mothers and fathers, 12.3% lived with their mothers and step-fathers, 3.5% lived with their fathers and step-mothers, 16.7% lived only with their mothers (excluding adult siblings), and .9% lived only with their fathers (excluding adult siblings). Household structure is presented in Table 5. Most participants (85.9%) reported that their mothers/stepmothers worked full time or part time. Similarly, most participants (79.7%) reported that their fathers/stepfathers worked full time or part time. The highest percentage of participants reported their parents' highest level of education as high school graduates for mothers (49%) and fathers (33.5%) (see Table 5).

Urban Participants

The mean age of urban participants was 14.89 years with a range of 9 to 20 years (see Table 5). Sixty-six (66.1) percent were females and 33.9% were males. Twenty-eight (28.3) percent were in elementary school, 38.6% were in middle school, and 33% were in high school. Twenty-eight (28.3%) percent were in fifth grade, 38.6% were in eighth grade, .6% were in eleventh grade, and 32.4% were in twelfth grade. Reported grades were 17.2% mostly As, 28.1% mostly Bs, 28.1% mostly Cs, 16% mostly Ds, and 10.1% mostly Fs.

Thirty-two (32.2) percent reported that their parents were married and 67.8% reported that their parents were not married. Twenty-nine percent reported living with their mothers and fathers, 14.4% lived with their mothers and step-fathers, 3.5% lived with their fathers and step-mothers, 30% lived only with their mothers (excluding adult siblings), and 1.2% lived only with their fathers (excluding adult siblings). Household

structure is presented in table 5. Most participants (82.9%) reported that their mothers/stepmothers worked full time or part time. Similarly, most participants (72%) reported that their fathers/stepfathers worked full time or part time. Most participants reported their parents' highest level of education as college graduates for mothers (31.1%) and high school graduates for their fathers (40.9%) (see Table 5).

In summary, the mean age and gender percentages were similar for rural and urban participants. Rural and urban participants reported receiving similar grades in school. More rural participants reported that their parents were married and that they lived with both parents. Parents' employment status was similar for rural and urban participants and education levels were also fairly similar. Table 5 provides a description of rural and urban demographic characteristics. See Table 6 for a summary of the total sample size according to community type, gender, and grade.

Sampling Bias

Chi-square tests were conducted to determine if gender and school type varied by community type. Analyses on 1) community type (urban and rural) x gender (girls and boys), 2) community type x school type (elementary, middle, and high school), and 3) school type x gender were conducted. Findings indicated that there was no bias in the community type x gender comparison ($p = .513$) or school type x gender relationship ($p = .283$). However, the community type x school type relationship was statistically significant ($p = .024$). A disproportionate number of students in urban elementary schools (67.6%) and middle schools (67.9%) were sampled.

Table 6

Sample Size by Community Type, Grade, and Gender

	Elementary	Middle	High	Total
<u>Rural Sub-Sample</u>				
<i>n</i> Girls	27 (58.7%)	40 (64.5%)	75 (63.0%)	142 (62.6%)
<i>n</i> Boys	16 (34.8%)	22 (35.5%)	44 (37.0%)	82 (36.1%)
Missing	3 (6.5%)			3 (1.3%)
<i>n</i> Total	46 (20.3%)	62 (27.3%)	119 (52.4%)	227 (40.0%)
<u>Urban Sub-Sample</u>				
<i>n</i> Girls	60 (62.5%)	94 (71.8%)	71 (63.4%)	225 (66.2%)
<i>n</i> Boys	36 (37.5%)	37 (28.2%)	42 (37.5%)	115 (33.9%)
<i>n</i> Total	96 (28.3%)	131 (38.6%)	112 (33.0%)	340 (60.0%)
<u>Total Sample</u>				
<i>n</i> Girls	87 (61.3%)	134 (69.4%)	145 (62.8%)	367 (64.7%)
<i>n</i> Boys	52 (36.6%)	59 (30.6%)	86 (37.2%)	197 (34.7%)
Missing	3 (0.5%)			3 (0.5%)
<i>N</i> Total	142 (25.0%)	193 (34.0%)	231 (40.7%)	567

Descriptive Statistics on Measures

Internal consistency reliability and central tendency were computed for all measures. The data are grouped for each measure. Table 7 summarizes the descriptive statistics. Table 8 summarizes the descriptive statistics according to gender and Table 9 summarizes the descriptive statistics according to community type. Refer to Table 10 for a comparison of internal consistency levels of the study measures with previously established levels.

Descriptive Statistics for Dependent Variables

Past 30 Day Tobacco Use, Alcohol Use, and Marijuana Use

Table 7 presents the descriptive statistics of the dependent variables to include frequency distributions. Responses could range from 0-6. Higher scores indicated higher frequency of cigarette smoking, alcohol consumption, and marijuana smoking during the past 30 day. Ninety-one percent of participants reported that they did not smoke cigarettes during the past 30 day (mode = 0). The mean score for past 30 day tobacco use was .22. Nearly eighty (79.8) percent of participants reported that they did not consume alcohol during the past 30 day (mode = 0). The mean score for past 30 day alcohol use was .35. Over ninety (90.8) percent of participants reported that they did not smoke marijuana during the past 30 day (mode = 0). The mean score for past 30 day marijuana use was .18. Refer to Table 11 for a comparison of the study participants' frequency of drug use to national data.

Drug Refusal Efficacy

Table 7 summarizes the descriptive statistics for drug refusal efficacy. The *Specific Event Drug and Alcohol Refusal Efficacy Scale* used to measure drug refusal

Table 7

Descriptive Statistics on Independent, Mediator, and Dependent Variables

	<i>M</i>	<i>SD</i>	Min.	Max.	Item Range	α	N of Items
<u>Dependent Variables</u>							
Past 30 Day Tobacco Use	0.22	0.84	0.00	6.00	0-6	N/A	1
0 days	516 (91.0%)						
1 or 2 days	22 (3.9%)						
3 to 5 days	12 (2.1%)						
6 to 9 days	3 (.5%)						
10 to 19 days	7 (1.2%)						
20 to 29 days	3 (.5%)						
All 30 days	4 (.7%)						
Past 30 Day Alcohol Use	0.35	0.87	0.00	6.00	0-6	N/A	1
0 days	450 (79.4%)						
1 or 2 days	68 (12.0%)						
3 to 5 days	25 (4.4%)						
6 to 9 days	10 (1.8%)						
10 to 19 days	7 (1.2%)						
20 to 29 days	2 (.4%)						
All 30 days	2 (.4%)						
Past 30 Day Marijuana Use	0.18	0.71	0.00	6.00	0-5	N/A	1
0 times	514 (90.7%)						
1 or 2 times	27 (4.8%)						
3 to 9 times	12 (2.1%)						
10 to 19 times	5 (.9%)						
20 to 39 times	3 (.5%)						
40 or more times	5 (.9%)						
Drug Refusal Efficacy	14.51	7.71	9.00	50.00	9-63	.87	9
<u>Independent and Mediator Variables</u>							
Parental Attitudes Toward Drug Use	10.87	1.75	3.00	12.00	3-12	.73	3
Mother-Adolescent Relationship	29.51	5.10	9.00	36.00	9-36	.76	9
Parental Monitoring	9.49	1.89	4.00	12.00	3-12	.70	4
Peer Risky Behavior	16.22	4.82	8.00	37.00	8-40	.77	8

Table 8

*Mean and Standard Deviations of Independent, Mediator, and Dependent Variables**By Gender*

	Total Sample		Males		Females	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
	<i>N</i> = 567		<i>n</i> = 197		<i>n</i> =367	
<u>Dependent Variables</u>						
Past 30 Day Tobacco Use	0.22	0.84	0.29	0.94	0.17	0.78
0 days			172 (87.3%)		341 (92.9%)	
1 or 2 days			10 (5.1%)		12 (3.3%)	
3 to 5 days			7 (3.6%)		5 (1.4%)	
6 to 9 days			2 (1.0%)		1 (.3%)	
10 to 19 days			4 (2.0%)		3 (.8%)	
20 to 29 days			0		3 (.8%)	
All 30 days			2 (1.0%)		2 (.5%)	
Past 30 Day Alcohol Use	0.35	0.87	0.40	0.96	0.33	0.82
0 days			154 (78.2%)		293 (79.8%)	
1 or 2 days			26 (13.2%)		42 (11.40%)	
3 to 5 days			8 (4.1%)		17 (4.6%)	
6 to 9 days			3 (1.5%)		7 (1.9%)	
10 to 19 days			4 (2.0%)		3 (.8%)	
20 to 29 days			1 (.5%)		1 (.3%)	
All 30 days			1 (.5%)		1 (.3%)	
Past 30 Day Marijuana Use	0.18	0.71	0.35	1.01	.10	0.46
0 times			167 (84.8%)		344 (93.7%)	
1 or 2 times			14 (7.1%)		13 (3.5%)	
3 to 9 times			6 (3.0%)		6 (1.6%)	
10 to 19 times			3 (1.5%)		2 (.5%)	
20 to 39 times			3 (1.5%)		0	
40 or more times			4 (2.0%)		1 (.3%)	
Drug Refusal Efficacy	14.51	7.71	14.62	7.94	14.43	7.61
<u>Independent and Mediator Variables</u>						
Parental Attitudes Toward Drug Use	10.87	1.75	10.68	1.81	10.96	1.72

Mother-Adolescent Relationship	29.51	5.10	29.55	5.14	29.50	5.09
Parental Monitoring	9.49	1.89	9.30	1.86	9.60	1.91
Peer Risky Behavior	16.22	4.82	17.39	4.88	15.59	4.69

Table 9

*Mean and Standard Deviations of Independent, Mediator, and Dependent Variables**By Community Type*

	Total Sample		Rural		Urban	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
	<i>N</i> = 567		<i>n</i> = 227		<i>n</i> = 340	
<u>Dependent Variables</u>						
Past 30 Day Tobacco Use	0.22	0.84	0.20	0.73	0.22	0.91
0 days			205 (90.3%)		311 (91.7%)	
1 or 2 days			9 (4.0%)		12 (3.5%)	
3 to 5 days			8 (3.5%)		4 (1.2%)	
6 to 9 days			0		3 (.9%)	
10 to 19 days			4 (1.8%)		3 (.9%)	
20 to 29 days			1 (.4%)		2 (.6%)	
All 30 days			0		4 (1.2%)	
Past 30 Day Alcohol Use	0.35	0.87	0.41	0.93	0.31	0.82
0 days			173 (76.2%)		277 (81.7%)	
1 or 2 days			30 (13.2%)		38 (11.2%)	
3 to 5 days			11 (4.8%)		14 (4.1%)	
6 to 9 days			4 (1.8%)		6 (1.8%)	
10 to 19 days			6 (2.6%)		1 (.3%)	
20 to 29 days			1 (.4%)		1 (.3%)	
All 30 days			0		2 (.6%)	
Past 30 Day Marijuana Use	0.18	0.71	0.17	0.65	0.19	0.75
0 times			205 (90.3%)		309 (91.2%)	
1 or 2 times			11 (4.8%)		15 (4.4%)	
3 to 9 times			4 (1.8%)		6 (1.8%)	
10 to 19 times			6 (2.6%)		3 (.9%)	
20 to 39 times			1 (.4%)		3 (.9%)	
40 or more times			0		3 (.9%)	
Drug Refusal Efficacy	14.51	7.71	15.10	8.14	14.08	7.37
<u>Independent and Mediator Variables</u>						
Parental Attitudes Toward Drug Use	10.87	1.75	10.86	1.76	10.87	1.75

Mother-Adolescent Relationship	29.51	5.10	29.39	4.80	29.59	5.29
Parental Monitoring	9.49	1.89	9.38	1.97	9.57	1.85
Peer Risky Behavior	16.22	4.82	16.69	5.00	15.90	4.67

Table 10

Scales: Established and Study Cronbach's alphas

Measures	Established Cronbach's alpha	Study Cronbach's alpha
<i>The Parental Attitudes Toward Drug Use Measure</i>	.78	.73
<i>Network of Relationship Inventory</i>		
Mother-Adolescent Relationship subscale	N/A	.76
<i>Parental Monitoring Scale</i>	.87-.94	.70
<i>Peer Problem Behavior Scale</i>	—	.77
<i>Specific Event Drug & Alcohol Refusal Efficacy Scale</i>	.89	.87

Note. Mother-Adolescent Relationship subscale was computed for this study. It was modified to use 9 items.

Table 11

Past 30 Day Drug Use Among African American Youth

Variable	Study Frequency (Ages 11 to 21)	Study Percentage	National Percentage (Ages 12 to 17)
Past 30 Day Cigarette Use	51	8.9%	6.5%
Past 30 Day Alcohol Use	114	20.3%	11.6%
Past 30 Day Marijuana Use	52	9.2%	11.0%*

Note. The source of the national data was the National Survey Drug Use and Health, 2005.

* This percentage is related to all illicit drug use (e.g., marijuana, cocaine)

efficacy was computed by summing scores of individual items. Reliability of this measure for this study was .87. The alpha of .87 is consistent with the alpha of .89 reported by Connors et al. (2001). Responses could range from 9-67 with higher scores indicating lower levels of drug refusal efficacy. The mean score was 14.51. The mode was 9 indicating that most participants felt very efficacious about refusing drugs.

Descriptive Statistics for Independent and Mediator Variables

Parental Attitudes Toward Drug Use

The *Parental Attitudes Toward Drug Use* scale was computed by summing scores of individual items. The internal consistency of the *Parental Attitudes Toward Drug Use* scale for this study was .73. The Cronbach alpha of .73 in this study is consistent with the alpha of .78 reported in a study of African American youth ages 11-18 (Arthur, Hawkins, Catalano, & Baglioni, 2002). Most participants reported high levels of perceived parent disapproval toward drug use. The mean was 10.87 on a scale that ranged from 3-12. Higher scores indicated youth perception of parents' disapproval of drug use. For example, 61.9% of participants reported that their parents would consider it "very wrong" for them to consume alcohol, 75.8% stated that their parents would consider it "very wrong" for them to smoke cigarettes, and 87% reported that their parents would consider it "very wrong" for them to smoke marijuana.

Mother-Adolescent Relationship

A modified subscale of the *Network of Relationship Inventory* (NRI) was used to examine mother-adolescent relationship. The modified scale consisted of nine items instead of ten as originally used. The "Who is the person who you see as a mother?" item was deleted because it was not theoretically necessary to explain the construct and

deleting it increased reliability. Specifically, deleting this item increased the potential to explain more of the variance in the construct given the increase in Cronbach's alpha from .66 to .76. The Cronbach's alpha of this subscale is consistent with previous studies (Furman & Buhrmester, 1985; Furman & Buhrmester, 1992).

The *NRI Mother-Adolescent Relationship* subscale was computed by summing scores of individual items. A Cronbach's alpha of .76 was computed for the *NRI Mother-Adolescent Relationship* subscale. Participants reported positive and close relationships with their mothers. Scores ranged from 9-36 with a mean score of 29.51. High scores indicated positive relationships with their mothers. The mode of all items was 33 indicating that most participants reported very positive and close relationships with their mothers.

Parental Monitoring

The *Parental Monitoring Scale* was computed by summing scores of individual items. Reliability of this measure for this study was .70. The Cronbach alpha of .70 is lower than the alphas of .87 to .94 reported in other studies (e.g., Li et al., 2000; Wu et al., 2003) but acceptable. Participants reported high levels of perceived monitoring. Responses ranged from 3-12 with a mean score of 9.49 with higher scores indicating higher levels of perceived parental monitoring. The mode of all items was 11 indicating that most participants reported very high levels of parental monitoring.

Peer Risky Behavior

The eight-item *Peer Problem Behavior Scale* was computed by summing scores of individual items. Reliability of this measure for this study was .77. Participants reported moderate levels of risky peer affiliation. The item range could be from 8-40.

The mean score for peer risky behavior was 16.22. Higher scores indicated risky peer affiliation.

Preliminary Analyses: Bivariate Analyses

To provide a preliminary understanding of the relationships among the variables, bivariate correlations were conducted. These correlations were conducted separately to examine the relationships among the 1) dependent variables (past 30 day tobacco use, past 30 day alcohol use, past 30 day marijuana use, and drug refusal efficacy); 2) demographic moderator variables (age, gender, community type); 3) independent, mediator, and moderator variables (parental attitudes toward drug use, mother-adolescent relationship, parental monitoring, peer risky behavior); and 4) demographic moderator variables, independent variables, mediator variables, moderator variables, and dependent variables.

Correlations among Dependent Variables and among Moderator Demographic Variables

Table 12 presents the correlations for the dependent variables. All dependent variables were correlated at $p < .01$. Table 13 presents the correlations for the moderator demographic variables. Two of three moderator demographic variables were correlated. Age was positively and significantly correlated with urban/rural community type. Older respondents lived in rural communities.

Correlations among Independent, Mediator, and Moderator Variables

Table 14 presents the correlations for the independent, mediator, and moderator variables. Perception of parental disapproval of drug use was associated with stronger quality mother-adolescent relationship ($r = .23$), higher levels of parental monitoring ($r = .29$), and less affiliation with peers who engage in risky behaviors ($r = -.31$). Perception

Table 12

Correlations among Dependent Variables

	1	2	3	4
(1) Past 30 Day Tobacco Use	1.0	.31**	.54**	.24**
(2) Past 30 Day Alcohol Use		1.0	.42**	.19**
(3) Past 30 Day Marijuana Use			1.0	.18**
(4) Drug Refusal Efficacy				1.0

Note. higher scores on past 30 day tobacco use = higher frequency of tobacco use
 higher scores on past 30 day alcohol use = higher frequency of alcohol use
 higher scores on past 30 day marijuana use = higher frequency of marijuana use
 higher scores on drug refusal efficacy = lower drug refusal efficacy

** $p < .01$.

Table 13

Correlations among Moderator/Demographic Variables

	1	2	3
(1) Age	1.0	-.04	.16**
(2) Gender		1.0	-.03
(3) Urban/Rural Community Type			1.0

Note. higher scores on age = older respondents
 higher scores on gender = female respondents
 higher scores on urban/rural community type = rural community type

** $p < .01$.

Table 14

Correlations among Independent, Mediator, and Moderator Variables

	1	2	3	4
(1) Parental Attitudes Toward Drug Use	1.0	.23**	.29**	-.31**
(2) Mother-Adolescent Relationship		1.0	.39**	-.28**
(3) Parental Monitoring			1.0	-.42**
(4) Peer Risky Behavior				1.0

Note. higher scores on parental attitudes toward drug use = perception of parents' disapproval of drug use
 higher scores on mother-adolescent relationship = perception of positive relationship with mothers
 higher scores on parental monitoring = higher levels of parental monitoring
 higher scores on peer risky behavior = higher frequency of risky peer affiliation

** $p < .01$.

of a positive mother-adolescent relationship was associated with higher levels of parental monitoring ($r = .39$), and fewer friends who engaged in risky behaviors ($r = -.28$).

Higher levels of parental monitoring was correlated with fewer friends who engaged in risky behavior ($r = -.42$).

Correlations among Independent, Mediator, Moderator, and Dependent Variables

Table 15 presents the correlations for the independent, mediator, moderator, and dependent variables. Older respondents lived in rural communities ($r = .16$), perceived that parents would approve their drug use ($r = -.21$), had lower quality relationships with their mothers ($r = -.21$), had lower levels of parental monitoring ($r = -.36$), more friends who engaged in risky behavior ($r = .39$), smoked cigarettes ($r = .21$), drank alcohol ($r = .24$), and smoked marijuana ($r = .18$). Female respondents perceived parents approval of their drug use ($r = -.08$), affiliated with fewer friends who engaged in peer risky behavior ($r = -.18$), and drank less alcohol ($r = -.17$). Youth who perceived that their parents disapproved of their drug use had higher quality relationships with their mothers ($r = .23$), higher levels of parental monitoring ($r = .29$), fewer friends who engaged in risky behaviors ($r = -.31$), smoked less cigarettes ($r = -.32$), drank less alcohol ($r = -.27$), smoked less marijuana, ($r = -.20$), and had higher levels of drug refusal efficacy ($r = -.11$). Youth who had positive relationships with their mothers had higher levels of parental monitoring ($r = .39$), few affiliations with risky peers ($r = -.28$), consumed less alcohol ($r = -.12$), and had higher drug refusal efficacy ($r = -.12$). Participants who had high levels of parental monitoring had fewer friends who engaged in peer risky behaviors ($r = -.42$), smoked fewer cigarettes ($r = -.21$), drank less alcohol ($r = -.29$), smoked less marijuana ($r = -.18$), and had higher drug refusal efficacy ($r = -.22$). Participants who

Note. higher scores on age = older respondents
higher scores on gender = female respondents
higher scores on urban/rural community type = rural community type
higher scores on parental attitudes toward drug use = perception of parents' disapproval of drug use
higher scores on mother-adolescent relationship = perception of positive relationship with mothers
higher scores on parental monitoring = higher levels of parental monitoring
higher scores on peer risky behavior = higher frequency of drug using peers
higher scores on past 30 day tobacco use = higher frequency of tobacco use
higher scores on past 30 day alcohol use = higher frequency of alcohol use
higher scores on past 30 day marijuana use = higher frequency of marijuana use
higher scores on drug refusal efficacy = lower drug refusal efficacy

* $p < .05$. ** $p < .01$.

had fewer affiliations with friends who engaged in risky behaviors smoked less cigarettes ($r = .33$), drank less alcohol ($r = .37$), smoked less marijuana ($r = .29$), and had less drug refusal efficacy ($r = .26$). Past 30 day tobacco use was significantly correlated with past 30 day alcohol use ($r = .31$), past 30 day marijuana use ($r = .54$), and drug refusal efficacy ($r = .24$). Past 30 day alcohol use was significantly correlated with past 30 day marijuana use ($r = .42$) and drug refusal efficacy ($r = .19$). Past 30 day marijuana use was significantly associated with drug refusal efficacy ($r = .18$).

Due to scale coarseness, the r values reported in the Pearson's product correlations are underestimated. As shown in Table 16, the Pearson's product correlations (r) were corrected using a Scale Coarseness Software Program (Aguinis, Pierce, & Culpepper, in press). These corrected r values are based upon sample size, observed correlation, and scale points for the independent and dependent variables.

Multiple Regression Analyses: Hypotheses Testing

As described in Chapter three, hierarchical multiple regression analyses were used to examine the predictive value of parent and peer factors on drug refusal efficacy and use. Age and gender were controlled in the regression equation. A dummy variable was created for gender during data entry, and gender and age were always entered in the first step of the regression equation. The empirical model illustrates the study's hypotheses (see Figure 6).

The effect size or total variance (R^2) in the dependent variables explained by the independent variable or combination of independent variables was examined for each model. Because R^2 typically overestimates the population value, R^2_{adj} was used instead to account for the bias in R^2 . Change in R^2 was also examined to assess the change in

Table 16

Correlations among Independent, Mediator, Moderator, and Dependent Variables: Corrected r

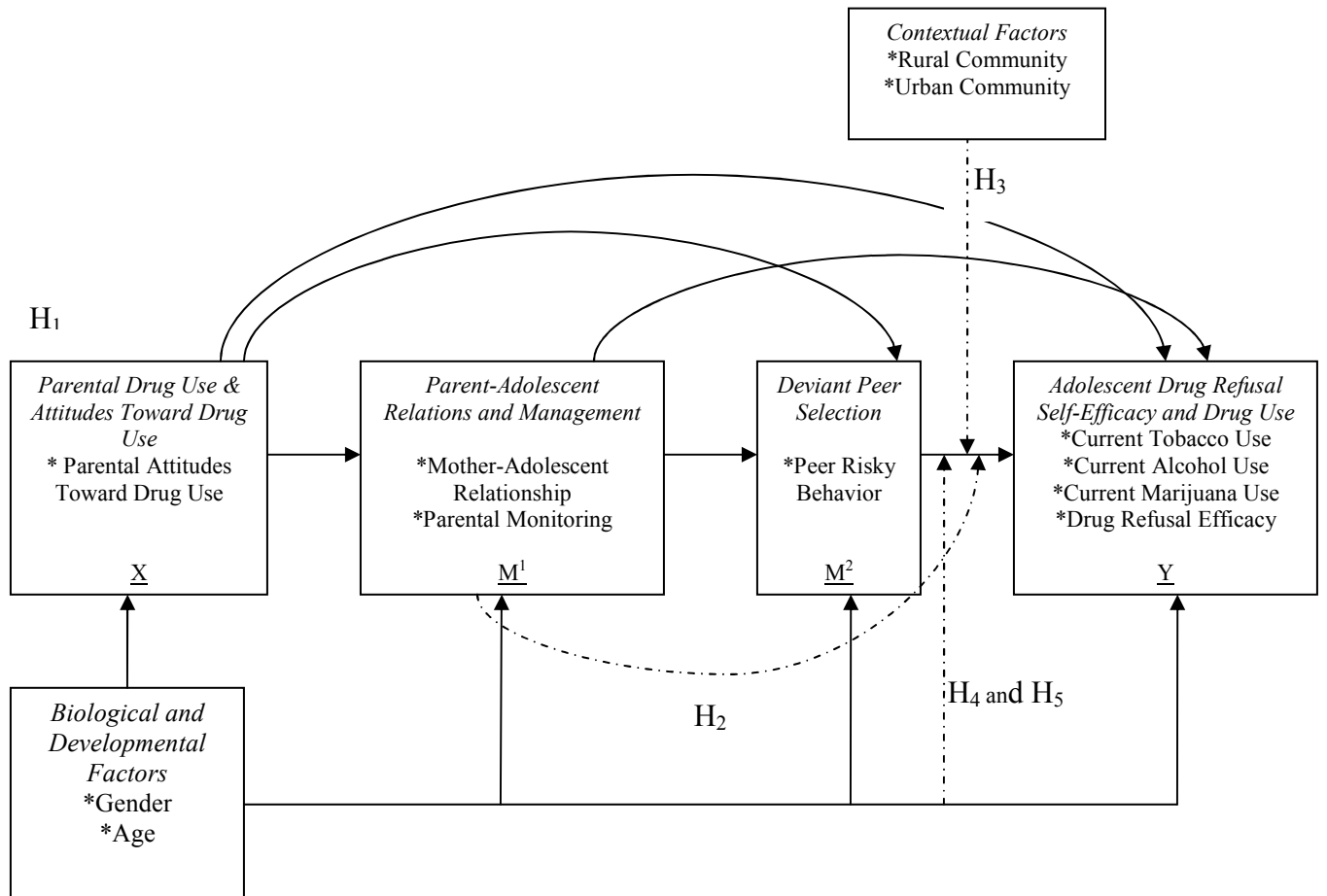
	1	2	3	4	5	6	7	8	9	10	11
(1) Age	1.0	-.04	1.6**	-.21**	-.21**	-.36**	.39**	.21**	.24**	.18**	.02
(2) Gender		1.0	-.03	-.11*	-.00	.07	-.18**	-.09	-.05	-.17**	-.01
(3) Urban/Rural Community Type			1.0	.00	-.01	-.05	.08	-.01	.06	-.01	.08
(4) Parental Attitudes Toward Drug Use				1.0	.27**	.37**	-.36**	-.36**	-.30**	-.23**	-.12**
(5) Mother-Adolescent Relationship					1.0	.39**	-.28**	-.08	-.12**	-.03	-.14**
(6) Parental Monitoring						1.0	-.42**	-.21**	-.35**	-.22**	-.26**
(7) Peer Risky Behavior							1.0	.36**	.40**	.32**	.28**
(8) Past 30 Day Tobacco Use								1.0	.31**	.58**	.26**
(9) Past 30 Day Alcohol Use									1.0	.45**	.20**
(10) Past 30 Day Marijuana Use										1.0	.19**
(11) Drug Refusal Efficacy											1.0

Note. Bold r values were not corrected because these values were measured using a continuous scale.

* $p < .05$. ** $p < .01$.

Figure 6

Empirical model of adolescent drug use



variance after new variables were added to the model. The F -test was also examined given that it indicates whether the relationship is linear and if the model significantly predicts the dependent variable. The p value of .05 was used and reported as a significance test. The unstandardized regression coefficient (B) was examined as it indicates how much the value of the dependent variable changes when the independent variable increases by 1. Confidence intervals (CI) for the B are reported in the tables to present information about the location, precision, and significance levels of the B . Specifically, the upper and lower bounds of the 95% CI s are consistently reported. The beta weight (β) was also examined to assess the contribution of each individual independent variable.

Hypothesis 1

Hypothesis₁: Parental attitudes toward drug use, parent-adolescent relations and management (mother-adolescent relationship, parental monitoring), and peer risky behavior will have direct and indirect effects on adolescent drug refusal efficacy and use. Parental attitudes toward drug use will have a direct effect on parent-adolescent relations and management, which will have a direct effect on peer risky behavior, which will have a direct effect on drug refusal efficacy and use. That is, 1) parent-adolescent relations and management will partially mediate the relationship between parental attitudes toward drug use and peer risky behavior and, 2) peer risky behavior will partially mediate the relationship between parent-adolescent relations and management and adolescent drug refusal efficacy and use and, 3.) parent-adolescent relations and management and peer

risky behavior will partially mediate the relationship between parental attitudes toward drug use and adolescent drug refusal efficacy and use.

In the social sciences, mediation analyses are typically guided by the procedures outlined by Baron and Kenny (1986). To date, their moderation-mediation article is one of the most frequently cited with 10,291 citations (Social Science Citation Index) as of September 4, 2008. Baron and Kenny pointed out that a mediation model must include the following criteria: 1) the independent variable must be significantly associated with the dependent variable ($X \rightarrow Y$), 2) the independent variable must be significantly associated with the mediator variable ($X \rightarrow M$), 3) the mediator variable must be significantly associated with the dependent variable while controlling for the independent variable, ($\cancel{X}M \rightarrow Y$), 4) the relationship between the independent variable and dependent variable is insignificant while controlling for the mediator variable ($\cancel{X} \rightarrow M \rightarrow Y$). That is, for full or complete mediation, when both the independent variable and mediator variable are entered into the model to predict the dependent variable, the mediator should remain significant while the independent variable should become non-significant.

Sobel Test

Still, there are more rigorous statistical procedures and tests that are used to examine mediation (Preacher & Hayes, 2004). One of these tests is the Sobel test (Sobel, 1982). One important limitation of Baron and Kenny's approach is that it does not provide a direct estimate of the size of the indirect effect of the independent variable (X) on the dependent variable (Y) (MacKinnon, 2002). The Sobel test extends Baron and Kenny's approach to formally require a direct test of the indirect effect of the independent variable on the dependent variable. The indirect effect is defined as the

product of the relationships between the independent and mediator variable ($X \rightarrow M$) and mediator variable and dependent variable controlling for the independent variable ($\cancel{X}M \rightarrow Y$) (Preacher & Hayes). That is, the indirect effect equals $(X \rightarrow M) \times (\cancel{X}M \rightarrow Y)$. The indirect effect may also be defined as the difference between the total effect ($X \rightarrow Y$) and the direct effect of $X \rightarrow Y$ controlling for the mediator ($\cancel{XM} \rightarrow Y$) (Preacher & Hayes). That is, the indirect effect equals $(X \rightarrow Y) - (\cancel{XM} \rightarrow Y)$. The requirement of a direct test of the indirect effect of the independent variable on the dependent variable is not explicitly stated by Baron and Kenny. Consequently, most researchers do not test this required effect (Preacher & Hayes).

There are several advantages to conducting mediation analyses with the Sobel test instead of Baron and Kenny (1986)'s guidelines. First, the Baron and Kenny approach has low statistical power (MacKinnon et al., 2002). Methods with low statistical power typically fail to detect real effects. Sobel's test has been demonstrated to have more statistical power than other tests used to test mediation including Baron and Kenny's approach (MacKinnon et al.). At a sample size of 500, the Aroian version of the Sobel test has power above .56 to detect small effect sizes and 1.0 power to detect medium and large sizes (MacKinnon et al.) Conversely, at a sample size of 500, the Baron and Kenny approach has power of .04 to detect small effect size, .86 to detect medium effect size, and 1.0 to detect large effect size. Second, Baron and Kenny's approach has Type I errors that are too low. The Sobel test produces fewer type I and II errors given that fewer inferential tests are required and it adds an additional step that does not rely solely on regression coefficients that may fluctuate due to sample size (Preacher & Hayes, 2004). Methods that exceed nominal rates of Type I error may find nonexistent effects

(MacKinnon et al.). Third, the requirement of the product of the relationships between the independent and mediator variable ($X \rightarrow M$) and mediator variable and dependent variables ($M \rightarrow Y$) controlling for the independent variable, addresses mediation more directly than does a series of regression steps (Preacher & Hayes). Detailed descriptions of the utility of the Sobel test have been described elsewhere (e.g., MacKinnon et al.; Preacher & Hayes).

In a comparison of 14 methods used to examine mediation and intervening effects, MacKinnon, Lockwood, Hoffman, West, and Sheets (2002) found that the Sobel test was superior in terms of statistical power. In the present study, Baron and Kenny's approach and the more conservative mediation test, the Sobel test were used and reported. Specifically, the Aroian version of the Sobel test that adds the third denominator (Aroian, 1944/1947; Sobel, 1982) was used per Baron and Kenny (1986)'s recommendation. It was important to use a conservative test such as the Sobel test, particularly given the large number of inferential tests conducted to test the study's hypotheses. The Sobel test statistic was computed using an online interactive calculation tool (Preacher & Leonardelli, 2001). However, it can also be calculated using statistical software programs (e.g., SPSS, SAS, STATA).

Mediation Analyses: Example

The next several paragraphs provide an example that describes the steps followed to test Hypothesis I using Baron and Kenny (1986)'s procedures. Hierarchical multiple regressions were conducted using separate regression analyses. First, past 30 day tobacco use (a dependent variable) was entered as the dependent variable and mother-adolescent relationship was entered as the independent variable in the regression equation to

determine whether these variables were correlated. If this model was not significant, analyses halted. If this model was significant, the mediator variable, peer risky behavior was entered as the dependent variable and mother-adolescent relationship was entered as the independent variable. If this model was not significant, analyses halted. If this model was significant, past 30 day tobacco use was entered as the dependent variable and the independent variable, mother-adolescent relationship and mediator variable, peer risky behavior were entered as independent variables in the regression equation. The purpose of this step was to show that the mediator variable affected the dependent variable, controlling for the independent variable. These steps were followed for each dependent variable (past 30 day tobacco use, past 30 day alcohol use, past 30 day marijuana use, drug refusal efficacy) and each variable in the parent-adolescent relations and management (mother-adolescent relations, parental monitoring) and deviant peer selection (peer risky behavior) domains. In this first phase, drug refusal efficacy and drug use variables were the dependent variables, the deviant peer selection variable was the mediator, and parent-adolescent relationship and management variables were the independent variables.

After determining mediation in the first phase, separate regression analyses were computed to test mediation in a second phase using the same steps. However, in this phase, the deviant peer selection variable was the dependent variable, parent-adolescent relationship and management variables were mediator variables, and parental attitudes toward drug use was the independent variable.

Finally, after determining mediation in the first two phases, the full model was examined. Parent attitudes toward drug use was entered as the independent variable,

parent-adolescent relations and management and deviant peer selection variables were entered as mediator variables, and drug refusal efficacy and use were entered separately as dependent variables.

Complete (also called “full” or “perfect”) mediation occurred if the relationship between the independent and dependent variable was zero or nonsignificant during the final step. Complete mediation occurs when the mediator completely mediates the relationship between the independent and dependent variable. Complete mediation was determined by examining whether the unstandardized regression coefficient was reduced to zero or if the standardized regression coefficient became insignificant in the final step. Using the Sobel test, complete mediation was established after the requirement of a direct test of the indirect effect of the independent variable (X) on the dependent variable (Y) was met.

To establish that partial mediation occurred, the relationship between the independent and dependent variable had to be significantly reduced. Specifically, this relationship had to be reduced by two standard errors of the *B* of the independent variable predicting the dependent variable in the equation.

Phase I: Mediation Analyses

During phase I, parent-adolescent relationship and management variables (mother-adolescent relationship, parental monitoring) were entered as independent variables (\underline{M}^1), deviant peer selection variable (peer risky behavior) was entered as the mediator variable (\underline{M}^2), and drug refusal efficacy and drug use variables were entered as dependent variables (\underline{Y}) (see Figure 6). Mother-adolescent relationship was entered as the independent variable in Phase Ia and parental monitoring was entered as the

independent variable in Phase Ib. Age and gender were entered in step one of each analysis.

Phase Ia: Mother-Adolescent Relationship and Past 30 Day Tobacco Use. Peer risky behavior was predicted to mediate the relationship between mother-adolescent relationship and past 30 day tobacco use. The first requirement of mediation that mother-adolescent relationship needed to significantly predict past 30 day tobacco use was not met. Results indicated that the overall model was significant when controlling for age and gender ($R^2 = .049$, $R^2_{adj} = .044$, $F(3, 559)=9.52$, $p < .01$), however, mother-adolescent relationship did not predict past 30 day tobacco use ($\beta=-.039$, $t(559)=-.927$, $p = .354$). Thus, further analyses were not performed. The effect size for this model was .044. The model explained approximately 4.4% of the variance in past 30 day tobacco use. The Sobel test was not calculated given that the independent variable and dependent variable were not associated.

Phase Ia: Mother-Adolescent Relationship and Past 30 Day Alcohol Use. Peer risky behavior was predicted to mediate the relationship between mother-adolescent relationship and past 30 day alcohol use. The first requirement of mediation that mother-adolescent relationship must significantly be associated with past 30 day alcohol use was not met ($\beta=-.073$, $t(559)=-1.746$, $p = .081$), although the overall model was significant ($R^2 = .065$, $R^2_{adj} = .060$, $F(3, 559)=12.87$, $p < .01$). No further analyses were conducted. The effect size for this model was .060. The model explained approximately 6.0% of the variance in past 30 day alcohol use. The Sobel test was not calculated.

Phase Ia: Mother-Adolescent Relationship and Past 30 Day Marijuana Use. Peer risky behavior was predicted to mediate the relationship between mother-adolescent

relationship and past 30 day marijuana use. The first requirement of mediation that mother-adolescent relationship needed to significantly predict past 30 day marijuana use was not met. Results indicated that the overall model was significant ($R^2 = .058$, $R^2_{adj} = .053$, $F(3, 559) = 11.47$, $p < .01$), however, mother-adolescent relationship did not predict past 30 day marijuana use ($\beta = .007$, $t(559) = .170$, $p = .865$). No further analyses were performed. The effect size for this model was .053. The model explained approximately 5.3% of the variance in past 30 day marijuana use. The Sobel test was not calculated.

Phase Ia: Mother-Adolescent Relationship and Drug Refusal Efficacy. Peer risky behavior was predicted to mediate the relationship between mother-adolescent relationship and drug refusal efficacy. The first requirement of mediation that mother-adolescent relationship must significantly be associated with drug refusal efficacy ($M^1 \rightarrow Y$) was met ($\beta = -.150$, $t(559) = -3.497$, $p = .001$). The effect size for this model was .009. This model explained less than 1% of the variance in drug refusal efficacy. For the second requirement, mother-adolescent relationship must significantly predict peer risky behavior, the mediator variable ($M^1 \rightarrow M^2$). This requirement was met ($\beta = -.216$, $t(559) = -5.682$, $p = .000$). The effect size for this model was .215. The model explained 21.5% of the variance in peer risky behavior. The third requirement was that peer risky behavior must be significantly associated with drug refusal efficacy while controlling for mother-adolescent relationship ($M^1 + M^2 \rightarrow Y$). When entered simultaneously, peer risky behavior remained significant ($R^2 = .079$, $R^2_{adj} = .073$, $F(4, 558) = 12.00$, $p < .01$; $\beta = .288$, $t(558) = 6.274$, $p = .000$) while mother-adolescent relationship did not ($\beta = -.059$, $t(558) = -1.387$, $p = .166$). Thus, the requirement for complete mediation was met ($M^1 + M^2 \rightarrow Y$). Peer risky behavior mediated the relationship between mother-adolescent relationship

and drug refusal efficacy. The effect size for the final model was .073. The model explained 7.3% of the variance on drug refusal efficacy. Table 17 summarizes these findings. Figure 7 illustrates the relationship. The Sobel test supported the complete mediation findings of the Baron and Kenny (1986) approach (*Sobel t* = -4.12888968, $p < .01$).

Phase Ib: Parental Monitoring and Past 30 Day Tobacco Use. Peer risky behavior was predicted to mediate the relationship between parental monitoring and past 30 day tobacco use. The first requirement of mediation was that parental monitoring needed to significantly predict past 30 day tobacco use ($M^1 \rightarrow Y$). This requirement was met ($\beta = -.151$, $t(559) = -3.442$, $p = .001$). The effect size for this model was .062. This model explained 6.2% of the variance in past 30 day tobacco use. For the second requirement, parental monitoring must significantly predict peer risky behavior, the mediator variable ($M^1 \rightarrow M^2$). This requirement was met ($\beta = -.305$, $t(559) = -7.789$, $p = .000$). The effect size for this model was .253. This model explained 25.3% of the variance in peer risky behavior. The third requirement was that peer risky behavior must be significantly associated with past 30 day tobacco use while controlling for parental monitoring ($M^1 + M^2 \rightarrow Y$). When entered simultaneously, peer risky behavior remained significant ($R^2 = .120$, $R^2_{adj} = .114$, $F(4, 558) = 19.05$, $p < .01$; $\beta = .268$, $t(558) = 5.809$, $p = .000$), while parental monitoring did not ($\beta = -.069$, $t(558) = -1.546$, $p = .123$). Thus, the requirement for complete mediation was met ($M^1 + M^2 \rightarrow Y$). Peer risky behavior mediated the relationship between parental monitoring and past 30 day tobacco use. The effect

Table 17

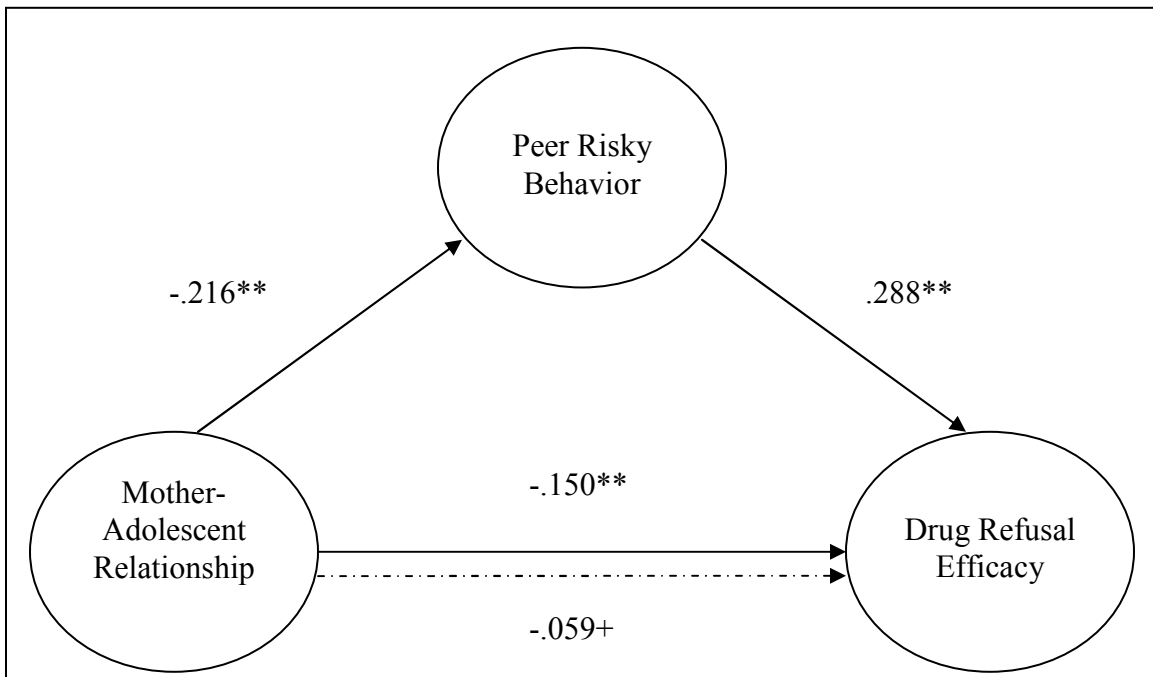
*Summary of Hierarchical Regression Analysis for Phase I Mediation of Peer Risky**Behavior on Mother-Adolescent Relationship and Drug Refusal Efficacy*

Variable	R^2_{adj}	$R^2\Delta$	B	SEB	95%CI	β
Step 1	-.003	.001				
Age			.047	.112	-.173, -.267	.018
Gender			-.210	.680	-1.546, 1.125	-.013
Step 2	.073	.079				
Age			-.275	.117	-.505, -.044	-.104*
Gender			.549	.666	-.759, 1.857	.034
Mother-Adolescent Relationship			-.090	.065	-.218, .038	-.059
Peer Risky Behavior			.464	.074	.319, .610	.288**

* $p < .05$. ** $p < .01$.

Figure 7

Peer Risky Behavior as a Complete Mediator in the Relationship between Mother-Adolescent Relationship and Drug Refusal Efficacy



Note. The dashed line (---) represents the relationship between the mediator(s) and dependent variable when controlling for the independent variable. The + symbol represents nonsignificant values.

$^{**} p < .01$. + *ns*.

size of the final model was .114. The model explained 11.4% of the variance in past 30 day tobacco use. Table 18 summarizes these findings. Figure 8 illustrates the relationship. The Sobel test supported the complete mediation findings of the Baron and Kenny (1986) approach (*Sobel* $t=-4.7239344$, $p < .01$).

Phase Ib: Parental Monitoring and Past 30 Day Alcohol Use. Peer risky behavior was predicted to mediate the relationship between parental monitoring and past 30 day alcohol use. The first requirement of mediation that parental monitoring must be significantly associated with past 30 day alcohol ($M^1 \rightarrow Y$) use was met ($\beta=-.233$, $t(559)=-5.430$, $p = .000$). The effect size for this model was .102. The model explained 10.2% of the variance in past 30 day alcohol use. For the second requirement, parental monitoring must significantly predict peer risky behavior, the mediator variable ($M^1 \rightarrow M^2$). This requirement was met ($\beta=-.305$, $t(559)=-7.789$, $p = .000$). The effect size for this model was .253. The model explained 25.3% of the variance in peer risky behavior. The third requirement was that peer risky behavior must be significantly associated with past 30 day alcohol use while controlling for parental monitoring ($M^1 M^2 \rightarrow Y$). When entered simultaneously, peer risky behavior remained significant ($R^2 = .164$, $R^2_{adj} = .158$, $F(4, 558)=27.30$, $p < .01$; $\beta=.277$, $t(558)=6.168$, $p = .000$) as well as parental monitoring ($\beta=-.149$, $t(558)=-3.396$, $p = .001$). Thus, the requirement for complete mediation was not met. Statistical calculations were conducted to establish partial mediation. Results indicated that partial mediation ($M^1 M^2 \rightarrow Y$) occurred (X step 1 $B = -.107$ and $SE = .020$, X step 3 $B = -.068$). That is, peer risky behavior partially mediated the relationship between parental monitoring and past 30 day alcohol use. The effect size for the final model was .158. The model explained 15.8% of the variance in past 30 day alcohol use.

Table 18

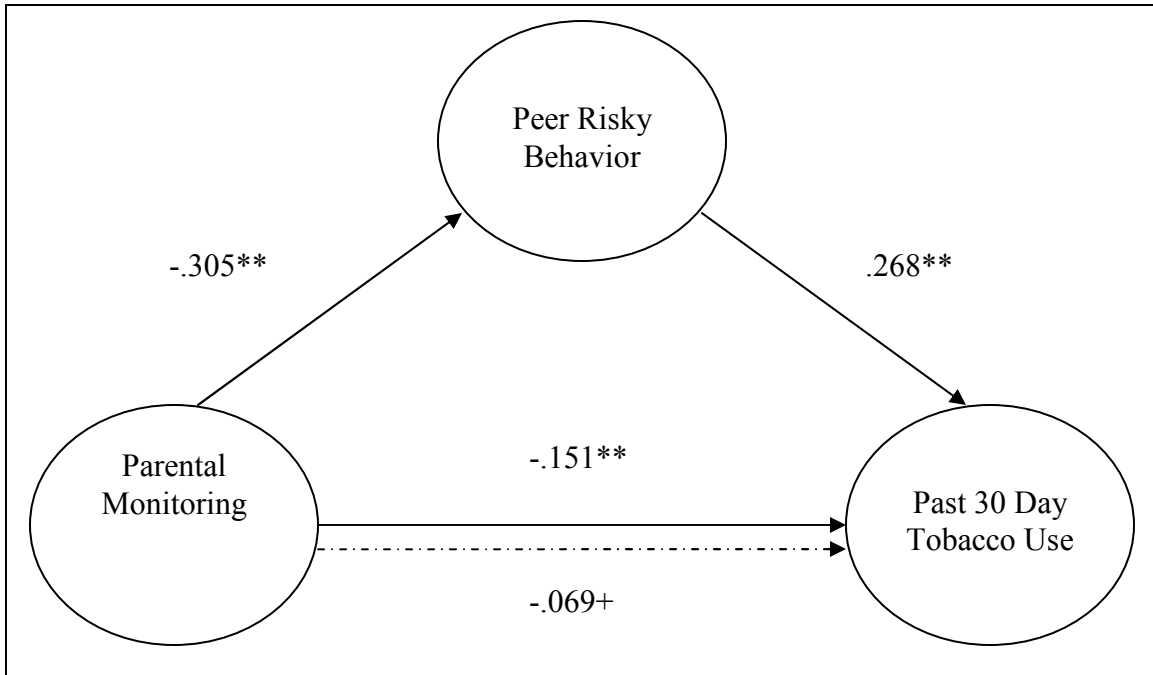
*Summary of Hierarchical Regression Analysis for Phase I Mediation of Peer Risky**Behavior on Parental Monitoring and Past 30 Day Tobacco Use*

Variable	R^2_{adj}	$R^2\Delta$	B	SEB	95%CI	β
Step 1	.044	.047				
Age			.060	.012	.037, .084	.206
Gender			-.108	.073	-.251, .036	-.061
Step 2	.114	.073				
Age			.023	.013	-.002, .049	.080
Gender			-.021	.072	-.161, .120	-.012
Parental Monitoring			-.031	.020	-.071, .008	-.069
Peer Risky Behavior			.048	.008	.031, .064	.268**

** $p < .01$.

Figure 8

Peer Risky Behavior as a Complete Mediator in the Relationship between Parental Monitoring and Past 30 Day Tobacco Use



Note. The dashed line (---) represents the relationship between the mediator(s) and dependent variable when controlling for the independent variable. The + symbol represents nonsignificant values.

$** p < .01. + ns.$

Table 19 summarize these findings. Figure 9 is an illustration of the relationship. The Sobel test supported the partial mediation findings of the Baron and Kenny (1986) approach (*Sobel* $t=-4.84513425, p < .01$).

Phase Ib: Parental Monitoring and Past 30 Day Marijuana Use. Peer risky behavior was predicted to mediate the relationship between parental monitoring and past 30 day marijuana use. The first requirement of mediation was that parental monitoring needed to significantly predict past 30 day marijuana use ($M^1 \rightarrow Y$). This requirement was met ($\beta=-.119, t(559)=-2.708, p =.007$). The effect size for this model was .065. The model explained 6.5% of the variance in past 30 day marijuana use. For the second requirement, parental monitoring must significantly predict peer risky behavior, the mediator variable ($M^1 \rightarrow M^2$). This requirement was met ($\beta=-.305, t(559)=-7.789, p =.000$). The effect size for this model was .253. The model explained 25.3% of the variance in peer risky behavior. The third requirement was that peer risky behavior must be significantly associated with past 30 day marijuana use while controlling for parental monitoring ($M^1 M^2 \rightarrow Y$). When entered simultaneously, peer risky behavior remained significant ($R^2 = .105, R^2_{adj} = .098, F(4, 558)=16.32, p < .01; \beta=.216, t(558)=4.641, p =.000$), while parental monitoring did not ($\beta=-.053, t(558)=-1.167, p =.244$). Thus, the requirement for complete mediation was met ($M^1 M^2 \rightarrow Y$). Peer risky behavior mediated the relationship between parental monitoring and past 30 day marijuana use. The effect size for the final model was .098. The model explained 9.8% of the variance in past 30 day marijuana use. Table 20 summarizes these findings. Figure 10 illustrates the relationship. The Sobel test supported the complete mediation findings of the Baron and Kenny (1986) approach (*Sobel* $t=-3.91575368, p < .01$).

Table 19

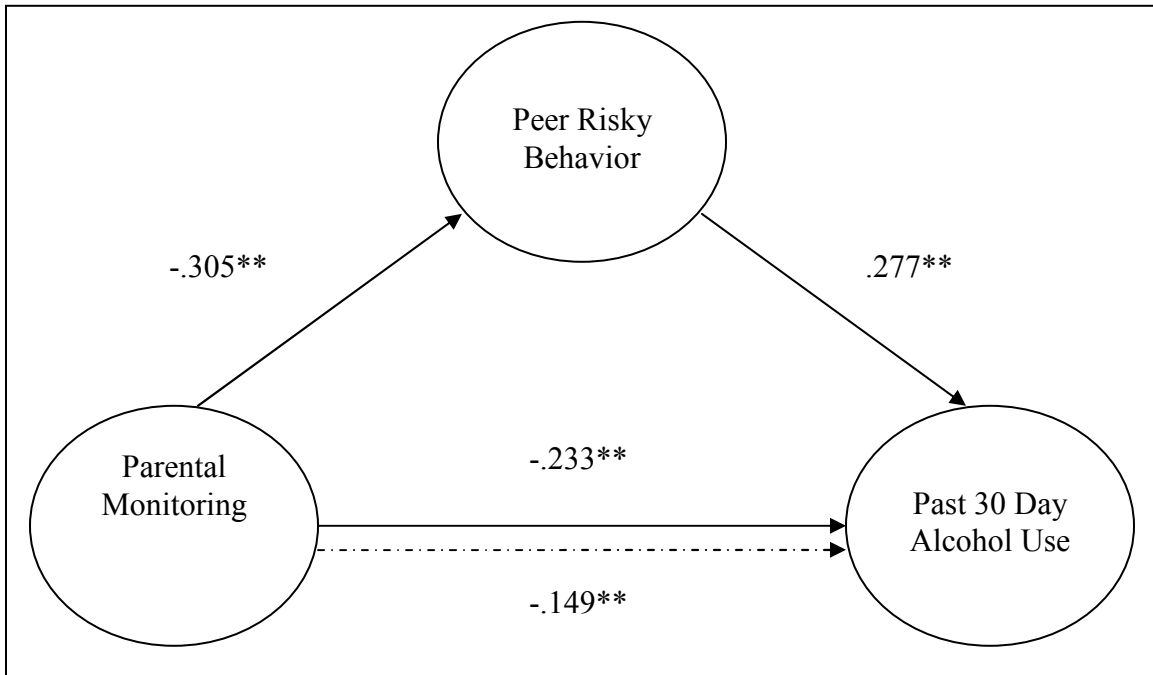
*Summary of Hierarchical Regression Analysis for Phase I Mediation of Peer Risky**Behavior on Parental Monitoring and Past 30 Day Alcohol Use*

Variable	R^2_{adj}	$R^2\Delta$	B	SEB	95%CI	β
Step 1	.056	.060				
Age			.072	.012	.048, .096	.241**
Gender			-.051	.075	-.198, .095	-.028
Step 2	.158	.104				
Age			.025	.013	.000, .050	.083
Gender			.050	.072	-.091, .190	.027
Parental Monitoring			-.068	.020	-.108, -.029	-.149**
Peer Risky Behavior			.050	.008	.034, .066	.277**

** $p < .01$.

Figure 9

Peer Risky Behavior as a Partial Mediator in the Relationship between Parental Monitoring and Past 30 Day Alcohol Use



Note. The dashed line (---) represents the relationship between the mediator(s) and dependent variable when controlling for the independent variable.

$^{**} p < .01$.

Table 20

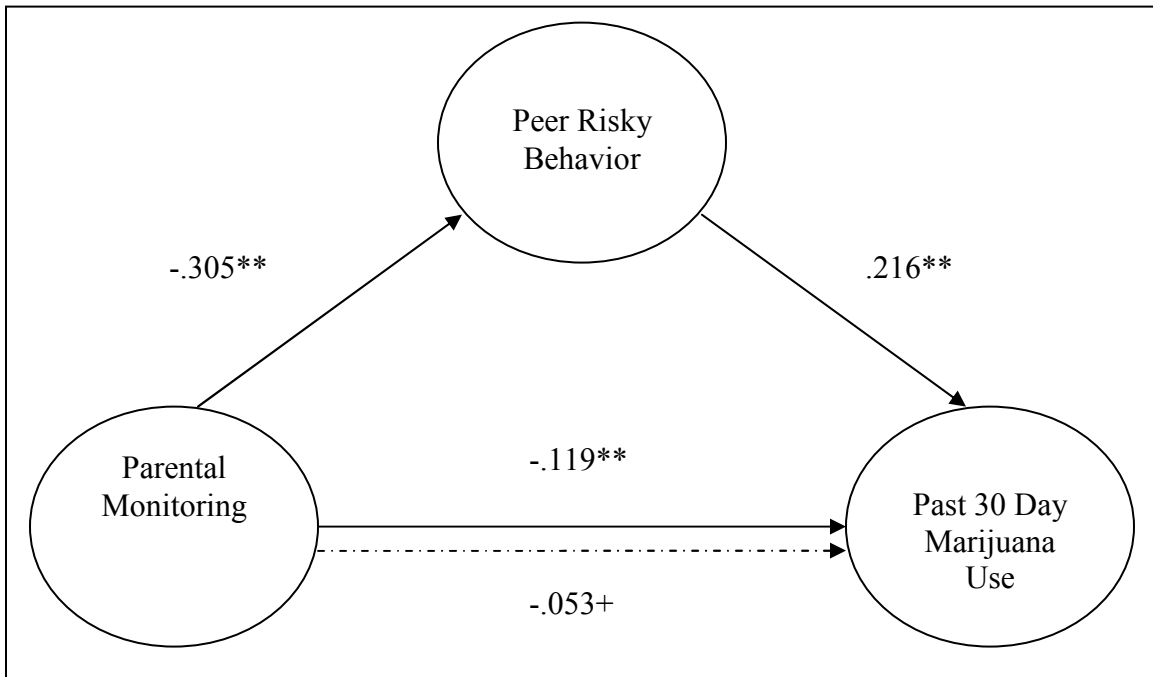
Summary of Hierarchical Regression Analysis for Phase I Mediation of Peer Risky Behavior on Parental Monitoring and Past 30 Day Marijuana Use

Variable	R^2_{adj}	$R^2\Delta$	B	SEB	95%CI	β
Step 1	.055	.058				
Age			.043	.010	.023, .063	.174**
Gender			-.238	.061	-.359, -.118	-.160**
Step 2	.098	.047				
Age			.018	.011	-.004, .040	.073
Gender			-.180	.061	-.299, -.060	-.120**
Parental Monitoring			-.020	.017	-.053, .014	-.053
Peer Risky Behavior			.032	.007	.019, .046	.216**

** $p < .01$.

Figure 10

Peer Risky Behavior as a Complete Mediator in the Relationship between Parental Monitoring and Past 30 Day Marijuana Use



Note. The dashed line (---) represents the relationship between the mediator(s) and dependent variable when controlling for the independent variable.

$^{**} p < .01. + ns.$

Phase Ib: Parental Monitoring and Drug Refusal Efficacy. Peer risky behavior was predicted to mediate the relationship between parental monitoring and drug refusal efficacy. The first requirement of mediation that parental monitoring must be significantly associated with drug refusal efficacy ($M^1 \rightarrow Y$) was met ($\beta = -.245$, $t(559) = -5.544$, $p = .000$). The effect size for this model was .048. The model explained 4.8% of the variance in drug refusal efficacy. For the second requirement, parental monitoring must significantly predict peer risky behavior, the mediator variable ($M^1 \rightarrow M^2$). This requirement was met ($\beta = -.305$, $t(559) = -7.789$, $p = .000$). The effect size for this model was .253. The model explained 25.3% of the variance in peer risky behavior. The third requirement was that peer risky behavior must be significantly associated with drug refusal efficacy while controlling for parental monitoring ($M^1 M^2 \rightarrow Y$). When entered simultaneously, peer risky behavior remained significant ($R^2 = .098$, $R^2_{adj} = .092$, $F(4, 558) = 15.24$, $p < .01$; $\beta = .248$, $t(558) = 5.329$, $p = .000$) as well as parental monitoring ($\beta = .169$, $t(558) = 3.726$, $p = .000$). Thus, the requirement for complete mediation was not met. Statistical calculations were conducted to establish partial mediation. Results indicated that partial mediation ($M^1 M^2 \rightarrow Y$) occurred (X step 1 $B = -.995$ and $SE = .358$, X step 3 $B = -.687$). That is, peer risky behavior partially mediated the relationship between parental monitoring and drug refusal efficacy. The effect size for the final model was .092. The model explained 9.2% of the variance in drug refusal efficacy. Table 21 summarizes these findings. Figure 11 is an illustration of the relationship. The Sobel test supported the partial mediation findings of the Baron and Kenny (1986) approach (*Sobel* $t = -4.37217017$, $p < .01$).

Table 21

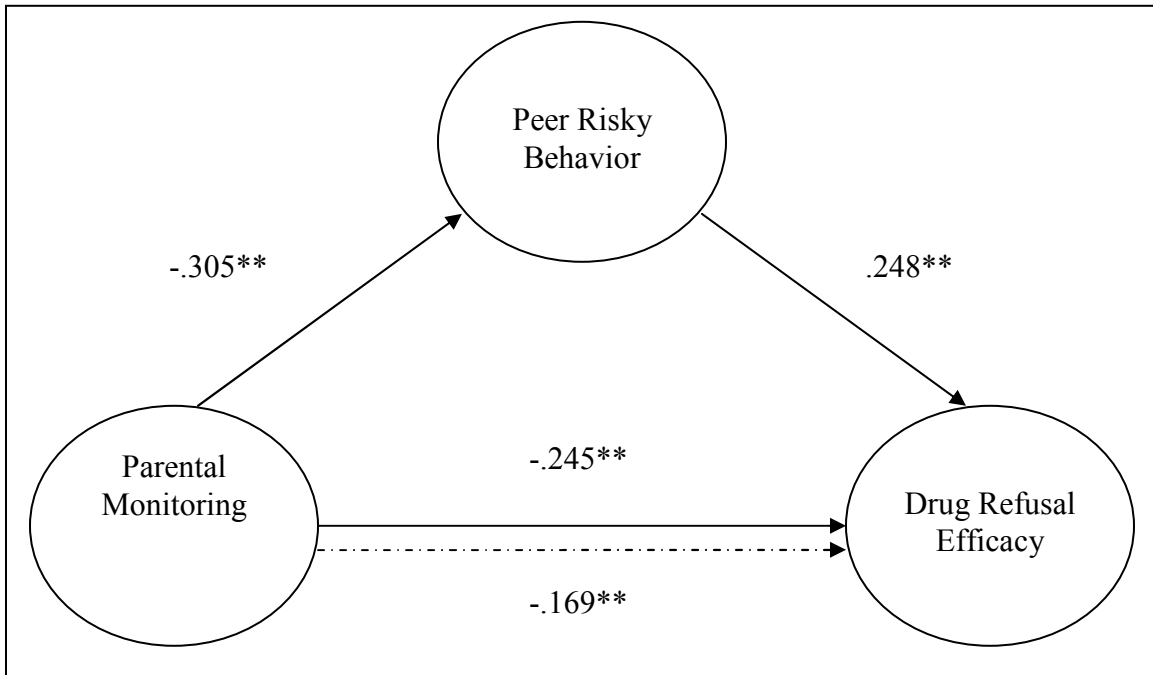
Summary of Hierarchical Regression Analysis for Phase I Mediation of Peer Risky Behavior on Parental Monitoring and Drug Refusal Efficacy

Variable	R^2_{adj}	$R^2\Delta$	B	SEB	95%CI	β
Step 1	-.003	.001				
Age			.047	.112	-.173, .267	.018
Gender			-.210	.680	-1.546, 1.125	-.013
Step 2	.092	.098				
Age			-.363	.119	-.597, -.130	-.137**
Gender			.628	.658	-.664, 1.920	.039
Parental Monitoring			-.687	.184	-1.050, -.326	-.169**
Peer Risky Behavior			.400	.075	.253, .548	.248**

** $p < .01$.

Figure 11

Peer Risky Behavior as a Partial Mediator in the Relationship between Parental Monitoring and Drug Refusal Efficacy



Note. The dashed line (---) represents the relationship between the mediator(s) and dependent variable when controlling for the independent variable.

$^{**} p < .01$.

Phase II: Mediation Analyses

During phase II, parental attitudes toward drug use variable was entered as the independent variable (\underline{X}), parent-adolescent relationship and management (mother adolescent relationship, parental monitoring) variables were entered as mediator variables (\underline{M}^1), and peer risky behavior was entered as the dependent variable (\underline{M}^2) (see Figure 6).

In Phase IIa, mother-adolescent relationship was entered as the mediator variable in Phase IIb, parental monitoring was entered as the mediator variable. Age and gender were entered into step one of each analysis.

Phase IIa: Parental Attitudes Toward Drug Use and Peer Risky Behavior.

Mother-adolescent relationship was predicted to mediate the relationship between parental attitudes toward drug use and peer risky behavior. The first requirement of mediation was that parental attitudes toward drug use needed to significantly predict peer risky behavior ($X \rightarrow \underline{M}^2$). This requirement was met ($\beta = -.239$, $t(559) = -6.292$, $p = .000$). The effect size for this model was .227. The model explained 22.7% of the variance in peer risky behavior. For the second requirement, parental attitudes toward drug use must significantly predict mother-adolescent relationship, the mediator variable ($X \rightarrow \underline{M}^1$). This requirement was met ($\beta = .195$, $t(559) = 4.684$, $p = .000$). The effect size for this model was .075. The model explained 7.5% of the variance in mother-adolescent relationship. The third requirement was that mother-adolescent relationship must be significantly associated with peer risky behavior while controlling for parental attitudes toward drug use ($\cancel{X} \underline{M}^1 \rightarrow \underline{M}^2$). When entered simultaneously, mother adolescent relationship ($R^2 = .258$, $R^2_{adj} = .252$, $F(4, 558) = 48.43$, $p < .01$; $\beta = -.171$, $t(558) = -4.493$, $p = .000$) and parental attitudes toward drug use ($\beta = -.206$, $t(558) = -5.404$, $p = .000$)

remained significant. The requirement for complete mediation was not met. Statistical calculations were conducted to establish partial mediation. Results indicated that partial mediation ($X \rightarrow M^1 \rightarrow M^2$) occurred (X step 1 $B = -.653$ and $SE = .104$, X step 3 $B = -.562$). That is, mother-adolescent relationship partially mediated the relationship between parental attitudes toward drug use and peer risky behavior. The effect size for the final model was .252. The model explained 25.2% of the variance in peer risky behavior. Table 22 summarizes these findings. Figure 12 is an illustration of the relationship. The Sobel test supported the partial mediation findings of the Baron and Kenny (1986) approach ($Sobel\ t = -3.20425563, p < .01$).

Phase IIb: Parental Attitudes Toward Drug Use and Peer Risky Behavior.

Parental monitoring was predicted to mediate the relationship between parental attitudes toward drug use and peer risky behavior. The first requirement of mediation model was that parental attitudes toward drug use needed to significantly predict peer risky behavior ($X \rightarrow M^2$). This requirement was met ($\beta = -.239, t(559) = -6.292, p = .000$). The effect size for this model was .227. The model explained 22.7% of the variance in peer risky behavior. For the second requirement, parental attitudes toward drug use must significantly predict parental monitoring, the mediator variable ($X \rightarrow M^1$). This requirement was met ($\beta = .230, t(559) = 5.893, p = .000$). The effect size for this model was .181. The model explained 18.1% of the variance in parental monitoring. The third requirement was that parental monitoring must be significantly associated with peer risky behavior while controlling for parental attitudes toward drug use. When entered simultaneously, parental monitoring ($R^2 = .286, R^2_{adj} = .281, F(4, 558) = 55.83, p < .01$;

Table 22

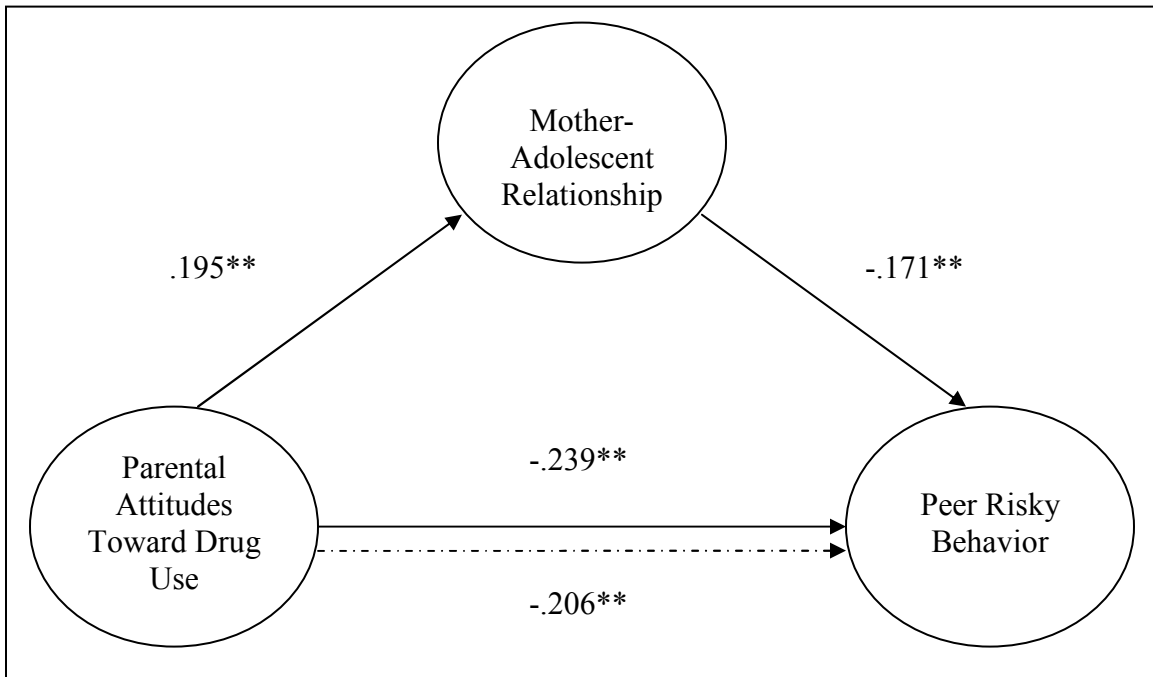
Summary of Hierarchical Regression Analysis for Phase II Mediation of Mother-Adolescent Relationship on Parental Attitudes Toward Drug Use and Peer Risky Behavior

Variable	R^2_{adj}	$R^2\Delta$	B	SEB	95%CI	β
Step 1	.173	.176				
Age			.623	.063	.499, .747	.379**
Gender			-1.666	.383	-2.419, -.913	-.167**
Step 2	.252	.081				
Age			.497	.062	.375, .619	.302**
Gender			-1.557	.366	-2.275, -.839	-.156**
Parental Attitudes Toward Drug Use			-.562	.104	-.767, -.358	-.206**
Mother-Adolescent Relationship			-.162	.036	-.233, -.091	-.171**

** $p < .01$.

Figure 12

Mother-Adolescent Relationship as a Partial Mediator in the Relationship between Parental Attitudes Toward Drug Use and Peer Risky Behavior



Note. The dashed line (---) represents the relationship between the mediator(s) and dependent variable when controlling for the independent variable.

$** p < .01.$

$\beta = -.260$, $t(558) = -6.554$, $p = .000$) and parental attitudes toward drug use ($\beta = -.179$, $t(558) = -4.745$, $p = .000$) remained significant. The requirement for complete mediation was not met. Statistical calculations were conducted to establish partial mediation. Results indicated that partial mediation ($X \rightarrow M^1 \rightarrow M^2$) occurred (X step 1 $B = -.653$ and $SE = .104$, X step 3 $B = -.490$). That is, parental monitoring partially mediated the relationship between parental attitudes toward drug use and peer risky behavior. The effect size for the final model was .281. The model explained 28.1% of the variance in peer risky behavior. Table 23 summarizes these findings. Figure 13 is an illustration of the relationship. The Sobel test supported the partial mediation findings of the Baron and Kenny (1986) approach (*Sobel* $t = -4.37420556$, $p < .01$).

Phase III: Full Mediation Model

During phase three, the complete mediation model was examined (see Figure 6). Parent attitudes toward drug use was entered as the independent variable (X), parent-adolescent relations and management and deviant peer selection variables were entered as mediators (M^1 , M^2), and drug refusal efficacy and use were entered separately as dependent variables (Y). The Sobel test statistic was not computed for the full model because it is best used to test simple mediation.

Phase III: Past 30 Day Tobacco Use. The first requirement of mediation that parental attitudes toward drug use must be significantly associated with past 30 day tobacco use ($X \rightarrow Y$) was met ($\beta = -.284$, $t(559) = -7.001$, $p = .000$). The effect size for this model was .119. The model explained 11.9% of the variance in past 30 day tobacco use. For the second requirement, parental attitudes toward drug use must significantly predict

Table 23

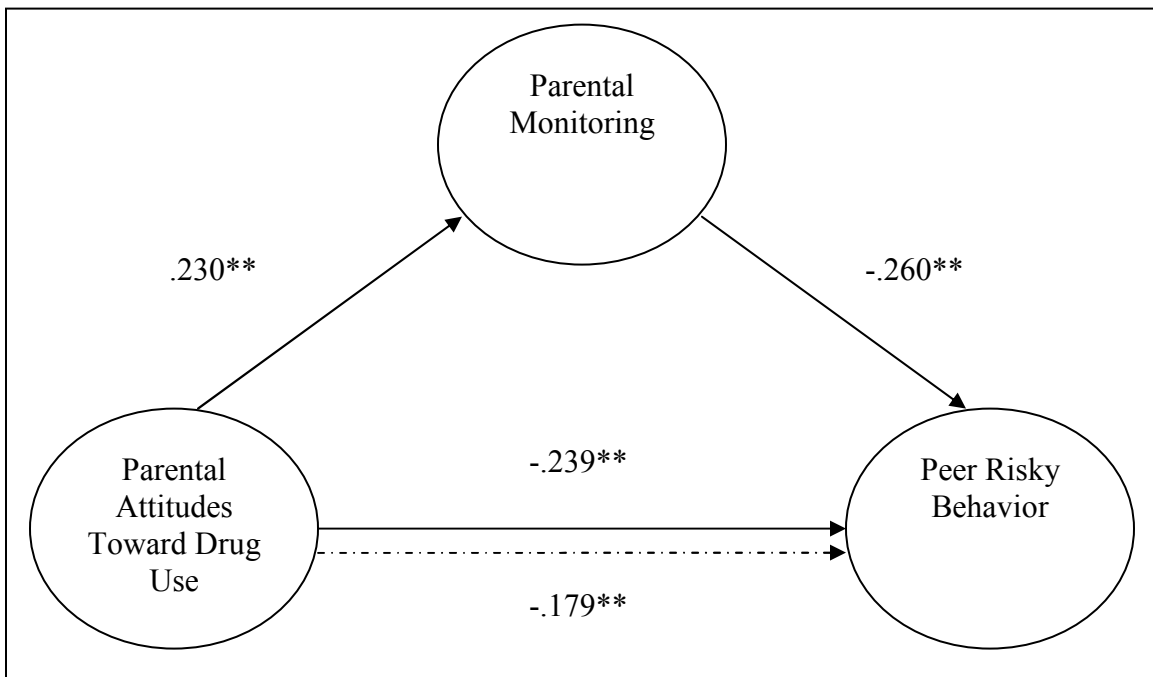
Summary of Hierarchical Regression Analysis for Phase II Mediation of Parental Monitoring on Parental Attitudes Toward Drug Use and Peer Risky Behavior

Variable	R^2_{adj}	$R^2\Delta$	B	SEB	95%CI	β
Step 1	.173	.176				
Age			.623	.063	.499, .747	.379**
Gender			-1.666	.383	-2.419, -.913	-.167**
Step 2	.281	.109				
Age			.411	.063	.286, .535	.250**
Gender			-1.386	.359	-2.091, -.681	-.139**
Parental Attitudes Toward Drug Use			-.490	.103	-.692, -.287	-.179**
Parental Monitoring			-.654	.100	-.850, -.458	-.260**

** $p < .01$.

Figure 13

Parental Monitoring as a Partial Mediator in the Relationship between Parental Attitudes Toward Drug Use and Peer Risky Behavior



Note. The dashed line (---) represents the relationship between the mediator(s) and dependent variable when controlling for the independent variable.

** $p < .01$.

the mediators, mother-adolescent relationship, parental monitoring, and peer risky behavior. Mother-adolescent relationship was not included in this model because it failed to predict past 30 day tobacco use during the lower level analysis. The second requirement was met. Parent attitudes toward drug use predicted parental monitoring ($\beta=.230, t(559)=5.893, p = .000$). The effect size for this model was .181. The model explained 18.1% of the variance in parental monitoring. Parent attitudes toward drug use also predicted peer risky behavior ($\beta=-.239, t(559)=-6.292, p = .000$). The effect size for this model was .227. The model explained 22.7% of the variance in peer risky behavior. The third requirement was that the mediators, parental monitoring and peer risky behavior must be significantly associated with past 30 day tobacco use while controlling for parental attitudes toward drug use ($X \rightarrow M^1 M^2 \rightarrow Y$). When entered simultaneously, peer risky behavior remained significant ($R^2 = .164, R^2_{adj} = .156, F(5, 557)=21.84, p < .01$; $\beta=.219, t(557)=4.774, p = .000$), but parental monitoring did not ($\beta=-.027, t(557)=-.610, p = .542$). The independent variable, parental attitudes toward drug use remained significant ($\beta=-.225, t(557)=-5.401, p = .000$) Results indicated that requirements for complete mediation were not met. Statistical calculations were conducted to establish partial mediation. Results indicated that partial mediation ($X \rightarrow M^2 \rightarrow Y$) occurred (X step 1 $B = -.138$ and $SE = .020$, X step 3 $B = -.109$). That is, peer risky behavior partially mediated the relationship between parental attitudes toward drug use and past 30 day tobacco use. The effect size for the final model was .156. The model explained 15.6% of the variance in past 30 day tobacco use. Table 24 summarizes these findings. Figure 14 is an illustration of the relationship.

Table 24

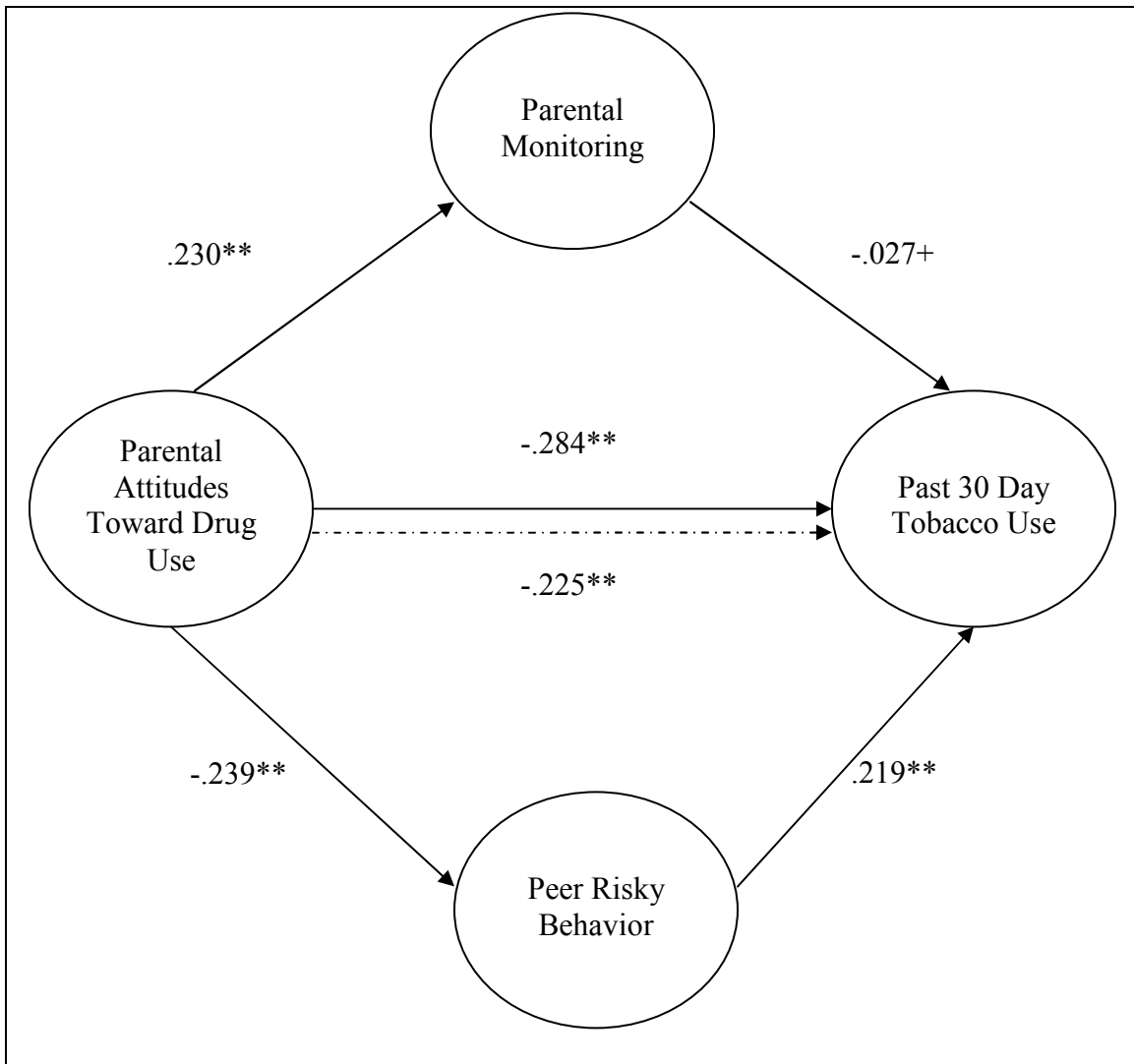
Summary of Hierarchical Regression Analysis for Phase III Mediation Analysis of Full Model on Past 30 Day Tobacco Use

Variable	R^2_{adj}	$R^2\Delta$	B	SEB	95%CI	β
Step 1	.044	.047				
Age			.060	.012	.037, .084	.206
Gender			-.108	.073	-.251, .036	-.061
Step 2	.156	.117				
Age			.020	.013	-.005, .045	.068
Gender			-.014	.070	-.151, .124	-.008
Parental Attitudes Toward Drug Use			-.109	.020	-.149, -.070	-.225**
Parental Monitoring			-.012	.020	-.051, .027	-.027
Peer Risky Behavior			.039	.008	.023, .055	.219**

** $p < .01$.

Figure 14

Peer Risky Behavior as a Partial Mediator in the Relationship between Parental Attitudes Toward Drug Use and Past 30 Day Tobacco Use



Note. The dashed line (---) represents the relationship between the mediator(s) and dependent variable when controlling for the independent variable. The + symbol represents nonsignificant values.

** $p < .01$. + ns.

Phase III: Past 30 Day Alcohol Use. The first requirement of mediation that parental attitudes toward drug use must be significantly associated with past 30 day alcohol use ($X \rightarrow Y$) was met ($\beta = -.230$, $t(559) = -5.620$, $p = .000$). The effect size for this model was .105. The model explained 10.5% of the variance in past 30 day alcohol use. For the second requirement, parental attitudes toward drug use must significantly predict the mediators, mother-adolescent relationship, parental monitoring, and peer risky behavior. Mother-adolescent relationship was not included in this model because it did not predict past 30 day alcohol use during the lower level analysis. The second requirement was met. Parent attitudes toward drug use predicted parental monitoring ($\beta = .230$, $t(559) = 5.893$, $p = .000$). The effect size for this model was .181. The model explained 18.1% of the variance in parental monitoring. Parent attitudes toward drug use also predicted peer risky behavior ($\beta = -.239$, $t(559) = -6.292$, $p = .000$). The effect size for this model was .227. The model explained 22.7% of the variance in peer risky behavior. The third requirement was that the mediators, parental monitoring and peer risky behavior must be significantly associated with past 30 day alcohol use while controlling for parental attitudes toward drug use ($X \rightarrow M^1 M^2 \rightarrow Y$). When entered simultaneously, peer risky behavior ($R^2 = .181$, $R^2_{adj} = .174$, $F(5, 557) = 24.66$, $p < .01$; $\beta = .246$, $t(557) = 5.425$, $p = .000$), parental monitoring ($\beta = -.122$, $t(557) = -2.768$, $p = .006$), and parental attitudes toward drug use ($\beta = -.143$, $t(557) = -3.458$, $p = .001$) remained significant. Results indicated that requirements for complete mediation were not met. Statistical calculations were conducted to establish partial mediation. Results indicated that partial mediation ($X \rightarrow M^1 M^2 \rightarrow Y$) occurred (X step 1 $B = -.114$ and $SE = .020$, X step 3 $B = -.071$). That is, parental monitoring and peer risky behavior partially mediated the relationship

between parental attitudes toward drug use and past 30 day alcohol use. The effect size for the final model was .174. The model explained 17.4% of the variance in past 30 day alcohol use. Table 25 summarizes these findings. Figure 15 is an illustration of the relationship.

Phase III: Past 30 Day Marijuana Use. The first requirement of mediation that parental attitudes toward drug use must be significantly associated with past 30 day marijuana use ($X \rightarrow Y$) was met ($\beta = -.161, t(559) = -3.871, p = .000$). The effect size for this model was .078. The model explained 7.8% of the variance in past 30 day marijuana use. For the second requirement, parental attitudes toward drug use must significantly predict the mediators, mother-adolescent relationship, parental monitoring, and peer risky behavior. Mother-adolescent relationship was not included in this model because it was not correlated with past 30 day marijuana use during the initial analysis. The second requirement was met. Parent attitudes toward drug use predicted parental monitoring ($\beta = .230, t(559) = 5.893, p = .000$). The effect size for this model was .181. The model explained 18.1% of the variance in parental monitoring. Parent attitudes toward drug use also predicted peer risky behavior ($\beta = -.239, t(559) = -6.292, p = .000$). The effect size for this model was .227. The model explained 22.7% of the variance in peer risky behavior. The third requirement was that the mediators, parental monitoring and peer risky behavior must be significantly associated with past 30 day marijuana use while controlling for parental attitudes toward drug use ($X \rightarrow M^1 \rightarrow M^2 \rightarrow Y$). When entered simultaneously, peer risky behavior remained significant ($R^2 = .115, R^2_{adj} = .107, F(5, 557) = 14.42, p < .01; \beta = .192, t(557) = 4.080, p = .000$), but parental monitoring did not ($\beta = -.033, t(557) = -.715, p = .475$). The independent variable, parental attitudes toward

Table 25

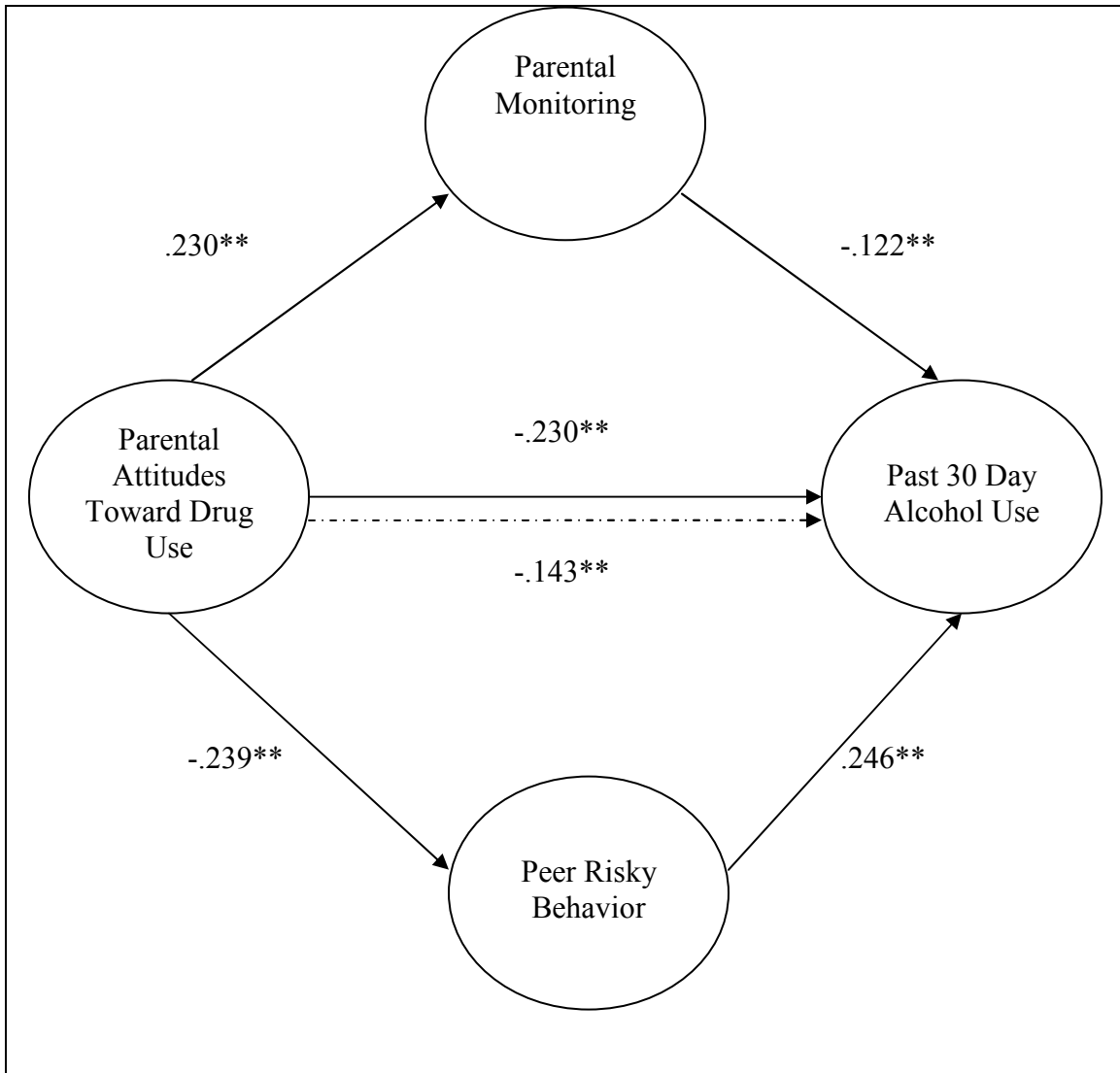
Summary of Hierarchical Regression Analysis for Phase III Mediation Analysis of Full Model on Past 30 Day Alcohol Use

Variable	R^2_{adj}	$R^2\Delta$	B	SEB	95%CI	β
Step 1	.056	.060				
Age			.072	.012	.048, .096	.241**
Gender			-.051	.075	-.198, .095	-.028
Step 2	.174	.122				
Age			.023	.013	-.003, .048	.075
Gender			.054	.071	-.085, .193	.030
Parental Attitudes Toward Drug Use			-.071	.021	-.111, -.031	-.143**
Parental Monitoring			-.056	.020	-.096, -.016	-.122**
Peer Risky Behavior			.045	.008	.029, .061	.246**

** $p < .01$.

Figure 15

Parental Monitoring and Peer Risky Behavior as Partial Mediators in the Relationship between Parental Attitudes Toward Drug Use and Past 30 Day Alcohol Use



Note. The dashed line (---) represents the relationship between the mediator(s) and dependent variable when controlling for the independent variable.

$** p < .01.$

drug use remained significant ($\beta = -.107$, $t(557) = -2.494$, $p = .013$) Results indicated that requirements for complete mediation were not met. Statistical calculations were conducted to establish partial mediation. Results indicated that partial mediation ($X \rightarrow M^2 \rightarrow Y$) occurred (X step 1 $B = -.066$ and $SE = .017$, X step 3 $B = -.044$). That is, peer risky behavior partially mediated the relationship between parental attitudes toward drug use and past 30 day marijuana use. The effect size for the final model was .107. The model explained 10.7% of the variance in past 30 day marijuana use. Table 26 summarizes these findings. Figure 16 is an illustration of the relationship.

Phase III: Drug Refusal Efficacy. The first requirement of mediation that parental attitudes toward drug use must be significantly associated with drug refusal efficacy ($X \rightarrow Y$) was met ($\beta = -.116$, $t(559) = -2.693$, $p = .007$). The effect size for this model was .008. The model explained less than 1% of the variance in drug refusal efficacy. For the second requirement, parental attitudes toward drug use must significantly predict the mediators, mother-adolescent relationship, parental monitoring, and peer risky behavior. The second requirement was met. Parent attitudes toward drug use predicted mother-adolescent relationship ($\beta = .195$, $t(559) = 4.684$, $p = .000$). The effect size for this model was .075. The model explained 7.5% of the variance in drug refusal efficacy. Parent attitudes toward drug use predicted parental monitoring ($\beta = .230$, $t(559) = 5.893$, $p = .000$). The effect size for this model was .181. The model explained 18.1% of the variance in parental monitoring. Parent attitudes toward drug use also predicted peer risky behavior ($\beta = -.239$, $t(559) = -6.292$, $p = .000$). The effect size for this model was .227. The model explained 22.7% of the variance in peer risky behavior. The third requirement was that

Table 26

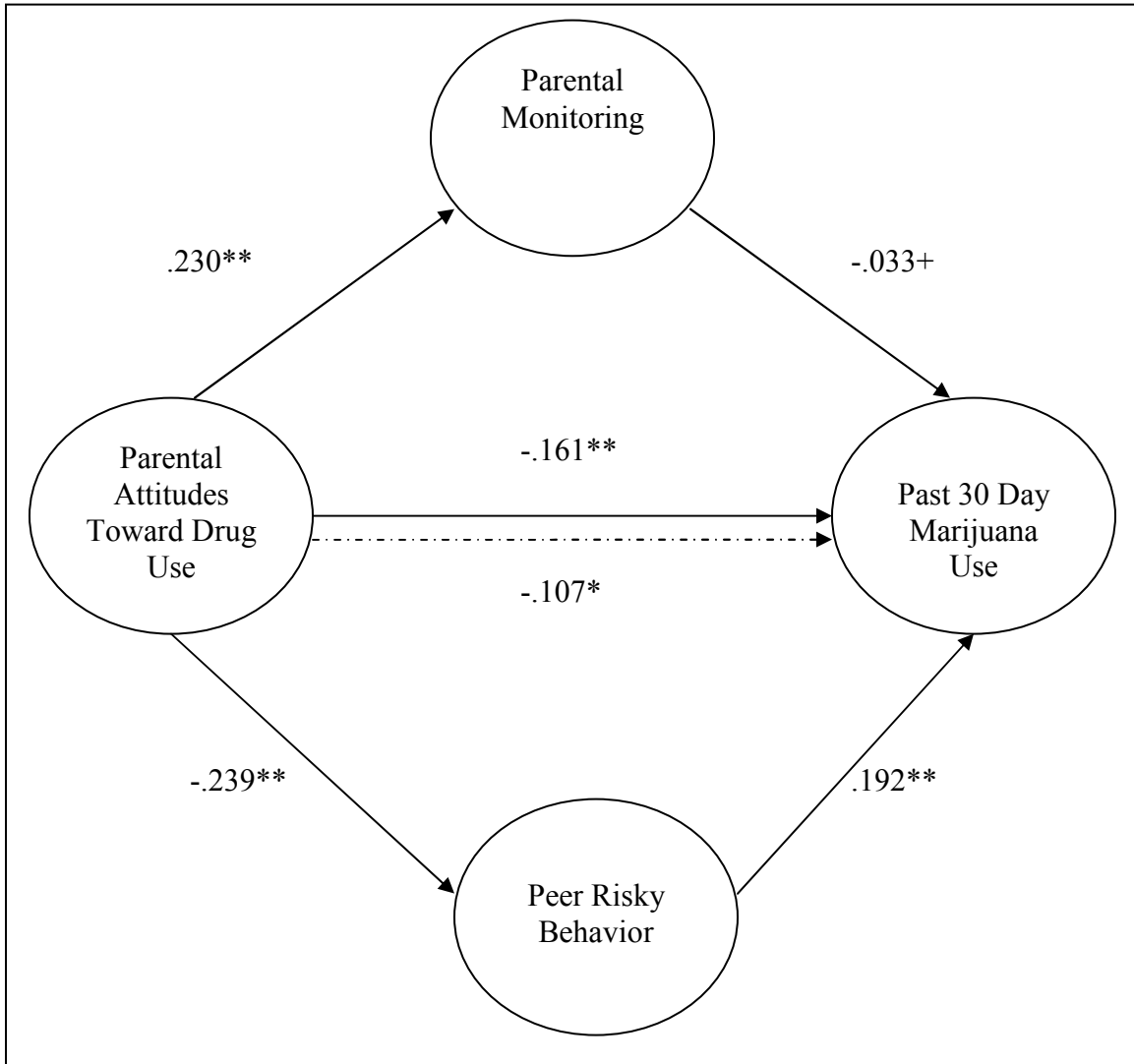
Summary of Hierarchical Regression Analysis for Phase III Mediation Analysis of Full Model on Past 30 Day Marijuana Use

Variable	R^2_{adj}	$R^2\Delta$	B	SEB	95%CI	β
Step 1	.055	.058				
Age			.043	.010	.023, .063	.174**
Gender			-.238	.061	-.359, -.118	-.160**
Step 2	.107	.057				
Age			.017	.011	-.005, .038	.068
Gender			-.177	.061	-.296, -.058	-.119**
Parental Attitudes Toward Drug Use			-.044	.018	-.078, -.009	-.107*
Parental Monitoring			-.012	.017	-.046, .022	-.033
Peer Risky Behavior			.029	.007	.015, .043	.192**

** $p < .01$.

Figure 16

Peer Risky Behavior as a Partial Mediator in the Relationship between Parental Attitudes Toward Drug Use and Past 30 Day Marijuana Use



Note. The dashed line (---) represents the relationship between the mediator(s) and dependent variable when controlling for the independent variable. The + symbol represents nonsignificant values.

* $p < .05$. ** $p < .01$. + ns.

the mediators, mother-adolescent relationship, parental monitoring and peer risky behavior must be significantly associated with drug refusal efficacy while controlling for parental attitudes toward drug use ($X \rightarrow M^1 M^2 \rightarrow Y$). When the mediators were entered simultaneously, peer risky behavior ($R^2 = .099, R^2_{adj} = .089, F(6, 556) = 10.17, p < .01; \beta = .243, t(556) = 5.068, p = .000$) and parental monitoring ($\beta = -.162, t(556) = -3.366, p = .001$) remained significant, but mother-adolescent relationship ($\beta = -.011, t(556) = -.252, p = .801$) did not. The independent variable, parental attitudes toward drug use became insignificant ($\beta = -.018, t(556) = -.418, p = .676$). Thus, the requirement for complete mediation was met ($X \rightarrow M^1 M^2 \rightarrow Y$). Peer risky behavior and parental monitoring mediated the relationship between parental attitudes toward drug use and drug refusal efficacy. The effect size for the final model was .089. The model explained 8.9% of the variance in drug refusal efficacy. Table 27 summarizes these findings. Figure 17 illustrates the relationship.

Figures 18, 19, 20, and 21 provide illustrations of the hypothesized mediation relationships to include peer risky behavior as a mediator in the relationship between parental-adolescent relations and management and drug refusal efficacy and use. Table 28 presents a comparison of the statistical findings using the Baron and Kenny (1986) approach and Aroian version of the Sobel test.

Hypothesis 2

Hypotheses 2 and 5 involve testing using continuous moderator and independent variables. Prior to analysis, interaction terms of the independent and moderator variables (e.g., peer risky behavior X mother-adolescent relationship) were created. In hierarchical

Table 27

Summary of Hierarchical Regression Analysis for Phase III Mediation Analysis of Full Model on Drug Refusal Efficacy

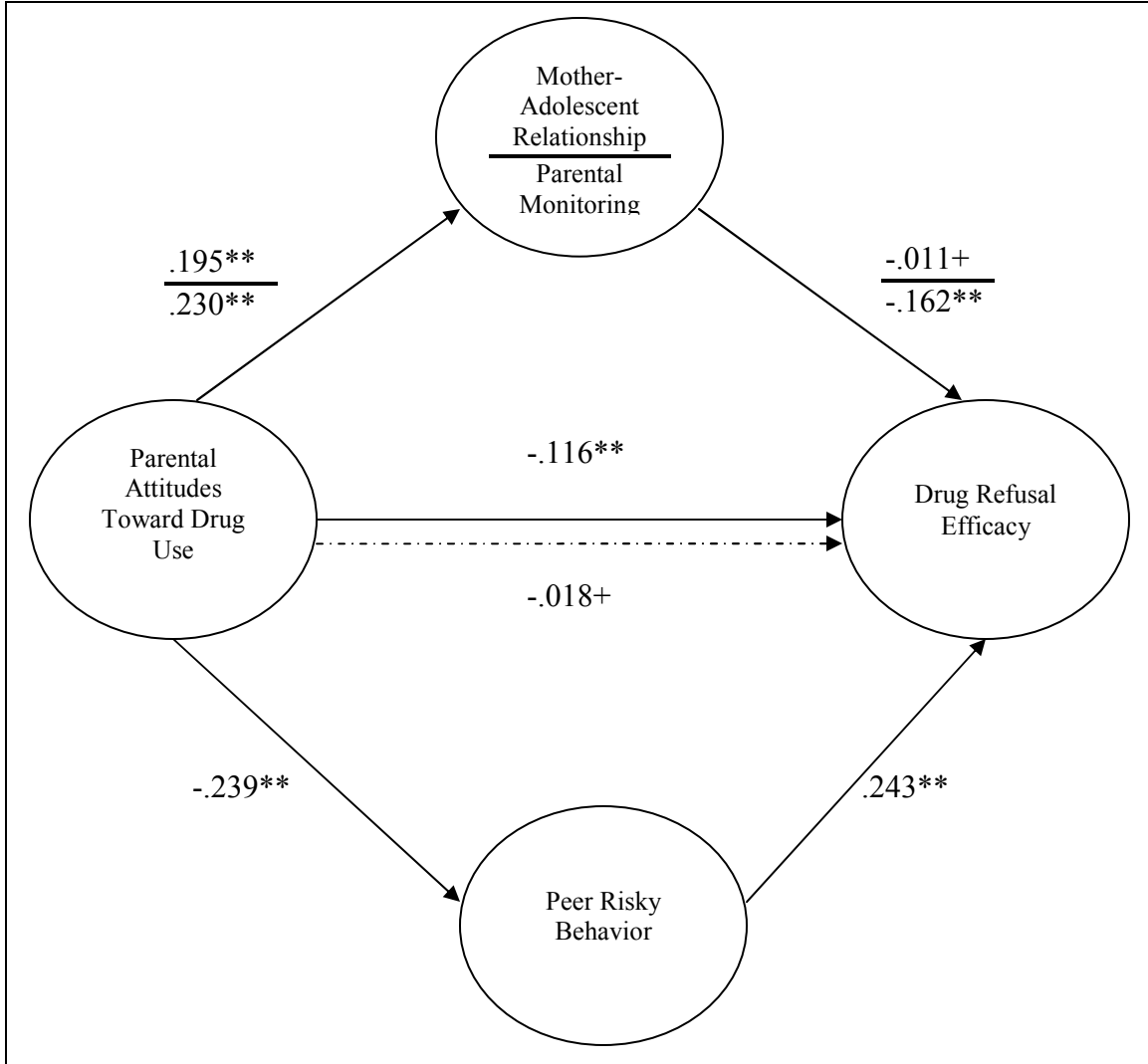
Variable	R^2_{adj}	$R^2\Delta$	B	SEB	95%CI	β
Step 1	-.003	.001				
Age			.047	.112	-.173, .267	.018
Gender			-.210	.680	-1.546, 1.125	-.013
Step 2	.099	.089				
Age			-.367	.119	-.601, -.133	-.139**
Gender			.623	.660	-.674, 1.919	.039
Parental Attitudes Toward Drug Use			-.080	.192	-.456, .296	-.018
Mother-Adolescent Relationship			-.017	.068	-.151, .116	-.011
Parental Monitoring			-.659	.196	-1.043, -.274	-.162**
Peer Risky Behavior			.391	.077	.240, .543	.243**

Note. The dashed line (---) represents the relationship between the mediator(s) and dependent variable when controlling for the independent variable.

** $p < .01$.

Figure 17

Parental Monitoring and Peer Risky Behavior as Complete Mediators in the Relationship between Parental Attitudes Toward Drug Use and Drug Refusal Efficacy

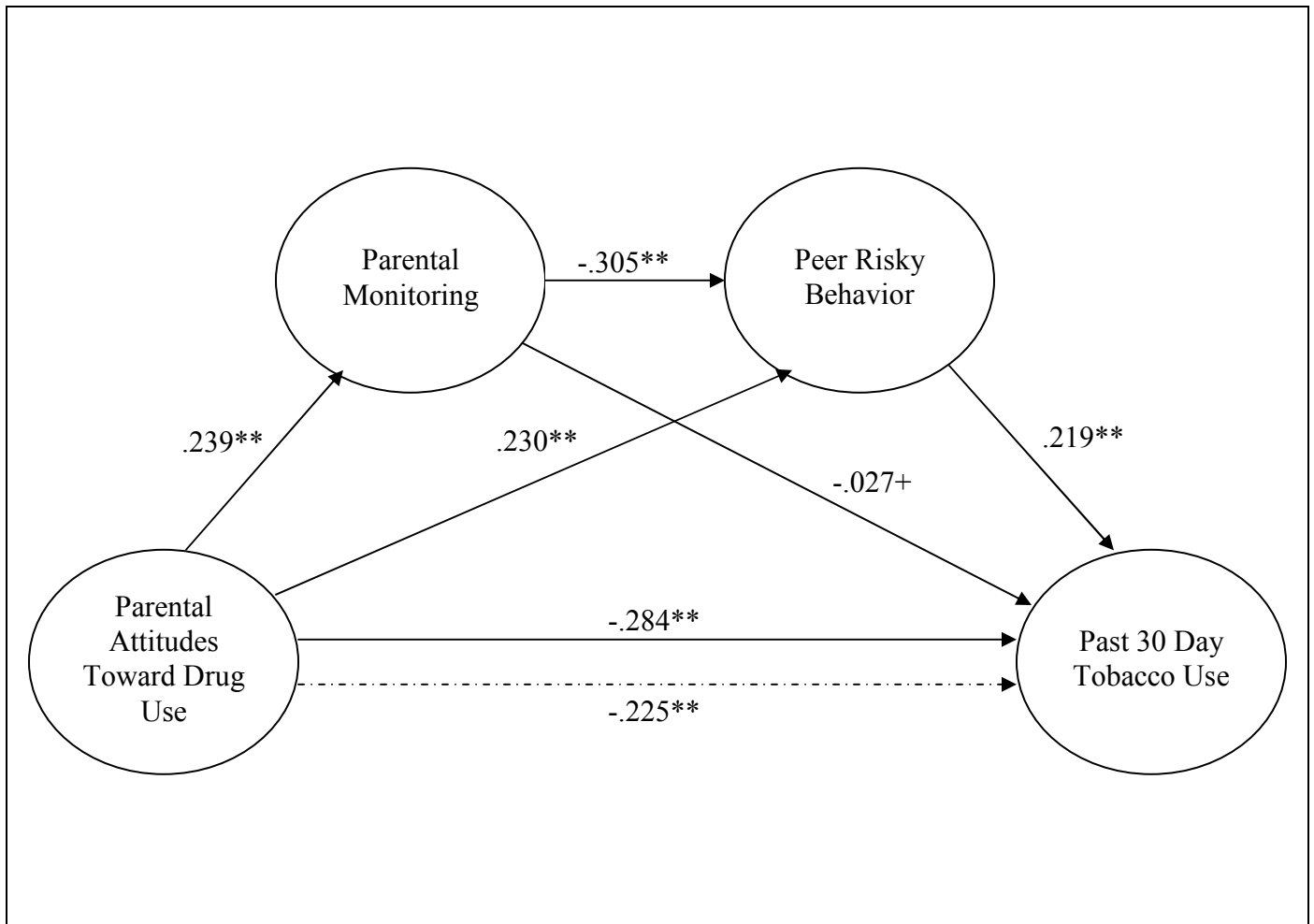


Note. The dashed line (---) represents the relationship between the mediator(s) and dependent variable when controlling for the independent variable. Values above the bold straight line represent mother-adolescent relationship values and values below the line present parental monitoring values. The + symbol represents nonsignificant values.

** $p < .01$. + ns.

Figure 18

Hypothesized Mediation Model: Peer Risky Behavior as a Partial Mediator in the Relationship between Parental Attitudes Toward Drug Use and Past 30 Day Tobacco Use

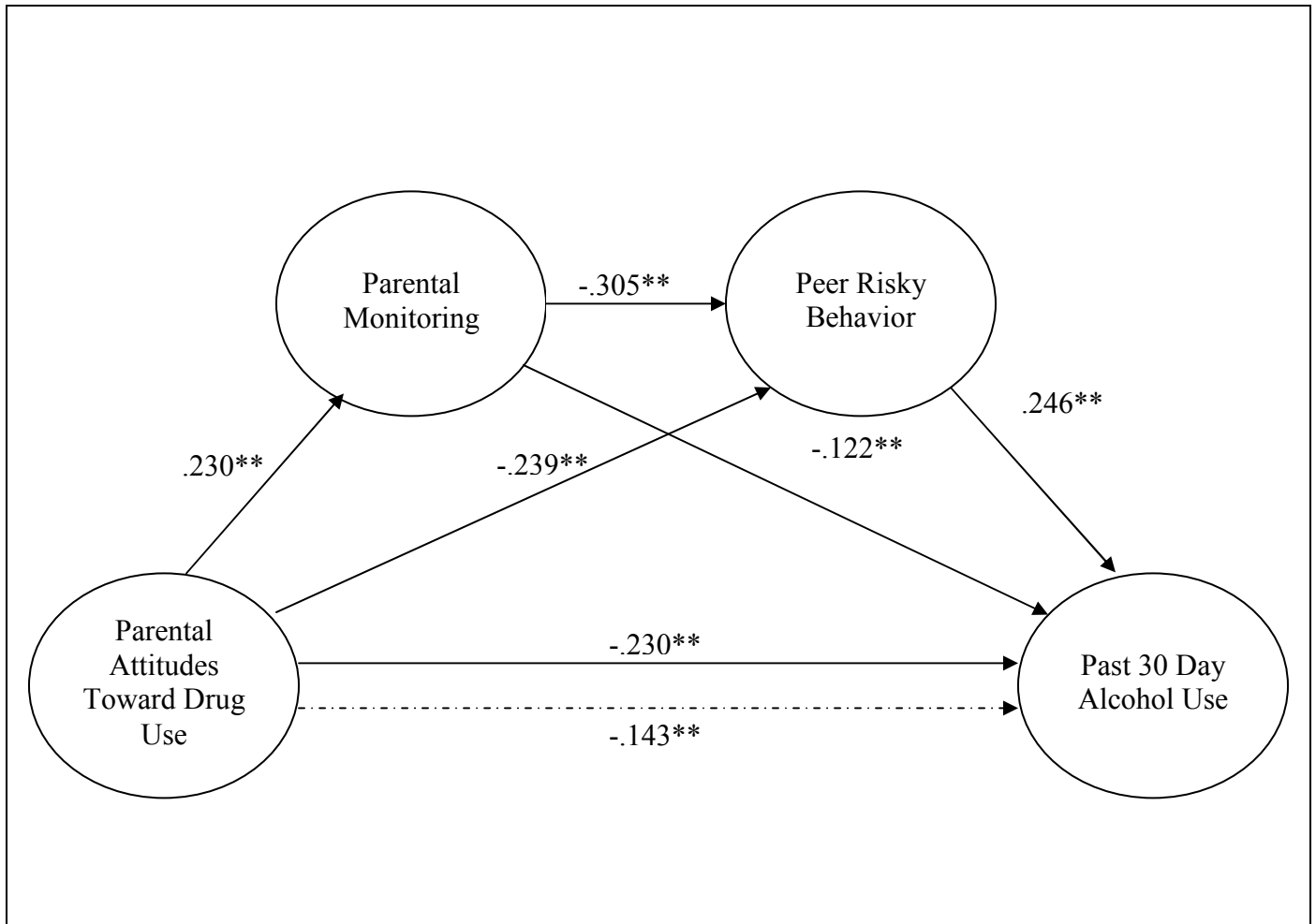


Note. The dashed line (---) represents the relationship between the mediator(s) and dependent variable when controlling for the independent variable. The + symbol represents nonsignificant values.

** $p < .01$. + ns.

Figure 19

Hypothesized Mediation Model: Parental Monitoring and Peer Risky Behavior as Partial Mediators in the Relationship between Parental Attitudes Toward Drug Use and Past 30 Days Alcohol Use

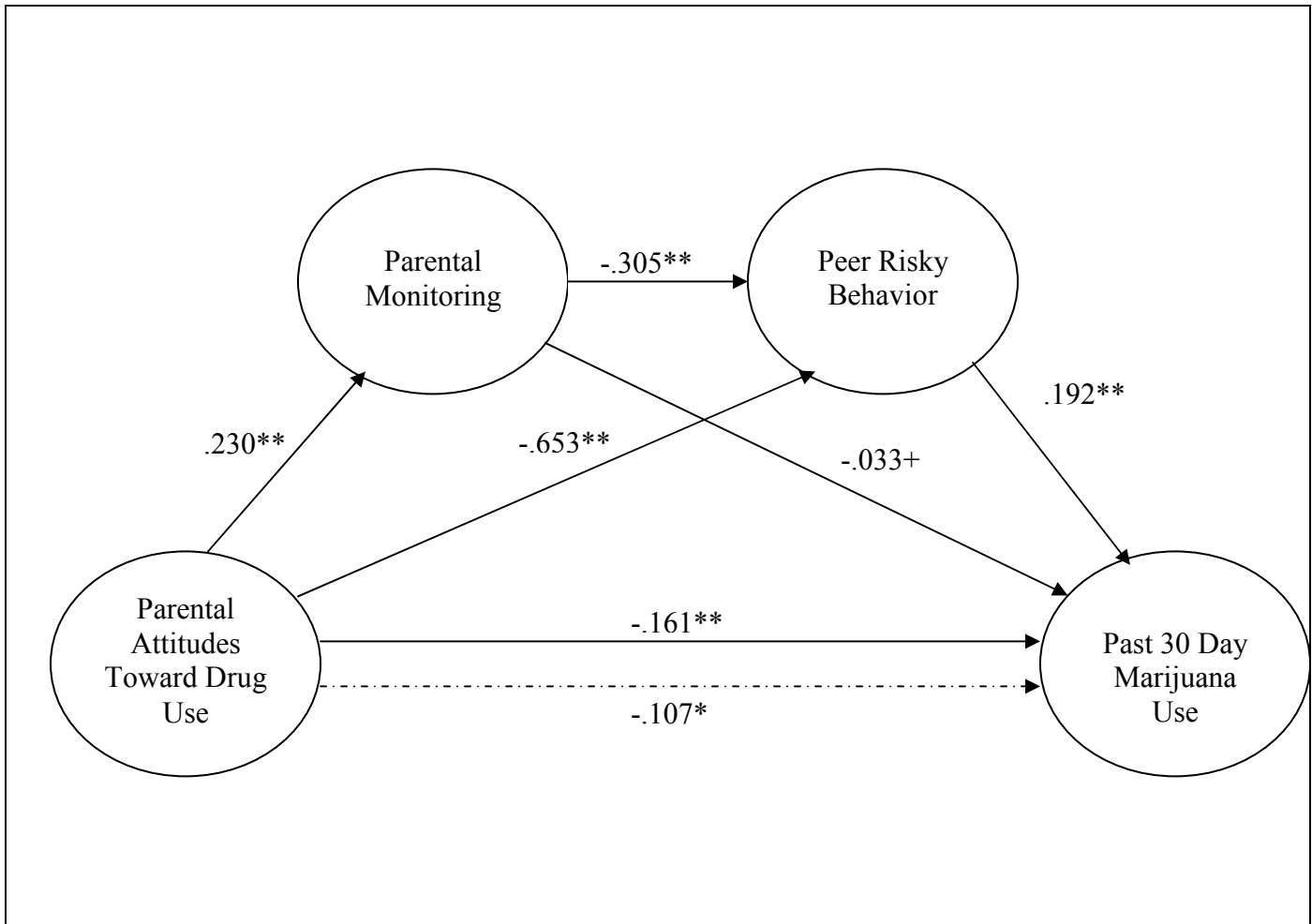


Note. The dashed line (---) represents the relationship between the mediator(s) and dependent variable when controlling for the independent variable.

$^{**} p < .01$.

Figure 20

Hypothesized Mediation Model: Peer Risky Behavior as a Partial Mediator in the Relationship between Parental Attitudes Toward Drug Use and Past 30 Day Marijuana Use

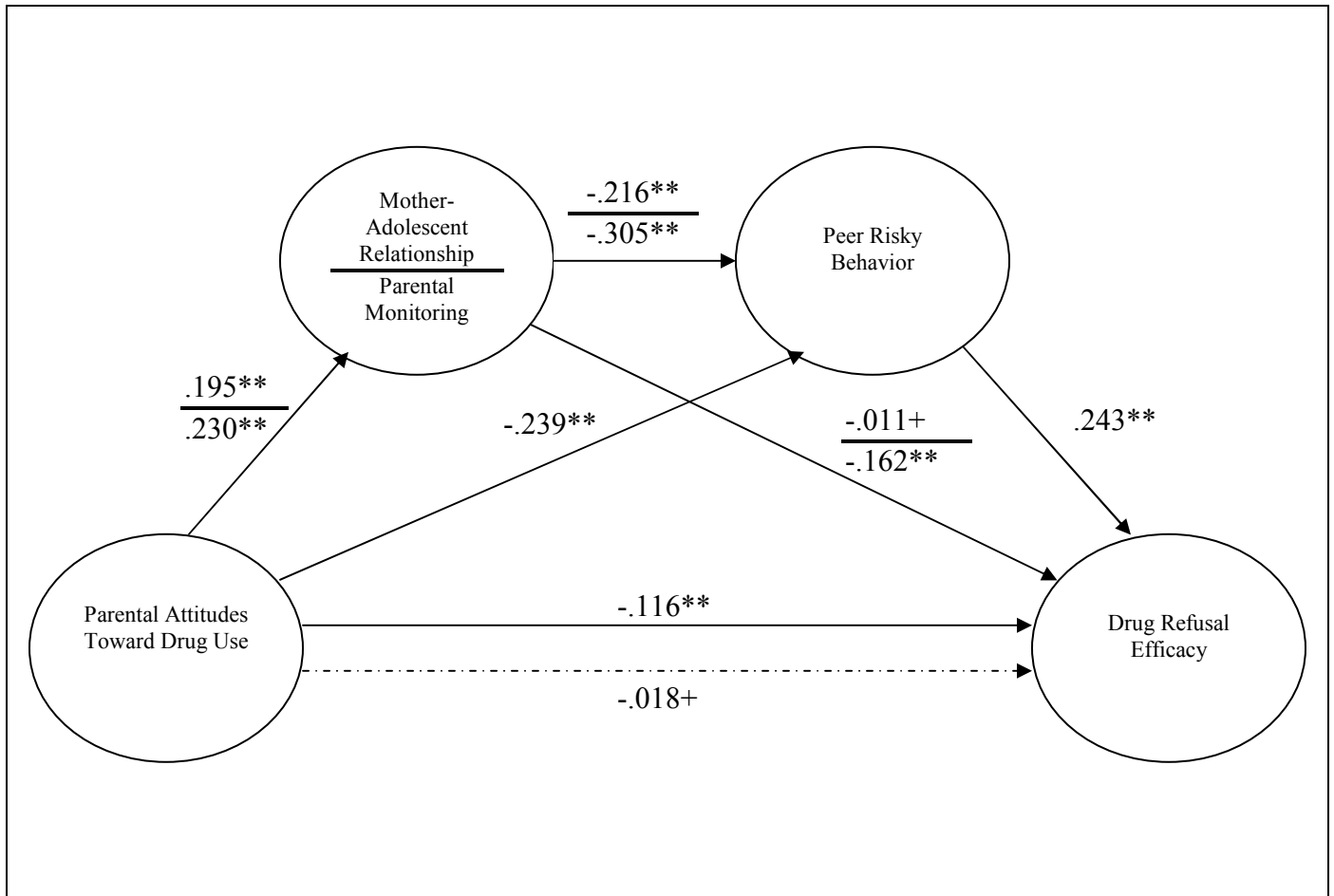


Note. The dashed line (---) represents the relationship between the mediator(s) and dependent variable when controlling for the independent variable. The + symbol represents nonsignificant values.

* $p < .05$. ** $p < .01$. + ns.

Figure 21

Hypothesized Mediation Model: Parental Monitoring and Peer Risky Behavior as Complete Mediators in the Relationship between Parental Attitudes Toward Drug Use and Drug Refusal Efficacy



Note. The dashed line (---) represents the relationship between the mediator(s) and dependent variable when controlling for the independent variable. Values above the bold straight line represent mother-adolescent relationship values and values below the line present parental monitoring values. The + symbol represents nonsignificant values.

****** $p < .01$. **+** ns.

Table 28

Comparison of Mediation Findings Using Baron and Kenny (1986) Approach and Sobel Test

Mediation Relationship	Baron and Kenny (1986)	Sobel Test
Phase I Mediation Analyses		
Mother-Adolescent Rel., Tobacco Use	Not Significant	Not Computed
Mother-Adolescent Rel., Alcohol Use	Not Significant	Not Computed
Mother-Adolescent Rel., Marijuana Use	Not Significant	Not Computed.
Mother-Adolescent Rel., Drug Refusal	Full mediation	Full mediation
Parental Monitoring, Tobacco Use	Full mediation	Full mediation
Parental Monitoring, Alcohol Use	Part. Mediation	Part. Mediation
Parental Monitoring, Marijuana Use	Full mediation	Full mediation
Parental Monitoring, Drug Refusal	Part. Mediation	Part. Mediation
Phase II Mediation Analyses		
Parent Attitudes, Mother-Adol., Peer Risky	Part. Mediation	Part. Mediation
Parent Attitudes, Monitoring, Peer Risky	Part. Mediation	Part. Mediation
Phase III Mediation Analyses: Full Model		
Past 30 Day Tobacco Use	Part. Mediation	Not Computed
Past 30 Day Alcohol Use	Part. Mediation	Not Computed
Past 30 Day Marijuana Use	Part. Mediation	Not Computed
Drug Refusal Efficacy	Full mediation	Not Computed

regression, age and gender were entered first. Second, the main effects of the independent variables were entered. Third, the main effects of the moderator variables were entered. The interaction terms were loaded fourth. If moderation was found to be statistically significant, interactions were graphed and are illustrated in figures.

Hypothesis₂: Parent-adolescent relations and management (mother-adolescent relationship, parental monitoring) will moderate risky peers-adolescent drug refusal efficacy and use relationships.

Mother-Adolescent Relationship

Age and gender were entered first in each regression analysis. Contrary to what was expected, mother-adolescent relationship did not moderate the relationship between peer risky behavior and past 30 day tobacco use ($p = .138$), past 30 day alcohol use ($p = .455$), past 30 day marijuana use ($p = .741$), and drug refusal efficacy ($p = .694$).

Parental Monitoring

Age and gender were entered first in each regression analysis. Parental monitoring moderated the relationship between peer risky behavior and past 30 day tobacco use ($R^2 = .159$, $R^2_{adj} = .151$ $F(5, 557)=21.02$, $p < .01$; $\beta=-.199$, $t(557)=-5.053$, $p = .000$). The effect size was .151. The regression model with interaction effects explained 15.1% of past 30 day tobacco use variance. The interaction accounted for 3.9% of the variance in past 30 day tobacco use. The interaction suggested that when peer risky behaviors were high, participants with high levels of parental monitoring were less likely than those with lower or medium levels of parental monitoring to smoke cigarettes during the past 30 day. Similarly, under conditions of high levels of peer risky behavior, participants with medium levels of parental monitoring were more likely than

those with high levels of parental monitoring to smoke cigarettes during the past 30 day but less likely to smoke than those with low levels of parental monitoring. Alternatively, under conditions of high levels of peer risky behavior, participants with low levels of parental monitoring were more likely to smoke cigarettes during the past 30 day than participants with low or medium levels of parental monitoring (see Figure 22).

Parental monitoring moderated the relationship between peer risky behavior and past 30 day alcohol use ($R^2 = .188$, $R^2_{adj} = .181$ $F(5, 557)=25.82$, $p < .01$; $\beta = -.158$, $t(557)=-4.103$, $p = .000$). The effect size was .181. The regression model with interaction effects explained 18.1% of past 30 day alcohol use variance. The interaction accounted for 2.5% of the variance in past 30 day alcohol use. The interaction suggested that under conditions of high levels of peer risky behavior, participants with high levels of parental monitoring were less likely than those with lower or medium levels of parental monitoring to have drunk alcohol during the past 30 day. Similarly, under conditions of high levels of peer risky behavior, participants with medium levels of parental monitoring were more likely than those with high levels of parental monitoring to have drunk alcohol during the past 30 day but less likely to have drunk alcohol than those with low levels of parental monitoring. Alternatively, under conditions of high levels of peer risky behavior, participants with low levels of parental monitoring were more likely to have drunk alcohol during the past 30 day than participants with low or medium levels of parental monitoring (see Figure 23).

Parental monitoring moderated the relationship between peer risky behavior and past 30 day marijuana use ($R^2 = .112$, $R^2_{adj} = .104$ $F(5, 557)=14.10$, $p < .01$; $\beta = -.088$,

Figure 22

Graph of Interaction of Peer Risky Behavior and Parental Monitoring for Past 30 Day

Tobacco Use

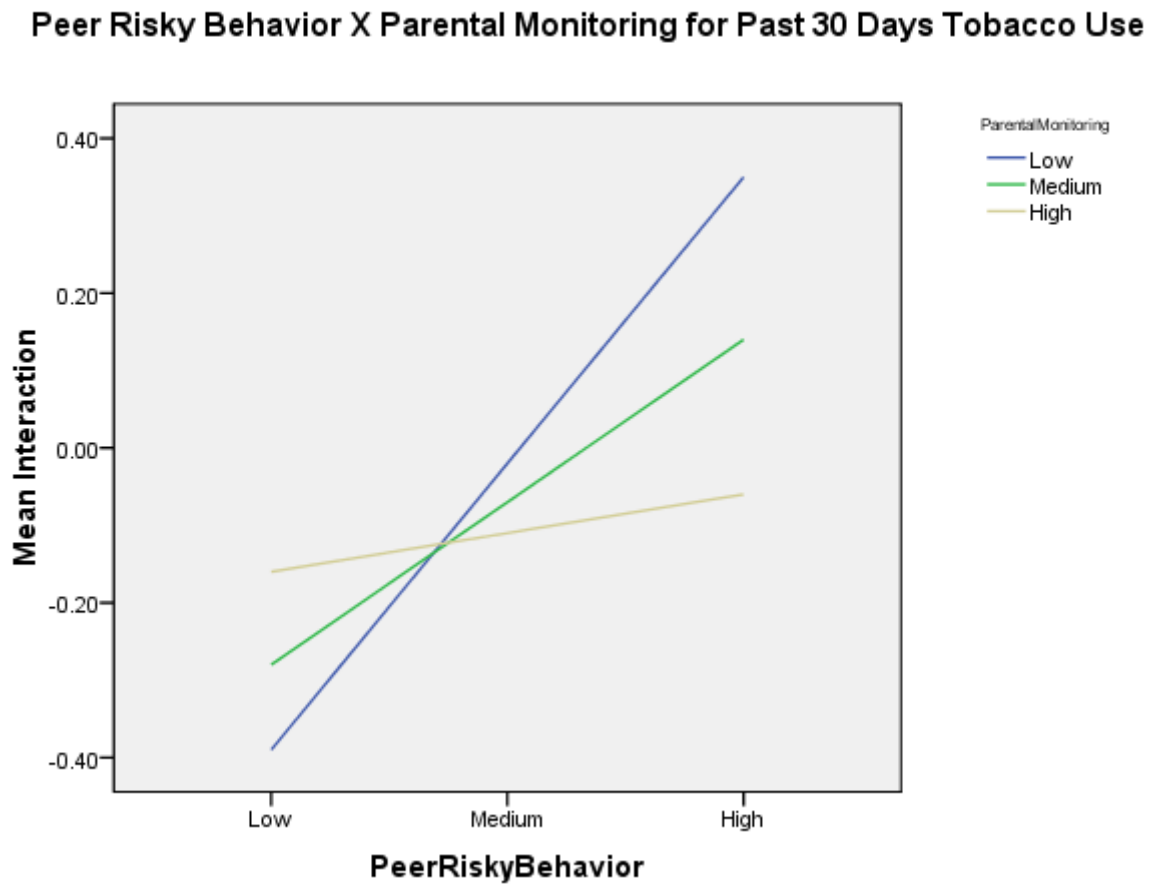
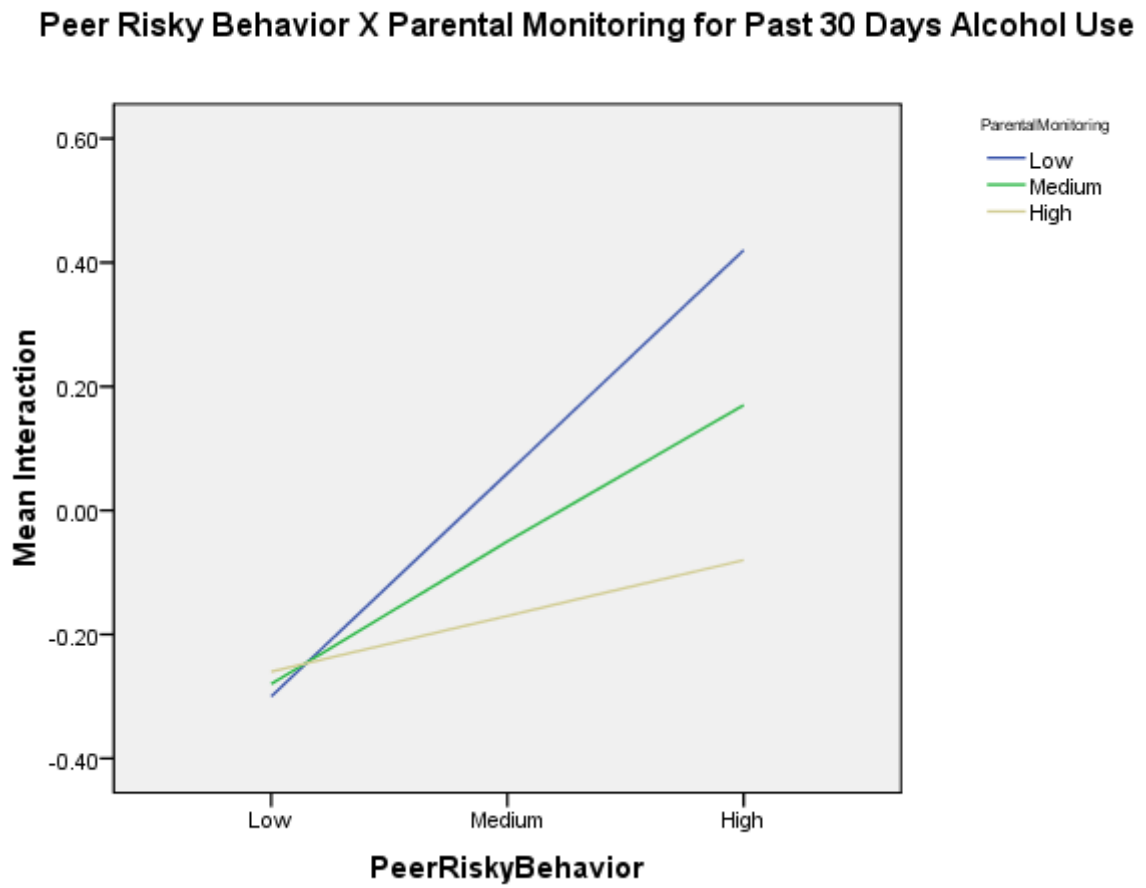


Figure 23

Graph of Interaction of Peer Risky Behavior and Parental Monitoring for Past 30 Day

Alcohol Use



$t(557)=-2.190, p = .029$). The effect size was .104. The regression model with interaction effects explained 10.4% of past 30 day tobacco use variance. The interaction accounted for .008% of the variance in past 30 day tobacco use. The interaction suggested that under conditions of high levels of peer risky behavior, participants with high levels of parental monitoring were less likely than those with lower or medium levels of parental monitoring to smoke marijuana during the past 30 day. Similarly, under conditions of high levels of peer risky behavior, participants with medium levels of parental monitoring were more likely than those with high levels of parental monitoring to smoke marijuana during the past 30 day but less likely to smoke than those with low levels of parental monitoring. Alternatively, under conditions of high levels of peer risky behavior, participants with low levels of parental monitoring were more likely to smoke marijuana during the past 30 day than participants with low or medium levels of parental monitoring (see Figure 24).

Parental monitoring did not moderate the relationship between peer risky behavior and drug refusal efficacy ($p = .840$).

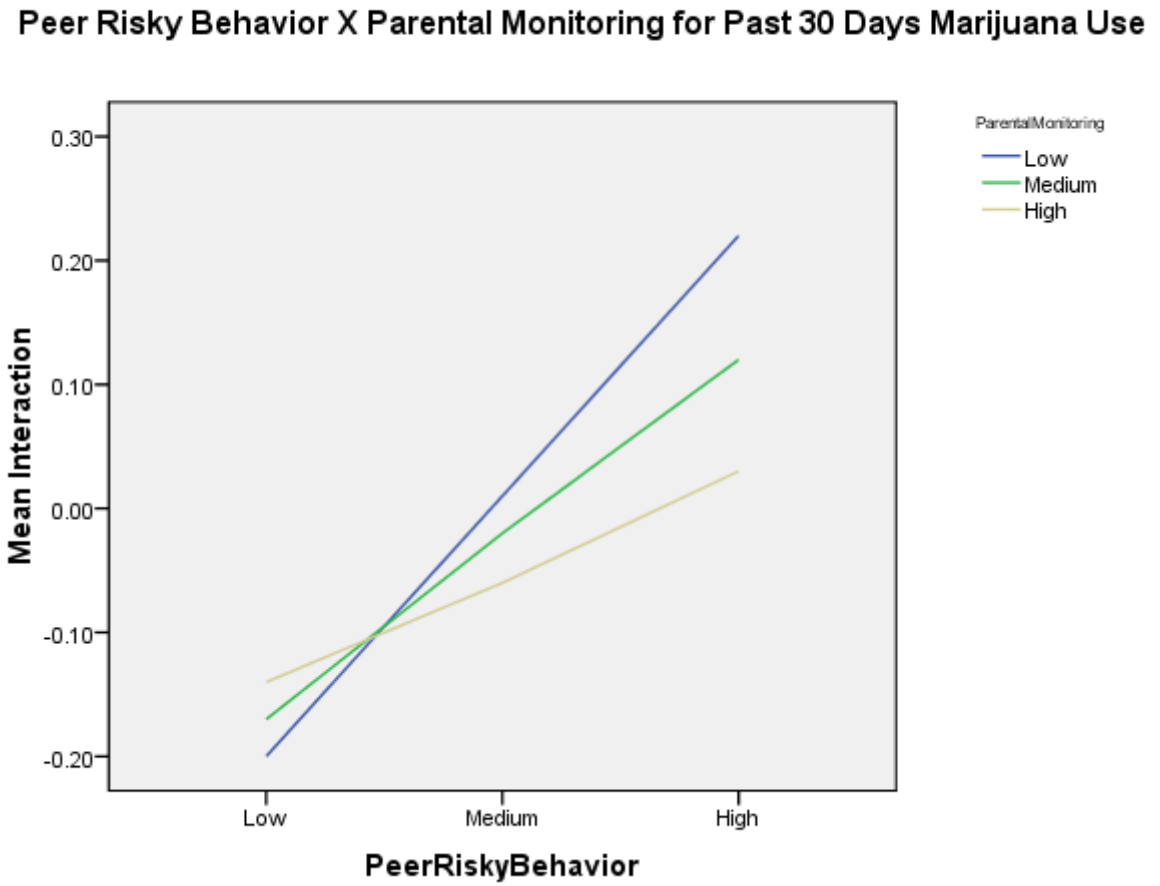
Hypothesis 3

Hypotheses 3 and 4 include categorical moderator and continuous independent variables. Prior to analysis, interaction terms of the independent variables and moderator variables (e.g., peer risky behavior X community type) were created. In hierarchical regression, age and gender were entered first. Second, the main effects of the independent variables were entered. Third, the main effects of the moderator variables were entered. The interaction terms were loaded fourth.

Figure 24

Graph of Interaction of Peer Risky Behavior and Parental Monitoring for Past 30 Day

Marijuana Use



Hypothesis 3: Community type will moderate the relationship between peer risky behavior and adolescent drug refusal efficacy and use.

Community type was dummy coded. Age and gender were entered first in each regression analysis. Hypothesis 3 was not supported. Community type did not moderate the relationship between peer risky behavior and past 30 day tobacco use ($p = .857$), alcohol use ($p = .893$), marijuana use ($p = .781$), and drug refusal efficacy ($p = .625$). Specifically, the addition of the product variables failed to explain unique variable above the variance attributed by the main effects of the independent and moderator variables.

Hypothesis 4

Hypothesis 4: Gender will moderate the relationship between peer risky behavior and adolescent drug refusal efficacy and use.

Age was entered first in each regression analysis. Gender did not moderate the relationship between peer risky behavior and drug refusal efficacy ($p = .159$) and past 30 day tobacco use ($p = .863$) and alcohol use ($p = .178$). Gender moderated the relationship between peer risky behavior and marijuana use ($R^2 = .117$, $R^2_{adj} = .111$ $F(4, 558)=18.51$, $p < .01$; $\beta=-.122$, $t(558)=-3.039$, $p = .002$). Gender differences for this interaction were examined using the split file function in SPSS. Results indicated that the magnitude of the interaction was stronger for males ($R^2 = .103$, $R^2_{adj} = .094$ $F(2, 193)=11.10$, $p < .01$; $\beta=.260$, $t(193)=3.433$, $p = .001$) than females ($R^2 = .071$, $R^2_{adj} = .066$ $F(2, 364)=13.86$, $p < .01$; $\beta=.235$, $t(364)=4.350$, $p = .000$), although there were significant interactions for both. See Table 29 for a summary of the results.

Table 29

Interaction of Peer Risky Behavior and Gender for Past 30 Day Marijuana Use

Coefficients	Total Sample	Males	Females
R^2	.117	.103	.071
R^2_{adj}	.111	.094	.066
B	-.038	.055	.023
SE	.013	.016	.005
CI	-.063, -.014	.023, .087	.013, .034
β	-.122	.260	.235
p	.002	.001	.000

Hypothesis 5

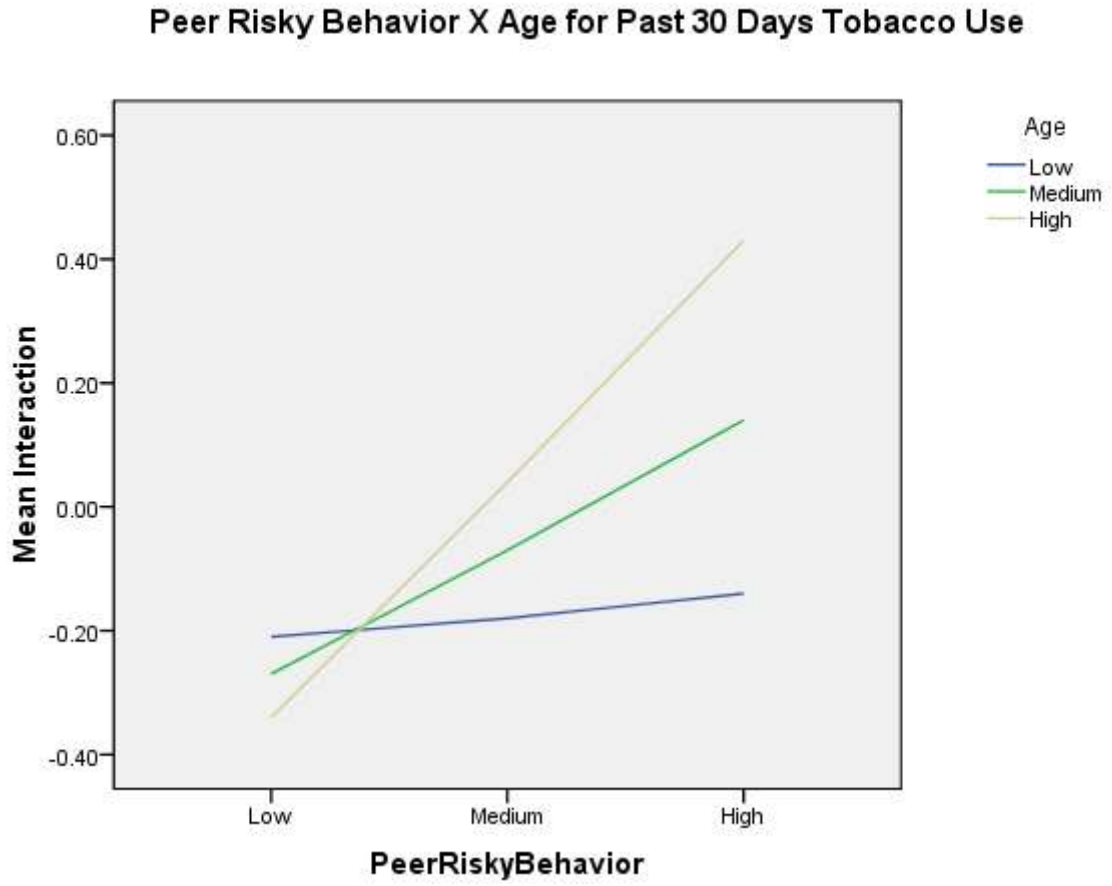
Hypothesis 5: Age will moderate the relationship between peer risky behavior and adolescent drug refusal efficacy and use.

Gender was entered first in each regression analysis. Age did not moderate the relationship between peer risky behavior and drug refusal efficacy ($p = .220$), past 30 day alcohol use ($p = .309$), and past 30 day marijuana use ($p = .071$).

Age moderated the relationship between peer risky behavior and past 30 day tobacco use ($R^2 = .154$, $R^2_{adj} = .147$, $F(4, 558) = 25.29$, $p < .01$; $\beta = .198$, $t(558) = 4.945$, $p = .000$). The effect size was .147. The regression model with interaction effects explained 14.7% of past 30 day tobacco use variance. The interaction accounted for 3.7% of the variance in past 30 day tobacco use. The interaction suggested that under conditions of high levels of peer risky behavior, younger participants were less likely than older participants to smoke cigarettes during the past 30 day. Similarly, under conditions of high levels of peer risky behavior, middle age participants were more likely than younger participants to smoke cigarettes during the past 30 day but less likely to smoke than older participants. Alternatively, under conditions of high levels of peer risky behavior, older participants were more likely to smoke cigarettes during the past 30 day than middle age and the youngest participants (see Figure 25).

Figure 25

Graph of Interaction of Peer Risky Behavior and Age for Past 30 Day Tobacco Use



CHAPTER FIVE

DISCUSSION

Introduction and Synopsis of the Dissertation

African American adolescents have traditionally engaged in drug use at disproportionately lower rates than youth of other ethnic groups. Nonetheless, African American youth and adults suffer disproportionately higher rates of drug-related consequences. This paradox is a health and social disparity that has been given fair attention but needs additional culturally intelligent theoretical and empirical explanations. Research that targets African American adolescent drug use has emerged but has failed to fully or moderately explain this paradox. The accurate identification of psychosocial factors that contribute to drug use among African American adolescents is central to the development of effective programs that prevent African American youth from using drugs.

Family Interactional Theory: The Developmental Model suggests that there is a pathway to adolescent drug use. It posits, in order, (1) the absence of parental drug use and positive attitudes toward adolescent drug use creates a warm and conflict-free parent-adolescent relationships; (2) the child internalizes the parents' conventional personality, attitudes, and behaviors that leads to his own conventional personality; and (3) due to the adolescent's conventional personality, he affiliates with fewer risky peers and maintains his own attitudes toward conventional behaviors. As a result, he is less likely to use drugs. *Family Interactional Theory: The Developmental Model* points to parents and peers as primary influences of adolescent drug use. In general, peer factors have consistently been found to be the strongest predictor of adolescent drug use (Bahr,

Hoffman, & Yang, 2005; Kandel, 1996). Conversely, Wallace and Muroff (2002) suggested that the family may be the most salient protective factor for African American adolescents. Perhaps, the family as a protective mechanism helps to explain the first part of the paradox; that is, lower African American youth drug use. It is possible that the African American family buffers against adolescent drug use. Still, the unanswered question is, under what conditions does the family's protective influence on drug use among African American adolescents fail to act as a protective factor?

The purpose of this study was to fill a gap in the literature by helping to explain the first part of the paradox, African American adolescent drug use. More specifically, this study examined the role of parents and peers in drug use among African American adolescents that live in rural and urban settings. Wallace and Muroff (2002)'s findings of family as a potential protective factor for African American adolescent drug use is intriguing. Yet, recent studies have used Wallace and Muroff's framework and examined these relationships and have found no support (e.g., Jones, Hussong, Manning, & Sterrett, 2008). The present study will help to lend support and clarification to these conflicting findings.

To achieve the goals of the present study, a cross sectional design was used. A purposive sample of 567 African American adolescents completed a paper-and-pen survey. Students were eligible to participate in the study if they were: (1) African American or bi-racial with one parent identifying as African American; (2) in fifth, eighth, or twelfth grades; (3) did not have a diagnosis of major emotional or behavioral disturbance (as identified by school staff); and (4) received parental consent and provided assent. Students completed surveys at their schools and received an incentive for their

participation. The survey was comprised primarily of standardized measures and was used to assess participants' attitudes, perceptions, and behaviors regarding a range of topics. Specifically, the survey explored the influence of family, peers, neighborhood, school, stress, and cultural variables upon adolescent drug use. The present study examined the descriptive and predictive value of parental attitudes toward drug use, mother-adolescent relationship, parental monitoring, and peer risky behavior to explain adolescent drug refusal efficacy and use.

The discussion in this chapter will (1) reiterate and synthesize the study's findings, (2) relate the study's findings to findings of other studies, (3) describe possible reasons for the lack of support for unsubstantiated hypotheses, (4) delineate study limitations, (5) identify implications for social work research and prevention programming, and (6) highlight the study's contributions to the knowledge base.

Synthesizing Findings

Hypothesis 1

Hypothesis 1 posited that parent-adolescent relations and management would partially mediate the relationship between parental attitudes toward drug use and peer risky behavior and, (2) peer risky behavior would partially mediate the relationship between parent-adolescent relations and management and adolescent drug refusal efficacy and use and, (3) parent-adolescent relations and management and peer risky behavior would partially mediate the relationship between parental attitudes toward drug use and adolescent drug refusal efficacy and use. This hypothesis was partially supported.

This hypothesis was tested in three steps. During step I, peer risky behavior was tested as a mediator in the relationship between mother-adolescent relationship and parental monitoring and drug refusal efficacy and drug use. Mother-adolescent relationship was entered as the independent variable in Step Ia and parental monitoring was entered as the independent variable in Step Ib. During step II, mother-adolescent relations and parental monitoring were entered as mediator variables in the relationship between parental attitudes toward drug use and peer risky behavior. In Step IIa, mother-adolescent relationship was entered as the mediator variable and parental monitoring was entered as the mediator variable in Step IIb. During step III, the full mediation model was examined. Mother-adolescent relations, parent monitoring, and peer risky behavior variables were entered as mediators in the relationship between parental attitudes toward drug use and drug refusal efficacy and use.

Step Ia: Mother-Adolescent Relationship and Drug Refusal Efficacy and Past 30 Day Tobacco Use, Alcohol Use, and Marijuana Use

During the first step, it was predicted that peer risky behavior would partially mediate the relationship between mother-adolescent relationship and drug refusal efficacy and current tobacco use, alcohol use, and marijuana use. The findings did not completely support this hypothesis. As expected, peer risky behavior mediated the relationship between mother-adolescent relationship and drug refusal efficacy. The findings suggest that mother-adolescent relationship impacts risky peer affiliation which in turn impacts drug refusal efficacy. This path possibly transpires such that positive mother-adolescent relationship limits association with risky peers which reduces opportunities for risky peers to negatively impact adolescent drug refusal efficacy. It is

also possible that positive mother-adolescent relationship reduces the influence of risky peer affiliation such that it weakens their influence upon drug refusal efficacy. The total effect of mother-adolescent relationship on drug refusal efficacy (this relationship was found during the first step of mediation analyses) supports the findings and theories that suggest that adolescents that are highly attached to their parents may be less likely to engage in drug use because of their desire to please their parents by upholding conventional attitudes and behaviors (e.g., Hirschi, 1969). It also supports the literature that suggest that the quality of the parent-adolescent relationship is one of the most important factors in determining adolescents' attitudes and behaviors (e.g., Hair, Jager, & Garrett, 2002). In this context, the findings suggest that the mother-adolescent relationship influences how efficacious their adolescent children feel about refusing drugs. These findings show the importance of the mother-adolescent relationship in developing skills, particularly drug refusal skills. Accordingly, drug prevention programs should incorporate a parent component that capitalizes on the influence of the mother-adolescent relationship in the development of drug refusal skills.

Another important contribution of this finding is that it extends previous research regarding peer risky behavior as a complete mediator in the relationship between mother-adolescent relationship and drug refusal-efficacy. It was expected that peer risky behavior would partially mediate the relationship between mother-adolescent relationship and drug refusal efficacy, but instead it completely mediated that relationship. The finding supporting this exploratory hypothesis suggests that the influence of the quality of mother-adolescent relationships is fully transmitted by way of risky peers to drug refusal efficacy. Partial mediation was expected in this study because it typically is unrealistic to

expect a single mediator to fully explain the relationship between an independent variable and dependent variable. Findings of complete mediation with peer risky behavior as the mediator supports the literature that suggests that peer factors are important and typically account for the most variance in adolescent drug use.

It was also predicted that peer risky behavior would partially mediate the relationship between mother-adolescent relationship and past 30 day tobacco use, alcohol use, and marijuana use. Mother-adolescent relationship was significantly associated with past 30 day alcohol use ($p < .01$) and approached significance in its relationship with past 30 day tobacco use ($p = .061$). However, when age and gender were entered in the first step of the regression model, mother-adolescent relationship lost significance and did not predict past 30 day tobacco use, alcohol use, or marijuana use. Thus, the first requirement for mediation was not met. Instead, age was a significant predictor accounting for a portion of the variance in the relationship between mother-adolescent relationship and past 30 day tobacco use, alcohol use, and marijuana use. Gender was also a significant predictor accounting for a portion of the variance in the relationship between mother-adolescent relationship and past 30 day marijuana use. It is possible that for African American adolescents, age may play a more important role in current drug use such that the impact of the mother-adolescent relationship above age was difficult to detect in this study. This finding may contribute to increased understanding of the crossover effect. Similarly, gender may play a more important role in current marijuana use among African American adolescents given that the impact of the mother-adolescent relationship above gender was difficult to detect. Specific findings were that older participants were more likely to use tobacco, alcohol, and marijuana and boys were more

likely to use marijuana. The findings suggest that age is associated with adolescent drug use, and thus, developmental factors are important to consider when designing drug use prevention programming. The findings also suggest that gender is an important factor to take into consideration when designing drug use prevention programming, particularly programs that focus on current marijuana use.

It is possible that significant relationships were not found in the relationships between mother-adolescent relationship and past 30 day tobacco use, alcohol use, and marijuana use because of the lack of variation in the drug use variables. As expected, the drug use variables were highly skewed toward “no drug use.” Ninety-one percent responded that they had not smoked tobacco use during the past 30 day, 79.4% reported that they had not drunk alcohol during the past 30 day, and 90.7% reported that they had not smoked marijuana during the past 30 day. These findings suggest that current tobacco and marijuana use are not normative behaviors among African American adolescents, particularly fifth and eighth graders. It is important to mention that it is likely that more variability would have been found in the drug use variables if a lifetime or “ever use” measure was used.

It is also possible that mother-adolescent relationship has greater influence depending upon the stage of drug use. For instance, mother-adolescent relationship may have stronger effects upon drug experimentation than current drug use. Thus, future research should examine the relationship between parent and peer factors and drug use across the drug use continuum.

The father-adolescent relationship was not empirically tested in this study because of efforts to limit study variables and test a parsimonious model. Still, fathers play an

important and influential role in their adolescent children's lives. Recent studies have found that father-adolescent relationship is associated with adolescent drug use (e.g., Bahr, Hoffman, & Yang, 2005; Musitu & Murgui, 2006). Castro et al. (2006) suggested that the father-adolescent relationship may be especially influential for African American and Hispanic adolescents. Although the present study did not examine this relationship, the literature suggests that the relationship between the father-adolescent relationship and adolescent drug use may be equally or more important than the relationship between mother-adolescent relationship and adolescent drug use.

Although the finding did not support this hypothesis as it relates to the drug use variables, it supports other studies that have found weak or no relationship between the quality of parent-adolescent relationship and adolescent drug use (e.g., Bahr, Marcos, & Maughan, 1995; Hoffmann & Su, 1998). The question remains regarding the reason that mother-adolescent relationship was associated with drug refusal efficacy but not the drug use variables. Again, it is possible that there were no significant findings between mother-adolescent relationship and adolescent drug use because of the lack of variability in the drug use dependent variables. Perhaps, due to the lack of variability in drug use, it was more difficult for mother-adolescent relationship rather than a stronger predictor of drug use, such as parental monitoring, to remain significant after entering age and gender. In addition, as previously mentioned, the literature suggests that adolescents that are highly attached to their mothers may be more likely to uphold conventional attitudes and behaviors because of their desire to please their parents. It is possible that positive mother-adolescent relationship is related to adolescents' intentions to please their parents by refusing drugs (drug refusal efficacy) but these intentions may not translate to

behaviors (past 30 day tobacco use, alcohol use, and marijuana use). Further, there may be a stronger association between conventional attitudes and efficacy than conventional attitudes and behaviors. More research is needed that further examines mother-adolescent relationship and adolescent attitudes and behaviors.

Step Ib: Parental Monitoring and Drug Refusal Efficacy and Past 30 Day Tobacco Use, Alcohol Use, and Marijuana Use

It was predicted that peer risky behavior would partially mediate the relationship between parental monitoring and drug refusal efficacy, past 30 day tobacco use, past 30 day alcohol use, and past 30 day marijuana use. The findings supported this hypothesis. Findings of analyses indicated that peer risky behavior partially mediated the relationship between parental monitoring and drug refusal efficacy and past 30 day alcohol use. That is, direct connections between parental monitoring and drug refusal efficacy and past 30 day alcohol use remained after peer influences were taken into account. Findings also indicated that peer risky behavior completely mediated the relationship between parental monitoring and past 30 day tobacco use and past 30 day marijuana use. That is, there were no direct relationships between parental monitoring and past 30 day tobacco use and past 30 day marijuana use after peer influences were taken into account. Findings of complete mediation demonstrate the important impact of peer influence on drug use.

The finding of peer risky behavior as a mediator in the relationship between parental monitoring and drug use suggest that parental monitoring may reduce affiliation with risky peers which in turn increases drug refusal efficacy and decreases drug use. Thus, parental monitoring is a tool used to limit opportunities for risky peer affiliation and adolescent drug use. These findings are consistent with other studies in the literature.

Several researchers have found that parental monitoring had direct effects on drug use with peer risky behavior (e.g., Dishion, Capaldi, Spracklen, & Li, 1995) and peer pressure (Kung & Farrell, 2000) mediating its effects. In summary, these findings support the existing empirical literature and suggest that peer risky behavior may account for some of the variance in the relationship between parental monitoring and drug refusal efficacy and past 30 day alcohol use. Further, peer risky behavior accounts for the variance in the relationship between parental monitoring and adolescent smoking behaviors, specifically, past 30 day tobacco use and past 30 day marijuana use.

Step IIa: Parental Attitudes Toward Drug Use, Mother-Adolescent Relationship, and Peer Risky Behavior

Mother-adolescent relationship was predicted to partially mediate the relationship between parental attitudes toward drug use and peer risky behavior. The finding supports this hypothesis and suggests that mother-adolescent relationship may account for some of the variance in the relationship between parental attitudes toward drug use and peer risky behavior. The finding suggests that parental attitudes toward drug use may influence the quality of the mother-adolescent relationship which in turn impacts affiliation with risky peers. This hypothesis was exploratory as existing research concerning this relationship is sparse. However, this hypothesis supports psychological theories such as social cognitive theory and sociological models such as the social development model. The social development model, for example, suggests that parental favorable attitudes toward deviance and actual deviant behavior influence the parent-adolescent relationship which in turn has a direct and indirect effect (through peers) on their adolescent children's deviant behavior (Catalano & Hawkins, 1996). Specifically, the path to drug use begins

with (1) parental favorable attitudes toward drug use, (2) stronger attachment to these parents influences adolescents' own favorable attitudes toward drug use, (3) which in turn influences affiliation with peers that share similar favorable attitudes toward drug use, (4) which leads to drug use. This process is an example of peer selection effects that was described in chapter two. Selection occurs when adolescents affiliate with peers who share similar attitudes and behaviors (Fisher & Bauman, 1988).

Step IIb: Parental Attitudes Toward Drug Use, Parental Monitoring, and Peer Risky Behavior

Parental monitoring was predicted to partially mediate the relationship between parental attitudes toward drug use and peer risky behavior. The finding supports this hypothesis and suggests that parental monitoring may account for some of the variance in the relationship between parental attitudes toward drug use and peer risky behavior. The finding suggests that favorable parental attitudes toward drug use may influence the manner in which parents monitor their children which in turn increases risky peer affiliation. This hypothesis was exploratory as research concerning this relationship is sparse. The notion is that parents that hold favorable attitudes toward drug use may permit their adolescents to use drugs, avoid discussing the consequences of drug use, and not establish rules regarding drug use. These parents are also expected to have lower levels of monitoring that would create adolescent opportunities to engage in activities with friends that engage in risky behavior. Adolescents whose parents disapprove of drug use are less likely to affiliate with risky peers and presumably are less likely to engage in drugs and vice versa. This notion has been supported empirically. Nash, McQueen, and Bray (2005) found that greater parental disapproval of drug use was

associated with less involvement with peers that used alcohol, less peer influence to use alcohol, greater self-efficacy for avoiding alcohol use, and lower alcohol use and other related problems.

Step III: Full Mediation Model

Mother-adolescent relationship, parental monitoring, and peer risky behavior was predicted to partially mediate the relationship between parental attitudes toward drug use and drug refusal efficacy and past 30 day tobacco use, alcohol use, and marijuana use. The findings partially supported this primary hypothesis. Mother-adolescent relationship was not found to be a mediator in any of the proposed relationships. Parental monitoring was not found to be a mediator in the relationships between parental attitudes toward drug use and past 30 day tobacco use and past 30 day marijuana use. However, parental monitoring was a mediator in the relationships between parental attitudes toward drug use and drug refusal efficacy and past 30 day alcohol use. Peer risky behavior was a mediator in all proposed relationships. To sum and specify the results, contrary to precise expectations, parental monitoring and peer risky behavior completely mediated the relationship between parental attitudes toward drug use and drug refusal efficacy. Parental monitoring and peer risky behavior partially mediated the relationship between parental attitudes toward drug use and past 30 day alcohol use. Only peer risky behavior mediated the relationships between parental attitudes toward drug use and past 30 day tobacco use and past 30 day marijuana use.

Mother-adolescent relationship was not found to be a mediator in the relationships between parental attitudes toward drug use and drug refusal efficacy and past 30 day tobacco use, alcohol use, and marijuana use. This is somewhat inconsistent with previous

findings that describe a relationship between mother-adolescent relationship and drug use (e.g., Bahr, Hoffman, & Yang, 2005; Shedler & Block, 1990). However, the findings are consistent with other studies that did not find significant relationships between mother-adolescent relationship and drug refusal efficacy (Boyd, Aschraft, & Belgrave, 2006). Again, the lack of findings in the current study could be related to the lack of variation in the drug use variables. Specifically, it is possible that it was more difficult for mother-adolescent relationship rather than a stronger predictor of drug use, such as parental monitoring, to remain significant after entering age and gender into the regression model. Also as described earlier, it is possible that age and gender may be more influential than the mother-adolescent relationship upon drug refusal efficacy and use, at least for this rural and urban African American adolescent sample.

Parental monitoring was not found to be a mediator in the relationships between parental attitudes toward drug use and past 30 day tobacco use and past 30 day marijuana use. These findings support the lower order findings in Step 1b that indicated that peer risky behavior completely mediated the relationships between parental monitoring and past 30 day tobacco use and past 30 day marijuana use. Thus, after peer risky behavior is entered into the equation, parental monitoring does not directly affect current tobacco use and marijuana use. This finding further supports the influential role of peers on drug use.

Parental monitoring and peer risky behavior partially mediated the relationship between parental attitudes toward drug use and past 30 day alcohol use and completely mediated the relationship between parental attitudes toward drug use and drug refusal efficacy. The partial mediation finding supports other studies that suggest that parental attitudes toward drug use directly and indirectly impacts drug use through peer risky

behavior (e.g., Bahr, Hoffman, & Yang, 2005). For example, Bahr, Hoffman, and Yang found that parental drug attitudes had direct and indirect effects on adolescent drug use and that the indirect effects were partially mediated by peer drug use. In Bahr et al.'s study, family influence was mediated by peers by approximately 50 percent. Bahr et al.'s findings and the past 30 day alcohol use findings of the present study indicate that family variables have significant direct effects on adolescent drug use independent of peer influence. Again, the finding of complete mediation in the relationship between parental attitudes toward drug use and drug refusal efficacy was surprising. The findings suggest that one path to drug refusal efficacy is via parental attitudes toward drug use, parental monitoring, and peer risky behavior. That is, parental attitudes toward drug use may influence parental monitoring and peer risky behavior which in turn influences drug refusal efficacy. The findings suggest that parental monitoring and peer risky behavior accounts for the variance in the relationship between parental attitudes toward drug use and drug refusal efficacy. Further, there is not a direct effect between parental attitudes toward drug use and drug refusal efficacy after parental monitoring and peer risky behavior are accounted.

Only peer risky behavior mediated the relationships between parental attitudes toward drug use and past 30 day tobacco use and past 30 day marijuana use. Peer influence is consistently found to be an important predictor and mediator upon adolescent drug use. The findings of the present study are consistent with the literature that describes peer influence as an important mediator in the relationship between parental attitudes toward drug use and adolescent drug use (e.g., Bahr, Hoffman, & Yang, 2005). The findings of the current study suggest that parental attitudes toward drug use influence

affiliation with risky peers which in turn increases two specific smoking behaviors, current cigarette use, and current marijuana use. Further, the findings suggest that peer risky behavior accounts for some of the variance in the relationship between parental attitudes toward drug use and past 30 day tobacco use and past 30 day marijuana use. These findings suggest that there is a direct effect between parental attitudes toward drug use and past 30 day tobacco use and past 30 day marijuana use after peer risky behavior is accounted.

Hypothesis 2

Hypothesis 2 posited that parent-adolescent relations (mother-adolescent relationship) and management (parental monitoring) would moderate risky peers-adolescent drug refusal efficacy and use relationships. This hypothesis was partially supported.

Mother-Adolescent Relationship

The present study did not find support for the hypothesis that mother-adolescent relationship would reduce the influence of friends' risky behavior upon drug refusal efficacy and use. It was expected that when mother-adolescent relations were strong, the relationship between risky peers and drug use would not be as strong as when mother-adolescent relations were weak. Although higher levels of mother-adolescent relationship was associated with fewer peers that engaged in risky behavior, less current alcohol use, and higher drug refusal efficacy, mother-adolescent relationship did not moderate the effects of peer risky behavior upon drug refusal efficacy and use. This finding is somewhat inconsistent with the empirical and theoretical literature. For instance, Wills, Gibbons, Gerrard, Murry, and Brody (2003) posited that youth who feel

comfortable talking to their parents about problems may be less susceptible to negative peer influences and risky behavior. Similarly, in this study, it was expected that positive mother-adolescent relationship would serve to buffer against peer risky behavior. Specifically, it was expected that adolescents with positive mother-adolescent relations would affiliate with fewer risky peers. It was expected that the affiliation with risky peers would be limited because of the openness of adolescent communication with their mothers, their desire to please their mothers, or because they internalized their mothers' conventional norms. This hypothesis was unsupported.

Correlational findings for mother-adolescent relationship, peer risky behavior, and drug refusal efficacy and use indicated that those with positive mother-adolescent relationships associated with fewer risky peers, consumed less alcohol use, and had higher drug refusal efficacy. Thus, this relationship might be a more direct rather than indirect relationship as hypothesized. Future studies should explore this possibility. It is important to highlight the inverse correlational relationship between mother-adolescent relationship and affiliation with risky peers. This relationship was expected and further supports the notion that positive mother-adolescent relationship is associated with adolescent peer selection. Correlational findings suggest that higher levels of positive mother-adolescent relationship may reduce risky peer selection and predict higher levels of drug refusal efficacy and lower levels of drug use. This relationship was unsupported in multivariate analyses.

The failure to find moderating effects of mother-adolescent relationship upon drug refusal efficacy and use may also be attributed to the reasons described in hypothesis 1. These reasons include (1) lack of variation in drug use variables, (2)

mother-adolescent relationship may be related to specific stages of drug use, (3) age and gender may play a more important role in drug refusal efficacy and use such that the impact of the mother-adolescent relationship above age and gender was difficult to detect, (4) the relationship between the father-adolescent relationship and adolescent drug refusal efficacy and use may be equally or more important than the relationship between mother-adolescent relationship and adolescent drug use, and (5) the relationship might be a more direct rather than indirect relationship.

Parental Monitoring

Hypothesis 2 also posited that parental monitoring would moderate risky peers-adolescent drug refusal efficacy and use relationships. It was expected that when parental monitoring was high, the relationship between risky peers and drug use would not be as strong as when parental monitoring was low. Partial support was found for this part of hypothesis 2. Parental monitoring was not found to moderate the relationship between peer risky behavior and drug refusal efficacy. This part of hypothesis 2 was exploratory. No studies were found that had examined this relationship. It was expected that parental monitoring would impact the relationship between peer risky behavior and drug refusal efficacy in a similar manner as drug use. There was no support for this exploratory hypothesis, but future studies should examine the conditions by which the relationship between affiliation with risky peers and drug refusal efficacy changes.

As expected, parental monitoring was found to moderate the relationships between peer risky behavior and past 30 day tobacco use, past 30 day alcohol use, and past 30 day marijuana use. Parental monitoring influenced the relationship of peer risky behavior such that under conditions of high levels of peer risky behavior, participants

with high levels of parental monitoring were less likely than those with lower or medium levels of parental monitoring to have used drugs during the past 30 day. Under conditions of high levels of peer risky behavior, participants with medium levels of parental monitoring were more likely than those with high levels of parental monitoring to have used drugs during the past 30 day but less likely to have used drugs than those with low levels of parental monitoring. Under conditions of high levels of peer risky behavior, participants with low levels of parental monitoring were more likely to have used drugs during the past 30 day than participants with low or medium levels of parental monitoring

These findings are consistent with the findings of several researchers (e.g., Dishion et al., 1995; Kung & Farrell, 2000; Wood, Read, Mitchell, & Brand, 2004). Adolescents with inadequate parental monitoring are more likely to associate with drug-using peers, and thus, are more likely to engage in drug use (Bahr, Hawks, & Wang, 1993; Dishion, Capaldi, Spracklen, & Li, 1995). The findings of this study suggest that parenting is a protective factor for drug use. Specifically, children who receive adequate parental monitoring may be less likely to be influenced by risky peers and less likely to use drugs.

In summary, parental monitoring may be more important than the quality of the mother-adolescent relationship upon drug use because it helps to keep youth safe. Many youth engage in drug use after school during unsupervised time. Parental monitoring provides supervision of adolescent activities, locations, and friends. Thus, adolescents with adequate monitoring will have fewer opportunities to acquire drugs and associate with friends who hold unconventional attitudes and behaviors.

Hypothesis 3

Hypothesis 3 posited that community type would moderate the relationship between peer risky behavior and adolescent drug refusal efficacy and use. It was expected that peer risky behavior would differ among rural and urban adolescents such that it would be more strongly related to adolescent drug use in urban communities. This study did not find support for this hypothesis. Community type did not moderate the relationship between peer risky behavior and drug refusal efficacy and past 30 day tobacco use, alcohol use, and marijuana use. This hypothesis was exploratory as no prior studies on this relationship were found.

The failure to find moderating effects of community type upon peer risky behavior may be attributed to the possibility that the attributes of rurality and urbanity more than “urban” or “rural” may be better predictors of drug refusal efficacy and use. That is, rurality and urbanity as well as the accompanying demographic, economic, and social characteristics may be salient and most influential upon drug refusal efficacy and use. In the present study, community type was coded as a dichotomous variable that may have masked important differences across rural and urban settings. Grouping adolescents into a dichotomous community type variable does not reflect the diversity of environments in which adolescents live and develop. In addition, grouping adolescents into “rural” and “urban” and failing to examine the characteristics of each community may mask the specific factors that may influence human behavior. Thus, the findings suggest that community type, as a dichotomous variable may be an inadequate measure of rural and urban contexts. Therefore, an examination of the effects of community type

upon peer risky behavior should include multiple items to assess the specifics of the community characteristics. Poverty, crime, access to resources, neighborhood ethnic heterogeneity, and drug availability among other salient characteristics should be considered in future studies that examine the effects of community type. These particular characteristics are more objective indexes of community functioning than the measure used in this study.

As hypothesized earlier, it is also possible that proximal factors, such as parent and peer factors may have a greater influence on drug refusal efficacy and drug use than community type. Proximal factors may include parent drug use (Bailey, Hill, Oesterle, & Hawkins, 2006; White, Johnson, & Buyske, 2000), parental attitudes toward drug use (Ary, Duncan, Duncan, & Hops, 1999; Welte, Barnes, Hoffman, & Dintcheff, 1999), parental monitoring (Miller & Volk, 2002; Wallace & Fisher, 2007), mother-adolescent relationship (Bahr, Hoffman, & Yang, 2005; Castro, Brook, Brook, & Rubenstone, 2006), and father-adolescent relationship (Bahr, Hoffman, & Yang, 2005; Jiménez, Musitu, & Murgui, 2006).

Hypothesis 4

Hypothesis 4 posited that gender would moderate the relationship between peer risky behavior and drug refusal efficacy and use. It was expected that peer risky behavior would differ according to gender such that peer risky behavior would be more strongly related to drug refusal efficacy and use for boys than girls. The findings did not completely support this hypothesis. Gender did not moderate the relationship between peer risky behavior and drug refusal efficacy, past 30 day tobacco use, and past 30 day

alcohol use. Gender moderated the relationship between peer risky behavior and marijuana use.

The lack of significant findings implicating gender as a moderator in the relationship between peer risky behavior and drug refusal efficacy and past 30 day tobacco and alcohol use is somewhat inconsistent with previous research. There is less research that has examined this relationship, which is an unfortunate gap in the literature. The research that exists paints a mixed picture. For instance, Andrews et al. (1997) found that peers had similar influence for boys and girls as it relates to drug use. On the other hand, the failure to find a moderating effect of gender in the relationship between peer risky behavior and drug refusal efficacy, past 30 day tobacco use, and past 30 day alcohol use supports the literature that suggest that peer influence in relation to drug use is similar for boys and girls.

As mentioned, the literature is equivocal regarding gender differences in the relationship between peer risky behavior and drug use. In contrast to the previously cited literature, some studies suggest that boys tend to be exposed to peer risky behavior more than girls and that peer effects on drug use may be stronger for boys. For instance, Svensson (2003) found that boys were more likely than girls to be exposed to risky behavior. This finding is of particular concern given that boys are also less likely to be monitored closely by their parents. Thus, boys may be most at risk for drug use. Similarly, Rauste-von Wright (1989) found that boys were involved in peer-group fights more often than girls, and responded in an aggressive manner to fights between peers. Taken together, these findings suggest that boys are more likely to be exposed to risky peers. It is also possible that this relationship differs for African American youth than

youth of other ethnic groups. Future studies should examine ethnic and gender differences in exposure and involvement in peer risky behavior.

As expected, this study found that gender moderated the relationship between peer risky behavior and marijuana use. Findings indicated that the magnitude of the interaction was stronger for males than females, although there were significant interactions for both. This study measured current drug use. The literature suggests that peer influence and peer risky behavior may be more important for boys than girls when examining drug use maintenance (Inciardi et al., 1993). Inciardi and colleagues found that although both boys and girls are likely to initiate drug use due to peer pressure, they maintain drug use for varying reasons. Notably, boys are more likely to continue using drugs due to peer influence whereas girls are more likely to continue drugs to cope with problems. Barber, Bolitho, and Bertrand (1999) found that peer drug use was more predictive of drug use among 12-13 year old boys whereas overt peer pressure was a better predictor of 12-13 year old girls. That is, peer risky behavior and drug use is more predictive of drug use among boys and peer pressure is more predictive of drug use among girls (Barber, Bolitho, & Bertrand). To sum, peer drug use and risky behavior may be a stronger predictor of drug use among boys. Thus, this finding supports the literature.

The question remains regarding the reason that gender was found to be a moderator only upon current marijuana use. It is possible that cultural norms are a factor. For example, if African American boys perceive that their African American peers smoke marijuana more often than other drugs, their peers may play a role in maintaining this thinking and influencing marijuana smoking behaviors. Also, adolescent

boys' possible perceptions that their peers will consider them less cool if they do not use the most popular drug may play a role. It is also possible that availability is a factor. Studies have demonstrated that drug availability or perceived drug availability is associated with drug consumption. Therefore, it is possible that peer influence is more strongly related to boys' marijuana use if marijuana is more available or perceived as more available than cigarettes or alcohol. The primary distribution of cigarettes and alcohol is via stores whose managers are aware of the strict laws and associated penalties for selling these products to underage adolescents. By contrast, marijuana is mostly distributed in "the streets." Thus, marijuana may be perceived by adolescents to be more available than cigarettes and alcohol. Future studies should explore the relationship between perceived drug availability and adolescent drug use while examining gender differences. It is expected that the antecedents of drug use may differ for boys and girls.

Hypothesis 5

Hypothesis 5 posited that age would moderate the relationship between peer risky behavior and adolescent drug refusal efficacy and use. It was expected that high levels of peer risky behavior would reduce adolescent drug refusal efficacy and increase drug use more for older than younger adolescents. That is, peer risky behavior would be more strongly related to drug refusal efficacy and use for older adolescents than younger adolescents. The findings did not completely support this hypothesis. Age did not moderate the relationship between peer risky behavior and drug refusal efficacy and past 30 day alcohol use and past 30 day marijuana use. Age moderated the relationship between peer risky behavior and past 30 day tobacco use.

The failure to find a moderating effect of age upon peer risky behavior for drug refusal efficacy, past 30 day alcohol use, and past 30 day marijuana use is somewhat inconsistent with the literature. Developmentally, older adolescents should be the adolescent group that is least susceptible to peer influence. This argument is based on the notion that older adolescents have improved metacognition, decision-making skills, cognitive self-regulation, memory strategies, scientific and systematic reasoning, and other psychological concepts. Thus, older adolescent should have developed the abilities to think reflexively and critically about their own behaviors and the behaviors of their peers. Older adolescents are also less peer oriented than during early stages of adolescence. Nevertheless, although older adolescents are less peer oriented, they are peer oriented nonetheless but are also more autonomous from their parents. Thus, the protective role of parents may be lessened as adolescents age. Steinberg and Silverberg (1986) pointed out that peer influence is especially significant during older adolescence due to the fact that achieving greater emotional and behavioral autonomy from parents is high on the agenda. Thus, in this study it was expected that age would moderate the relationship between peer risky behavior and drug refusal efficacy and use. It is possible that age did not moderate these relationships because of the developmental factors described here.

As expected, this study found that age moderated the relationship between peer risky behavior and current tobacco use. The interaction indicated that under conditions of high levels of peer risky behavior, younger participants were less likely than older participants to smoke cigarettes during the past 30 day. Under conditions of high levels of peer risky behavior, middle age participants were more likely than younger

participants to smoke cigarettes during the past 30 day but less likely to smoke than older participants. Under conditions of high levels of peer risky behavior, older participants were more likely to smoke cigarettes during the past 30 day than middle age and the youngest participants. The finding suggests that age is associated with the strength of peer risky behavior on cigarette use and older adolescents are the most likely adolescent group to smoke cigarettes under high levels of peer risky behavior.

The question remains as to the reason that age was found to be a moderator only upon current tobacco use. It is likely that the reasons are similar to the reasons that gender was found to be a moderator only upon current marijuana use. It is possible that cultural norms and availability are factors. Physical or perceived availability may differ for cigarettes and marijuana use for older adolescents because older adolescents are closer to the legal age required to purchase and smoke cigarettes. It is also possible that there is a stronger effect of peer risky behavior upon current cigarette use because older adolescents may use cigarettes to cope with problems more than use them for recreational purposes as during younger adolescence. Future studies should explore the relationship between perceived drug availability and adolescent drug use while examining age.

Summary of Findings

A key finding of this study is that pathways to drug refusal efficacy and drug use are not equal in their salience and that these relationships differ according to the drug used. Findings of this study indicate that the full mediation model best explained current alcohol use, tobacco use, marijuana use, and drug refusal efficacy, respectively. Specifically, parental monitoring and peer risky behavior partially mediated the relationship between parental attitudes toward drug use and current alcohol use and

completely mediated the relationship between parental attitudes toward drug use and drug refusal efficacy. Only peer risky behavior mediated the relationships between parental attitudes toward drug use and current tobacco and marijuana use. Mother-adolescent relationship was not a mediator in any of the hypothesized relationships. To sum, the findings suggest that peer risky behavior and parental monitoring help to explain the process by which parental attitudes toward drug use influence drug refusal efficacy and use. This study also sought to determine the manner by which parenting variables interact with peer risky behavior to influence adolescent drug use. There was no support for the hypothesis that mother-adolescent relationship would reduce the influence of friends' risky behavior upon drug refusal efficacy and use. However, although parental monitoring was not found to moderate the relationship between peer risky behavior and drug refusal efficacy, it moderated the relationship upon the drug use variables. That is, parental monitoring reduced the influence of friends' risky behavior upon current tobacco, alcohol, and marijuana use.

This study also examined the interaction of demographic characteristics (community type, gender, age) and peer risky behavior upon adolescent drug use. Despite expectations, community type did not moderate the relationship between peer risky behavior and drug refusal efficacy and current tobacco use, alcohol use, and marijuana use. The findings indicated that gender did not moderate the relationship between peer risky behavior and drug refusal efficacy, current tobacco use, and current alcohol use. However, gender moderated the relationship between peer risky behavior and current marijuana use. That is, this relationship was stronger for boys than girls. In addition, findings indicated that age did not moderate the relationships between peer

risky behavior and drug refusal efficacy, current alcohol use, and current marijuana use. However, it moderated the relationship between peer risky behavior and current tobacco use. That is, under conditions of high levels of peer risky behavior, younger participants were less likely than older participants to smoke cigarettes during the past 30 day.

Study Limitations

This study yielded salient findings regarding the relationship between parents, peers, and drug refusal efficacy and use among rural and urban African American adolescents. Still, the findings of this study should be interpreted within the context of the study's limitations. The limitations of the study include shortcomings inherent in the research design, sampling methods, and measurement. These limitations will be discussed next.

Study Design

The present study used a cross-sectional design to meet its objectives. This design is appropriate for this exploratory study given the state of knowledge in the research area. However, because this study used a cross-sectional design, it is difficult to make causal inferences. Cross-sectional studies do not allow for examination of the stability of relationships over time. Internal validity is an issue with cross sectional studies because it is difficult to rule out extraneous variables. Researchers may attempt to rule out the plausibility of rival hypotheses by controlling for alternative variables during multivariate procedures (Rubin & Babbie, 2001). These multivariate procedures enhance the internal validity of cross sectional studies. Thus, in the present study, age and gender were considered important alternative variables, and were simultaneously entered and controlled for during each regression model.

Another limitation and threat to external validity is selection biases. This study required active parental consent. That is, students were required to return a parental consent form signed by their parents prior to being enrolled into the study. Some studies suggest that studies that require active parental consent may lead to participation by different types of students than studies that require passive consent (e.g., Dent, Sussman, & Stacy, 1997). It is possible that the adolescents that participated in this study were different than those that did not. And, it is likely that the parents of adolescents that did not participate in the study are different than parents that participated in the study. Hence, the participating students are likely similar which may have lead to minimum variability among the sample. In addition, it could be argued that the participating adolescents are likely from families with higher parental monitoring and healthier mother-adolescent relationships than nonparticipating adolescents. Thus, these youth might be more pro-social than typical adolescents. Nonetheless, the participants of this study are descriptively similar to participants in other studies. For example, in general, participants in this study reported similar drug use prevalence rates and household structures as participants in other studies such as the Monitoring the Future national study. It would be interesting to examine how parents, those that provided consent and those who did not participate (no consent form returned) differed from the parents that returned consent forms indicating that they did not want their children to participate in the study.

History is not an issue in this study because attitudes and behaviors were measured only one time. Maturation is not a problem because adolescents did not mature during survey administration. Regression is not an issue because multiple tests were not

administered. Attrition is not a problem, instrumentation is not a problem, and there are no testing effects.

Sampling

Sampling limitations are related to the study's ability to generalize the findings to the sampling frame, an external validity limitation. The sampling frame for this study is composed of students in central Virginia. This study did not employ a random sample. Instead, a purposive sample was used. Thus, the findings of this study cannot be generalized to adolescents outside of central Virginia. Further, this study only includes African American adolescents. Thus, the findings of this study cannot be generalized to other ethnic groups.

Efforts were made to sample an equal number of boys and girls. Despite these efforts, the sample had a relatively smaller number of male participants. Gender differences should be interpreted cautiously.

Another limitation of this study is that participants were recruited from only two school districts. Despite efforts to sample students from several school systems, this goal was not met. Most participants lived within the same cities and towns and possibly shared the same experiences. This sampling issue may have lead to homogeneity of findings. Thus, sampling diversity is limited.

A fourth sampling limitation is that this study used a school based sample. School based samples provide a normative basis for examining problem behavior and providing comparisons with other studies. However, because this study used a school based sample, it likely excluded students who were consistently suspended or chronically absent. It also excluded students that had dropped out of school and those that are home

schooled. Thus, the findings of this study cannot be generalized to the larger population of all adolescents to include adolescents that dropped out of school, those that are chronically truant, and those that are home schooled.

Measurement

The present study relied exclusively on self report. Advantages of the self reporting process is that it is less costly, less time consuming, and participants might be more likely to reveal undesirable behaviors. A disadvantage of the self-reporting process is response bias. Response bias may limit the ability to gather honest data that accurately reflects participants' attitudes and behaviors. Participants may have been reluctant to disclose their true attitudes and behaviors and answered in a way that was more socially desirable. Many of the measures may have contained social desirability biases as participants may have felt uncomfortable answering certain questions. These questions likely related to their own drug use behaviors and their parents' parenting behaviors. Fortunately, some researchers have suggested that under proper circumstances, adolescents tend to be reasonably honest in reporting problem behaviors such as drug use (e.g., Johnston, 1985; Oetting & Beauvais, 1990). Therefore, efforts were made to create a safe and comfortable data collection environment that would demonstrate to students that their privacy would be respected. Examples of efforts taken to create a safe and comfortable data collection site are (1) it was emphasized to participants that their responses would remain private, (2) teachers were typically not in the room during survey administration except in cases related to students' behavioral problems, (3) students were seated apart to ensure privacy, and (4) talking was not allowed.

Another similar measurement limitation is that students solely provided information for this study. The study did not include the perspectives of parents, teachers, peers, and other important figures that could have substantiated, dispelled, or supported the data acquired from participating adolescents. Future studies should seek to include multiple sources.

A third limitation relates to the study's measures. First, this study used a general measure of peer risky behavior that combined peer drug use, peer school suspension, and other peer problem behaviors. Measuring these peer problem behaviors together may have blurred the distinctions between these behaviors. It is possible that these variables contribute unique variance in adolescent drug use. Future studies should measure these constructs individually. Second, community type was measured with a single dichotomous item. As described earlier, this dichotomous variable may have masked the differences across rural and urban America. Future studies should use measures that examine rural and urban contexts and the accompanying demographic, economic, and social characteristics. For example, community cohesion and regard may be important variables to explore in the future. Third, the mother-adolescent relationship measure did not provide a context. Items did not specifically assess the mother-adolescent relationship as it relates directly to drug refusal efficacy and use, which could explain the reason that these relationships were found insignificant during most tests.

Measurement error is another noteworthy limitation. Most of the measures in this study yielded coefficient alphas of .80 or greater. However, because the reliabilities of the measures were not perfect, it was impossible to predict 100 percent of the variance. Measurement error led to decreased statistical power. Another limitation is the use of

coarse measures as described in chapter three. Due to scale coarseness, the r value reported in Pearson's product correlation is underestimated and statistical power was lost. The corrected r was reported in chapter four.

Implications for Social Work Research and Knowledge Building

Methodological Considerations

Future studies that examine the relationship between parent and peer contexts and drug refusal efficacy and use among African American adolescents should address several methodological limitations. First, studies should seek to utilize longitudinal designs that would allow some understanding of how behaviors change over time. Using longitudinal designs with African American samples, particularly urban African Americans may be more challenging than with other groups. Specifically, the factors that impact the lives of many urban low-income African Americans, such as residential mobility and financial problems may make it more difficult to retain them over long periods of time. Therefore, strategies to retain African American participants over longer period of times are also worthy of additional attention. Second, studies should employ random sampling so that findings can be generalized to the larger population of African American adolescents. A third avenue for future research is related to measurement. The development of many measures has typically not involved African American participants. Therefore, the validity of measures for African American populations is less clear. In the present study, efforts were made to identify culturally valid measures that had been standardized using African American adolescents. Future studies should attempt to employ measures that were developed using African American samples or if not, measures that have been used with African American adolescents and shown to be valid.

Researchers should also assess the validity of the measures with their specific population to contribute to the gaps in the literature regarding measurement validity with diverse African American populations. In general, researchers should explore the psychometric properties of these measures for adolescents of different ages, races/ethnicities, and community types. Fourth, in this study, several expected moderator effects were not found. As described in chapter three, statistical power is needed to detect interactions. It could be that some hypothesized interactions were not found due to lower statistical power. Future studies should seek to maximize statistical power through obtaining equal sample size, estimating effect size, and reducing measurement error. Researchers should give careful attention to these factors prior to designing their research studies. Fifth, as described throughout this dissertation, there are various definitions of “rural” and “urban” to include the Census definition used in this study. The dichotomous definition used in the present study is an inevitable limitation of this study. Communities and neighborhoods vary in the extent to which they are able to provide resources to meet the needs of their residents. The differences across these rural and urban ecological niches and subcultures are masked when collapsed into such dichotomous categories. Future studies should include a greater range of rural and urban populations and definitions that capture the similarities and differences in communities, neighborhoods, and culture that might impact drug refusal efficacy and use. Sixth, this study did not consider the diversity among African Americans. Future studies should seek to explore the diversity within the African American community by exploring predictors of drug use among subgroups . These subgroups may include African Americans who have been in this country for at least four generations, (2) individuals that migrated from Caribbean

countries, (3) individuals who are first generation immigrants from Africa, and (4) biracial or multiracial individuals (Sharma & Atri, 2006). It is expected that the diversity within the African American community may present varied vulnerabilities and protective characteristics.

Research Avenues and Questions

Several opportunities for research emerged from the present study. A first intriguing line of inquiry relates to model and theory building. Little variance associated with drug refusal efficacy and use was explained by the parent and peer variables as they were measured in this study. For the full mediation analyses in hypothesis one, the variance explained was 15.6% for past 30 day tobacco use, 17.4% for past 30 day alcohol use, 10.7% for past 30 day marijuana use, and 8.9% for drug refusal efficacy. These findings indicate that minimum variance was explained by the full mediation model. Findings imply that the model may be misspecified. In addition, findings suggest that (1) these variables should be examined using measures with better reliability and validity (2) a more complete set of parent and peer variables should be included, and (3) it might be useful to explore alternative variables. First, most measures used in this study nearly met the conventional Cronbach alpha standard of .80. The problem with this level of reliability is that because of the 20% error, only a maximum of 80% of the variance could be explained. Thus, in future studies, researchers should seek to use measures that have higher Cronbach alphas. Second, this study focused on parental attitudes toward drug use, mother-adolescent relationship, parental monitoring, and peer risky behavior. When feasible, future studies should seek to examine a more complete set of parent and peer variables. These variables might include parent drug use, father-adolescent relationship,

parental supervision, peer drug use, and peer pressure. Third, future studies should explore alternative variables. These variables might include environmental, educational, developmental, and social factors. Notably, developmental studies such as the present study should include developmental factors, such as menarche and spermatarche, which have been demonstrated to affect drug refusal efficacy and use. One question remains, under what conditions do developmental factors exacerbate or protect youth from drug involvement? The varied variance explained in this study also suggests that the paths to drug use are not the same across all drugs. The findings indicate that the full mediation model best explained current alcohol use, tobacco use, marijuana use, and drug refusal efficacy, respectively. Studies should continue to examine models across various drugs and refrain from combining multiple drugs into composite variables. Information is lost when this is done. As noted, the model poorly explained drug refusal efficacy. Notably, studies that have examined parents and peers and drug use have traditionally focused only on drug use. Hence, there is a paucity of studies that examine the relationships between parents, peers, and drug refusal efficacy. More studies are warranted to examine drug refusal efficacy. This study expands the literature by including this often overlooked construct. In this study, drug refusal efficacy was considered as a dependent variable. It is likely however, that drug refusal efficacy is a partial mediator or intervening variable in the relationships between certain psychosocial factors and drug use. Future studies should examine these relationships.

A second research area of focus relates to the examination of gender differences. Like national studies (e.g., SAMHSA, 2007), this study found that boys and girls reported similar rates of drug use. In general, descriptively, boys and girls were similar, reporting

similar levels of perceived parental monitoring and quality relationships with their mothers. Future studies should consider how better to explore gender differences. For example, Farrell and White (1998) and Kung and Farrell (2000) found that peer pressure was more strongly related to drug use for girls than boys. However, Barber, Bolitho, and Bertrand (1999) and the findings of the present study suggest that peer drug use and risky behavior may be more strongly related to drug use for boys than girls. Future studies should examine jointly peer pressure, peer drug use, peer risky behavior, and gender differences. It is likely that the antecedents and intervening variables related to drug refusal efficacy and use differ for boys and girls in fundamental ways.

A third avenue of future research relates to household structure and parenting. Youth in the current study reported a wide variety of living arrangements and many adolescents' families seem to represent Hill's definition of the African American family that was described in chapter two. This study's findings clearly implicate parental monitoring in adolescent drug use. Future studies should examine whether it is parental monitoring or monitoring by any adult in the household that has a stronger effect on adolescent drug use and how this relationship differs for boys and girls. These studies may be especially important for African American adolescents given that many are raised by single parents who may use the support of other adults to help monitor their children.

A fourth avenue of research relates to the lack of significant findings for the relationships between mother-adolescent relationship and the drug use variables. Findings regarding the association between mother-adolescent relationship and adolescent drug use are inconsistent. Some published studies suggest that mother-adolescent relationship predicts adolescent drug use (e.g., Castro, Brook, Brook, &

Rubenstein, 2006), some suggest that there are modest effects (e.g., Bahr, Marcos, & Li, 1998), and the present study yielded insignificant findings. Future studies should seek to replicate existing studies to determine under which conditions the relationship between mother-adolescent relationship and drug use is significant or nonsignificant. Future studies should also give careful attention to the measures used to assess the quality of the mother-adolescent relationship. In this study, the *Network of Relationship Inventory* (NRI) was used to assess adolescents' perceptions of their relationships with their mothers. The NRI examined various aspects of the mother-adolescent relationship to include communication, affection, and satisfaction. In order to gain a better understanding of the mother-adolescent relationship, future studies should use measures that examine these constructs separately.

A fifth area of research relates to the moderation findings. This exploratory study hypothesized several relationships that had limited existing empirical support. First, findings indicated that community type did not moderate the relationship between peer risky behavior and drug refusal efficacy and use. Future studies should use comprehensive measures of community type and examine this relationship. Second, findings indicated that gender did not moderate the relationship between peer risky behavior and drug refusal efficacy, past 30 day tobacco use, and past 30 day alcohol use. Gender moderated the relationship between peer risky behavior and past 30 day marijuana use. Future studies should examine this relationship using peer drug use and peer influence as alternative predictors of drug use. Studies should also continue to examine these relationships upon various drug outcomes. Third, findings indicated that age did not moderate the relationships between peer risky behavior and drug refusal

efficacy and past 30 day alcohol use and marijuana use. Age moderated the relationship between peer risky behavior and past 30 day tobacco use. Future studies should continue to examine these relationships upon various outcomes with diverse samples. Although age only moderated the relationship between peer risky behavior and past 30 day tobacco use in this sample, the relationship might differ for other samples. Fourth, additional studies are warranted that examine cultural attributes, such as ethnic identity, perception of discrimination, and racial/ethnic heterogeneity in school, as they affect and interact with adolescent drug use.

Notwithstanding the existing literature and findings of this study, two intriguing and important questions remain in light of the cross-over pattern: Under what conditions does the protective role of parental monitoring upon African American adolescent drug use fail to act as a protective factor for drug use for this population? What role do ecological niches play in understanding the drug use phenomenon?

Implications for Prevention Programming

Given the consequences of drug use for African American adolescents, developing additional prevention and intervention programming is a noted national public health priority. The results of the study suggest several implications for prevention and intervention programming to prevent drug use among African American adolescents. First, the results suggest that prevention and intervention programming should seek to enhance parenting skills and practices. Parenting, particularly parental attitudes toward drug use and parental monitoring had direct effects on drug refusal efficacy and use. Further, the results suggest that despite the strong influence of peers, parents retain substantial influence over the attitudes and behaviors of their adolescent children.

Programs should also educate parents regarding the effects of parental attitudes toward drug use on their adolescent children's attitudes and behaviors. There may be a disconnect between parents' education and knowledge of the consequences of their attitudes and behaviors upon their children's attitudes and behaviors with their actual behaviors. That is, parents' knowledge may not translate to actions. Therefore, prevention and intervention programming should incorporate cognitive behavior techniques to foster change in parental behaviors.

Second, the findings of this study should dispel the myth that parenting practices are insignificant during adolescence. The results suggest that parental influence on adolescents' behaviors remain extensive in adolescence. Notably, findings indicate that parental monitoring has indirect effects on drug refusal efficacy and use such that it may reduce drug use by decreasing exposure to risky peers. It is possible that parental monitoring reduces initial affiliation with risky peer as well as reduces the influence of already established risky peer relationships. Hence, the protective role of parents should be emphasized in programs.

Third, although this study found no effect between mother-adolescent relationship and adolescent drug use, it found a weak effect between mother-adolescent relationship and drug refusal efficacy. Prevention and intervention programming that seek to improve adolescents' drug refusal efficacy should emphasize the mother-adolescent relationship. This may include communication and affection as key components of the program.

Fourth, efforts should be made to involve multiple stakeholders in programming, such as adolescents, parents, extended family members, peers, and the community. Programmers should consider the role of the larger macro environment in drug use. How

might prevention and intervention programs influence media in such a way that it impacts drug refusal efficacy and use? How might prevention and intervention programs become involved in policy development such that it positively impacts drug refusal efficacy and use among rural and urban African American adolescents? Programs should seek to build on the unique strengths of communities such as intergenerational networks in rural communities and extracurricular activities in urban communities to impact adolescent drug use and foster growth and change in these communities.

Contributions of this Study

The drug use prevalence rates among African American adolescents and young adults and the adverse drug related consequences experienced by some African Americans are well established. The drug use epidemic as it is today is not inevitable. The examination of the manner by which parents and peers operate jointly to impact drug refusal efficacy and use among African American adolescents is a critical step towards improving the drug use epidemic. This study was a step towards better understanding the influential role of parents and peers and the impact of select demographic factors on drug refusal efficacy and use.

Research with rural African American adolescents is scarce. Most studies have typically been confined to urban areas. The inclusion of a large sample of rural African American young, middle, and older adolescents is a contribution to the literature because it addresses a neglected area of research. Further, few drug use studies have included large samples of both rural and urban African American adolescents. This is another contribution to the literature. In addition, according to Jones, Hussong, Manning, and Sterrett (2008) studies that have examined parent and peer factors and adolescent drug

use have rarely included African American youth. This study examined parent and peer factors using an African American youth sample, which is another contribution to the literature.

A key finding of the present study was that rural and urban adolescents reported similar rates of drug use across all types of drugs. These results should help to dispel the notion that drug use is only an urban problem. Drug use is not only concentrated in urban areas. This study is a contribution to the literature because it supports recent research that indicates that rural and urban adolescents are using drugs at comparable rates.

Only a few studies were found that examined parenting practices as a moderator in the relationship between peer influence and drug use. The present study found that parental monitoring moderated the relationships between peer risky behavior and adolescent drug refusal efficacy and use. This study's moderation findings suggest that in addition to peers, parents matter as it relates to adolescent drug refusal efficacy and use. In addition, no study found examined parenting practices as a moderator in the relationship between peer influence and drug refusal efficacy. This exploratory study took a first step in the direction of better understanding the protective role of parents as it relates to drug refusal skills. Future studies should continue to examine this relationship. Moreover, the study is a contribution to the literature in that it examined interactions. Studies that only consider the main effects of parents and peers may underestimate the role of parents (Kung & Farrell, 2000).

Few studies have simultaneously examined the relationships between mother-adolescent relationship and parental monitoring and adolescent drug use. The present study found that mother-adolescent relationship did not have a main effect on drug use or

a significant interaction with peer risky behavior upon drug refusal efficacy and use. Also, mother-adolescent relationship was not found to be an important mediator in the full step mediation analyses. On the other hand, parental monitoring was found to be significantly associated with drug refusal efficacy and use and was a moderator in the relationship between peer risky behavior and drug refusal efficacy and use. It was also found to be a mediator during mediation analyses. These findings suggest that parental monitoring may be a more important factor than mother-adolescent relationship as it relates to drug refusal efficacy and use for African American adolescents.

This study examined the relationship between parenting and drug refusal efficacy and use. Findings revealed that parents have a direct effect on drug refusal efficacy and use. It also revealed that parents have an effect on drug refusal efficacy and use independent of peer influence. Thus, the results of this study should shed light on the important and protective role of parents and move research, programming, and policy toward family centered efforts.

Conclusion

This study lends further support to the studies that suggest that there is not a meaningful difference between the prevalence of adolescent drug use in rural and urban settings. This study further underscores the importance of examining moderating effects of parenting practices. The results indicate that parents are influential and may be a protective mechanism against the strong influence of risky peers. These interesting findings regarding parents' influence should be comforting news to parents, school officials, practitioners, and policy makers.

To this end, rigorous research projects are warranted to explore and determine the risk and protective factors that influence drug refusal efficacy and use among African American adolescents across all contexts. It is imperative that findings be translated into programs, practice, and policies to reduce the disproportionate drug-related suffering among African Americans. As social workers, we seek to enhance human well-being “with particular attention to the needs and empowerment of people who are vulnerable, oppressed, and living in poverty” (NASW, 2007, p.1). Hence, this drug use paradox should become a top priority for our research, practice, and education. This task will not be achieved immediately. Still, together, we can agree that, “Yes, we can.”

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Appendix A

Letter to Principals

November 14, 2006

Dear *Principal's Name*,

Your school has been recommended by Mr. Larry Everette, of Richmond Public Schools Office of Truancy and Safe Schools, as a possible school site for an important new project at the Center for Cultural Experiences in Prevention (CCEP) at Virginia Commonwealth University. Over the past several years the CCEP has delivered research based, culturally appropriate programs to youth at several middle schools and Boys and Girls Clubs in the Richmond area. These programs are designed to prevent and delay drug use and other risky and unhealthy behaviors on the part of our youth. The Office of Truancy and Safe Schools is currently carrying out one of these programs at several middle schools in partnership with the CCEP.

The CCEP in collaboration with Virginia State University, James Madison University, and several school districts in the state is launching a new research project. The purpose is to investigate why African-American youth do and do not smoke tobacco. Although young African-American teens smoke less than their peers from other ethnic groups, tobacco smoking increases substantially when they become older teens and young adults. The study seeks to examine why this happens. It is our hope that this information can then be used to develop more effective smoking prevention programs.

Effective prevention programs evolve from sound research; research that is only possible with the support of the community. Please lend us your support in this effort. Dr. Faye Belgrave, the center's director, and I would like to meet briefly with you to discuss the project. I will contact you in the next few days to request a meeting.

If you like you may contact me by phone or email: (804) 828-6261 or dsbutler@vcu.edu. I look forward to speaking with you.

Sincerely,

Deborah S. Butler, MIS
Project Director

Faye Z. Belgrave, PhD
Professor and Director
Center for Cultural Experiences in Prevention

Appendix B

Consent Cover Letter

Center for Cultural Experiences in Prevention
Virginia Commonwealth University
906 W. Broad St.
Richmond, VA 23284

Date:

Dear Student and Parent:

We are asking students from elementary, middle, and high schools to complete a survey. Young African-American teens smoke less than teens from other ethnic groups. But tobacco smoking increases a lot when they become older teens and young adults. The purpose of the survey is to find out why this happens. This information can then be used to design better programs to prevent smoking for all youth. The consent form tells more about the study. Students will complete the survey three different times.

If you are interested in having your child take the survey please read and sign the consent form. Please sign only after you've had all of your questions answered.

Please contact me if you have any questions.

Sincerely,

Deborah S. Butler, MIS
Project Director
(804) 828-6261

Appendix C

Parent/Guardian Consent Form

RESEARCH SUBJECT INFORMATION AND PARENT CONSENT FORM

TITLE: Pathways to Smoking among African American Adolescents

VCU IRB NO: HM10618

SPONSOR: Virginia Tobacco Settlement Foundation

This consent form may contain words that you do not understand. Please ask the study staff to explain any words that you do not understand. You may keep a copy to think about or discuss with family or friends before making your decision.

Purpose of the Study:

The purpose is to find out about tobacco smoking and other drug use among African-American youth. African-American children and teens smoke less than youth from other ethnic groups. But they begin to smoke a lot more when they become older teens and young adults. We want to find out why this happens.

Your child is being asked to participate in this study because he/she is in fifth, eighth, or twelfth grade and attends one of the elementary, middle, or high schools that are participating in the study.

Description of the Study and Your Child's Involvement:

If you decide that your child can be in this study, you will be asked to sign this consent form. Please sign this form after you have had all your questions answered and after you understand what your child will do.

Your child will be asked to complete a survey that contains questions about smoking, alcohol and other drugs, stress, and culture. They will be asked to complete this survey three times. The first time will be in the spring. The second time will be about six months later, in the fall. The third and final time will be six months after the second time. The survey will take about 45 minutes to complete. We will also obtain information from your child that will let us know how to contact with him/her over the next 18 months. The surveys will be completed at school. If your child is no longer in public school, we will arrange for the surveys to be completed via telephone or the internet.

Risks and Discomforts:

There are no known risks for students participating in this study. We do not think that answering these questions will cause students to feel embarrassed or upset. However, students do not have to answer any questions they do not want to and they can stop at any time.

Benefits:

Your child will not get any direct benefit from this study. But information we learn may help us design better tobacco prevention programs for youth.

Costs:

There is no cost for participating in the study except for the time it takes to complete the survey.

Payment for Participation:

Your child will receive a small thank-you present such as a \$10.00 gift card each time they complete a survey.

Alternatives:

The alternative is for your child not to participate in the study.

Confidentiality:

We will not tell anyone the answers your child gives us. We will not use any names on the survey your child answers. We will use a number to identify your child's answers. But only the researchers will know that number. Information from the study may be looked at for research purposes by the sponsor of the research (Virginia Tobacco Settlement Foundation) or by Virginia Commonwealth University. What we find from this study may be presented at meetings or published in papers. However, your child's name will not be used in these presentations or papers.

We will not tell anyone the answers your child gives us. But, if your child tells us that someone is hurting him or her, or that he or she might hurt himself/herself or someone else, the law says that we have to let people in authority know. This is so they can protect your child.

Voluntary Participation and Withdrawal:

Your child does not have to participate in this study. If your child participates, he or she may stop at any time without penalty. She/he may also choose not to answer any questions that are asked.

Questions?

In the future, you may have questions about your child's participation in this study. If you have any questions contact:

Faye Z. Belgrave
Virginia Commonwealth University
PO Box 842018
Department of Psychology
Richmond, VA 23284-2018
Phone: 804 225-4415
Email: fzbelgra@vcu.edu

If you have any questions about your child's rights as a participant, you may contact:

Office for Research Subjects Protection
Virginia Commonwealth University
800 E. Leigh Street, Suite 113
PO Box 980568

Richmond, VA 23298
Phone: 804 827-2157

Do not sign this consent form until you've had a chance to ask questions and have received satisfactory answers to all of your questions.

Appendix D

Consent Form for Participants Ages 18 and Older

RESEARCH SUBJECT INFORMATION AND CONSENT FORM

TITLE: Pathways to Smoking among African American Adolescents

VCU IRB NO: HM10618

SPONSOR: Virginia Tobacco Settlement Foundation

This consent form may contain words that you do not understand. Please ask the study staff to explain any words that you do not understand. You may keep a copy to think about or discuss with family or friends before making your decision.

Purpose of the Study:

The purpose is to find out about tobacco smoking and other drug use among African-American youth. African-American children and teens smoke less than youth from other ethnic groups. But they begin to smoke a lot more when they become older teens and young adults. We want to find out why this happens.

You are being asked to participate in this study because you are in the twelfth grade and attend high schools that are participating in the study.

Description of the Study and Your Involvement:

If you decide that you want to be in this study, you will be asked to sign this consent form. Please sign this form after you have had all your questions answered and after you understand what you will do.

You will be asked to complete a survey that contains questions about smoking, alcohol and other drugs, stress, and culture. You will be asked to complete this survey three times. The first time will be in the spring. The second time will be about six months later, in the fall. The third and final time will be six months after the second time. The survey will take about 45 minutes to complete. We will also obtain information from you that will let us know how to contact you over the next 18 months. The surveys will be completed at school. If you are no longer in public school, we will arrange for the surveys to be completed via telephone or the internet.

Risks and Discomforts:

There are no known risks for you participating in this study. We do not think that answering these questions will cause you to feel embarrassed or upset. However, you do not have to answer any questions you do not want to and you can stop at any time.

Benefits:

You will not get any direct benefit from this study. But information we learn may help us design better tobacco prevention programs for youth.

Costs:

There is no cost for participating in the study except for the time it takes to complete the survey.

Payment for Participation:

You will receive a small thank-you present such as a \$10.00 gift card each time you complete a survey.

Alternatives:

The alternative is for you not to participate in the study.

Confidentiality:

We will not tell anyone the answers you give us. We will not use any names on the survey you answer. We will use a number to identify your answers. But only the researchers will know that number. Information from the study may be looked at for research purposes by the sponsor of the research (Virginia Tobacco Settlement Foundation) or by Virginia Commonwealth University. What we find from this study may be presented at meetings or published in papers. However, your name will not be used in these presentations or papers.

Voluntary Participation and Withdrawal:

You do not have to participate in this study. If you participate, you may stop at any time without penalty. You may also choose not to answer any questions that are asked.

Questions?

In the future, you may have questions about your participation in this study. If you have any questions contact:

Faye Z. Belgrave
Virginia Commonwealth University
PO Box 842018
Department of Psychology
Richmond, VA 23284-2018
Phone: 804 827-3908
Email: fzbelgra@vcu.edu

If you have any questions about your rights as a participant, you may contact:

Office for Research Subjects Protection
Virginia Commonwealth University
800 E. Leigh Street, Suite 113
PO Box 980568
Richmond, VA 23298
Phone: 804 827-2157

Do not sign this consent form until you've had a chance to ask questions and have received satisfactory answers to all of your questions.

Consent:

I have been given the chance to read this consent form. I understand the information about this study. Questions that I wanted to ask about the study have been answered. My signature says that I am willing to participate in this study.

Please have a witness sign this consent. The witness can be any adult person such as a friend, relative, or neighbor over the age of 18.

<i>Participant name printed</i>	<i>Participant signature</i>	<i>Date</i>
Witness Signature (Required)		Date
Signature of person conducting informed consent		Date
Investigator Signature (If different from above)		Date

Appendix E

Fifth Grade Youth Assent Form

**YOUTH ASSENT FORM
(5th Grade)**

TITLE: Pathways to Smoking among African American Adolescents

VCU IRB NO: HM10618

This consent form may contain words that you do not understand. Please ask someone to explain any words that you do not understand. You may keep a copy to think about or talk about with your parents before you decide if you want to be in this study.

What is this study about?

This study will try to find out what keeps children and teens from smoking tobacco. The study may help us plan programs for children and teens.

What will happen to me if I choose to be in this study?

In this study you will be asked to fill out a survey at three different times. You will take the survey at school. The survey will take about 45 minutes to complete. There will be questions about smoking, alcohol and other drugs, stress, and how you see yourself.

If you decide to be in this research study, you will be asked to sign this form. Do not sign the form until you have all your questions answered and understand what you will be doing.

What might happen if I am in this study?

Sometimes people do not want to answer certain questions. You do not have to answer any question you do not want to.

What do I get if I am in this study?

You will get a small gift every time you finish a survey.

Will you tell anyone what I say?

We will not tell anyone the answers you give us. We will not share your answers with your teachers, parents, or friends. If you tell us that someone is hurting you or that you might hurt yourself, the law says that we have to let people in authority know so they can protect you.

If we talk or write about this study we will never use your name.

Do I have to be in this study?

You do not have to be in this study. If you choose to be in this study you may stop at any time. No one will blame you or talk badly about you if you drop out of the study.

Appendix F

Eighth and Twelfth Grade Youth Assent Form

**YOUTH ASSENT FORM
(8th and 12th Grades)**

TITLE: Pathways to Smoking among African American Adolescents

VCU IRB NO:

This consent form may contain words that you do not understand. Please ask someone to explain any words that you do not understand. You may keep a copy to think about or discuss with your parents before you decide if you want to be in this study.

Purpose of the Study:

The purpose is to find out about tobacco smoking from children and teenagers. The study will try to find out what keeps children and teens from smoking tobacco. The study may help us develop better programs for children and teens.

What will happen to me if I choose to be in this study?

In this study you will be asked to complete a survey at three different times. You will take the survey at school. The second and third survey may be taken at another place. The survey will take about 45 minutes to complete. There will be questions about smoking, alcohol and other drugs, stress, and culture topics such as racial identity.

If you decide to be in this research study, you will be asked to sign this form. Do not sign the form until you have all your questions answered and understand what will happen to you.

What might happen if I am in this study?

Sometimes people do not want to answer certain types of questions. You do not have to answer any question you do not want to.

What do I get if I am in this study?

You will get a small gift every time you complete a survey.

Will you tell anyone what I say?

We will not tell anyone the answers you give us. We will not share your answers with your teachers, parents, or friends. If you tell us that someone is hurting you or that you might hurt yourself, the law says that we have to let people in authority know so they can protect you.

If we talk about this study in speeches or in writing we will never use your name.

Do I have to be in this study?

You do not have to be in this study. If you choose to be in this study you may stop at any time. No one will blame you or criticize you if you drop out of the study.

Questions?

If you have any questions about being in this study, you can talk to the following person or you can have your parent or another adult call:

Deborah S. Butler
Virginia Commonwealth University
Department of Psychology
Richmond, VA 23284-2018
Phone: 804 828-6261
Email: dsbutler@vcu.edu

Faye Z. Belgrave
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Richmond, VA 23284-2018
Phone: 804 225-4415
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Do not sign this form if you have any questions. Be sure someone answers your questions.

Assent:

I have read this form. I understand the information about this study. All my questions about the study have been answered. I am willing to be in this study.

Youth Name (printed)	Youth Signature	Date
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Witness Signature (Required)	Date
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Signature of person conducting informed consent	Date
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Investigator Signature (If different from above)

Date

Appendix G

The Parental Attitudes Toward Drug Use Measure

These next questions ask about how YOUR PARENT'S ATTITUDES toward drug use. Circle the number that best fits.

HOW WRONG DO YOUR PARENTS FEEL IT WOULD BE FOR YOU TO:

	<u>Not wrong at all</u>	<u>A little bit wrong</u>	<u>Wrong</u>	<u>Very Wrong</u>
1. Drink beer, wine, hard liquor (for example, vodka, whiskey or gin)?	1	2	3	4
2. Smoke cigarettes?	1	2	3	4
3. Smoke marijuana?	1	2	3	4

Appendix H

Network of Relationship Inventory

These questions ask about YOUR RELATIONSHIP WITH YOUR MOTHER AND FATHER or the adult woman or man who raised you. Circle the number that best fits how you feel about this person. If you did not have a person whom you consider mother or father, leave blank.

	My mother	My grandmother	My foster mother	My aunt	My stepmother	Other (Specify)	
1. Who is the person who you see as a “mother”?	1	2	3	4	5	6	
	My father	My grandfather	My foster father	My uncle	My stepfather	Other (Specify)	
2. Who is the person who you see as a “father”?	1	2	3	4	5	6	
				<u>Not at all happy</u>	<u>Kind of Happy</u>	<u>Happy</u>	<u>Very Happy</u>
3. How satisfied (happy) are you with your relationship with your father?				1	2	3	4
4. How satisfied (happy) are you with your relationship with your mother?				1	2	3	4
5. How good is your relationship with your father?				1	2	3	4
6. How good is your relationship with your mother?				1	2	3	4
				<u>Not at all</u>	<u>Kind of</u>	<u>Very Much</u>	<u>A lot</u>
7. How much do you love your father?				1	2	3	4
8. How much do you love your mother?				1	2	3	4
9. How much does your father love you?				1	2	3	4
10. How much does your mother love you?				1	2	3	4
11. How much does your father like or approve of the things you do?				1	2	3	4
12. How much does your mother like or approve of the things you do?				1	2	3	4
				<u>Not a lot</u>	<u>Sometimes</u>	<u>Often</u>	<u>All the time</u>
13. Overall, how close are you with (i.e. how much do you share your feelings with) your father?				1	2	3	4
14. Overall, how close are you with (i.e. how much do you share your feelings with) your mother?				1	2	3	4
15. How often do you talk about personal things with your mother?				1	2	3	4

16. How often do you talk about personal things with your father?	1	2	3	4
17. How much physical affection, like hugs and kisses, do you get from your father?	1	2	3	4
18. How much physical affection, like hugs and kisses, do you get from your mother?	1	2	3	4
19. How often do you and your father get upset or angry with each other?	1	2	3	4
20. How often do you and your mother get upset or angry with each other?	1	2	3	4

Appendix I

Parental Monitoring Scale

The next questions ask about your parents when you are not at home. Circle the number that best fits.

WHEN YOU GO OUT, HOW OFTEN DO YOUR PARENT(S):

	<u>Never</u>	<u>Most of the time</u>	<u>Always</u>
1. Know where you are going?	1	2	3
2. Know whom you are with?	1	2	3
3. Know what you are doing?	1	2	3
4. Set a time for you to come home?	1	2	3

Appendix J

Peer Problem Behavior Scale

The questions in this section ask about things YOUR FRIENDS may do or think.

HOW MANY OF YOUR FRIENDS DO THE FOLLOWING?

	<u>None</u>	<u>A Few</u>	<u>Some</u>	<u>Most</u>	<u>All</u>
1. Drink beer, wine, wine coolers, or hard liquor?	1	2	3	4	5
2. Get good grades?	1	2	3	4	5
3. Get along well with other students?	1	2	3	4	5
4. Attend school everyday?	1	2	3	4	5
5. Smoke cigarettes?	1	2	3	4	5
6. Get suspended from school?	1	2	3	4	5
7. Smoke marijuana or weed?	1	2	3	4	5
8. Use other drugs to get high? (meth, "x", gas)	1	2	3	4	5

Appendix K

Specific Event Drug and Alcohol Refusal Efficacy Scale

Please complete the following questions by circling the number that best fits from NOT TRUE to VERY TRUE for each item.

	Not True			Somewhat True		Very True	
	1	2	3	4	5	6	7
1. I feel tempted to smoke when some one in my family is smoking	1	2	3	4	5	6	7
2. I feel tempted to smoke when my friends are smoking	1	2	3	4	5	6	7
3. I would feel tempted to smoke if some one made fun of me for not doing it	1	2	3	4	5	6	7
4. If my boyfriend / girlfriend wanted me to smoke, I would feel tempted	1	2	3	4	5	6	7
5. If I was worried about a problem I had, I would be tempted to smoke	1	2	3	4	5	6	7
6. I feel tempted to drink when someone in my family is drinking	1	2	3	4	5	6	7
7. I feel tempted to drink when my friends are drinking	1	2	3	4	5	6	7
8. I would feel tempted to drink if some one made fun of me for not doing it	1	2	3	4	5	6	7
9. If my boyfriend / girlfriend wanted me to drink, I would feel tempted	1	2	3	4	5	6	7

Vita

Trenette Tyrell Clark was born on September 27, 1979 in Ahoskie, North Carolina, and is a U.S. citizen. She graduated from Northampton County High School-East, Conway, North Carolina in 1997. She graduated magna cum laude from Elizabeth City State University in 2001 where she earned a Bachelor of Arts Degree in Sociology/Social Work and Bachelor of Science Degree in Criminal Justice. She obtained the Master of Social Work from the University of North Carolina at Chapel Hill in 2003. Trenette is a licensed clinical social worker and holds a nonprofit leadership certificate from the University of North Carolina at Chapel Hill. Prior to engaging in doctoral education, Ms. Clark was awarded the Council on Social Work Education Minority Fellowship Program Award, funded by the Center for Mental Health Services, the Center for Substance Abuse Prevention, and the Center for Substance Abuse Treatment in the Substance Abuse and Mental Health Services Administration (2005-2008). She was also awarded the Southern Regional Education Board Doctoral Scholar (2005-2010). Both these fellowships provided support during her doctoral coursework and dissertation. While completing her doctoral studies, Ms. Clark presented her research at numerous local, state, national, and international conferences and gained several additional publications.

Past professional experiences include working as a social worker in the Department of Neurology at Duke University Medical Center and as an outpatient therapist for Family & Youth, Inc. Ms. Clark received most of her predoctoral training related to her substantive area in the Department of Psychology at Virginia Commonwealth University and at the Center for Cultural Experiences in Prevention.