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PERCEIVED RISK FOR HIV AMONG HIGH RISK INDIVIDUALS: A COMPARISON OF ADOLESCENTS AND ADULTS

by

AKÉLE JEFFERS

ABSTRACT:

The United States continues to be affected by the HIV/AIDS epidemic, and public health is now faced with new challenges in mitigating the spread of the disease. African-Americans are disproportionately affected by HIV and a further understanding about the factors that influence high risk sexual behaviors needs to continuously be examined. The aim of this study was to understand and compare the perception of HIV risk and factors associated with risk perception in high-risk adult and adolescent groups. After multivariate analysis, having multiple partners was the only predictor for an increased HIV risk perception among adults. Among adolescents, no significant relationship was found between HIV risk indicators and having an increased HIV risk perception. Both adults and adolescent appeared to underestimate their HIV risk based on the reported risky sexual behaviors. More work is necessary to help adolescents accurately assess their risk of infection.

INDEX WORDS: adults, adolescents, high-risk, HIV risk perception, risky sexual behavior

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by

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B.S., OGLETHORPE UNIVERSITY

A Thesis Submitted to the Graduate Faculty
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PERCEIVED RISK FOR HIV AMONG HIGH RISK INDIVIDUALS: A COMPARISON OF ADOLESCENTS AND ADULTS

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Chapter I

Introduction

In 2012, which is now 33 years after AIDS was first recognized, the United States continues to be affected by the HIV/AIDS epidemic, despite increased levels of awareness of the disease. Recent estimates of prevalence levels of HIV/AIDS in the US indicate that 1.2 million people are living with HIV infection. Since the epidemic began, an estimated 1,129,127 people in the US have been diagnosed with AIDS (CDC, 2012). The federal government has recognized the AIDS/HIV epidemic as a combatable issue, and has taken serious responsibility in addressing the AIDS problem. Because HIV continues to take a major toll on populations in the United States, Government agencies like the Centers for Disease Control and Prevention (CDC) have maintained a comprehensive HIV/AIDS surveillance system monitoring many aspects of the epidemic. Federal agencies, state and local health departments, national organizations, community based organizations, the private sector, and advocates are working together to reduce the spread of HIV in the United States. During the early years of the epidemic, America's prevention efforts primarily targeted people most at risk of acquiring HIV. What initially began as a disease affecting homosexual white men has evolved into national campaigns targeting various high-risk groups. Many of the changes that have occurred in the last several decades in the fight against HIV infection have focused on the changing demographics of who is at risk. To complicate the situation, there are numerous issues

such as stigma, discrimination and poverty that face our society, and which set the background for the future of HIV prevention efforts.

America's response to the epidemic to date has produced mixed results. It is estimated that during the 1980s approximately 150,000 people in the United States were infected with HIV were infected with HIV (CDC, 2012). In the late 1990s, antiretroviral therapy changed the infection of HIV from an almost uniformly fatal infection into a chronic disease. The wide spread use of antiretroviral therapy in the US led to rapid declines in morbidity and mortality (Cohen et al. 2008).

Public health is now faced with new challenges in mitigating the spread of the disease, such as implementing research results and tailoring prevention methods to various communities facing high HIV infection burdens. Today, HIV continues to directly affect thousands of gay and bisexual men and injecting drug users every year, but it has also become a serious problem among Black African-Americans and, more recently, among the Hispanic/Latino population. In 2009, African-Americans accounted for approximately 47.9% of the new HIV cases, while they made up only 12% of the US population. Similarly, in 2009, Hispanics/Latinos made up 15% of the US population and accounted for 21.2% of the new HIV infections (GDPH, 2012). The demographics of who is being infected have changed, creating the need for modified prevention efforts.

Geographic differences are a key feature of the epidemic in the US. The southeastern United States has been increasingly affected by HIV/AIDS, and is more affected than any other region in the country (Hanna et al. 2012). According to a report published in 2010, in many southern states, socio-economic conditions combine with specific state laws and policies. This interferes

with human rights and creates an environment where the risk of acquiring, transmitting, and dying of HIV/AIDS is higher than any region in the country (Costenbader, Zule, and Coomes 2010). Epidemiologists are beginning to understand that HIV is not distributed evenly and realizing that to understand risk factors for HIV they must take a closer look at who is primarily being affected.

The issues affecting the South are evident in Georgia. As of 2009, Georgia ranked 6th among the 50 states in cumulative reported AIDS cases (CDC, 2012). The disparities of HIV are evident in Georgia: the data reveals that Black/Non-Hispanics accounted for the majority of newly diagnosed HIV and AIDS cases among all races/ethnicities. In 2010, 77% of HIV/AIDS cases diagnosed were among African-Americans who make up only 31% of Georgia's population (GDPH, 2012). African- Americans are disproportionately affected by the disease and in order to effectively combat the HIV/AIDS epidemic, a further understanding about the factors that influence high risk sexual behaviors needs to continuously be examined.

Purpose of Study

The purpose of this study is to understand the perception of HIV risk and factors associated with risk perception in adult and adolescent groups of urban, predominantly Black/African-American persons. The study compares high-risk individuals of different age groups because the CDC reported that younger people are becoming increasingly affected by HIV and youth speak to the future progression of the disease, and in turn, could affect the two groups' levels of HIV risk. Knowing about people's perception of risk is important to understanding why they engage in the behaviors they do, and this knowledge can play an instrumental role in the development of effective prevention and intervention messages. The present research is important because of its

implications for HIV intervention within high risk subsets of the population. Given the disproportionate impact of the HIV/AIDS epidemic on Black/African-Americans, it is important that we develop a better understanding of their HIV risk perception as it relates to behavior. This is especially true in light of research findings indicating that many minority individuals perceive their HIV risk to be low and are in denial of being at risk at all (Klein, Elifson, and Sterk 2003). By understanding the differences between adolescents and adults risk perceptions we can better understand the specific needs of each group, and in turn, create better designs for the HIV/AIDS preventive measures necessary to have an impact on the spread of the disease among different populations and subgroups. The main questions are whether or not there is an association between HIV risk perception and high risk sexual behaviors, what the direction and strength of this association is, and how do these two groups compare.

Hypotheses

Based on the research questions mentioned, the following hypotheses were generated:

1. Adults who engage in high risk sexual behaviors are more likely than adults who do not engage in high risk sexual behaviors to report a medium/high risk perception of HIV.
2. Adolescents who engage in high risk sexual behaviors are more likely than adolescents who do not engage in high risk sexual behaviors to report a medium/high risk perception of HIV.
3. Many adults will underestimate their HIV risk in relation to their HIV risk behaviors.
4. Many adolescents will underestimate their HIV risk in relation to their HIV risk behaviors.

Ultimately, I believe there will be slight differences in risk perceptions between each group, but both groups will be very similar with respect to how their HIV risk perception relates to their sexual behaviors.

Chapter II

Literature Review

In recent years HIV prevention has faced complex issues in the fight to mitigate HIV infections. Issues surrounding risky sexual behaviors have contributed to the multi-layered HIV epidemic in the United States. It is imperative that these issues be understood in order to provide substantive HIV prevention messages that tackle many of the underlying issues. These issues are complex for those looking to understand how risky sexual behaviors relate to HIV risk perception. Fully understanding these issues will help provide the foundation for future inquires into the behavioral aspects that contribute to HIV transmission. It is important to understand the context of risk perception in relation to sexual behavior because it is seen as the first stage of behavior change from risk taking to safer sex.

Theories of Behavior Change

Health professionals have been inquiring for years about how behavioral change occurs. Although that question has many answers, and changes in the context of varying populations and cultures, there are underlying principles that have been recognized as theories. Throughout the literature there have remained three commonly cited theories for behavior change that acknowledge the importance of perceived risk in behavioral change, but it remains unclear how people's personal risk assessments relate to their risk behavior. The health belief model was developed in the 1950s in an attempt to explain and predict health behaviors. It posits that people who perceive themselves to be at risk for negative outcomes are more likely to reduce risk behaviors than those who do not see themselves at risk (Janz and Becker 1984). The Protection motivation theory (Rogers, 1983) proposes that the intention to protect one's self depends on the perceived severity and the perceived probability of an event. This subsequently influences an individual's intention to engage in risk-reduction behaviors, and in turn, motivates the individual to protect themselves. The AIDS risk reduction model states that individuals need to recognize their behaviors are risky before change can occur. The hypothesized influences are: knowledge of sexual activities associated with HIV transmission, believing that one in personally susceptible to contracting HIV, believing that having AIDS is undesirable, and social norms and networking (Catania, Kegeles, and Coates 1990). Common to all models is the need for one to accurately assess risk. Although these models indicate that this is important, accurately perceiving risk is seen as a necessary but not sufficient condition for behavior risk reduction. Throughout the years, these behavior models have been applied to many HIV intervention programs in an attempt to influence perceived risk. Many prevention programs focus on populations at risk, assuming that increasing knowledge of HIV transmission will lead to an

increased perception of risk and eventually to the adoption of protective behaviors or reduction in risky behaviors. Sieving et al. (1997) set out to identify important cognitive predictors of sexually transmitted disease risk behavior among a sexually active adolescent cohort, and found that perceived susceptibility to STDs was associated with protective behaviors. Although risk perception plays a role in promoting and maintaining protective behavior, factors that determine an individual's perception of risk are still not well understood, and have produced mixed results.

Estimation of Risk

A review of various studies shows that individuals are more likely to underestimate than to overestimate their risk for HIV infection, regardless of the nature of their sexual behavior. Nunn et al. (2011) found that individuals engaging in high risk behaviors, including low rates of condom use, substance abuse, and exchanging money for drugs, typically did not perceive themselves at risk for contracting HIV. In addition, individuals who reported more than five partners were more likely to perceive their risk as zero or low, and less likely to use condoms. Also, individuals testing HIV positive dramatically underestimated their own HIV risk; two thirds of individuals who tested HIV positive believed they were at zero or low risk for contracting HIV. Such findings shed light on areas in which HIV prevention can tailor messages to tackle issues such as accurate risk assessment (Nunn et al. 2011).

Many people often rationalize risk taking behavior using a range of socially and psychologically constructed criteria that could explain the apparent mismatch between actually risk and perceived risk, and there are a number of possible explanations. Unrealistic optimism - a phenomenon first described by Weinstein (1982) -describes a reluctance to admit to vulnerability because the threat of harm would produce too much anxiety (Weinstein 1982). Based on this notion, Kershaw et al. (2003) assessed social and psychological factors associated with sexual risk

accuracy and focused their study around the psychological maintenance theory-which builds on the notion of Weinstein's unrealistic optimism. Their theory states that people inaccurately perceive their risk because acknowledging self destructive behavior damages psychological well being (Kershaw et al. 2003). It was discovered that the contribution of psychological maintenance varied across all levels of actual sexual risk. In addition, the high risk individuals did not seem to differ from the low risk individuals on the psychological constructs. These results counter studies that have found that not acknowledging risks and having illusional beliefs are ego-protective, and that high risk individuals use this strategy to minimize distress when confronted with information that should make them aware of their risk. It is theorized that having illusions effectively minimizes negative emotions, and individuals who underestimate their risk for negative sexual outcomes have lower levels of anxiety and stress than individuals who accurately perceive themselves at risk (Wiebe and Black 1997). Smith, Gerrard, and Gibons (1997) designed a study to examine the effect of self esteem on individuals' interpretation of their health risk behavior. The study found that after reviewing their sexual and contraceptive behaviors, low self-esteem women had significantly higher perceived vulnerability estimates than did high self-esteem women. This study provided evidence that women with high self esteem engaged in cognitive adjustments that allowed them to buffer acknowledgement of actual risks. This suggests that women with high self-esteem avoid information that may threaten their positive sense of self, like acknowledging risky behavior (Smith, Gerrard, and Gibbons 1997).

Psychological maintenance incorporates defense mechanisms such as denial and withdrawal, and can function as a coping strategy in situations or events that lead to high stress. An individual may deny or avoid information that suggests his behavior is risky to protect his self-esteem and reduce anxiety caused by engaging in behaviors that might lead to undesirable health

consequences such as HIV infection (Kershaw et al. 2003). People may simply avoid information that might contradict their optimistic beliefs. Individuals who use avoidant coping strategies should be more likely to inaccurately perceive their risk because they will use denial and avoidance to manage distress instead of actively changing behavior. Employing illusional behavior to regulate distress will result in bias responses to risk relevant information (Wiebe and Black 1997). According to Kershaw et al.'s view of the psychological maintenance theory, psychological threat needs to be severe enough to warrant maintenance actions. Individuals reporting more HIV risk behaviors may use denial and distancing to minimize the perception of their risk compared with individuals reporting fewer HIV risk behaviors as a way of coping with anxiety and fears about their own behavior (Brown, Outlaw, and Simpson 2000). According to this theory, individuals who underestimate their HIV risk should have higher self esteem, less anxiety, and use more avoidant coping mechanisms than those who accurately access their HIV risk.

Partner Dynamics

Risky sexual behavior can be viewed in the context of the number and types of partnerships and sexual acts. The risk for HIV is influenced not only by the behavior of the individual, but by the behavior of his/her sexual partners. The length and type of partnership often influences feelings of trust and safety, resulting in a false sense of protection which can ultimately lead to a misperception of risk. For example, a longer partnership can lead to a lowered sense of HIV risk. Many individuals can falsely perceive their partner's current and past risk behaviors and fail to take appropriate preventative action (Ellen et al. 1998). Mehrotra et al. (2001) examined whether risk perception of contracting HIV varied in the case of casual versus main sexual partners. It was found that casual sexual partners were perceived as much more risky than main sexual

partners for both HIV and STDs. Kelly and Kalichman (1995) point out that in a relationship where an individual has a close, affectionate, or loving feelings towards their partner, are less likely to feel threatened by HIV(Kelly and Kalichman 1995).People can enter into relationships with blinding notions of romance, and lose sight of health issues such as HIV. Comer and Nemroff (2000) undertook a study to understand the basis for risk perception strategies for casual versus regular sexual partners. They found that participants did not distinguish between emotional and physical safety and that in main relationships individuals felt emotionally and physically safe. Participants failed to notice AIDS relevant information about their partner, and therefore did not feel the need to employ safer sex practices. In main relationships, participants tended to assume monogamy even though it was not specified. Reduced salience of health issues and feelings of safety may all lead to reduced risk perception and lead to risky sex practices in main sexual relationships (Comer and Nemeroff 2000). Although main relationships buffer mental health issues of worry, they can have negative consequences for sexual health behavior. Mehrotra et al. (2009) did a study which highlighted an interesting phenomenon-that if a person does not fit the cognitive prototype of an HIV-positive person, then the person is assessed to be of little or no risk. External characteristics such as dress, demeanor and personality, have also shown to influence HIV risk perceptions.

Risky Behaviors

Elements of risky sexual behavior include early age at first sexual intercourse, multiple sexual partners, unprotected sexual intercourse, untreated sexually transmitted diseases, and exchanging sex for money. Having multiple partners, having a previous diagnosis of an STD and condom use have demonstrated an increased risk perception of HIV/STDs. Ford et al. (2004) demonstrated at the national level that compared with respondents who had always used

condoms in the last 12 months, inconsistent users and nonusers had elevated odds of perceiving some risk of infection. Having exchanged money for sex was significantly associated with perceived risk. Respondents who had received a STD diagnosis in the past year were significantly more likely to perceive risk than were those who had not received a STD diagnosis. The same relationship existed with respondents who had multiple partners within the last year. These results provide evidence that compared with their peers, young adults who are at increased risk of infection due to risky sexual behaviors accurately perceive higher levels of risk (Ford et al. 2004). The association between risk perception and risky sexual behaviors can work both ways. Risky sexual behavior can influence an increased risk perception, or a high risk perception can lead to modifying sexual behaviors, like refusing to have sexual intercourse at all. Akwara, Madise and Hinde (2003) point out that in some cases a person's perception of risk may be passive, and not necessarily based on his or her previous sexual behavior.

Intravenous drug use has also been shown to be an associated risk factor for greater perceived risk of HIV. One early study showed that among impoverished minority women, the women who perceived themselves to be at high risk were about 7 times as likely to use intravenous drugs as those who expressed no concern about contracting AIDS (Nyamathi et al. 1993). In another study among high school students, on the scale measuring perceived chance of having HIV, significantly higher scores were found among intravenous drug users (DuRant et al. 1992).

Social Forces and Risk Behavior

At the national level, policy on HIV/AIDS prevention and reproductive health can shape the way an individual perceives risk by influencing access to HIV information, access to healthcare, the testing and treating sexually transmitted diseases, and receiving much needed counseling services. Restricting access to healthcare services can ultimately influence an individual's

perception of HIV risk and sexual behavior. Thomas and Thomas (1999) sought to examine social forces that facilitate the transmission of sexually transmitted diseases. They proposed that neighborhoods with the highest rates of STDs are influenced by changes in national economy, and racially discriminatory policies and practices. They found that less access to health care resulted in more opportunity for HIV transmission, further fuelling the epidemic. Policies can affect the availability of community-level health services, the distribution of economic resources, transportation, communication, urbanization, gender roles and the empowerment of women (Thomas and Thomas 1999). Socioeconomic forces such as racial discrimination, low ratios of men to women, and deprivation of economic opportunities that inhibit stable sexual partnering can increase the likelihood of concurrent partnerships and influence sexual risk behavior and increase the spread of HIV (Adimora and Schoenbach 2005).

Where an individual resides can also determine level of access to information and reproductive health services, which could influence sexual behavior and perception of risk. For example, numerous studies have found that on some key measures of health, residents of rural areas have worse outcomes than residents of more urbanized areas. Many factors are related to rural health disparities including demographic and socioeconomic characteristics, health risk factors and ultimately health care access (Eberhardt and Pamuk 2004).

Policy influences a wide range of community level social norms, and social norms can have a strong impact on what society considers a “good woman”. In many societal setting, a good woman is considered one ignorant of sex and passive in sexual encounters. Gender roles and ideals can impact and shape an individuals’ identity and self-concept and in turn, influence sexual decision making. A study of 904 adolescents and women ages 14 to 26 revealed that 20% of the sample felt they did not have the right to be sexually assertive. Surprisingly, age had

nothing to do with sexual assertiveness. This demonstrated that the social culture, are important influences on managing sexual relationships and behaviors (Rickert, Sanghvi, and Wiemann 2002). Numerous studies have demonstrated that an association exists between sexual assertiveness and HIV/STD risk; sexual assertiveness can be a significant predictor of condom use (Onuoha and Munakata 2005; Zamboni, Crawford, and Williams 2000). Gavey, McPhillips, and Doherty (2001) interviewed 14 women about their experiences and views on condoms and argued that women's and men's sexuality shape the sexual experiences and behaviors of individual women (Gavey, McPHILLIPS, and Doherty 2001). Additionally, Langen (2005) demonstrated that age, economic dependence on a partner and history of abuse played an important role in powerlessness and the ability of a woman to negotiate condom use with her partner. Results of these studies suggest that risk perception is not enough to predict protective behaviors, and that socialization of women to submit to their sexual partners and give priority to male pleasure and control in sexual relationships contributes significantly to women's ability to negotiate, when, where and how sexual intercourse takes place. Society's construct of a man as one with a strong and uncontrollable sexual nature may create feelings of powerlessness among women in sexual encounters.

Individual Factors for Risk

Individual background factors such as gender, current age, ethnicity and religion may influence sexual behavior and predict risk perception. Mehrotra et al. (2009) found that gender was a predictor for risk perception. Females reported a stronger association for HIV risk for both main and casual partners compared to males. Comer and Nemeroff (2000) argue that this could be because females are aware that they are more susceptible to contracting HIV through heterosexual sex. Liverpool et al. (2002) found similar results. Females reported higher

perceived risk for contracting HIV than males. They speculated that since the females believed that males were less likely to wear condoms, they felt they were at an increased risk for HIV and STDs (Liverpool et al. 2002). Conard & Blythe (2003) revealed that adolescent females face special risk for increased STD risk, including both physiological and individual factors. Physiological factors such as cervical ectopy can place females at greater risk for HIV and other STDs. Individual factors such as consensual and non consensual choice of an older partner, incorrect condom use, and limited disease knowledge can also put females at an increased risk for infection (Conard and Blythe 2003)(DiClemente, Salazar, and Crosby 2007).

Additionally, age can influence sexual behavior on the level of perceived risk of HIV infection. It has been understood for years that adolescence marks a developmental period of increased autonomy, affiliation with peers, and often risk-taking behaviors (GREENE et al. 2000; Donovan and Jessor 1985). More specifically, adolescence is a time when individuals begin experimenting with alcohol, drugs, and sexual activity. Many adults who are diagnosed with AIDs contract HIV in their teen years (Tapert et al. 2001). Rates of STDs are also high among adolescents. Estimates suggest that even though young people represent only 25% of the sexually experienced US population, they acquire nearly half of all new STDs (Weinstock, Berman, and Cates 2004). Weinstock, Berman and Cates (2004) found that compared with adults, adolescents are more likely to have multiple (sequential or concurrent) partners, select high risk partners, and engage in unprotected sex. Wildsmith et al. (2010) noted that the prevalence of STDs among young adults is high. Twenty percent of young adult women and 10% of young adults men in their study sample tested positive for chlamydia, gonorrhea, or trichomoniasis at the time of the interview or were diagnosed with and STD by a medical practitioner in the past year. Among young adults who tested positive for an STD at interview, most of these same young adults did

not perceive themselves at risk for being infected. Only 28% of young adults who tested positive for chlamydia, gonorrhea, or trichomoniasis at the time of the interview actually believed they were at risk for contracting an STD (Wildsmith et al. 2010). Ford et al. (2004) found that only 14% of their adolescent respondents thought that they had some risk of infection. The vast majority of young adults in the study thought that their risk of chlamydial or gonococcal infection was very low--even if they engaged in high-risk behaviors. The majority of young adults currently infected with chlamydia or gonorrhea appeared to not think they are at risk (Ford et al. 2004).

The role of race and ethnicity was also examined as an antecedent for HIV risk perception in numerous studies, and may influence risk perception through cultural beliefs and norms. Although not consistent across studies, ethnicity has been shown to be a factor in predicting risk perception. In one study, among the demographic factors, a perception of personal risk for AIDS was significantly greater among Asian-Americans than among Whites, Hispanics, and Blacks (Prohaska et al. 1990). It was expected that membership in a demographic category of individuals at high risk for AIDS should heighten a respondent's perceptions of risk, but this was not the case. Being Black or Hispanic was not associated with greater perception of risk. National findings at the time of the study showed that Blacks and Hispanics were more likely than Whites to consider themselves at risk for AIDS. However, these demographic differences disappeared when other factors were controlled. Another study examined differences between minority and non-minority women with respect to AIDS related knowledge, perceptions, and experiences. It was expected that ethnic minority women would demonstrate less AIDS-related knowledge, would perceive themselves to be at less risk, and would be less concerned about AIDS than their nonminority counterparts. Based on prior research, it was also expected that

minority women would be less likely to have AIDS-related experiences and would take fewer precautions against HIV infection. The study results confirmed the expected differences between minority and non-minority women. When compared with non-minority women, minority women reported less concern about AIDS and estimated their personal risk to be lower. An interaction between ethnicity and risk level was also found, showing that the minority women at high risk, although similar to the women at low behavioral risk, were less concerned about AIDS than non-minority women at high risk. Minority women were also more likely to be misinformed about AIDS and were less likely to have recently talked about AIDS (S C Kalichman, Hunter, and Kelly 1992).Mehrotra et al. (2009) found that race was a significant predictor or risk perception. African-Americans perceived main sexual relationships more risky than Whites. Since African-Americans register at the highest rates for HIV infection, they speculated that the increased prevention efforts tailored for African-Americans had their desired effect in increasing the salience of the risk among African-Americans. DuRant et al. (1992) examined the effects of ethnicity on adolescents' perceived risk of HIV/AIDS. On the scale measuring perceived chance of HIV infection, significantly higher mean scores were found among Hispanic students, among Black, Asian/Pacific Islander and Other ethnic group adolescents. When these variables were entered into a multivariate ANOVA model, ethnicity and Hispanic background ceased to be significantly associated with perceived chance of having AIDS (DuRant et al. 1992).

Religion can also influence sexual behavior through intermediate factors such as age at first sexual intercourse, marital status, and access to information and services. It can also influence attitudes towards HIV and perception of risk. Evidence suggests that religiosity is a protective factor for sexual risk behaviors. Religiosity can be defined in many ways, but Haglund and Fehring (2010) define it as a set of institutionalized beliefs, doctrines and rituals, and ethical

standards for how to live a good life. Many studies have found that adolescents who have increased religiosity are more likely to engage in protective behaviors such as delaying sexual activity. Lefkowits et al. (2004) examined associations between religiosity and sexual behaviors and attitudes among young adults. Sexually abstinent youth were found to attend church services more frequently than sexually active youth. Religiosity demonstrated to have an effect on sexual attitudes, sexual behaviors and perceived vulnerability to HIV. For sexually experienced youths, increased attendance at religious services and participation in organized religious activities were related to decreased frequency of sexual intercourse, and number of sexual partners. They also found that those attending church more often felt like they were less susceptible to contracting HIV and also feared HIV more (Lefkowitz et al. 2004). Haglund and Feng's (2010) findings supported Lefkowits et al.'s research regarding religiosity and sexual attitudes.

Due to the stigma associated with HIV infection, many cultures see HIV as punishment or retribution for violating community norms. The stigmatized person is held responsible for real or imagined ills that afflict the community, which can only be repaired by the excommunication or isolation of the individual (Muturi and An 2010). In order to explore this notion, Muturi and An (2010) explored the extent to which religiosity plays a role in stigma towards HIV/AIDS within African-American churches. Religion was a significant predictor of level of stigma, and it was confirmed that those with high religiosity displayed significantly higher stigma, associating HIV/AIDS with a curse or punishment from God. Within African-American churches, HIV/AIDS is also closely linked to homosexuality and carries a strong stigma. Based on the notion that the Black church is an integral part of the African American community, Schulte and Battle (2004) explored how African-Americans' attitudes toward homosexuality would mirror the views set forth by the Black church (Schulte and Battle 2004). They discovered that

HIV/AIDS is closely linked to homosexuality and it carries a negative connotation and strong stigma. Muturi and An (2010) also noted that many African American churches often associate HIV/AIDS with immortal behaviors, delivering the message to their congregations that HIV/AIDS is a punishment by God. From the standpoint of risk assessment, people tend to avoid admitting risk if it is associated with shame, or outside their moral code. Consequently, those who are religious may perceive their risk as low, as demonstrated by Lefkowits et al. (2004). This can be explained in the way that moral values shape risk calculations about HIV. Those who see AIDS as a shameful conditions are likely to their own risk as low.

Religion can also work to influence community practices and national policies. A study looking at demographic and social factors that help shape underlying beliefs in policy preferences about sex education programs showed that religious and political factors emerged as key characteristics for explaining support or opposition to different sex education approaches in the United States (Bleakley, Hennessy, and Fishbein 2010).

The conceptual framework of the major theories of behavioral change assumes that the background factors operated through a range of intermediate factors to influence perception of risk and sexual behaviors. These intermediate factors may be sociodemographic or psychosocial.

Socio-Demographic and Psychosocial Factors for Risk

Early initiation of sexual intercourse is often associated with a long period of exposure to sexual activity, which often results in an accumulation of sexual partners and increased chances of contracting sexually transmitted diseases. Several studies have explored the impact of early sexual initiation on health outcomes. In a study by Sneed (2009), sexual risk behavior among early initiators of sexual intercourse was explored for US adolescents. It was hypothesized that early initiators of sexual intercourse were significantly more likely to report having four or more

lifetime partners and to drink alcohol or use drugs before the last time they had sex. Males classified as early initiators of sexual intercourse were 5.85 times more likely to report four or more sexual partners in their lifetime when compared to later initiators. Early initiation can lead to an increased risk for HIV through the exposure of multiple partners and drug use before sex. In addition, marital status can influence perception of the risk of HIV infection and sexual behavior. The challenges of negotiating safe sex are increasingly salient among married women. The fear of being thought of as promiscuous by a spouse may force women to acquiesce to her husband's sexual needs (Akwara, Madise, and Hinde 2003). Couples may have fear of bringing up the topic of safe sex in fear of offending their partner, so they keep quiet to avoid conflict. As quoted by Younge, Salem and Bybee (2010), in the context of relationship dynamics, "the sway of coerced threats, allurements, desire for social acceptance, social pressures, situation constraints, fear of rejection..can override the influence of the best informed judgment"(Younge, Salem, and Bybee 2010, p.53).

Knowledge of HIV has increased over the years but the association between knowledge and sexual behavior is ambiguous. Among adults, some studies have shown that less HIV/AIDS knowledge decreases the likelihood of engaging in preventative health behaviors and may contribute to HIV related stigma by perpetuating misconceptions about how HIV is transmitted (White, Chen, and Atchison 2008). Among sexually experienced youth, findings suggest that greater HIV knowledge is associated with more consistent condom use and greater likelihood of HIV testing (St. Lawrence, 1993) but other studies did not show this relationship and even found that more knowledge was associated with more risk taking. Since there was limited research on current HIV knowledge and how it relates to sexual behaviors, Swenson et al. (2010) aimed to describe the knowledge level among at risk African-American adolescents and determine

whether knowledge contributes to sexual behavior. They found that HIV knowledge was associated with a lower proportion of safe-sex acts. Another study among Historically Black Colleges and Universities (HBCUs) students showed that students had an average/high HIV knowledge score based on survey questions, attended a University with HIV testing services on campus, and perceived themselves to be at low risk for HIV infection. However, more than 50% of the respondents reported two or more sex partners in the previous 12 months, with inconsistent condom use. This suggests that knowledge is not always associated with risk perception or risky behavior (Sutton et al. 2011).

One possible explanation for the weak link between knowledge, perceived risk and behavior is the African American community may be that many feel that their lives are guided by a higher power and that circumstances are at times beyond their control (Younge, Salem, and Bybee 2010). Powe (1996) described this as fatalism and stated "In addition to poverty, oppressive forces such as long history of slavery, segregation, discrimination, substandard health care and the subsequent perceptions of meaninglessness, hopelessness, and social despair provide the environment for the emergence of fatalism" (Powe 1996, pg. 18). As a consequence of fatalism, people demonstrate less participation in precautionary health behaviors. When applied to perceptions of HIV infection, in situations where individuals have little control, these coping mechanisms may contribute to the decreased perception of risk (Younge, Salem, and Bybee 2010).

Exposure to HIV and STD information through mass media may lead to high levels of awareness, which in turn can influence self-assessed risk of HIV/STDs and behavior. But this approach has been criticized because of the lack of cultural sensitivity in relaying these messages. It has been criticized that the effectiveness of these messages are weak because of the

lack of cultural sensitivity, and this is particularly true for campaigns targeting African Americans (Romer et al. 2009).

The role of Heuristics on Risk

The belief that HIV is a disease for "high-risk" groups can influence people's perception and behavior. In the early years of the epidemic, HIV was considered to be a disease that affected white gay men, intravenous drug users and sex workers. Epidemiologists would frame their research and focus on these specific risk groups. Research has suggested that framing risks of HIV infection in terms of risk groups rather than risk behaviors may influence the perception of risk. People who do not fall into a risk category may not perceive their risk behaviors as risky, even though they may actually be at high risk (Kowalewski, Henson, and Longshore 1997). Early in the epidemic Mays and Cochran (1988) recognized this as a problem, and in the backdrop of the common view that AIDS was a "white gay disease", they examined the patterns of AIDS infections in women and assessed factors associated with risk perception and behavior change in a sample of Black and Latina women. Although AIDS posed a serious threat to the women in their study, the women perceived their risk of HIV infection to be low (Mays and Cochran 1988). Brown, Outlaw and Simpson (2000) found a consistent perceptual bias in risk estimation when they compared female college students to female seronegative injecting drug users. It was theorized that both groups used the cognitive coping strategies of denial, distancing, and downward comparison to minimize their risk of HIV infection (Brown, Outlaw, and Simpson 2000). Risk assessments of HIV infection may be biased for people who define HIV as a problem of risk groups but not directly related to their own behaviors. By separating one's self from the so called high risk groups, once can perceive his/her risk to be low (Kowalewski, Henson, and Longshore 1997)

HIV Prevalence and Risk

Perceptions of the prevalence of disease may be particularly important in influencing risk perception and in turn, risk behaviors related to HIV. If HIV is not prevalent, an individual's actual risk for it lessens, regardless of risky sexual behavior. People who live in HIV/AIDS epicenters and who engage in behaviors that expose them to HIV are at greater risk for infection than people who live in lower HIV/AIDS prevalent areas and who engage in the same risk practices (Seth C Kalichman and Cain 2005). When attempting to understand factors that shape risk perception, HIV prevalence and the actual probability that any given partner will be infected must be taken into consideration. Perceived disease prevalence may also influence risk practices. Kalichiman and Cain (2005) examined the association between perceived HIV/AIDS prevalence and behavioral risk for HIV and other STDs. Individuals who perceived a relatively lower AIDS burden reported significantly more sex partners in the previous 3 months and engaged in more unprotected and protected vaginal and anal intercourse than the higher perceived AIDS burden group. They found that perceptions of the AIDS burden were associated with sexual risk behaviors. People who estimated the relative burden of AIDS in their city as lower in other cities reported more sexual partners and greater rates of unprotected and protected vaginal and anal intercourse (Seth C Kalichman and Cain 2005).

Previous Studies

In response to the lack of understanding of why adolescents seem to engage in more risky behaviors, Cohn et al. (1995) examined whether teenagers are more likely than adults to exaggerate their own invulnerability to harm. They also examined whether teenagers are more likely than adults to minimize harm associated with periodic risk taking. It has been posited that adolescent risk behavior is often due to exaggerated feelings of invulnerability. They found that

compared with their parents, teenagers minimized the harm associated with periodic involvement in health-threatening activities. Surprisingly, these finding did not support the proposition that adolescents feel more invulnerable to harm than do adults (Cohn et al. 1995). A study published prior to this study directly compared risk perceptions of adults and adolescents. In the study, teenagers did not perceive themselves as less likely than their parents to encounter a negative outcome (Quadrel, Fischhoff, and Davis 1993).

A more recent study by Theall et al. (2003) looked at the risk perceptions and risk factors associated with risk perception in two age groups of predominantly minority women. The researchers compared women of a younger age group to women of an older age group. They hypothesized that factors associated with both the perceived chance of HIV infection and actual risky behaviors would differ between the two cohorts. The perceived chance of acquiring HIV differed significantly between the two cohorts, as they hypothesized. Younger women perceived a greater risk of infection compared to the older cohort. Factors associated with perceptions of risk differed according to age group, but overall, there were similarities between the groups. They inferred from the data the need for special attention to older women who are at risk for HIV (Theall et al. 2003).

In exploring both quantitative and qualitative research on HIV risk assessment and the management of risk, it has been discovered that there are a variety of factors that influence risk perception. Psychological factors such as optimistic bias and psychological maintenance, social factors such as gender, ethnicity, social networks, cultural norms, policies and religion have been noted to shape perception of risk. Prevalence of HIV within a network may also play a major role in decision making, a topic which has not been greatly explored as of yet. Many of the theoretical models of health behavior fail to include social values and demographic factors that

are imbedded in an individual's decision making progress. Each factor may weigh differently on its influence on one's risk perception depending on the situation, but it cannot be ignored that an accurate perception of risk is necessary to engage in protective behaviors regarding HIV

Chapter III

Methods and Procedures

Primary Data Collection

Data for the secondary analysis were obtained from two separate data sets. Participants from the adult data set were recruited as part of an ongoing longitudinal Atlanta Urban Network Study. In the study, urban networks of adults, who are described as high risk for HIV because of their drug using and sexual practices, were analyzed to test the hypothesis that individual behaviors do not completely explain the propagation of HIV. It was proposed that network dynamics play a critical role by placing individual HIV risk behaviors in context. Data was collected from 1995 through 1998, with follow up through August 1999. Participants were recruited for the study after a period of ethnographic investigation from three geographically separate communities. Two persons at each site were identified as initial respondents to start the connected chain of persons and their contacts. The study instrument was developed from a number of studies, although it was modified over time and for the particular purpose of the research. It was a questionnaire that was designed to collect typical epidemiologic information as well as to maximize information on personal network structure. The first section contained psychosocial and demographic variables such as place of residence, perceptions of the community, daily routine and a brief medical history. Section two covered drug related HIV-risk, including an in depth drug use history that collected information on the type of drugs used

throughout the respondents life time, as well as frequency of recent use. Section three addressed self Participants from the adolescent data set were recruited for a Behavioral Clustering Study for Adolescents. The study was conducted to explore the relative importance of adolescent boys and girls in chlamydial transmission among young people. The study proposed to study the behavioral and network dynamics of high risk adolescents. Adolescents were considered high risk for sexually transmitted diseases due to thebehavior and network structure. Participants were recruited from DeKalb County and drawn from the juvenile justice system and were those who were currently on probation. Initially 100 boys and 100 girls were screened to enroll 10 of each who were positive for *Chlamydia trachomatis* (CT). To obtain a network, a combination of snowball sampling and chain link sampling were used. The interview instrument was an amalgam of previous epidemiologic and social network instruments and a series of specific scales. The final instrument was culturally sensitive, and tailored to the specific needs and interests of adolescents. It contained information on civil status, demography, medical history and health seeking behavior, self-reported sexual and other behaviors and network variables.

Secondary Data Analysis

That data for this study was gathered from the Atlanta Urban Network Study and the Behavioral Clustering Study for Adolescents. All data were de-identified through removal of identifiers such as names. This study was approved by the Georgia State University IRB.

Eligibility

Among the adolescent data set, 280 participants were incorporated into the final data set. Individuals who reported not engaging in sexual intercourse over the last 12 months were omitted. Among the adult data set, 248 participants were incorporated into the final data set.

Individuals who reported an HIV diagnosis or zero sexual partners in the last 6 months were omitted.

Study Variables (Adolescents)

Dependent Variable

Perceived susceptibility

Participants rated their likelihood that they would get HIV as either being high risk, medium risk, or low risk. Ratings were dichotomized; categories of medium risk and high risk were combined.

Independent Variables

STI History

Participants were categorized as having a previous STI if they reported that they were ever told by a health professional that they had gonorrhea, chlamydia, genital herpes (HSV), genital warts (HPV), hepatitis (Hep A, Hep B, Hep C, Jaundice), chancroid, syphilis, or any other STD or VD.

Unprotected Sex

Participants were categorized as having unprotected sex if they had unprotected sex the last time they had sex or their reported condom use indicated less than 100% use.

Multiple sexual partners

Participants were categorized as having multiple partners if they had >=4 partners within the past year.

Exchanged sex for drugs or money

Participants were categorized as exchanging sex for money if they ever gave or received money or drugs to have sex.

Gender

Gender was categorized as either being female or male.

Study Variables (Adults)

Dependent Variable

Perceived Susceptibility

Participants rated their likelihood that they would get HIV as either being high, medium, low or none. Ratings were dichotomized; categories of “high chance” and “medium chance” were combined as were categories of “low chance” and “no chance”.

Independent Variables

STI History

Participants were categorized as having a previous STI if they reported that they were ever diagnosed as having gonorrhea, chlamydia, genital herpes (HSV), chancroid, syphilis, or any other STD.

Unprotected sex

Participants were categorized as having unprotected sex if their reported condom use indicated less than 100% use when having anal sex, oral sex or vaginal sex.

Multiple sexual partners

Participants were categorized as having multiple partners if they had >=4 partners within the past 90 days.

Exchanged sex for drugs or money

Participants were categorized as exchanging sex for money if they ever gave or received money or drugs to have sex.

Gender

Gender was categorized as either being female or male.

Data Management

SPSS Version 18 was utilized for data management and statistical analysis purposes. Ratings of HIV risk were dichotomized; categories of medium risk and high risk were combined in the adolescent data set. In the adult data set, ratings of HIV risk were dichotomized; categories of "high chance" and "medium chance" were combined as were categories of "low chance" and "no chance". Number of partners was recoded from a continuous variable to a dichotomous outcome variable of "1-3" and "4 or more" partners. Self reported races of Black and African American were combined to make the race Black. Self reported races of White and Caucasian were combined to make the race White.

Statistical Analysis

Descriptive analysis was conducted on the demographic variables such as age, race, number of partners and HIV risk perception. The mean and standard deviations (SD) were computed for the continuous variable of age while frequencies and percentages were computed for all other categorical variables. Additional descriptive analyses were conducted to compare cases and controls on various variables. Odds ratios were computed to assess association between HIV risk perception with the four independent variables of STI history, unprotected sex, multiple sex

partners, exchanged sex for drugs or money and gender. P-values were calculated to assess the signification of the association of these variables.

Logistic Regression

Binary logistic regression was conducted to determine the degree of association of HIV risk perception with the independent variables of STI history, unprotected sex, multiple sex partners, exchanged sex for drugs or money and gender. Odds ratios (OR) and 95% confidence intervals (CI) were computed for each dependent variable.

Chapter IV

Results

Cross-tabulations were utilized to examine the descriptive variables, as well as to assess the association between HIV risk perception and the various independent variables. This analysis provided significant information about the sample. As seen in Table 1, among adolescents, the average age of the sample was 17.84 years of age (SD=3.66) and participants represented an entirely Black sample. Black (African-Americans) represented 97.5% of the sample while Blacks and Hispanic Blacks represented 2.1% and .4% of the sample respectively, which resulted in the way participants were allowed to self identify. Among adults, the average age of the sample was 38.86 years (SD=7.89). Very similar to the adolescents, participants in the adult sample were predominantly Black making up 87.5% of the sample. Whites made up only 6% of the sample, and specific nationalities (4.8%), People of color (1.2%) and American Indians (.4%) made up the remainder of the sample. Adolescent males and females made up 59.3% and 40% of the sample respectively. Unlike the adolescents, females made up the majority of the adult sample at 53.6% while males made up 46.4% of the remaining sample. Most of the adolescents were currently enrolled in school (63.9 %). Although the adult sample was too old to be in high school, 56% reported that they dropped out of high school at some point. In both the adolescent and adult data sets, more than half the sample reported having unprotected sex, 55.5% and 86.5%, respectively. Adults were very close in

percentages when it came to having multiple partners, 48.4% of the sample reported 4 or more partners in the past 6 months and 51.6% reported fewer than 4 partners in the last 6 months. The majority of the adolescent sample (67.7%) had fewer than 4 partners within the past year. When it came to having exchange money/drugs for sex, adults reported a great difference compared to the adolescents. Seventy-nine percent of adults compared to 8.3% adolescents reported exchanging money/drugs for sex. The majority of both samples had no STD history, 68.0% of adults and 81% of adolescents. When it came toHIV risk perception, 86.3 % of adolescents and 57.9% of adults reported a low susceptibility to HIV risk based on their behavior current behavior.

In order to assess the relationship between HIV risk perception and risky sexual behavior, first, crude odds ratios (OR) were computed. As seen in Table 2, there were no significant associations between having unprotected sex, multiple sex partners, STD history, exchanging money or drugs for sex or gender and having a medium/high HIV risk perception among adolescents. Interestingly, only 17.6% of those who had unprotected sex, 18.9% of those who had multiple partners, 18.4% who had a history of an STD and 26.1 % of individuals who exchanged money or drugs for sex reported having a medium/high chance of contracting HIV. Approximately 12% of females and only 15 % of males reported having a medium/high chance of contracting HIV. Unlike adolescents, as seen in Table 2, the adults demonstrated a significant association between having multiple partners and having a medium/high chance of contracting HIV, OR=3.169 (CI=1.8772 to 5.365, p=.000). Similar results were found with having a history of STD and having a medium/high risk perception of contracting HIV, OR 2.155 (CI=1.248 to 3.720, p=.005). Lastly, a significant association was found between having exchanged money/drugs for sex and having a medium/high risk perception of contracting HIV, OR=3.248 (CI=1.575-6.700,

p=.001). Table 2 also shows that significant results were not found when looking at the association between having unprotected sex, and having a medium/high risk perception of contracting HIV, OR=1.478 (CI=.655 to 3.333, p=.345). Compared to males, being female was not significantly associated with having a medium/high risk perception of contracting HIV, OR=.715 (.429 to 1.190, p=.196). Out of the sample that had unprotected sex, only 51.1% reported a low/no chance of contracting HIV. Out of those who had multiple partners, 43.7% reported a low/no chance of contracting HIV. Out of those who reported having an STD history, 44.9% reported low/no chance of contracting HIV. Similar results were reported with those who exchanged money/drugs for sex, with 52.8% reporting a low/no chance of contracting HIV. Approximately 54% of females and 62% of males reported low/no chance of contracting HIV.

In order to further assess how the multiple variables interacted to influence HIV risk perception, multivariate analysis was run and odds ratios (OR) were computed. As seen in Table 3, the multivariate analysis weakened the association, but there was still no significant association between the independent variables of unprotected sex, multiple partners, STD history, exchanging money/drugs for sex or gender and a medium/high HIV risk perception among adolescents. Also, as seen in Table 3, among adults, the only significant association that remained was having multiple partners and having a medium/high risk perception of contracting HIV, OR=3.238 (CI=1.725 to 6.079, p=.000). Significant association was lost between unprotected sex, STD history, exchanging money/drugs for sex, gender and having a medium/high HIV risk perception, OR=1.68 (CI=.972 to 3.236), OR=1.68 (CI=.872 to 3.236, p=0.121), OR=1.436 (CI=.612 to 3.371), OR=1.436 (CI=.612 to 3.371, p=0.406) respectively.

TABLE 1: COMPARISON OF DEMOGRAPHICS AND OTHER CHARACTERISTICS OF THE TWO GROUPS

Characteristic (Adolescents)	**Number (%)**
Age (Mean)	17.84 (SD=3.66)
Race/Ethnicity	
Black (African-American)	273 (97.5)
Black	6 (2.1)
Hispanic (Black)	1 (.4)
Gender	
Male	166 (59.3)
Female	114 (40.7)
Enrolled in School	
Yes	179 (63.9)
No	101 (36.1)
Unprotected Sex	
Yes	152 (55.5)
No	122 (44.5)
Multiple Partners	
≥4	90 (32.3)
<4	189 (67.7)
STD History	
Yes	50 (18.1)
No	227 (81.9)
Exchanged Money/Drugs for Sex	
Yes	23 (8.3)
No	255 (91.7)
Perceived HIV Risk	
Medium/High	37 (13.7)
Low	234 (86.3)

Characteristic (Adults)	**Number (%)**
Age (Mean)	38.86 (SD=7.89)
Race/Ethnicity	
Person of Color	3 (1.2)
Black	217 (87.5)
White	15 (6.0)
Amer. Indian	1 (.4)
Specific Nationality	12 (4.8)
Gender	
Male	115 (46.4)
Female	133 (53.6)
High School Drop Out	
Yes	130 (56.0)
No	102 (44.0)
Unprotected Sex	
Yes	179 (86.5)
No	28 (13.5)
Multiple Partners	
≥4	120 (48.4)
<4	128 (51.6)
STD History	
Yes	79 (32.0)
No	168 (68.0)
Exchanged Money/Drugs for Sex	
Yes	196 (79.4)
No	51 (20.6)
Perceived HIV Risk	
Medium/High	104 (42.1)
Low/None	143 (57.9)

TABLE 2: COMPARISON OF THE CRUDE ODDS RATIOS OF THE IMPORTANT FACTORS WITH PERCEIVED RISK

Adolescents

Variable		Low Chance	Medium/High Chance	
		No. (%)	**No. (%)**	**OR (95% CI), p level**
Unprotected sex	Yes	122 (82.4%)	26 (17.6%)	2.151 (1.015-4.554), .042
	No	111 (91.0%)	11 (9.0%)	
Multiple partners	≥4	73 (81.8%)	17 (18.9%)	1.875 (.928-3.787), .077
	<4	161 (89.0%)	20 (11.0%)	
STD history	Yes	40 (81.6%)	9 (18.4%)	1.543 (.676-3.519), .300
	No	192 (87.3%)	28 (12.7%)	
Exchanged money/drugs for sex	Yes	17 (73.9%)	6 (26.1%)	2.459 (.901-6.711), .071
	No	216 (87.4%)	31 (12.6%)	
Gender	Female	96 (88.1%)	13 (11.9%)	.779 (.378-1.605), .497
	Male	138 (85.2%)	24 (14.8%)	

Adults

Variable		Low/No chance	Medium/High Chance	
		No. (%)	**No. (%)**	**OR (95% CI), p level**
Unprotected sex	Yes	91 (51.1%)	87 (48.9%)	1.478 (.655-3.333), .345
	No	17 (60.7%)	11 (39.3%)	
Multiple partners	≥4	52 (43.7%)	67 (56.3%)	3.169 (1.872-5.365), .000
	<4	91 (71.1%)	37 (28.9%)	
STD history	Yes	35 (44.9%)	43 (55.1%)	2.155 (1.248-3.720), .005
	No	107 (63.7%)	61 (36.3%)	
Exchanged money/drugs for sex	Yes	103 (52.8%)	92 (47.2%)	3.248 (1.575-6.700), .001
	No	40 (78.4%)	11 (21.6%)	
Gender	Female	72 (54.1%)	61 (45.9%)	.715 (.429-1.190), .196
	Male	71 (62.3%)	43 (37.7%)	

TABLE 3: COMPARISON OF THE MULTIVARIABLE RESULTS IN THE TWO GROUPS FOR HIV INDICATORS AND MEDIUM/HIGH PERCEIVED HIV RISK

Adolescents			
Variable	**OR**	**95% CI**	**P Value**
Unprotected sex			
No	Reference	Reference	Reference
Yes	1.682	.542-5.227	0.368
Multiple Partners			
<4	Reference	Reference	Reference
≥4	1.565	.723-3.388	0.255
STD History			
No	Reference	Reference	Reference
Yes	1.094	.429-2.789	0.851
Exchanged Money/Drugs for Sex			
No	Reference	Reference	Reference
Yes	1.682	.542-5.227	0.368
Gender			
Male	Reference	Reference	Reference
Female	0.839	.383-1.836	0.66

Adults			
Variable	**OR**	**95% CI**	**P Value**
Unprotected Sex			
No	Reference	Reference	Reference
Yes	1.68	.872-3.236	0.121
Multiple Partners			
<4	Reference	Reference	Reference
≥4	3.238	1.725-6.078	0
STD History			
No	Reference	Reference	Reference
Yes	1.68	.872-3.236	0.121
Exchanged Money/Drugs for Sex			
No	Reference	Reference	Reference
Yes	1.436	.612-3.371	0.406
Gender			
Male	Reference	Reference	Reference
Female	0.687	.368-1.283	0.239

Chapter V

Discussion & Conclusion

Discussion

Despite the heightened efforts of HIV prevention messages and campaigns, HIV is still on the rise among certain high risk groups. Although HIV infection rates have remained stable within recent years the infection rate among African American men and women are disproportionally high. In 2009 the estimated rate of new HIV infection for black/African-American men was more than six times as high as that of white men, nearly two and a half times that of Hispanic/Latino men, and more than twice that of black/African-American women. In addition, in 2009 the estimated rate of new HIV infection for black/African-American women was 15 times the rate for white women, and over three times that of Hispanic women (CDC, 2012). Younger people are also a more at-risk group. Although overall, the rate of new infections remained stable between 2006 and 2009, among adolescents and young adults HIV incidence increased by 21 percent. For young people who belong to key populations at higher risk, the increase is especially high (CDC, 2012). These findings have ultimately resulted in an increased need for understanding the efficacy of the current prevention messages and programs that are available.

In order to fully assess the issue at hand, it is important that we understand the population of interest. This paper set out to examine the association between self-perceived risk of

HIV infection and risky sexual behavior among adults and adolescents. Although classic theories and models of behavior change identify increased risk perception as a motivating force behind protective behavior, studies have often found mixed results. While some researchers may have abandoned these theories all together, many researchers still view risk perception as a necessity for behavior change, and because of that, research in this area is still warranted. Consistent with previous findings (Nunn et al. 2011), this study found that most individuals perceived themselves as having a low risk of contracting HIV. This perception is inconsistent with the CDC's (2012) report that African-American's of lower socioeconomic status have some of the highest HIV incidence rates of any population in the United States. The self-reported behaviors of many of the individuals in this study suggest that they may in fact be underestimating their risk because many had engaged in behaviors that would place them at risk for HIV infection.

In keeping with other findings (Foulkes et al. 2009), this study found that the consistent use of condoms to protect individuals from HIV infection was low in this sample of adults and adolescents. Among adults, 86.5% of the sample used condoms less than 100% of the time, and among adolescents almost half the sample used condoms less than 100% of the time. In addition, many of the adolescents and adults reported multiple partners. Among the adults, 48% had four or more partners within the last 6 months, and among adolescents 32.3% had four or more partners within the past year. This suggests that many participants in the study were engaged in behaviors that exposed them to the risk of HIV infection. This level of exposure was not reflected in their perception of personal risk.

The samples were chosen in order to be representative of populations and neighborhoods that are at a substantial risk for HIV, and the descriptive analysis of the data provides a greater understanding of the adolescents and adults who belong to these groups. Although these groups

do not represent the entire population of Black/African-Americans, they represent a subset, which may represent a sizeable proportion of Black/African-American people, and thus put the entire category of Black/African-Americans in a higher risk situation. The results indicated some differences between adults and adolescents in their experiences of risky sexual behavior and self-perceived risk, but among the sample of respondents, 99.2% of the adults and almost 90% of the adolescents reported some high risk sexual behavior within the last year. Needless to say, age was a very big difference between samples. The mean age of the adult sample was about 39 years of age while the mean age of the adolescent sample was about 18 years of age, approximately a 20 year age difference.

The conceptual framework of risk perception and behavior assumes that background factors at national, community and individual levels operate through a range of intermediate sociodemographic and psychosocial factors. Although these are important factors they could not be assessed in this study. This is a limitation of the study. In a study by Akwara et al. (2003), sociodemographic and psychosocial factors in their models did not attenuate the positive association between risk perception and sexual behavior, suggesting that an independent association exists between these two variables among people of different demographic and social profiles (Akwara, Madise, and Hinde 2003).

Adults

It was hypothesized that there was a relationship between risky sexual behaviors and high risk perception of HIV. The study found there is a positive association between medium/high perceived risk and risky sexual behavior for adults, and this is consistent with findings from previous studies (Theall et al. 2003). When assessing the relationship between risky sexual

behaviors and HIV risk perception in a univariate analysis, multiple partners, STD history, and exchanging money/drugs for sex were found to be significant. In the multivariate logistic regression model, having multiple sex partners was found to be the only predictive factor for having an increased perceived HIV risk. Since the adult sample is cross-sectional, it is difficult to say whether perception of risk is based on previous sexual behavior or whether behavior is based on perception. Feelings of personal vulnerability are very subjective and can vary by context and time and is believed that sexual behavior is more likely to be based on subjective perceptions of risk rather than actual risk (Akwara, Madise, and Hinde 2003). Although not reported in this study, the majority of the adult sample was intravenous drug users (IDUs). In the early 90s- around the time that the data was collected- preventative efforts targeting the drug-using community typically focused attention on preventing transmission through the sharing of contaminated needles, and placed less emphasis on communicating advice on precautionary sexual behavior. As a result, IDUs evaluating their risk of HIV infection may perceive needle sharing as the more immediate threat and underemphasize the risk from sexual transmission (Kline and Strickler 1993). Additionally, Kline and Strickler (1993) note that the presence of competing daily problems may play a part in shaping assessments of personal risk for HIV. For example, daily survival issues may be more salient in the minds of our participants, and as a result they may be less mindful of problematic behaviors relating to a HIV whose consequences may not be apparent for several years. Findings from this study seem to elicit cognitive dissonance due to the high HIV infection rates found in this population. It is still noteworthy to point out that their behavior did not reflect in their level of HIV risk perception.

Adolescents

When looking at adolescents' risky sexual behavior, it was hypothesized that there was a relationship between risky sexual behaviors and an increased HIV risk perception. This relationship was found to be non significant. This further deepens the questions regarding specific needs of prevention programs aimed at reducing HIV transmission. Previous research suggests that individuals often feel invulnerable to HIV infection and this may be true for the adolescents in the sample. HIV is seen as a distant rather than immediate threat, a disease that affects other people. With the reports from the CDC indicating younger people are becoming at increased risk for HIV, it is imperative that the adolescents in this group be made aware of their risks. Another possible explanation is that risk assessments and behavioral decisions involving high-risk sexual practices may be context specific and shaped by peer norms. Among adolescents, peer norms can establish a point of reference for which they guide their behaviors. Peer norms on sexual risk taking and HIV susceptibility may serve as a type of reinforcement, modeling and support concerning values and beliefs systems. Additionally, findings by Kline, Kline and Oken (1992) suggest that individuals assess their HIV risk in relation to specific partners and specific situations (Kline, Kline, and Oken 1992). For example, length and intimacy of the relationship, perceptions concerning the partners' risk practices, partners' known or presumed HIV status, and a sense of responsibility toward the partner all factor into perceptions about the riskiness of particular behaviors. Unfortunately this study did not assess these measures but it can be something to examine in the future.

While the HIV risk behaviors of the adolescents were relatively low compared to the adults, there are still many adolescents who were engaging in these risky behaviors. Researchers have provided many differing explanations for why adolescents engage in high risk behaviors. As

mentioned previously, condom use was not a predictor of HIV risk perception. In a study among adolescents attending an STD clinic found those adolescents' perceptions of risk for STDs with a main sex partner predicted their subsequent condom use, but it differed with casual partners (Ellen et al. 2002). Relationship type can play an important role in risk perceptions and risky sexual behaviors, but this could not be assessed in the study, which is another limitation. There was no significant relationship between all obvious risk indicators (that is, previous STD diagnosis, exchanging drugs/money for sex, unprotected sex, and high numbers of sex partners) and perceptions of susceptibility. The patterns in these data indicate a mismatch between risk behavior and perceptions of risk. Other research suggests a similar lack of an association between perceived risk for STDs and HIV and factors expected to be important in judgments of risk (for example, condom use, number of partners, STI/HIV beliefs) (Ethier et al. 2003). Adolescents may not be fully aware that unprotected sex puts them at risk for HIV. Developmental theory suggests that adolescents have an increased sense of invulnerability with a propensity towards risk taking due to adolescent egocentrism and "personal fables,'' (Alberts, Elkind, and Ginsberg 2007). Research suggests that the lack of an association between perceived susceptibility and disease outcomes have more to do with a general tendency towards optimistic biases (Whaley 1999). In order to produce effective prevention programs in the future, it is imperative that adolescents understand the implications of their risky sexual behavior.

Perceived HIV prevalence

Although not reported, the HIV prevalence within each respective group was very different. Among the adults, the HIV prevalence was 13.3%, and among the adolescents, there was no HIV reported within the network. Perception of HIV prevalence can play an instrumental role in shaping HIV risk perception and in turn, affect risk taking behavior. The threat of HIV for an

individual living in an HIV epicenter is different than the threat of HIV to an individual in an area with lower HIV prevalence regardless of risky sexual behavior. The adolescent network had alower perception of HIV risk than the adults, and in actuality, this may have matched their HIV risk perceptions. The respective groups may have had a sense of the relative HIV burden within their networks, which assists in predicting risk perception and risky behavior. Intuitive epidemiology is an important factor to consider when examining HIV risk perceptions. The perception of HIV prevalence may have also affected the sexual risk taking of the adolescents and accounted for apparent differences between the adolescents and the adults.

Limitations

There were several limitations to this study, some previously noted. Due to the cross-sectional nature of the data, causality was not ascertained from this study and only association could be concluded through the analysis conducted. Additionally, given the fact that this study used population based data from a large metropolitan area, it could only be generalized to such settings. Because the results are based on two separate questionnaires developed for other research questions, questions related to several HIV risk behaviors and factors influencing HIV risk perception were somewhat limited. For example, data on partner characteristics, emotional and psychological profiles were not collected. Additionally, because the adult and adolescent data sets were not standardized, questions were not the same for the adults as they were for the adolescents, and they had to be grouped according to themes. While the interviews were confidential, there is potential for bias due to the fact that the data are self-reported. Lastly, the information on the adult data set was collected in 1995, and because of the age of the data, findings may no longer be valid. Despite the limitations, the analysis provided some significant insight to high risk populations and the issues being discussed.

Conclusion

Public health practitioners, researchers and educators face the important task of fighting a disease that has many layers and many determinants. During the 1990s, prevention programs were utilized as the primary front against the progression of the disease. The primary objective of most prevention programs was reducing HIV transmission through increasing the use of condoms and educating individuals about a disease that was fairly knew and unknown. Research has shown that HIV education is not enough. As the face of the disease has changed, new programs have attempted to meet these same objectives as well as take on new issues that face specific populations. New programs are needed to address specific issues that are relevant to new frameworks of understanding disease transmission in the midst of the epidemic.

Overall, the adults and adolescents in this study differed greatly on the association between risky sexual behaviors and HIV risk perception. While adults seemed to have a better sense of their HIV risk, the adolescents demonstrated no association between high risk behavior and increased HIV risk perception. Because of the gravity of the situation regarding adolescents, more research in this area is warranted. This includes an increased need for understanding the dynamics between adolescents' risky behavior and HIV risk perception. Given the high rates of HIV in the African-American population, especially young people, more work is necessary to help adolescents accurately assess their risk for infection. Adolescents must have the knowledge and skills to recognize their susceptibility to HIV infection as a first step toward disease prevention by behavior change. Sexual risk behavior patterns and risk assessment tools adopted during adolescence and young adulthood may continue throughout adulthood. It is therefore vital to tackle these issues now before many adolescents, like the ones in this study, end up following a trajectory similar to the adults in the sample.

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