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Risky Sexual Behavior among African-American Men Who Have Sex with Men: The Effects of Peer Norms for Condom Use on Risky Sexual Behavior as Moderated by Socio-Demographic, Socio-Contextual, and Health-Related Variables

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RISKY SEXUAL BEHAVIOR AMONG AFRICAN-AMERICAN MEN WHO HAVE SEX WITH MEN: THE EFFECTS OF PEER NORMS FOR CONDOM USE ON RISKY SEXUAL BEHAVIOR AS MODERATED BY SOCIO-DEMOGRAPHIC, SOCIO-CONTEXTUAL, AND HEALTH-RELATED VARIABLES

by

Christopher S. Holliday

Under the direction of John Peterson

ABSTRACT

This study examined contextual influences on the relationship between peer norms for condom use and risky sexual behavior among African-American men who have sex men. Analyses assessed the moderating effects of socio-demographic, socio-contextual, and health-related variables. One thousand forty African-American men, who have sex with men, ages 17 to 25 years, were surveyed as part of the Community Intervention Trial for Youth (CITY) from 1999 to 2002 in Atlanta, Georgia. Findings supported the hypothesis that participants who engaged in unprotected insertive anal intercourse, socio-contextual variables moderated the relationship between peer norms and risky sexual behavior. Findings also supported the hypothesis that participants who engaged in unprotected receptive anal intercourse, both socio-demographic variables and a health variable moderated the relationship between peer norms and risky sexual behavior. Findings have implications for intervention, policy, and research, including a need for interventions that recognize the contexts of influence that shape African-American MSM sexual behavior and that support norms for consistent condom use in both steady and casual sexual relationships.

INDEX WORDS: HIV, AIDS, African American, MSM, Risky Sex, Moderation, Peer Norms, Condom Use

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by

Christopher S. Holliday

A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of

Master of Arts

in the College of Arts and Sciences

Georgia State University

2006

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LIST OF ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
CDC	Centers for Disease Control and Prevention
HAART	Highly Active Antiretroviral Therapy
HIV	Human Immunodeficiency Virus
MSM	Men who have sex with men
PNCU	Peer Norms for Condom Use
STD	Sexually Transmitted Disease
UAI	Unprotected Anal Intercourse (general)
UIAI	Unprotected Insertive Anal Intercourse
URAI	Unprotected Receptive Anal Intercourse
YMS	Young Men's Study
YMSM	Young men who have sex with men

CHAPTER 1

INTRODUCTION

The prolific spread of human immunodeficiency virus (HIV) and subsequent deaths of millions due to acquired immune deficiency syndrome (AIDS) constitutes a global pandemic. AIDS impacts every ecological level, from the individual infected, to the social settings in which they interact, to the community and society in which they live. Annually, there are approximately 40,000 new HIV infections worldwide and recent analyses suggest a potential rise in the numbers of cases among specific populations (CDC, 2003). As well, the effects of HIV/AIDS cross all boundaries of age, race, ethnicity, religion, and class, and span continents to affect every population on the planet. Almost 25 years ago, public health agencies acknowledged HIV/AIDS as a threat to all societies and began redirecting resources toward surveillance, prevention, treatment, research, and policy (Wolitski et al., 2003). Without this critical focus that led to the discovery of highly active antiretroviral therapies (HAART) that have dramatically decreased HIV seroprevalence and deaths due to AIDS, the disease would continue to end many more lives unchecked.

However, despite the mobilization of global societies and the funneling of billions of dollars to combat the devastating effects of the disease, the AIDS crisis persists and threatens to worsen among specific populations. Prevention of HIV infection remains a hard-fought battle. Since the first known cases of AIDS were reported in June of 1981, approximately 1.5 million Americans have been infected with HIV and more than 500,000 have died (CDC, 2004). Currently, between 850,000 and 950,000 people in the United States are infected with HIV; however, nearly one-third are unaware that they are carrying the virus (Fleming et al., 2002).

Still, the population in which the effect of HIV remains highest is among men who have sex with men (MSM; CDC, 2000, 2003, 2004). An estimated 365,000 to 535,000 MSM are living with HIV, and 42% of new HIV infections occur in this population (Wolitski, Valdiserri, Denning, & Levine, 2001). Recent data on sexually transmitted diseases (STDs) and on unprotected sexual behavior indicate the potential for resurgence in HIV infections among MSM (Wolitski et al., 2001). Furthermore, epidemiologic research has documented that HIV infection remains elevated in vulnerable populations and is spreading at alarmingly high rates among MSM of color (Valleroy et al., 2000; Catania et al., 2001; Wolitski et al., 2001; Brooks et al., 2003).

Though behavior change messages and media campaigns have had some effect on increasing awareness of the disease and reducing risky behavior among MSM, these strategies fall short when applied without considering relative contextual factors, socio-cultural norms, and socioeconomic realities of respective minority populations. The latest statistics show that over 50% of new HIV infections in the U.S. occur among African Americans (CDC, 2000), though they only comprise approximately 12% of the U.S. population (U.S. Census, 2000). The incidence of new AIDS cases and AIDS-related deaths is also higher for blacks than for whites (CDC, 2000). While black men comprise less than 6% of the overall population, their rate of new HIV infections is more than double the rate for white men. Furthermore, among African-American MSM in particular, the prevalence of unrecognized HIV infection is extremely high (CDC, 2002; Mashburn & Peterson, 2004).

The most effective method for preventing the transmission of HIV during sexual contact is the use of a male latex condom (CDC, 2004). However, norms that support carrying and using condoms have not been fully researched. Hart and Peterson (2004) suggest that changing peer

norms to make them more supportive of condom use and encouraging men to carry condoms may improve HIV intervention in this vulnerable population. Specifically, they found that peer norms for condom use play a direct role in reducing risky sexual behavior among African-American MSM, ages 18 to 25.

Bingham et al. (2003) argue that current research on rates of risky behavior by African-American MSM lacks convergence, so researchers should look beyond individual-level behavioral risk data. Research focused on social, interpersonal, and contextual factors is clearly needed. More specifically, the influences of socio-demographic, socio-contextual, and health variables on risky sexual behavior is unexamined. This type of research captures elements of behaviors that are a function of the individual in concert with others or their environment (Mays, Cochran, & Zamudio, 2004).

This study investigates the moderating effects of socio-demographic, socio-contextual, and health-related variables, on the relationship between peer norms for condom use and risky sexual behavior among young African-American men who have sex with men. The remainder of this chapter reviews contemporary literature regarding risky sexual behavior, peer norms for condom use, and the potential influences of various socio-demographic, socio-contextual, and health factors. The review concludes with a summary and critique of existing literature, followed by a discussion of the specific research questions and hypotheses suggested by the review and examined in the current study.

Risky Sexual Behavior

Assessing recent trends in risky behavior among MSM is extremely difficult because only limited longitudinal data have been collected on the sexual practices of this population (Wolitski et al., 2001). A CDC (2001) review of HIV incidence found that having five or more

male sex partners during the preceding six months, having unprotected anal sex with men, or injecting drugs were risk behaviors associated with high HIV incidence. Also, increased risk of HIV transmission is due to greater numbers of high-risk sexual partners (Stall, 2002). For the purpose of this study, risky sexual behavior is operationalized as unprotected anal sex (Peterson, Bakeman, & Stokes, 2001) that, more specifically, includes unprotected *insertive* anal intercourse (UIAI) and unprotected *receptive* anal intercourse (URAI).

There are several factors that may influence risky sexual behavior among African-American men who have sex with men, these include inconsistent condom use (Pinkerton, 1997), ethnicity (Stokes & Peterson, 1998), and psychological distress (Rotheram-Bous et al., 1995; Stokes & Peterson, 1998). African Americans, in general, face societal problems of racism. However, African-American MSM must contend with their sexual minority status as homosexual or bisexual (Stokes & Peterson, 1998) as well as their racial minority status. Also, being a member of an ethnic and sexual minority can lead to depression, psychological stress, anxiety, and low self-esteem (Peterson, Folkman & Bakeman, 1996). Unprotected anal intercourse is associated with high levels of these psychological phenomena (Rotheram-Bous, Rosario, Reid, & Koopman, 1995).

In addition, there are more complex factors that influence sexual risk-taking by African-American MSM. They include attitudes towards condoms, comfort in disclosing same-sex behavior to others, the physical and interpersonal context of sex, and socio-cultural characteristics such as racism and homophobia (Beeker, Kraft, Peterson & Stokes, 1998). Other causes of sexual risk-taking result from diminished social capital (e.g., as a result of low socioeconomic status, marginalization, and lack of empowerment). These factors are deeply embedded within multiple levels of the environment (Maton, 2000) of African-American MSM.

Moreover, salient contextual factors that affect sexual risk-taking include low support for condom norms among peers (Hart & Peterson, 2004), substance abuse (Beeker et al., 1998; Stall & Purcell, 2000; Stueve et al., 2002), and low perceived risk (Peterson et al., 1992; Johnson et al., 2000). Since the advent of antiretroviral therapies, the perception of reduced HIV risk also might affect sexual risk-taking behavior. Although HIV-positive patients receiving Highly Active Antiretroviral Therapy (HAART) do not exhibit increased risky behavior (i.e., when therapy achieved an undetectable viral load), other people's beliefs about HAART and viral load may promote unprotected sex (Crepaz, Hart, & Marks, 2004).

Although some studies have found that rates of unprotected anal intercourse are higher among African-American MSM than white MSM, other studies have found no significant racial differences or that African-American MSM are less likely to have unprotected anal intercourse (Mansergh et al., 2001; Peterson et al., 2001; Torian et al., 2002, McKirnan et al., 2001; Easterbrook et al., 1993; Valleroy et al., 2002). As far as reporting unprotected penetrative sex with either gender, African-American MSM are more likely to report unprotected penetrative sex with men and women (McKirnan et al., 1994). However, African-American MSM have been reported to have fewer sexual partners than other racial groups (McKirnan et al., 2001; Stokes et al., 1996; Valleroy et al., 2002). In fact, Stokes et al. (1996) found that African-American MSM had fewer casual or anonymous partners.

Sexual risk reduction is not likely to be sustained without corresponding changes in community tolerance of homosexuality and the capacity of MSM to collectively address HIV and other survival threats (Beeker, Kraft, Peterson & Stokes, 1998). There is a wealth of accumulated knowledge on the modes of HIV transmission, high-risk populations, prevention, and treatment. More recently, groundbreaking research about the effect of peer norms for

condom use on risky sexual behavior (Hart and Peterson, 2004) may be critical in guiding future efforts to develop effective social interventions for young African-American MSM.

Engaging in risky sexual behavior, such as unprotected anal intercourse (UAI), whether receptive or insertive, is the most salient risk factor for HIV transmission in African-American MSM. Therefore, it is important to recognize that prevention efforts specifically targeting African-American MSM who engage in this behavior are all the more imperative.

Peer Norms

Aside from abstaining from sexual intercourse or being in a long-term mutually monogamous relationship with an HIV-negative partner, the surest way to avoid transmission of sexually transmitted diseases, such as HIV, is to use a latex condom (CDC, 2004). Several studies have suggested that condoms are 90% to 95% effective in reducing the risk of HIV transmission, if used consistently (Pinkerton, 1997; NIAID, 2001). One strategy to reduce the risk of HIV transmission among men who have multiple sexual partners is to use condoms. Men who can demonstrate greater skill at using condoms, who have ready access to condoms and lubricants, and who report a greater sense of self-efficacy at being able to use condoms consistently, also typically report lower rates of sexual risk-taking (Stall, 2002).

However, condom availability alone is not sufficient for reducing risky sexual behavior. There must be support mechanisms that promote and support their use. A primary avenue for support comes from peers and the norms that peer groups establish. At different periods, and in different contexts, peer influence can be more or less effective in shaping behavior. Among many groups, when one is younger, norms that are set by one's peers might be more influential than when older. Therefore, as a psychosocial variable, "peer norms for condom use" is a salient predictor of risky sexual behavior, but one that has not been studied extensively, particularly

among African-American MSM. Much less studied are the socio-demographic, socio-contextual, and health variables among MSM that potentially moderate (i.e., strengthen or weaken) this relationship.

Perceived peer norms for condom use, which reflect community assumptions about whether anal sex should (or should not) involve condoms, have been shown to be associated with sexual risk among MSM (Stall, 2002). According to Hart and Peterson (2004), the effect of peer norms on risky behavior indicates a unique contribution of social norms to risky sexual behavior among young African-American MSM and is consistent with prior research (Peterson et al., 1992; Heckman et al., 1999). Regarding condom use, a long-held belief was that *not* carrying condoms predicted general risky sexual behavior. However, Hart and Peterson (2004) found that *non*-supportive or low peer norms for condom use predicted an increased likelihood of unprotected insertive anal intercourse (UIAI) and an increased likelihood of unprotected receptive anal intercourse (URAI). Although, not carrying condoms predicted an increased likelihood of URAI, it did not predict an increased likelihood of UIAI. Their findings suggest that more supportive peer norms for condom use and encouraging sexually active MSM to carry condoms may reduce risky sexual behavior.

Social support/social resources.

The prevailing factor that drives the effects of moderating variables (i.e., socio-demographic, socio-contextual, and health-related) on the relationship between peer norms for condom use and risky sexual behavior is social support or the availability of social resources. Having someone with whom one can talk about safer sex or tell if one were having unsafe sex is vitally important. Equally important is having someone with whom one can share concern about HIV and AIDS.

In a study by Kraft, et al. (2000), data were examined from 76 qualitative interviews with 18- to 29-year-old African-American men who have sex with men in Chicago and Atlanta to identify perceptions of "community" and components of a community-level HIV/AIDS intervention. When asked about community assets or the benefits of community membership, men reported a sense of belonging and social support, socialization, sociability, and support for safer sexual behavior. The understanding is that based on these resources, these men would have access to the kinds of help or support they needed around these issues. The presence and degree of social support within a social structure (e.g., peer group), in large part, determines the level of risky sexual behavior that is exhibited (Peterson et al., 1996). Peer norms for condom use are more influential in reducing risky sexual behavior if the socio-demographics of the MSM, his social context, and health-related issues are supportive of these norms.

Socio-Demographic Factors

Socio-demographic variables reflect considerable differences in human sexual behavior. These factors determine, in large part, a person's worldview. Consequently, this worldview determines how stimuli, such as peer norms, will be processed and how subsequent behaviors will be elicited. For African-American MSM, several socio-demographic variables are considered that may affect risky sexual behavior, including age, education, employment, sexual identity, and whether they have a main or non-main (i.e., causal) male sexual partner.

Age.

Typically, research in the United States has shown that younger MSM are more likely than older MSM to engage in risky sexual practices (Mansergh, 1998). To determine HIV incidence among young MSM, the CDC analyzed data from the Young Men's Survey (YMS), a study that found a high prevalence of HIV and associated risks among MSM aged 15 to 22 years

of age sampled in seven U.S. cities (Valleroy et al., 2000). The study also found the highest incidence of HIV among young African-American MSM (20 to 22 years old) in their multiethnic sample (CDC, 2001). Similarly, the youngest MSM in a large sample (N = 750) of young African-American men (18 to 25 years old) were more likely to engage in risky sexual behavior than the older men in the study (Hart and Peterson, 2004).

Education.

The relationship between educational level and sexual HIV risk is less well examined in research for MSM in the United States. One population-based study found a strong association between HIV seroprevalence and low educational attainment among MSM (Catania et al., 2001). According to this four-city study, higher levels of HIV infection (37%) were found among African-American MSM who were less educated (i.e., had less than a high school education). In addition, Denning and Campsmith (2005) found that lack of education beyond high school was predictive of UAI in HIV-positive MSM.

Employment.

Although not widely studied in this population, employment as it relates to SES might affect the relationship between peer norms for condom use and risky sexual behavior in African-American MSM. Employment represents a salient socio-demographic factor in this minority population. Mays et al. (1993) found associations between unprotected anal sex and black MSM in low-skilled jobs. In addition, when employment as it relates to SES or poverty was considered, Mays et al. (1993) and Peterson et al. (1992), both found associations between lower income and unprotected sexual behavior in black MSM.

Sexual identity.

It is widely assumed that among men who do *not* self-identify as gay and who fear disclosure, public discussion is diminished about sex in general and safe sex in particular (Stall, 2002). Sexual self-identification is strongly related to sexual behavior, but not all MSM self-identify as gay or bisexual (Doll et al., 1992; Wolitski, 1993).

Sexual identity is problematic in African-American MSM. One reason might be that because many African-American MSM do not self-identify as gay or homosexual, prevention messages aimed toward the gay community do not reach them. Very few African-American MSM become part of the mainstream (i.e., predominantly white) gay community (Beam, 1988). Stokes et al. (1996) found that African-American MSM were less likely than white MSM to perceive friends and neighbors as accepting homosexuals. Many African-American MSM identify with their racial identity rather than their sexual identity (Mays, 1989), and have been likely unaffected by the myriad of prevention efforts aimed toward the white gay community.

Matters are even more complex for African-American bisexual men, who also may not identify as gay. In a study of 209 HIV-seropositive male blood donors, 44% of the African-Americans were more likely to identify themselves as bisexual than gay (Doll et al., 1992). Heckman et al. (1995) found that bisexual men, relative to exclusively gay men, had lower intentions to use condoms the next time they were to engage in intercourse and perceived weaker peer norms that favor safe sex and risk avoidance. In this study, one-third of bisexual men reported engaging in unprotected anal intercourse, and 17% had multiple unprotected anal sex partners within the previous two months (Heckman et al. 1995). Similarly, McKirnan et al. (1995) found that bisexually active black men may be at greater risk of both acquiring and transmitting HIV because of the higher seroprevalence and higher likelihood of unprotected sex

with both men and women. However, in their large sample (N = 750) of African-American MSM, Hart and Peterson (2004) found no differences in the rates of unprotected anal intercourse between gay, bisexual, and non-gay/bisexual men.

Main sexual partner and non-main sexual partners.

Given the possible link between HIV transmission and partner selection, Varghese et al. (2002) suggest that the choice of partner is the most important factor determining risk for HIV infection. The status of partnerships (e.g., main vs. non-main, or steady vs. casual) has often been found to be associated with whether unprotected anal sex occurs between MSM, with men having a main male sexual partner or in steady partnerships more likely to report risky behavior (Stall, 2002; Hart & Peterson, 2004). In a later study, Hart and Peterson (2004) also found that research participants with main male partners were more likely than those without main partners to have had unprotected insertive anal intercourse and unprotected receptive anal intercourse.

In a study by Bingham et al. (2003) that specifically examined partner characteristics to determine if attributes of male sex partners account for racial/ethnic differences in HIV prevalence, the authors found that African-American MSM reported a higher frequency of older male partners compared with other racial groups. In addition, African-American MSM were more likely than whites or Latinos to have sex only with partners of the same race. Therefore, older and more African-American anal sex partners may account for some of the disproportionate burden of HIV among African-American MSM (Bingham et al., 2003).

Socio-Contextual Factors

Sex between men occurs in a physical, emotional, and socio-cultural context, and these variables are also understood to influence whether high-risk sex occurs (Stall, 2002). These socio-contextual variables are external factors whose influence has the potential to play a

considerable part in human sexual behavior. Consequently, these factors can determine how stimuli, such as peer norms, will be processed and how subsequent behaviors will be elicited. For the focus population, a range of socio-contextual variables are considered that may affect the relationship between peer norms for condom use and risky sexual behavior. These variables include knowledge of antiretroviral therapy, beliefs about HIV treatment, exposure to HIV/AIDS prevention messages, knowledge of HIV testing, and testing behavior.

Knowledge of highly active antiretroviral therapy (HAART) and HIV treatment beliefs.

The emergence of combination therapies ("cocktail" drugs), also known as HAART medications, to fight HIV infection have profoundly changed MSM's perceptions about HIV risks. In a meta-analytic review of the effect of HAART on the sexual behavior of HIV-positive men, Crepaz, Hart & Marks (2004) found that since HAART became available, the prevalence of unprotected sex and the incidence of sexually transmitted diseases (STDs) have increased. However, this effect is unclear in the relationship between peer norms for condom use and risky sexual behavior.

In addition, DiClemente et al. (2002) found that among MSM, treatment with protease inhibitors was strongly associated with failure to use condoms during sexual intercourse. This lowered fear of contracting HIV during unprotected sex is partially attributable to an inappropriate sense of "treatment optimism" (Kalichman et al., 1998; Stall, 2000). Stall (2000) notes that several researchers have found associations between a sense of HIV treatment optimism and increased high-risk sexual behaviors. Therefore, knowledge of new, emerging, and existing HIV treatments will continue to pose challenges to HIV prevention.

Exposure to HIV/AIDS prevention messages.

As a socio-contextual variable, levels of exposure to HIV/AIDS prevention interventions should influence the way that peer norms for condom use affect risky sexual behavior among young African-American MSM. In examining perceived helpfulness of sources of help, Peterson et al. (1995) found that various sources were not perceived to be equally helpful. African-American MSM were least likely to seek help from family members and less likely than other groups to perceive them as helpful with concerns about their high-risk sexual behavior. Peers and professionals were the most widely sought sources of help. In a study by Seal et al. (2000) that asked young MSM the prevention interventions they felt were needed to reduce high-risk sexual behavior, respondents reported prevention activities that provided safe havens for youth, peer educators, older MSM mentors, and school-based sexuality education, as well as greater support from churches, the gay community, communities of color, and society as a whole.

Regarding exposure to HIV/AIDS prevention interventions, a study by Goldbaum et al. (1998) showed that 96% of gay-identified MSM, 91% of bisexually-identified MSM, and 89% of straight-identified MSM reported recent exposure (in the previous three months) to HIV information. Specifically, gay-identified MSM were most likely to get HIV information from talking with gay friends and health care workers, whereas bisexual and straight-identified MSM tended to get HIV information from television. Straight-identified MSM were generally least likely to report any recent exposures to HIV/AIDS information. According to Goldbaum et al. (1998) overall, 93% of MSM reported exposures to AIDS information during the previous three months, and 54% reported seeing something about AIDS on television, the largest single medium reported. Television reached more than half of the men.

The concern is that while risk reduction messages often target men who self-identify as gay, non-gay-identified men often have limited contact with the gay community and so may not be reached by these messages (McKirnan et al., 1995). However, bisexual men and straight MSM who reported any exposure to HIV information were consistently more likely to report condom use at last sex (Goldbaum et al., 1998).

In an evaluation of an HIV risk reduction intervention among African-American homosexual and bisexual men, Peterson et al. (1996) found greater efficacy in the use of multiple-occasion interventions rather than single-occasion interventions. Specifically, only the multiple-session interventions led to successful behavior change.

Knowledge of testing/testing behavior.

Although knowledge about HIV testing or awareness of locations for testing can be highly related to exposure to HIV/AIDS prevention messages, this knowledge and awareness can also potentially have a unique influence on how peer norms impact risky sexual behavior. Since the advent of HAART, decreased rates of testing have shown a need to improve access to testing. Despite the availability of free and low-cost anonymous or confidential HIV testing, one-quarter of people living with HIV do not know that they are infected (Fleming et al., 2002).

Bingham et al. (2003) found that nearly two-thirds of the 920 African-American MSM in their study had ever been tested for HIV, although few tested frequently (median number of tests = 1). Of those who reported testing previously and testing negative (N=536), 16% now tested positive and nearly all were unaware of their HIV-positive status. Of those who had not tested previously (N=148), 7% were HIV-positive.

In a study among MSM presenting to New York City's Department of Health STD clinics, from 1990 to 1999 (N = 4,076), Torian et al. (2002) found that African-American MSM

were neither more or less likely to have accepted anonymous or confidential testing compared to men from other ethnic groups.

Health Factors

Particular health variables are clear influences on the way in which MSM engage in risky sexual behavior. These factors can affect the way peer norms for condom use are perceived and interpreted. For the current study, three such health variables will be considered. These variables include sex under the influence of drugs or alcohol with main and non-main partners, HIV serostatus, and knowing the HIV status of sexual partners.

Sex under the influence.

In a study of MSM in four urban centers (i.e., San Francisco, Los Angeles, New York City and Chicago), Catania et al. (2001) found that HIV prevalence varies widely, with the highest prevalence observed among low socioeconomic status men, African-Americans, injection drug users, and heavy non-injection substance users. In addition, HIV prevalence was significantly higher among recent and past injection drug users and other substance users, including moderate, heavy, and ultra-heavy users (Catania et al., 2001).

The behavioral research on alcohol or drug use during sexual activity shows that both seroprevalence and seroincidence data strongly support the argument that MSM who use alcohol and drugs are a vulnerable population for HIV infection (Stall & Purcell, 2000). Consequently, sex under the influence of alcohol and/or drugs is an important health variable that may significantly influence the relationship between peer norms for condom use and risky sexual behavior. According to Stall and Purcell (2000), studies about whether MSM who combine alcohol or drugs with sex are more likely to engage in high-risk sexual behavior show statistically significant relationships between substance use during sex and the likelihood of

participating in high-risk sex (McKirnan & Peterson, 1989; Ostrow & McKirnan, 1997). McKirnan et al. (2001) stated that African-American MSM are more likely to combine sex with drugs rather than sex with alcohol.

Moreover, when examining the effect of sexual behavior while under the influence of drugs or alcohol with a main partner versus a non-main partner, Stall (2002) and Hart & Peterson (2004) found that men having a main male sexual partner are more likely to report risky behavior. Ostrow & McKirnan (1997) suggest the need for innovative concepts of risk prevention aimed at gay and bisexual men who combine substance use with risky sexual behaviors. For many people, sexual risk does not stem from a lack of community norms and standards but from a desire to escape cognitive awareness of very rigorous norms and standards (Ostrow & McKirnan, 1997). The authors contend that both substance use and high stimulation or other sexual settings facilitate this cognitive disengagement, wherein people enact "automatic" sexual scripts, become more responsive to external pressures toward risk, or both.

HIV serostatus.

HIV status is a health variable among MSM that is related to risky sexual behavior. Studies have detected a strong association between HIV seropositivity and greater sexual risk among MSM (Stall, 2002; Bingman et al., 2001; Ostrow & McKirnan, 1997). Of the estimated 900,000 or more people living with HIV disease in the United States (Karon et al., 1996), according to one estimate, two-thirds are aware of their seropositive status (Sweeney et al., 1997) and over 70% of these were sexually active after they learned they were infected (Kline and VanLandingham, 1994). Many engage in safe sexual practices after finding out their status, but some do not (Bingman et al., 2001).

Ostrow & McKirnan (1997) claim that despite near-universal knowledge about HIV infection, safe sex, and widespread intentions to be safe, unprotected sex and HIV seroconversion continue among subgroups of gay and bisexual men. The authors cite explanatory models that link risk-taking to knowledge processing, perceived norms, behavioral intentions, or perceived vulnerability to infection, but cannot fully account for the increase in continued risk behavior.

Knowing partner HIV status.

Varghese et al. (2002) noted that choosing a partner who has tested negative for HIV reduces the risk for HIV transmission 47-fold, compared with the risk associated with choosing a similar partner of unknown serostatus. However, one study found that men who were young and less educated were more likely than their counterparts to believe that URAI is safe with an HIV-positive man if he has an undetectable viral load (Kalichman, Nachimson, Cherry, & Williams, 1998). Therefore, some MSM may perceive that choosing a partner who is HIV positive does not put them at risk for HIV.

In a recent study, Denning and Campsmith (2005) sought to determine the prevalence and predictors of unprotected anal intercourse (UAI) among HIV-positive men who have a single, steady male partner with negative or unknown HIV serostatus. They found that of 970 HIV-positive MSM who had a single steady male sex partner with negative or unknown serostatus, 278 (29%) reported UAI during the previous year. In a subset of 674 men who were aware of their infection, 144 (21%) had UAI. Among the men who were aware of their infection, having a partner with unknown serostatus was among the factors found to be predictive of UAI. Therefore, one-fifth to one-third of HIV-positive MSM who have a single, steady male sex partner with negative or unknown serostatus might be engaging in UAI.

Summary

Among young African-American men who have sex with men, there is a disproportionate burden of HIV infection. To respond to estimates of increased seroprevalence in this population, prevention efforts must be examined from a contextual perspective. This contextual perspective includes understanding individuals' knowledge of HAART, exposure to prevention efforts, and knowledge of testing and testing behavior, all of which have been shown to have some effect on risky behavior. In addition, understanding how socio-demographic factors including age, education level, employment status, sexual orientation, and choice of partner affect risky behavior may have significant implications for how peer norms for condom use are interpreted and acted upon. Furthermore, understanding how health factors such as sex while under the influence of drugs, knowledge of HIV status, or partner HIV status influence the impact of peer norms for condom use on sexual risk behavior would substantially advance HIV prevention among African-American MSM.

Although prior research has examined both the relationships between social support and risky sexual behavior and the effect of condom peer norms on risky sexual behavior in young African-American MSM (Hart & Peterson, 2004), this research did not consider the factors that may moderate this relationship. Understanding how socio-demographic, socio-contextual, and health-related variables affect the relationship between peer norms for condom use and risky behavior among African-American MSM will be helpful in developing appropriate HIV prevention and intervention programs. This study will examine the moderating influences of socio-demographic, socio-contextual, and health-related variables on the relationship between peer norms for condom use affect risky sexual behavior.

Research Hypotheses

Figure 1 (p. 21) shows three path diagrams illustrating the following hypotheses that examine the moderating effects of socio-demographic factors, socio-contextual factors and health factors on the relationship between peer norms for condom use and risky sexual behavior among young African-American MSM.

1. Hypothesis: Socio-demographic factors (i.e., age, education, employment, sexual identity, having a main sex partner, and having a casual sex partner) will moderate the relationship between peer norms for condom use and risky sexual behavior. Specifically, among MSM, the likelihood of those with low peer norms engaging in risky sexual behavior will be greater for:
   A. younger MSM than for older MSM
   B. less educated MSM than for more educated MSM
   C. those with less than full-time employment than for those employed full-time
   D. those who do not self-identify as gay than for those who do identify as gay
   E. those with a main male sex partner than for those without a main male sex partner
   F. those with a casual male sex partner than for those without a casual male sex partner
2. Hypothesis: Socio-contextual factors (i.e., knowledge of HAART, HIV treatment beliefs, exposure to HIV/AIDS prevention interventions, and knowledge of testing/testing behavior) will moderate the relationship between peer norms for condom use and risky sexual behavior. Specifically, among MSM, the likelihood of those with low peer norms engaging in risky sexual behavior will be greater for:
   A. those who are aware of HAART than for those who are not aware of HAART

B. those who endorse inaccurate beliefs about the effectiveness of HIV treatment than for those with more accurate beliefs

C. those not exposed to prevention interventions than for those who have been exposed to prevention interventions

D. those who have never been tested for HIV than for those who have been tested

E. those who have not been recently tested for HIV (i.e., > 4 months ago) than for those who have been tested in the past 4 months

3. Hypothesis: Health factors (i.e., sex under the influence with main and non-main sexual partner, HIV serostatus, and partner HIV status) will moderate the relationship between peer norms for condom use and risky sexual behavior. Specifically, among MSM, the likelihood of those with low peer norms engaging in risky sexual behavior will be greater for:

A. those who had sex while under the influence of drugs/alcohol with a main partner than for those who did not have sex while under the influence of alcohol/drugs with a main partner

B. those who had sex while under the influence of drugs/alcohol with a casual partner than for those who did not have sex while partner under the influence of alcohol/drugs with a casual partner

C. those with a HIV+ serostatus than for those with a negative HIV serostatus

D. those who do not know their partner's HIV serostatus than for those who do know their partner's serostatus

SOCIO-DEMOGRAPHIC FACTORS

(Variables include: age, education, employment, sexual identity, main partner, non-main partner)

Peer Norms for Condom Use → Risky Sexual Behavior

SOCIO-CONTEXTUAL FACTORS

(Variables include: knowledge of HAART, HIV treatment beliefs, exposure to HIV/AIDS prevention interventions, knowledge of testing and testing behavior)

Peer Norms for Condom Use → Risky Sexual Behavior

HEALTH FACTORS

(Variables include: sex under influence with main and non-main partner, HIV serostatus, and partner HIV serostatus)

Peer Norms for Condom Use → Risky Sexual Behavior

Figure 1. Path Diagrams for Moderator Models.

CHAPTER 2

METHODS

Participants

This study uses data collected in a previous study. The participants were part of the Community Intervention Trial for Youth (CITY), which included samples from 13 cities throughout the United States. The CITY study data files used in the current study were based on the total respondents who participated in four waves of data collection from 1999 to 2002 in the Atlanta, Georgia, metropolitan site. Study participants constituted a large sample (N = 1,040) of young, 18 to 25 year old, African-American men who have sex with men.

Sampling and Procedures

The sampling protocol for the CITY study was designed to randomly recruit young men who have sex with men (YMSM), who may or may not self-identify as gay or bisexual, from venues where sufficient proportions of YMSM could be found. Time-space sampling (TSS) methods were used to provide an alternative to traditional probability and nonprobability sampling methods by constructing a sampling frame of venue-day-time units (VDTs), randomly selecting and enumerating VDTs (the primary sampling units), and systematically intercepting and collecting data from eligible members of the sample population. This procedure allowed investigators to construct a sample with known characteristics, make statistical inferences to the larger population of venue visitors, and theorize about the introduction of biases that may limit generalization of results to the target population (Muhib et al., 2001).

The study involved a cross-sectional, random selection of participants. Data were collected from African-American YMSM in pre-determined locations (e.g., parks, bars, bookstores, coffee houses, social events, etc.) using time-space sampling based on the following

eligibility criteria: age (18-25 years old), race/ethnicity (African-American), and sexual behavior (same-sex activity within past year). Data collection occurred in four waves each year (May-August) from 1999 to 2002, with approximately equal numbers of participants (n=255) per wave with a total sample of over a thousand participants (*N*=1,040). Although "wave" was an analytic variable in the original study, for the purposes of the current study, it is not. This is because "wave" was shown not to make a difference in history of the data collection.

Measures

The present study used the CITY study's *Quantitative Interview (QTI)*. The QTI was completed by consenting eligible YMSM as defined by BSI (i.e., the screener). Surveys were anonymous and tracked by a unique identifier and an interviewer read and completed the questionnaire based on participant responses. The original survey assessed several psychosocial factors including items on demographics, male partners in the past three months, sex with main and non-main male partners, peer norms about condoms, knowledge and attitudes about antiretrovirals, and exposure to interventions. The variables examined in the current study include: peer norms for condom use, the independent variable; risky sexual behavior (unprotected receptive and insertive anal intercourse), the dependent variables; and 15 moderating variables grouped into three categories: socio-demographic factors (six variables), socio-contextual factors (five variables), and health factors (four variables).

Peer Norms for Condom Use.

Peer norms for condom use were assessed with five items that determine the influence of peer norms for condom use on the participant. Examples of items are, "Most of my friends think you should always use condoms when having anal sex," and "Most of my friends are using condoms these days when they have anal sex." These items were rated using a 5-point Likert

scale ranging from 1 ("Agree Strongly") to 5 ("Don't Know/No Response"). Scores range from 5 to 20 with lower scores reflecting a greater influence of peer norms about condom use. In a prior study, Hart & Peterson (2004) reported reliability for peer norms regarding condom use for this sample using Cronbach's measure of internal consistency ($\alpha = .79$). The inter-item correlation for peer norms that was obtained for this study was similar ($\alpha = 0.76$). Each response was collapsed and recoded to reflect 0 (Disagree Strongly, Disagree Somewhat, Don't Know/No Response) or 1 (Agree Strongly, Agree Somewhat), and then summed, yielding a range of 0 to 4, with higher scores indicating higher influence of peer norms. This distribution was then dichotomized to reflect 0 (Low Peer Norms) and 1 (High Peer Norms).

Risky Sexual Behavior.

Unprotected Insertive Anal Intercourse (UIAI). Risky sexual behavior was assessed using items that examined main and non-main male sex partners in the past three months. For sex with male partners in the past three months, participants were asked to indicate the number of times they had unprotected sexual intercourse, and if they were the insertive partner. For example, "In the past three months, how many times have you had anal sex with men (*or* this man), where you were the *inserting* partner, and you did not use a condom?" A sizeable proportion (84.4%) of participants (n=858) reported that they had *not* engaged in this risky behavior. This variable was dichotomized to a Yes/No variable in which each response was collapsed and recoded to reflect 0 (No UIAI, No anal sex, No sex with a male in the last three months) or 1 (Yes UIAI).

Unprotected Receptive Anal Intercourse (URAI). Also, the participants were asked to indicate the number of times they had unprotected sexual intercourse, as the receptive partner. For example, one item was "In the past three months, how many times have you had anal sex where you were the *receptive* partner, and your partner did not use a condom?" Similarly, a very

large proportion (82.6%) of participants (n=840) reported that they had *not* engaged in this risky behavior. This variable was also dichotomized to a Yes/No variable. Each response was collapsed and recoded to reflect 0 (No URAI, No anal sex, No sex with a male in the last three months) or 1 (Yes URAI).

Socio-Demographic Variables.

Socio-demographic characteristics that were assessed include: age, education, employment status, sexual identity, sex with a main partner, or non-main sexual partner(s). Age was a continuous variable and response options were recoded and collapsed by a median-split to indicate 0 (21 and under) or 1 (greater than 21). Education level was measured by the number of years of school that participants had completed; for example, finished high school (12 years) or completed a bachelor's degree (16 years). Each response was collapsed and recoded to reflect 0 (high school graduate or less) or 1 (post-secondary education). Employment status was indicated by how the participant described their current work situation (e.g., "full-time paid job" or "not employed, looking for work" or "unemployed"). Each response was collapsed and recoded to reflect 0 (no full-time employment) or 1 (full-time employment). Sexual identity was assessed by asking participants to indicate whether they considered themselves to be gay, bisexual, straight, undecided or don't know, other, or whether they refused to answer. Each response was collapsed and recoded by a median-split to indicate 0 (Not Gay) or 1 (Gay). Sex with a *main* male partner was assessed by asking respondents to answer "Yes" or "No" to questions regarding whether the participant had sexual contact with a man whom they considered to be their main male partner (e.g., a lover or boyfriend). For example, "In the past year, have you had any kind of sexual contact with a man whom you consider to be your main male partner?" Each response was recoded to reflect 0 (No) or 1 (Yes). For sex with a non-main male partner, participants

were asked to respond either “Yes” or “No” to questions about whether they had sexual contact with a man whom they did not consider their main male partner. For example, “In the past year, have you had any kind of sexual contact with a man who was not your main male partner?” Each response was recoded to reflect 0 (No) or 1 (Yes).

Socio-Contextual Variables.

Knowledge of HAART. Knowledge of HAART was assessed by a question that asked about the participant’s knowledge of HIV antiretroviral treatments. This question was, “Have you heard about using a combination of drugs to treat HIV/AIDS, referred to sometimes as ‘combination drug cocktails’? (Sometimes they include drugs called protease inhibitors.)” Each response was collapsed and recoded to reflect 0 (No or Not Sure) or 1 (Yes).

HIV Treatment Beliefs. HIV treatment beliefs were assessed using two questions that asked the participant’s beliefs and attitudes about the threat of HIV in the advent of new drug treatments. These were, “Because of these drugs, HIV is a less serious threat than it used to be” and “I practice safe sex less often now because new medical treatments for HIV/AIDS have come along.” These items were rated using a 5-point Likert type scale ranging from 1 ("agree strongly") to 5 ("don’t know/no response"). The inter-item correlation for these items in this study was $\alpha = 0.98$. Each response item was then recoded to remove those participants who reported that they “Never Heard of Drug Cocktails,” (n=619). A new variable, HIV Treatment Beliefs, was calculated from these two questions, yielding a range of 2 to 10, with higher scores indicating stronger disagreement with the belief that HIV treatments reduce HIV risks. This distribution was then dichotomized to reflect 0 (Low HIV treatment beliefs) or 1 (High HIV treatment beliefs).

Exposure to HIV/AIDS Prevention Interventions. Exposure to prevention interventions was assessed by six Yes/No questions that asked participants about their exposure to AIDS prevention efforts (e.g., workshops, social events, health educators, flyers, etc.) in the last six months. Items included, "In the past six months, have you participated in any workshops about AIDS prevention?" and "In the past six months, have you attended any social events or parties that included AIDS prevention activities?" Each response was collapsed and recoded to reflect 0 (No) or 1 (Yes), and then summed, yielding a range of 0 to 6, with higher scores indicating greater exposure to prevention interventions. This distribution was then dichotomized by median-split to reflect 0 (low exposure to prevention interventions) or 1 (high exposure to prevention interventions).

Knowledge of Testing/Testing Behavior. Knowledge of testing and testing behavior was assessed by two questions. The first was a Yes/No question that asked participants "Have you ever been tested for HIV?" Each response was coded to reflect 0 (No) or 1 (Yes). The second question asked, "About how long ago was the last time you were tested for HIV?" This was a continuous variable that was computed in days. Scores ranged from 1 to 3,650 (10 years ago) with lower scores reflecting more recent testing behavior. Those not tested (n=140) were excluded to focus on testing behavior. Each response was collapsed and recoded to reflect 0 (testing greater than four months ago) or 1 (testing within the last four months).

Health Variables.

Sex Under the Influence of Drugs with Main Partner. A Yes/No question assessing sex under the influence of drugs asked participants to indicate whether they were high on drugs or alcohol the last time they had sex with their main partner. The question was, "Were you high on

drugs or alcohol the last time you had sex with him?" Each response was collapsed and recoded to reflect 0 (No) or 1 (Yes).

*Sex Under the Influence of Drugs with Non-Main Partner***.** A Yes/No question assessing sex under the influence of drugs, asked participants to indicate whether they were high on drugs or alcohol the last time they had sex with their non-main partner. The question was, "Were you high on drugs or alcohol the last time you had sex with him?" Each response was collapsed and recoded to reflect 0 (No) or 1 (Yes).

HIV Serostatus. A question assessing HIV serostatus asked participants to report the results of their last HIV antibody test. This item was used to differentiate participants who were HIV-negative (seronegative) from those who were HIV-positive (seropositive) or not sure of their HIV status (unknown). Each response was recoded to reflect 0 (Positive, Don't Know, or Not tested) or 1 (Negative).

Partner HIV Serostatus. The partner HIV status item assessed whether participants knew the HIV status of any male partners (main or non-main) with whom they had sexual contact in the previous three months. The response options were: "Yes, I knew the test results of all the men," "No, I did not know the test results…," or "I am not sure about the test results…." Each response was collapsed and recoded to reflect 0 (no or not sure) or 1 (I knew the HIV status of the men, used a condom, did not have anal sex, or did not have sex with a male in the past three months).

Data Analysis Plan

A power analysis was conducted using the standard power formula (Bakeman, 1992) to assess the ideal sample needed to detect a medium effect size of $f^2 = .15$. Cohen (1992) recommends the use of .15 as a medium effect size estimate for multiple correlation analyses,

when no other information is known. The sample size (N=88) was calculated using a formula from Bakeman (1992) to detect a significant effect size with a power of .90, alpha of .05, and a medium effect size of .15. In addition, Cohen (1992) recommends adding 20% to the calculated sample size in an effort to minimize the influence of missing data or incomplete measures. Therefore, in this study, the ideal sample size is 106 participants. The proposed sample size is sufficient to adequately test for moderation effects. According to Tabachnick and Fidell (2001), having at least 20 cases per independent variable in multivariate regression analysis is sufficient to ensure robustness. Thus, having 1,040 cases in this dataset is adequate to conduct analyses.

Moderation analyses were computed according to procedures described in Baron and Kenny (1986). In order to analyze relationships among variables with a dichotomous dependent variable, binary Logistic Regression (LR) analysis was selected as the appropriate statistical method. According to Tabachnick and Fidell (1986), for logistic regression, the outcome variable must be discrete, but a continuous variable can be converted to a discrete variable. In addition, logistic regression has no assumptions about the distributions of the predictor variables; in logistic regression, the predictors do not have to be normally distributed, linearly related, or of equal variance within each group (Menard, 2002). Unlike multiple regression analysis, which has distributional requirements, logistic regression cannot produce negative predicted probabilities (Tabachnick and Fidell, 1986).

A series of regression analyses were conducted (Figure 2). In the first regression analysis, risky sexual behavior, the outcome variable, was regressed on peer norms for condom use (PNCU), the predictor variable (path a). This determined the effect of the independent variable on the dependent variable. Second, each outcome variable was regressed, in separate analyses, on each of the 15 moderator variables, which determined the effect of each moderator

variable on the outcome variable (path b). Third, in separate analyses, risky sexual behavior was regressed on the product of PNCU and each moderator variable, which determined the interaction effect of the independent and moderator variables on the dependent variable (path c). This procedure yielded 30 separate logistic regression analyses. Moderator effects were identified by statistically significant interaction effects of the independent and moderator variables on the dependent variable. Posthoc analyses were performed for each significant interaction to explicate significant results. Posthoc analyses included assessing the effect of the independent variable on the dependent variable for each level of the moderator variable. The antilog of the regression coefficient (i.e., *EXP* (*B*)) produced an odds ratio (OR), reflecting the likelihood that a predictor influences the odds of risky sexual behavior. For ease of interpretation, reciprocals of the odds ratios and adjusted odds ratios were reported; thus the reported odds ratios can be interpreted as the likelihood of engaging in risky behavior when the first group is compared to the second. For example, if the first group is *Knowledge of HAART* and the second group is *No knowledge of HAART*, and the (reported) odds ratio is greater than 1, then the odds of engaging in risky behavior is greater for those who know about HAART than for those who do not know.

Analyses were performed using SPSS for Windows, Version 12.0, REGRESSION. Variables with missing responses were excluded from analyses using listwise deletion. The alpha level for significance testing was .05.

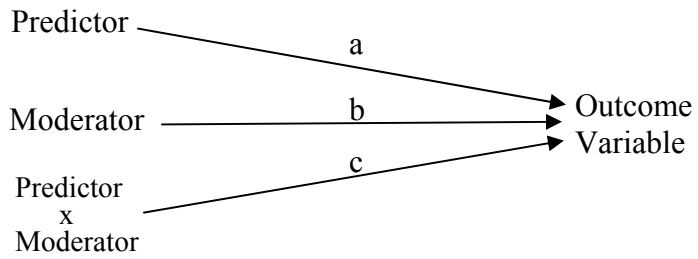

Figure 2. Moderator model.

CHAPTER 3

RESULTS

Descriptive Statistics

Prior to conducting inferential statistical analyses, descriptive analyses of demographic and outcome variables for this sample were performed. Table 1 presents the ranges, means, and standard deviations of select study variables, prior to dichotomizing. All study participants (*N* = 1040) were African-American men from the Atlanta metropolitan area who have sex with men. Participants ranged in age from 17–25 years, with a mean age of 21.5 years (*SD* = 2.11) and an average education level of one and a half years of college (*M* = 13.53, *SD* = 1.66). Over half (56%) of participants reported full-time employment, with nearly a quarter reporting having a part-time job (Table 2). Of the 1,019 participants that responded to this question, 55% (n=558) self-identified as gay, and 32% (n=321) self-identified as bisexual.

Study participants also reported the influence that peer norms had on their use of condoms during sex. Most reported that they somewhat agree with their peers' thoughts and behaviors that support condom use when having anal sex with primary or casual partners (*M* = 3.31, *SD* = 1.09).

As shown in Table 2, regarding knowledge and behavior about HIV testing, over 86% reported that they had previously been tested for HIV, with the average last HIV test being over seven months prior to the time of the survey administration (*M* = 212.69 days, *SD* = 271.84). As shown in Table 2, 82% reported that their last HIV test result was negative, while a modest proportion (2%, n=22) reported that their test was positive for HIV. For the item assessing knowledge of partner's HIV status, of those responding, 48% reported either that they did not know or were unsure of the HIV status of their sexual partners.

Over 60% of participants reported that they had never heard of AIDS retroviral treatments or HAART. Of those who had heard of HAART, on average participants reported that they disagreed somewhat that HIV is a less serious threat than it used to be because of these new treatments (M = 3.09, SD = 1.20). Participants more strongly disagreed that they practice safe sex less often now because new medical treatments for HIV/AIDS were available (M = 3.78, SD = 0.74).

Table 3 presents the frequencies for items assessing high-risk sexual behavior. As shown, 16% and 17% of participants, respectively, reported having unprotected insertive anal intercourse and unprotected receptive anal intercourse in the past three months. Of those participants who reported engaging in these risky sexual behaviors, on average, they reported having at least one such encounter in the past three months (M_{UIAI} = 1.13, SD = 10.88, M_{URAI} = 1.15, SD = 5.60). In addition, the majority of participants reported having sex with a main male partner (78%) and/or a non-main male partner (74%), in the past year. Thirteen percent (n=133) reported being high on drugs the last time they had sex with their main partner, while 15% (n=155) reported being high on drugs the last time they had sex with a non-main male partner.

Table 1

Descriptive statistics for African-American MSM[a] in Atlanta, GA (N =1040)

Predictor Variables	*Range*	*Mean*	*SD*
Independent Variable			
Peer Norms for Condom Use[†]	0 – 4	3.31	1.09
Moderator Variables			
Age (years)	17 – 25	21.45	2.11
Education Level (years)	7 – 22	13.53	1.66
HIV Treatment Beliefs[†]	2 – 10	6.87	1.50
Exposure to Prevention, 6 mos[†]	0 – 6	2.46	1.44
Last HIV Test (days)	1 – 3650	212.69	271.84

[a] Men who have sex with men
[†] Aggregate variables

Table 2

Frequencies of Study Variables

Variable	N (%)
Work Situation (*N* = 1027)	
Full-time Paid Job	579 (56.4)
Part-time Paid Job	245 (23.9)
Not Working-Disability	1 (.1)
Not Employed-Looking	156 (15.2)
Not Employed-Not Looking	39 (3.8)
Other	7 (.7)
Sexual Orientation (*N* = 1019)	
Gay	558 (54.8)
Bisexual	321 (31.5)
Heterosexual	8 (.8)
Undecided/Don't Know	50 (4.9)
Other	79 (7.8)
Refused	3 (.3)
Ever Heard of AIDS Drug Cocktails (*N* = 1016)	
Yes	382 (37.6)
No	619 (60.9)
Not Sure	15 (1.5)
Ever Tested for HIV (*N* = 1018)	
Yes	878 (86.2)
No	138 (13.6)
Don't Know/Not Sure	1 (.1)
Refused	1 (.1)
Last HIV Test Result (*N* = 1018)	
Not Tested	140 (13.8)
Positive (seropositive)	22 (2.2)
Negative (seronegative)	830 (81.5)
Didn't go get results	13 (1.3)
Don't Know	11 (1.1)
Refused	2 (.2)
Knew HIV Status of Partners (*n* = 117)[†]	
Yes, I knew test results	61 (52.1)
No, I did not know results	53 (45.3)
I am not sure	3 (2.6)

Note. [†]Cases excluded = 923. Of the cases excluded, 528 were missing, 314 used a condom, 36 did not have anal sex, 45 had not had sex with a male past 3 months.

Table 3

Descriptives of Variables for High-Risk Sexual Behavior

Variable	*N*	Yes n (%)
Unprotected Insertive Anal Intercourse, 3 months	1017	159 (15.6)
Unprotected Receptive Anal Intercourse, 3 months	1017	177 (17.4)
Sex with a Main Partner in the Past Year	1021	792 (77.6)
Sex with a Non-Main Partner in the Past Year	1021	760 (74.4)
Drug Use at Last Sex with Main Partner[a]	791	133 (13.0)
Drug Use at Last Sex with Non-Main Partner[b]	760	155 (15.2)

Note. [a] Participants reporting no main male partner, n=229(22.5%), are excluded. [b] Participants reporting no non-main male partner, n=261(25.6%), are excluded.

Correlations

Zero-order correlations for demographic and outcome variables are shown in Table 4. As Baron and Kenny (1986) state, testing a moderator model requires that the predicted relationship between the moderator variables and both the independent and dependent variables be uncorrelated (r < .80) for clear interpretation of interaction terms. There was a small, but significant, correlation between the independent variable, peer norms for condom use and each of the dependent variables, UIAI, $r = -.10$, $p < .01$ and URAI, $r = -.06$, $p < .05$. The two correlations above .80 involved moderator variables and items that assessed similar information. Specifically, the items that assessed HIV testing behavior (i.e., ever tested) and most recent HIV test results, produced a correlation of $r = .84$, $p < .01$. There was also a similar, significant correlation between participant's last HIV test and whether they had ever been tested for HIV, $r = .90$, $p < .01$.

Table 4

Zero Order Correlations Matrix for all Study Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1.	—																
2.	.23**	—															
3.	.22**	.09**	—														
4.	–.02	.07*	–.02	—													
5.	–.01	.04	–.02	.06*	—												
6.	.02	–.03	.01	.01	–.30**	—											
7.	.03	.02	.02	–.02	.12**	.02	—										
8.	.01	.04	.03	.13**	.13**	.01	.42**	—									
9.	.07	.02	.09	.00	.30**	–.21*	.10	–.09	—								
10.	.05	–.01	–.02	–.08*	.21**	.08**	.12**	.04	.07	—							
11.	.01	–.01	–.04	–.09**	–.10**	.25**	.11**	–.01	–.09	.28**	—						
12.	.09**	.13**	.08**	–.01	.06	–.01	.02	–.02	.21*	.02	.06	—					
13.	.14**	.03	.18**	.08*	.00	.09**	–.01	–.03	.14	.01	.02	.04	—				
14.	.09	.13**	.22**	.12*	–.04	.02	.00	.05	–.21	.00	–.06	.01	.06	—			
15.	–.05	–.03	.11**	.01	.04	–.06	–.09**	–.04	.00	–.04	–.08**	.07*	.13**	–.02	—		
16.	.13**	.12**	.07*	.00	.05	–.02	.01	.02	.26**	.01	.05	.84**	.09**	.01	.10**	—	
17.	–.11**	–.02	–.08**	.04	.09**	–.11**	–.06	–.07*	.07	.03	–.04	–.02	.01	–.04	.08*	.90**	—
18.	.00	.04	.08*	.01	.03	–.01	–.10**	–.06*	.08	–.06	–.06	.01	.02	.11*	.06	.00	.01

Note. *N*=1040. 1 = Age; 2 = Employment; 3 = Education Level; 4 = Sexual Orientation; 5 = Sex w/ Main Past Year; 6 = Sex w/ Non-Main Past Year; 7 = UIAI, Past 3mos (DV_1); 8 = URAI, Past 3mos (DV_2); 9 = Knew HIV status of partners; 10 = High last sex with main; 11 = High last sex with non-main; 12 = Last HIV Test Results; 13 = Ever heard of AIDS drugs; 14 = HIV Treatment Beliefs; 15 = Exposure to Prevention; 16 = Ever Tested for HIV; 17 = When was Last HIV Test ; 18 = Peer Norms Condom Use (PNCU).
$^{*}p \leq .05$, $^{**}p \leq .01$ (two-tailed).

Inferential Statistical Analyses

A total of 30 separate logistic regressions were performed to assess the 15 models used to predict the moderating effects of social demographic, socio-contextual and health variables on the relationships between peer norms for condom use and the unprotected insertive and receptive anal intercourse (UIAI, URAI). A test of each moderation model was performed to determine significant interaction effects. Posthoc analyses were performed for each significant interaction to explicate significant results. No hypotheses were examined for main effects, as the current study focuses on moderator effects. Main effects were examined in prior published results.

Table 5 shows the interaction step of moderations performed for each dependent variable, UIAI and URAI, in addition to adjusted odds ratios, 95% confidence intervals and significance levels. Tables 6 and 7 show regression coefficients, Wald statistics, odds ratios (reciprocal), and 95% confidence intervals for post hoc analyses of statistically significant interaction effects of particular moderator variables. Also, Figures 3 through 7 show bar graphs that explicate the significant interaction effects for these variables.

Moderation Analyses

Thirty separate logistic regression analyses were performed. There were 15 moderators tested for each of the two dependent variables (see Table 5). Moderator effects were identified by statistically significant interaction effects of the independent and moderator variables on the dependent variable.

Table 5

Interaction Step of Moderations Performed for each Dependent Variable

Interaction (IV x Moderator)	*AOR*	*95% C.I.*	*p*
UIAI			
1. Norms x Age	1.07	0.91–1.26	.40
2. Norms x Employment	1.61	0.80–3.24	.18
3. Norms x Education	1.32	0.37–1.58	.46
4. Norms x Sexual Identity	1.79	0.89–3.57	.10
5. Norms x Main Partner	1.05	0.36–3.02	.93
6. Norms x Non-Main Partner	1.29	0.58–2.89	.53
7. Norms x Partner HIV Status	2.86	0.83–10.00	.09
8. Norms x Drugs/Sex/Main[a]	1.00	0.42–2.36	.99
9. Norms x Drugs/Sex/Non-Main[b]	1.03	0.42–2.22	.94
10. Norms x HIV Status	1.28	0.32–1.94	.60
11. Norms x Knowledge of HAART	2.72	1.10–4.55	.03
12. Norms x Treatment Beliefs	2.13	1.04–4.35	.04
13. Norms x Prevention Activities	1.11	0.54–2.28	.77
14. Norms x Ever Tested for HIV	1.03	0.38–2.82	.95
15. Norms x Last HIV Test	1.02	0.37–2.78	.98
URAI			
1. Norms x Age	1.08	0.94–1.22	.30
2. Norms x Employment	1.12	0.57–2.19	.75
3. Norms x Education	1.35	0.36–1.50	.40
4. Norms x Sexual Identity	2.72	1.10–4.76	.03
5. Norms x Main Partner	1.00	0.37–2.75	.99
6. Norms x Non-Main Partner	2.52	1.17–5.43	.02
7. Norms x Partner HIV Status	4.76	1.12–20.00	.03
8. Norms x Drugs/Sex/Main[a]	1.52	0.61–3.79	.37
9. Norms x Drugs/Sex/Non-Main[b]	1.52	0.60–3.84	.37
10. Norms x HIV Status	1.05	0.46–2.38	.92
11. Norms x Knowledge of HAART	1.69	0.85–3.33	.14
12. Norms x Treatment Beliefs	1.59	0.80–3.13	.19
13. Norms x Prevention Activities	1.35	0.68–2.66	.39
14. Norms x Ever Tested for HIV	1.45	0.25–1.89	.47
15. Norms x Last HIV Test	1.45	0.25–1.89	.47

Note. AOR = Adjusted odds ratio.
[a] Sex under the influence of drugs with a main partner
[b] Sex under the influence of drugs with a non–main partner

Significant Moderator Effects

Unprotected Insertive Anal Intercourse.

The moderating effect of knowledge about HAART. The hypothesis was supported that the relationship between peer norms for condom use and UIAI would be moderated by participants' knowledge of AIDS retroviral treatments.

After controlling for the unique contribution of peer norms and having heard about AIDS therapy, there was a significant effect for the interaction between peer norms and having heard about AIDS treatments. The effect of peer norms on UIAI for each level of the moderator variable is shown in Table 6. A posthoc analysis of the interaction effect revealed that among those who had heard of AIDS treatments those with low peer norms were 2.78 times more likely to engage in unprotected insertive anal sex than those men who reported high peer norms, $B = -1.03$, $p < .001$ (see Table 6 and Figure 3). Among those men who had not heard of AIDS drugs, however, there was not a significant difference in UIAI for those with low or high peer norms.

Table 6

Post Hoc Analyses of Significant Moderating Effect of Peer Norms on UIAI by Condition of the Moderating Variable

Predictors	*B*	SE_B	Z_{Wald}	*OR*	*95% CI*
Heard of AIDS drugs (No)	–.22	.22	.97	1.23	0.81–1.92
Heard of AIDS drugs (Yes)	–1.03	.29	12.59***	2.78	1.59–5.00
Treatment beliefs (Low)	–1.49	.71	4.39*	4.35	1.10–16.67
Treatment beliefs (High)	–.96	.32	9.11**	2.63	1.41–4.76

*$p < .05$, **$p < .01$, ***$p < .001$

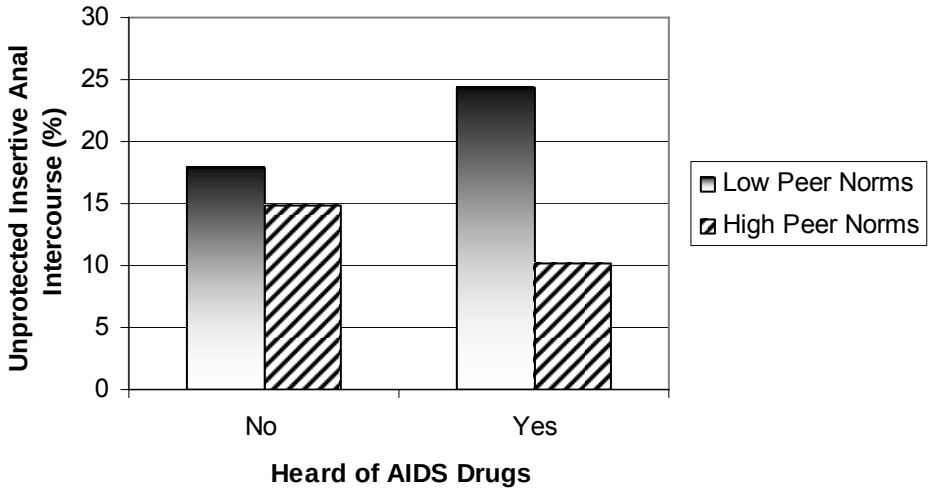

Figure 3. Moderating effect of knowledge of AIDS drugs on the relationship between peer norms for condom use and unprotected insertive anal intercourse.

The moderating effect of treatment beliefs. The hypothesis was supported that the relationship between peer norms for condom use and UIAI would be moderated by participants' beliefs about the effect of drug treatments on the severity of AIDS.

After controlling for the unique contribution of peer norms and treatment beliefs, there was a significant effect for the interaction between peer norms and treatment beliefs. A posthoc analysis of the interaction effect revealed that among those who endorsed high (i.e., accurate) treatment beliefs, those with low peer norms were 2.63 times more likely to engage in UIAI than those men who reported high peer norms, $B = -.96$, $p < .01$ (see Table 6 and Figure 4). Among men who endorsed low (i.e., inaccurate) beliefs about AIDS treatments, however, those with low peer norms were 4.35 times more likely to engage in UIAI than those with high peer norms, $B = -1.49$, $p < .05$.

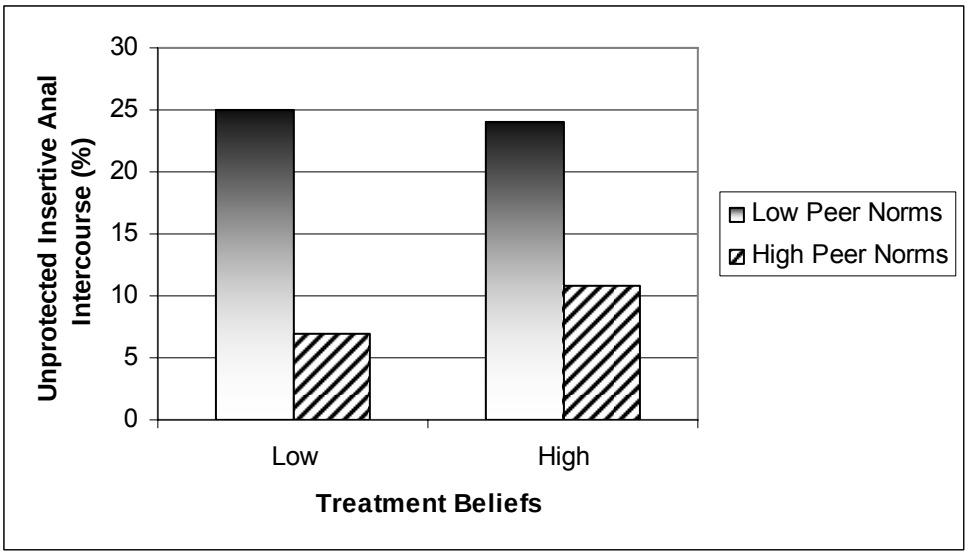

Figure 4. Moderating effect of HIV treatment beliefs on the relationship between peer norms for condom use and unprotected insertive anal intercourse.

Unprotected Receptive Anal Intercourse.

The moderating effect of sexual identity. The hypothesis was supported that the association between peer norms for condom use and URAI would be moderated by participants' sexual identity, however, in the opposite direction expected.

After controlling for peer norms and sexual identity, there was a significant effect for the interaction between peer norms and sexual identity. The effect of peer norms on URAI for each level of the moderator variable is shown in Table 7. A posthoc analysis of the interaction effect revealed that among those who identified as gay, those with low peer norms were 1.84 times more likely to engage in URAI than those men who reported high peer norms, $B = -.61$, $p < .01$ (see Table 7 and Figure 5). Among those men who did not identify as gay, however, there was not a significant difference in URAI for those with low or high peer norms.

Table 7

Post Hoc Analyses of Significant Moderating Effect of Peer Norms on URAI by Condition of the Moderating Variable

Predictors	B	SE_B	Z_{Wald}	OR	95% CI
Sexual Orientation (Gay Identified)	–.61	.21	8.54**	1.84	1.22–2.78
Sexual Orientation (Not Gay Identified)	.22	.31	.50	1.24	0.68–2.26
Sex w/ Non-main (No)	–1.02	.34	9.07**	2.76	1.43–5.26
Sex w/ Non-main (Yes)	–.09	.20	.21	1.10	0.75–1.61
Knew HIV status (No)	.95	.67	1.99	2.59	0.69–9.70
Knew HIV status (Yes)	–.64	.33	3.81*	1.89	1.00–3.57

Note. $^{*}p < 0.05$, $^{**}p < 0.01$

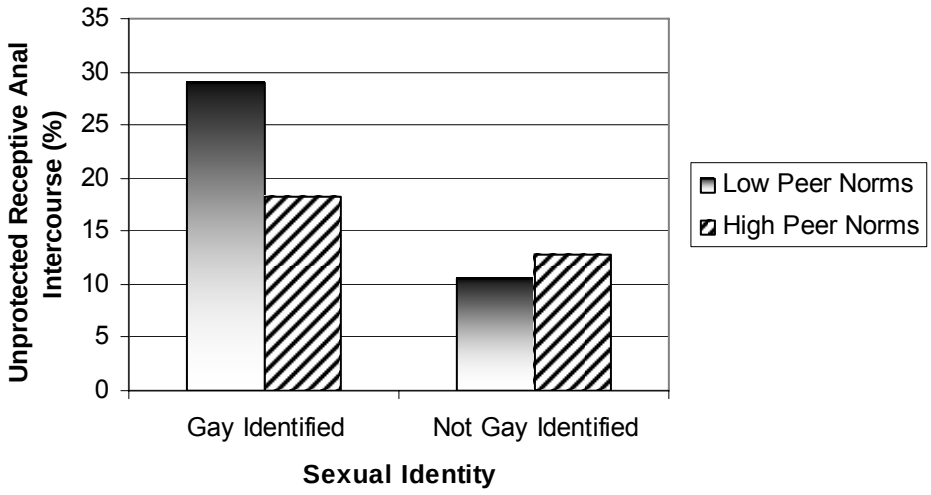

Figure 5. Moderating effect of sexual identity on the relationship between peer norms for condom use and unprotected receptive anal intercourse.

The moderating effect of sex with non-main partner. The hypothesis was supported that the association between peer norms for condom use and URAI would be moderated by whether the participant had sex with a non-main partner in the past year.

After controlling for the unique contribution of peer norms and sex with a non-main partner in the past year, there was a significant effect for the interaction between peer norms and sex with a non-main partner. A posthoc analysis of the interaction effect revealed that among those who had sex with a non-main partner, there was not a significant difference in URAI for those with low or high peer norms (see Table 7 and Figure 6). However, among those men who did not have sex with a non-main male partner (but a main partner), those with low peer norms were 2.76 times more likely to engage in URAI than those men who reported high peer norms, $B = -1.02$, $p < .01$.

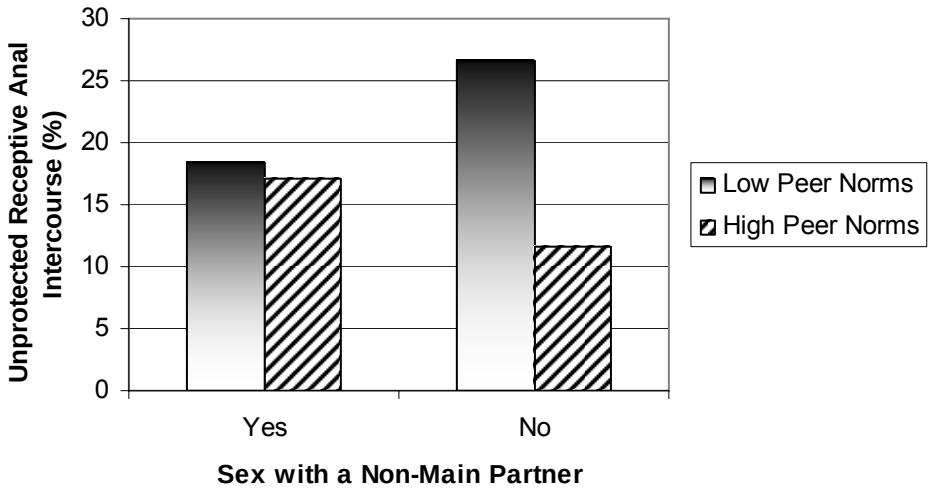

Figure 6. Moderating effect of sex with a non-main partner on the relationship between peer norms for condom use and unprotected receptive anal intercourse.

The moderating effect of knowledge of the HIV serostatus of male sex partners. The hypothesis was supported that the association between peer norms for condom use and URAI would be moderated by participants' knowledge of the HIV status of their male sex partners.

After controlling for the unique contribution of peer norms and knowing the HIV status of male sex partners, there was a significant effect for the interaction between peer norms and knowledge of HIV status. A posthoc analysis of the interaction effect revealed that among those who knew the HIV status of their partners, those with low peer norms were 1.89 times more likely to engage in URAI than those men who reported high peer norms, $B = -.64$, $p = .05$ (see Table 7 and Figure 7). However, among those who did not know the HIV status of their partners, there was no significant difference in URAI for those with low or high peer norms.

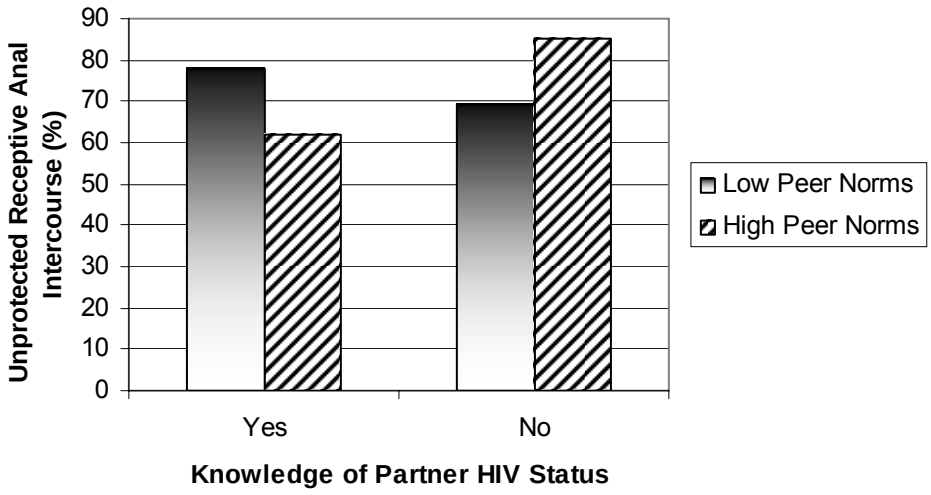

Figure 7. Moderating effect of knew HIV status of male sex partners on the relationship between peer norms for condom use and unprotected receptive anal intercourse.

Non-significant Moderator Effects

It would be expected that 5% of the hypothesized results would be significant by chance but, in fact, 17% of the hypothesized results of the current study were significant, which suggests the hypotheses supported were not due to chance. However, there were no significant interaction effects for the remaining proposed moderator variables. For several socio-demographics variables (i.e., age, education, employment, or having a main partner), there were no moderator effects as hypothesized. Also, for a few of the socio-contextual variables (i.e., exposure to HIV/AIDS prevention interventions, and knowledge of testing/testing behavior) there was no moderator effect. Finally, for health-based variables (i.e., sex under the influence with main and non-main sexual partner, and HIV serostatus), did not moderate the relationship between peer norms for condom use and risky sexual behavior.

CHAPTER 4

DISCUSSION

The findings from this study confirm the results of previous research which indicates that peer norms play a significant role in determining risky sexual behavior among African-American men who have sex with men. Perceived peer norms about whether anal sex should (or should not) involve condoms have been shown to be associated with sexual risk among MSM (Stall, 2002), and that there is a unique contribution of social norms to risky sexual behavior among young African-American MSM (Hart & Peterson, 2004, Heckman et al., 1999, Peterson et al., 1992).

However, prior research has not examined how socio-demographic, socio-contextual, and health-related variables affect the relationship between peer norms for condom use and risky sexual behavior among African-American MSM. These variables are critical contextual influences unique to this population that should be considered in developing appropriate HIV prevention and intervention programs. This study found that several of these factors significantly influence the way that peer norms for condom use affect risky sexual behavior. The findings further demonstrate the importance of considering these factors when understanding the occurrence of UIAI and URAI.

Social support and social resources are important factors in affecting behavior and positive, supportive environments are shown to foster a sense of belonging and social support, socialization, sociability, and support for safer sexual behavior. The availability and degree of social support within a social structure (e.g., peer group), in large part, determines the level of risky sexual behavior that is exhibited (Kraft et al., 2000; Peterson et al., 1996). In this study, the majority of study participants reported that they were

influenced by peer norms that support condom use when having anal sex with primary or casual partners. Still, 16 percent of participants reported having unprotected insertive anal intercourse and 17 percent reported unprotected receptive anal intercourse in the past three months, with at least one such encounter in the past three months.

Unprotected Insertive Anal Intercourse

For UIAI, only two socio-contextual variables, knowledge of HAART and HIV treatment beliefs moderated the relationship between peer norms for condom use and risky sexual behavior. What participants knew about antiviral drug cocktails significantly impacted the degree to which their perceptions of peer norms for condom use affected whether they engaged in unprotected insertive anal intercourse. The emergence of combination therapies (i.e., HAART) to fight HIV infection have profoundly changed MSM's perceptions about HIV risks, leading to increased prevalence of unprotected sex and the incidence of sexually transmitted diseases (Crepaz, Hart & Marks, 2004).

In the current study, over 60 percent of participants reported that they had never heard of AIDS retroviral therapies or HAART. Among those who had heard of AIDS treatments, those with low peer norms were nearly three times more likely to engage in UIAI than those men who reported high peer norms. Among those men who had not heard of AIDS drugs, however, there was not a significant difference in UIAI for those with low or high peer norms. Therefore, those participants who had heard of AIDS drugs and who had low peer norms for condom use, seemed to be subject to a false sense of security regarding the ability of these drugs to prevent AIDS and tended to be more likely to engage in unprotected insertive anal sex. This finding points to the need for interventions that support norms for condom use and public relations campaigns that

explain the effectiveness of treatments, but that also reiterate that there is no cure for HIV and AIDS.

Similarly, this study found support for the hypothesis that one's beliefs about the effectiveness of HIV drug treatment would moderate the relationship between peer norms for condom use and unprotected insertive anal intercourse. On average, those study participants who had heard of highly active antiretroviral therapy (HAART), expressed accurate beliefs about the drug therapy and reported that they did not believe that HIV is a less serious threat than it used to be because of these new treatments. Among men who endorsed high (i.e., accurate) treatment beliefs, those with low peer norms were more than twice as likely to engage in UIAI as those with high peer norms. However, among men who endorsed low (i.e., inaccurate) beliefs about AIDS treatments, those with low peer norms were nearly four and a half times more likely to engage in UIAI than those with high peer norms. Therefore, although having low peer norms predicted risky behavior, having both low peer norms and low treatment beliefs indicated the most risk for engaging in UIAI. These findings support prior research that shows among MSM, treatment with protease inhibitors was strongly associated with failure to use condoms during sexual intercourse as well as reduced fear (i.e., "treatment optimism") of contracting HIV during unprotected sex (DiClemente et al., 2002; Stall, 2000; Kalichman et al., 1998). The current finding suggests a need for interventions that support norms for condom use and public relations campaigns that explain the effectiveness of AIDS drug treatments, while dispelling myths that the virus is not transmissible while being treated for the disease.

Unprotected Receptive Anal Intercourse

For URAI, both socio-demographic variables (i.e., sexual orientation and sex with a non-main partner) and the health variable, knowledge of partner's HIV status, moderated the relationship between peer norms and risky sexual behavior. A participant's sexual identity, having sex with a non-main partner in the past year, and whether they knew the HIV status of their most recent partner(s) each significantly influenced the degree to which peer norms for condom use affected whether they engaged in unprotected receptive anal intercourse.

Socio-demographic variables reflect considerable differences in human sexual behavior. These factors determine, in large part, a person's worldview, which affect how social factors such as peer norms will be perceived and how subsequent behaviors may change. Based on prior research, it is widely assumed that among MSM who do not self-identify as gay and who fear disclosure, public discussion about sex, in general, and safe sex in particular, is diminished (Stall, 2002). Sexual self-identification is strongly related to sexual behavior, though not all MSM self-identify as gay or bisexual (Doll et al., 1992; Wolitski, 1993). Because sexual identity is problematic among African-American MSM, that is, many African-American MSM do not self-identify as gay or homosexual, prevention messages aimed toward the gay community do not reach them (Mays, 1989; Beam, 1988). Furthermore, African-American MSM are less likely than white MSM to perceive peers (e.g., friends and neighbors) as accepting homosexuals (Stokes et al., 1996; Stokes & Peterson, 1998), coupled with social stigma in the African-American community, many African-American MSM identify with their racial identity rather than their sexual identity (Mays, 1989). This too is problematic and more complex for

African-American bisexual men. Studies have found that bisexual men, relative to exclusively gay men, had lower intentions to use condoms the next time they were to engage in intercourse and perceived weaker peer norms that favor safe sex and risk avoidance. Therefore, these men may be at greater risk of both acquiring and transmitting HIV because of the higher seroprevalence and higher likelihood of unprotected sex (Heckman et al., 1995; McKirnan et al., 1995). Still, a recent study found no differences in the rates of unprotected anal intercourse between gay, bisexual, and non-gay/bisexual men (Hart and Peterson, 2004).

The hypothesis that sexual identity would moderate the relationship between peer norms for condom use and risky sexual behavior was supported, however, in the opposite direction theorized. The current study proposed that MSM who do not self-identify as gay with low peer norms supporting condom use engage in more unprotected insertive and receptive anal intercourse than MSM who self-identify as gay. Over half of the participants in the current study self-identified as gay, and just over a third self-identified as bisexual. The results revealed that, overall, participants who were gay-identified reported engaging in more unprotected receptive anal intercourse than those participants who were not gay-identified. For those participants who identified as gay, those men with low peer norms were nearly twice as likely to engage in URAI than those men who reported high peer norms. Neither low nor high peer norms had a significant effect on the degree of URAI reported by those men who did not identify as gay. Therefore, those men who identified as gay were more likely to engage in unprotected receptive anal intercourse, regardless of whether peer norms were low or high. This finding suggests a continued need for education of the black gay (i.e., gay-identified) community about the

use of condoms, including culturally relevant public education campaigns that reach all African-American men who have sex with men.

Prior research has shown that partner selection might provide a possible link to the risk of HIV transmission, with men having a main male sexual partner or in steady partnerships more likely to report risky sexual behavior (Hart & Peterson, 2004; Varghese et al., 2002; Stall, 2002). The hypothesis that having a non-main sexual partner would moderate the relationship between peer norms for condom use and risky sexual behavior was supported. Specifically, it was hypothesized that MSM with low peer norms supporting condom use who do not have sex with a non-main partner would engage in more unprotected insertive and receptive anal intercourse than those who had sex with a non-main male partner. Over 74 percent of the current study's participants reported having sex with a non-main male partner in the past year. In addition, nearly 80 percent of participants reported having sex with a main male partner in the past year. Therefore, many of the participants are having sex with both steady and casual partners. The present study showed that among those men who did not have sex with a non-main male partner (but with a main partner), those with low peer norms were nearly three times more likely to engage in URAI than those men who reported high peer norms. Among those who had sex with a non-main partner, there was not a significant difference in the likelihood of URAI for those with low or high peer norms. Therefore, having sex with a non-main partner did not affect the degree to which peer norms affected URAI. Therefore, prevention interventions aimed at African-American MSM should include messages encouraging consistent condom use, in both steady, as well as casual sexual relationships.

As a health factor, knowing your partner's HIV status is critical in determining one's risk for acquiring HIV. Choosing a partner who has tested negative for HIV reduces the risk for HIV transmission 47-fold, compared with the risk associated with choosing a similar partner of unknown serostatus (Varghese et al., 2002). One study of nearly 1,000 HIV-positive MSM showed that one-fifth to one-third who had a single, steady male sex partner with negative or unknown serostatus might be engaging in unprotected anal intercourse (Denning and Campsmith, 2005). The current study's hypothesis that knowledge of the partner's HIV serostatus would moderate the relationship between peer norms for condom use and risky sexual behavior was supported. MSM who knew their partner's HIV status and who perceived high peer norms for condom use were found to engage in less unprotected receptive anal intercourse than MSM who did not know their partner's HIV status. Nearly 50 percent of the participants in this study reported either that they did not know or were unsure of the HIV test results of their sexual partners. Among those who knew the HIV status of their partners, those with low peer norms were nearly twice as likely to engage in URAI than those men who reported high peer norms. However, among those who did not know the HIV status of their partners, there was no significant difference in URAI for those with low or high peer norms. Therefore, for those participants who knew the HIV status of their partner, the critical need is having supportive peer norms for condom use. Prevention interventions should continue to focus on testing and knowing your status and that of your sexual partner(s), whether steady or casual.

Non-Significant Moderator Effects

For African-American MSM, several additional socio-demographic variables were considered that might affect the relationship between peer norms for condom use and risky sexual behavior, including age, education, employment, and whether they have a main male sexual partner. Participants in the current study were, on average, about 22 years old with approximately a year and a half of college education. Prior research has found that men who were young and less educated were more likely than their counterparts to believe that URAI is safe with an HIV-positive man if he has an undetectable viral load (Kalichman, Nachimson, Cherry, & Williams, 1998). However, there were no significant interaction effects for these proposed moderator variables. Although age or education influence risky sex, in the current study neither increased nor decreased peer norm's affect on risky sexual behavior. According to prior research, when employment as it relates to SES was considered, associations between lower income and unprotected sexual behavior in black MSM were found (Mays et al., 1993; Peterson et al., 1992). In the current study, over half of the participants reported full-time employment, and nearly a quarter reported having a part-time job. Also, employment did not affect the established relationship between peer norms and UIAI/URAI. Because peer norms are partially derived from age group and other demographics, such as education and SES, this may explain the inability of these variables to moderate the peer norms–URAI/UIAI relation.

For African-American MSM in this study, there were no moderator effects for a few additional socio-contextual variables (i.e., exposure to HIV/AIDS prevention interventions and knowledge of testing/testing behavior). Participants reported a

moderate degree of exposure to prevention messages in the previous few months. One reason exposure to prevention interventions did not moderate the relationship between peer norms for condom use and risky sexual behavior might be that exposure to these messages were not sustained (e.g., multiple occasions), supported, or presented in a culturally appropriate way that they would have an impact on this relationship. Still, over a third of the participants in the current study identified as bisexual, which may have lessened their exposure to prevention messages aimed at gay-identified MSM (McKirnan et al., 1995).

Nearly 87 percent of men in the current study reported that they had previously been tested for HIV. Knowledge about HIV testing or awareness of locations for testing can be highly related to exposure to HIV/AIDS prevention messages (Fleming et al., 2002). However, the last reported testing, on average, was seven months prior to this study, which might have decreased the influence of this variable on the relationship between peer norms and risky sexual behavior.

Finally, for certain health-based variables (i.e., sex under the influence with main and non-main sexual partners and participant HIV serostatus), there were no moderating effects of the relationship between peer norms for condom use and risky sexual behavior. One reason why sex under the influence of drugs or alcohol with a main or non-main partner did not influence the relationship between peer norms and risky sexual behavior is that in order for peer norms to be perceived, one must be sober. Having sex under the influence of drugs or alcohol renders a person unable to perceive norms for sexual behavior, which would decrease the likelihood that these variables would interact to affect risky behavior. Studies show statistically significant relationships between

substance use during sex and the likelihood of participating in high-risk sex (Stall and Purcell, 2000; McKirnan & Peterson, 1989; Ostrow & McKirnan, 1997). Studies have also shown a strong association between HIV seropositivity and greater sexual risk among MSM (Stall, 2002; Bingman et al., 2001; Ostrow & McKirnan, 1997). However, considering that nearly 82 percent of participants in the current study reported that their last HIV test result was negative and only 2 percent reported that their last test was positive, this lack of variability in participant HIV serostatus possibly explains the nonsignificant moderating effect for this variable.

Implications for Intervention, Policy, Practice, and Research

Efforts that encourage peer support and modify norms for safer sex behavior are first on the list of essential prevention interventions. Findings from this study suggest that interventions that support norms for condom use and public relations campaigns that explain the effectiveness of treatments are still needed. In addition, public relations campaigns should continue to explain the effectiveness of condom use in preventing transmission of the AIDS virus. There is an on-going need for culturally-relevant education of the black gay community about the use of condoms that is responsive to the social mores and taboos. Creative public education campaigns that reach all African-American men who have sex with men, regardless of their sexual identity, are vital. Prevention interventions aimed at African-American MSM should include messages encouraging consistent condom use in both steady and casual sexual relationships, as well as messages focusing on testing, knowing one's HIV status and that of one's sexual partner(s).

Finally, further research should involve the assessment of socio-ecological influences on African-American MSM that might play an additional role in shaping sexual behavior and attitudes toward condom use and risky sexual behavior.

Strengths and Limitations

The main strength of this study is the sample size of more than 1,000 African-American men who have sex with men and the methodology with which data was gathered from this population. The study involved randomized group design. The sampling protocol for the CITY study was designed to randomly recruit participants, who may or may not self-identify as gay or bisexual, from venues where sufficient proportions of young MSM could be found. The time-space sampling method that was used to collect data provided an alternative to traditional probability and nonprobability sampling methods. This method allowed investigators to construct a sample with known characteristics, make statistical inferences to the larger population of venue visitors, and theorize about the introduction of biases that may limit generalization of results to the target population (Muhib et al., 2001).

An additional strength is that logistic regression is relatively free of restrictions and, with the capacity to analyze a mix of all types of predictors (continuous, discrete, and dichotomous), the variety and complexity of data sets that can be analyzed is almost unlimited (Tabachnick and Fidell, 2001). This statistical method allowed clear analysis of the predictor and outcome variables in the current study which were dichotomized. As well, this methodology allowed posthoc analyses assessing the effect of the independent variable on the dependent variable for each level of the moderator variable and reflected the likelihood that a predictor influenced the odds of risky sexual behavior.

The findings of this study should be considered in light of some limitations. The data used was cross-sectional and therefore, there is an inability to infer causality with this study's findings. Instead, associations can be interpreted. In addition, data were obtained by self report of sexual practices and are thus subject to the biases of social stigma, and social desirability. However, the surveys were anonymous which should have increased the likelihood of honest reporting of health behaviors. Finally, the use of secondary data collected in four sampling waves from 1999 to 2002, or between four to seven years prior to this analysis, might not reflect new interventions that may have altered the attitudes and behaviors examined in this study.

Another potential limitation to the current study is missing data for many of the variables analyzed. Although small, on average there were 20 to 25 missing cases for each variable. There was a particularly large number of missing cases (n=528) for the variable "Knew HIV Test Results of Partners." This might have affected the ability to detect a significant effect for all analyses requiring this variable.

One final limitation of this study is its focus on African-American MSM, therefore results are not generalizable to Caucasian or other ethnic minority men who have sex with men.

CONCLUSION

Engaging in risky sexual behavior such as unprotected anal intercourse, whether receptive or insertive, is the most salient risk factor for HIV transmission in African-American MSM. Therefore, it is important to recognize that prevention efforts specifically targeting African-American MSM who engage in this behavior are imperative.

It is apparent that a clear understanding of how socio-demographic, socio-contextual, and health-related variables affect the relationship between peer norms for condom use and risky behavior among African-American MSM is necessary. This knowledge will be helpful in developing appropriate HIV prevention programs that recognize contexts that facilitate supportive peer norms and thereby reduce risky sexual behavior. The findings from this study suggest it is important to examine the contexts in which the association between peer norms for condom use and risky sexual behavior may be strengthened or weakened. Changing norms, increasing social support, and community building should be part of initial community-level interventions. Community building might include identifying leaders, creating new settings, and creating opportunities for dialogue between MSM and African-American community groups to address negative perceptions of homosexuality (Kraft et al., 2000). Moreover, sexual risk reduction is not likely to be sustained without corresponding changes in community tolerance of homosexuality and the capacity of MSM to collectively address HIV and other survival threats (Beeker, Kraft, Peterson & Stokes, 1998). The current study contributes to these goals in that it helps community leaders, prevention programs, researchers, and the African-American community further understand that African-

American MSM are humans in context, and that behavior (i.e., risky sexual behavior) is strengthened or weakened by this context. Recognizing and responding to these factors in prevention efforts may help to reduce the disproportionate burden of HIV disease and deaths due to AIDS in this vulnerable population.

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