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Understanding Online and offline Sex Seeking Behavior Among Young Men Who Have Sex With Men: Implications For HIV/AIDS Interventions

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UNDERSTANDING ONLINE AND OFFLINE SEX SEEKING BEHAVIOR AND ITS CORRELATES AMONG YOUNG MEN WHO HAVE SEX WITH MEN: IMPLICATIONS FOR HIV/AIDS PREVENTION

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DEDICATION

To God, without whom I would be nothing. To my mother, father, and brother, for instilling in me the virtues of diligence and perseverance, for setting a high standard for me to follow, and for supporting and encouraging me to pursue my dreams.

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ABSTRACT

Men who have sex with men (MSM), especially those living in the southeastern US, are disproportionately impacted by the HIV/AIDS epidemic. Young MSM and African American MSM are particularly burdened accounting for a greater proportion of HIV/AIDS diagnoses. Factors such as risky sexual behavior, perception of sexual risk, ignorance about HIV sero-status, internalized homonegativity/homophobia (IH), stigma, and alcohol and illegal drug use have been advanced as reasons for this disproportionate burden. HIV/AIDS prevention efforts aimed at stemming the epidemic among MSM have focused on locations where MSM meet other men for sex such as parks, beaches, bathhouses, adult book stores, clubs, and bars. However, in recent years, the Internet has emerged as a venue where MSM also meet other men for sex. This has prompted research studies examining the correlates of Internet sex seeking behavior among MSM. A review of these research studies show that most were conducted in regions other than the southeastern US, and on predominantly homogenous samples of MSM, usually older and White MSM. Furthermore, these studies have produced contradictory findings and focused almost exclusively on sexual risk behavior. The paucity of studies conducted in the southeastern US focusing on a diverse sample of young MSM (18-29 years) provided the basis for the current research study. The overall goal of this study was to investigate

the relationship between IH, risky sexual behavior, health protective sexual communication, perception of partners' sexual risk, and Internet sex seeking behavior among young MSM. Additionally this study examined the influence of race on these relationships. The study design was cross-sectional recruiting MSM from North Carolina, South Carolina, Georgia, Alabama, Florida, Tennessee, and Mississippi. Participants were recruited online and offline. Online participants completed an electronic survey while offline participants completed a pencil and paper survey. Two hundred and sixty seven participants were recruited but four participants were dropped because they failed to meet the study's inclusion criteria, resulting in a sample size of 263. Analysis was done using the Statistical Program for the Social Sciences (SPSS) version 21 and Mplus version 7. Descriptive statistics and a path analysis were conducted. Results of the analyses showed a high prevalence of Internet sex seeking behavior and risky sexual behavior respondents. Also, IH was not associated with Internet sex seeking behavior though African American MSM reported significantly higher levels of IH than White MSM. African American MSM who sought sex online reported a greater perception of partners' sexual risk than White MSM who sought sex online but were less likely to engage in health protective sexual communication relative to White MSM. Per sexual risk, African American MSM who sought sex online were more likely to engage in unprotected anal intercourse (UAI) than White MSM and MSM who sought sex online were more likely to engage in casual sex and report a history of sexually transmitted infection (STI) than MSM who sought sex offline. These findings support the need for

more aggressive sexual health interventions that include equipping MSM with the tools and self-efficacy to navigate these virtual communities and understand the sexual risk associated with it. They also lend support to the use of the Internet and other mobile platforms as a tool for HIV/AIDS prevention interventions while presenting a new focus for interventions that target African American MSM.

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CHAPTER 1

INTRODUCTION

Overview of Statement of the Problem

Worldwide, an estimated 35 million people are living with HIV (UNAIDS, 2012; KFF, 2012), the virus that causes AIDS. Since the first case of HIV was identified 30 years ago, approximately 65 million people have been infected with HIV (UNAIDS, 2012), and of this number, an estimated 25 million people globally have died of HIV-related causes (UNAIDS, 2012; KFF, 2012). HIV remains the leading cause of death worldwide among individuals aged 15-59 years and due to its debilitating nature, is considered a threat to the economic wellbeing, and social and political stability of many nations (Global Health, 2010; KFF, 2012).

In the US, 1.1 million people are believed to be living with HIV and almost 1 in 5 are unaware of their infection (CDCa, 2013). Since the epidemic began, about 600,000 people have died with an AIDS diagnosis (CDCa, 2013). Overall, the rates of new HIV infections have remained fairly stable and the number of people living with HIV has steadily increased, ostensibly due to new and improved highly active anti-retroviral therapy (HAART) (CDCa, 2013). Despite these advances, HIV/AIDS appears to impact some populations, regions and groups more severely than others (CDCb, 2013).

Sexual and racial minorities in particular have been disproportionately impacted by HIV/AIDS (CDCb, 2013). African Americans bear the greatest burden of HIV/AIDS

of all racial/ethnic groups in the US, from new infections to deaths (CDCb, 2013; CDCc, 2013). African Americans accounted for 44% of all new HIV infections in 2010 while representing just 12%-14% of the US population (CDCb, 2013; CDCc, 2013). Among all men, African American men accounted for 70% of all infections with an HIV incidence rate seven times that of White men, three times that of African American women and twice as high as Latino men (CDCd, 2013).

As a risk group, men who have sex with men (MSM) have been most severely impacted by HIV/AIDS (CDCe, 2013). This group accounted for the largest numbers of new HIV infections in 2009 (CDCe, 2013). MSM represent approximately 2%-4% of the US population but accounted for 61% of all incident HIV infections as well as 79% of incident HIV infections among all men in 2009 (CDCe, 2013). In the same year, 44% of new HIV infections were attributed to young MSM, aged between 13 and 29 years (CDCe, 2013). Furthermore, the rate of HIV diagnosis in MSM is 44 times greater than that of other men and 40 times that of other women (CDCe, 2012).

Racial disparities also occur in the burden of HIV/AIDS among MSM (CDCe, 2013). African American MSM accounted for 37% of all new cases of HIV among all MSM in 2010 (CDCe, 2013). Among young MSM between the ages of 13 and 29 years, incident HIV infections increased 34% between 2006 and 2009 (CDCe, 2013), due in large part to an increase among young African American MSM (48%) and Hispanic/Latino MSM (45%) (CDCe, 2013). In addition to racial disparities, regional disparities exist in the HIV/AIDS burden with the southern US bearing the brunt (CDCb, 2013; CDCc, 2013; Prejean, Tang, & Hall, 2012). In 2009, this region reported the

highest rate of new HIV infections, half of all new AIDS diagnoses, and worst clinical outcomes in individuals receiving a HIV diagnosis (CDCf, 2013).

The CDC has proposed a number of reasons for the disproportionately high prevalence of HIV/AIDS in this population. Sexual risk behaviors like unprotected anal intercourse (UAI), alcohol and drug use during/prior to sexual activity, complacency surrounding perception of sexual risk and HIV testing, and internalized homonegativity/homophobia (IH), have all been associated with the elevated burden of HIV in this population (CDCd, 2013). Failure of sexual communication that may determine whether or not MSM engage in risky sexual behavior has also been implicated in the risk of HIV/AIDS transmission (Finlayson et al, 2011).

To address the HIV/AIDS epidemic among MSM, the CDC developed a number of effective behavioral intervention (EBIs) that have focused on prevention and risk reduction strategies (CDCg, 2011; CDCh, 2011; CDCi, 2011). These interventions have focused on MSM and the dynamics of meeting men in traditional meeting places like bars, clubs and public cruising areas (CDCi, 2011). However, in the last decade the Internet has emerged as a venue for MSM to meet other men and establish sexual partnerships, with studies suggesting that as much as 40% to 97% of MSM report seeking sex online at some point (Liau, Millet, & Marks, 2006; Mustanski, 2007). The anonymity, accessibility and widespread availability of the Internet have no doubt contributed to its popularity among MSM (Garofalo Herrick, Mustanski, & Donenberg, 2007).

Overview of Significance of the Study

Given the popularity of the Internet as a medium to seek sex among MSM, attention has turned to the role that the Internet may play in the epidemic of HIV in this population, especially in relation to the aforementioned factors that contribute to HIV/AIDS. The majority of studies that have examined Internet sex seeking behavior among MSM have focused on its association with risky sexual behavior. The findings of these studies have however been mixed. Some studies suggest that MSM who meet men online are more likely to engage in risky sexual behavior such as UAI (Berry, Raymond, Kellogg, & McFarland, 2008), multiple sexual encounters (Garofalo, Herrick, Mustanski, & Donenberg, 2007) and casual sex (Kim, Kent, McFarland, & Klausner, 2002). Other studies have suggested no significant difference in the likelihood of engaging in risky sexual behavior between MSM who meet men online and those who meet men offline (Mettey, Crosby, DiClemente, & Holtgrave, 2003). This study aims to build upon these studies given the mixed outcomes, the lack of diversity of study samples, as well as the fact that this relationship has been understudied among MSM in the southern US. In addition, this study will examine the relationships between Internet sex seeking behavior and IH, perception of partners' sexual risk, and health-protective sexual communication.

IH refers to internalizing society's negative perception of a gay identity that manifests as feelings of self-guilt, shame, and self-denigration. The southern US is largely conservative and is not widely supportive of a gay identity (Barton, 2010). Similarly, within the African American community, cultural influences that define masculinity in terms of heterosexuality and a strong disapproval of homosexuality are also prevalent (Glick & Golden, 2010). These perceptions may drive IH among MSM,

especially African American MSM. MSM with high IH may therefore be more likely to use the Internet to connect to the gay community and discreetly meet other men for sexual encounters, which in itself may increase the risk of contracting HIV and other sexually transmitted infections (STIs).

Perceptions of partners' sexual risk and health protective sexual communication have also been understudied among MSM, especially in relation to Internet sex seeking. Most studies on perception of partners' sexual risk have focused on heterosexual populations (Mehrotra, Noar, Zimmerman, & Palmgreen, 2009). The high prevalence of Internet sex seeking behavior among MSM may be associated with the way MSM perceive the sexual risk of other men they meet online. MSM may feel that their risk of contracting HIV may be influenced by the opportunity they have to express their sexual preferences on their profile and review that of a prospective partner's profile before initiating contact. This may not be the same with a partner they meet offline where they have to initiate contact before discussing sexual preferences.

Health protective sexual communication refers to communication between sexual partners that solely evaluates sexual risk concisely (Catania, 2010). It enables prospective partners discuss strategies for safe sexual health. Online, this may be done passively i.e. through a review of online profiles or actively i.e. direct discussion before meeting physically (Benostch, Kalichman, Cage, 2002). Most studies conducted with MSM who seek sex online have focused on sexual communication i.e. communication between partners that may include a sexual act or safe sexual strategy (Horvath, Oakes, & Rosser, 2008) and sexual negotiation i.e. evaluates how partners arrive at a compromise on a sexual act or safe sexual strategy (Carballo-Dieguez, Miner, Dolezal, Rosser, & Jacoby,

2006). Though relevant, they may not account for communication about other risk reduction strategies like number of past sexual partners and previous history of STI. This study aims to determine if MSM who meet men offline are more or less likely to engage in health protective sexual communication than MSM who meet men online using the health protective sexual communication scale, a reliable and validated survey (Catania, 2010). MSM who use the Internet to meet men may be more comfortable actively communicating about safe sex from behind a computer or passively obtaining this information from online profiles than MSM who meet men at offline locations.

As HIV/AIDS rates within the MSM subgroup increase, understanding these factors and their relationships to Internet sex seeking behavior is crucial. The dearth of studies focusing on MSM in the southeastern US represents a void this study hopes to fill. Overall, the study findings may inform future interventions that target MSM especially in the southern US, support the evolution of technology–based public health prevention messages, equip MSM to safely navigate these virtual communities, and include resources to mitigate IH among MSM as a part of comprehensive sexual health interventions.

Purpose of the Study

The purpose of this study is twofold. The first is to determine if MSM who meet men online significantly differ in IH, risky sexual behavior, health-protective sexual communication, and perception of partners' sexual risk from MSM who meet men offline. Secondly, this study will explore the potential moderating influence of race (White and African American) on these associations. The specific aims of this study are as follows:

a) Specific Aim 1 (SA1): Examine the association between sex-seeking behavior, race, and IH among MSM.

b) Specific Aim 2 (SA2): Examine the association between sex-seeking behavior, race, and risky sexual behavior among MSM.

c) Specific Aim 3 (SA3): Examine the association between sex-seeking behavior, race, and health-protective sexual communication among MSM.

d) Specific Aim 4 (SA4): Examine the association between sex-seeking behavior, race, and perception of partners' risk among MSM.

Chapter Summary

This chapter briefly demonstrated the national burden of HIV/AIDS, and regional and racial disparities among MSM. Factors contributing to this burden were discussed. This chapter also examined the Internet as the new meeting place for MSM and how the discretion it provides and accessibility to other men for sexual partnerships may play a role in the high HIV/AIDS rates in this population. Prior research examining the association between Internet sex seeking behavior and IH, risky sexual behavior, health protective sexual communication, and perception of partners' risk were reviewed briefly. The paucity of these studies in the southern US was as well as the significance of the study's finding were highlighted. Finally, the purpose of the study and its specific aims were presented.

The next chapter will provide an in-depth discussion of HIV/AIDS in the United States, the southern US, and South Carolina, outline the public health significance of the disease, as well as disparities that exist within these regions. It will also focus more extensively on previous research examining Internet sex seeking behavior among MSM.

CHAPTER 2

BACKGROUND AND SIGNIFICANCE

Introduction

The purpose of this chapter is to extensively describe the national and regional (southern US) impact of HIV/AIDS on MSM; discuss the Internet as a virtual community where MSM may establish sexual relationships; describe extant studies that have examined the relationship between Internet sex seeking behavior and risky sexual behavior, IH, health protective sexual communication, and perception of partners' risk, highlight their strengths and limitations; and conclude with a description of how the current study will contribute to the literature. This chapter is organized into the following sections, i) HIV/AIDS in the United States, ii) HIV/AIDS in the southern US, iii) HIV/AIDS in South Carolina, iv) Current efforts to address HIV/AIDS among MSM, v) MSM, the Internet and sex seeking behavior, vi) Risky Sexual Behavior and the Internet, vii) Internalized Homonegativity and the Internet, viii) Health Protective Sexual Communication, ix) Perception of Partners' Sexual Risk, x) Access to STI testing and condoms and, xi) Contribution to the Literature.

HIV/AIDS in the United States

According to the Centers for Disease Control and Prevention (CDC), there are approximately 1.1 million people living with HIV in the United States (US) with one in five persons unaware of their infection (CDCa, 2013). Annually, nearly 56,300

Americans become infected with HIV and 16,000 people die of AIDS-related causes each year (CDCa, 2013). Although regular testing is key in prevention and treatment efforts, many people with HIV (32%) are diagnosed late in their illness, approximately 50% of people with an HIV diagnosis are not on highly active anti-retroviral therapy (HAART) (Gardner, McLees, Steiner, del Rio, Burman, 2011), and not everybody who requires treatment has access to it (Lemly, et al, 2009).

Despite advances in the diagnosis, treatment and mortality of HIV/AIDS in the US, the impact of the burden of the disease is still felt (CDCa, 2013; CDCb, 2013). A diagnosis of HIV is life changing, posing physical, financial, and social challenges that can significantly affect an individual's quality of life (Vanable, Carey, Blair, Littlewood, 2006; Hickey, Bury, O'Boyle, Bradley, O'Kelly, Shannon, 1996). Besides this, stigma associated with being HIV positive may also have emotional and psychological consequences that can result in isolation, depression and abandonment by family members (Fife & Wright, 2000).

African Americans face the most severe burden of HIV/AIDS nationally (CDCa, 2013). Despite making up 12%-14% of the US population, African Americans accounted for approximately 44% of incident HIV infections in 2010 and 45% of people living with HIV in 2009 (CDCa, 2012; CDb, 2013; CDCd, 2013). Further, 70% of all HIV diagnoses in 2010 were among African American men with an incident rate seven times that of White men and twice that of Latino men (CDCb, 2013; CDCd, 2013). Morbidity rates from HIV/AIDS show a similar pattern with 250,000 African Americans reported dying with an AIDS diagnosis since the onset of the epidemic (CDCa, 2013; CDCb, 2013).

Like African Americans, MSM are also disproportionately impacted by HIV/AIDS. MSM make up 4% of the US population but accounted for 78% and 63% of incident infections among males and all new infections respectively in 2009 (CDCe, 2013). Between 2008 and 2010, incident infections among MSM increased by 12%. Among all MSM in 2009, the greatest increase in incident infections occurred among young MSM (CDCe, 2013). Racial disparities also exist in HIV/AIDS rates among MSM. Among all MSM, African American MSM accounted for 37% of new HIV infections in 2009 (CDCd, 2013; CDCe, 2013). Likewise, among young MSM (13-29 years), the greatest increase (48%) in incident infections occurred among young African American MSM between 2006 and 2009 (CDCe, 2013). In 2010, African American MSM represented 72% of incident infections among all African American men. Further, many African American MSM, especially young MSM, are unaware of their sero-status and may unknowingly infect others (CDCe, 2013). A recent study by the CDC reported young MSM between 18 and 29 years (63%) and African American MSM (54%) were more likely to be unaware that they were HIV positive (CDCe, 2013).

Data from the CDC suggest that higher rates of STIs within African American communities, lack of awareness about HIV status, stigma, IH, negative perception about testing and sexual risk, and poverty may be responsible for these high HIV/AIDS rates (CDCd, 2013; CDCe, 2013). Risky sexual behaviors such as UAI, alcohol and drug use during or prior to sex, and ignorance about sero-status further contribute to these rates (CDCd, 2013; CDCe, 2013).

Besides racial and ethnic disparities that occur nationally, HIV/AIDS rates vary by geographical region with various socio-economic and behavioral factors responsible

for this (CDCb, 2013; Adimora, Schoenbach, & Doherty, 2006). I will go on to focus on HIV/AIDS in the southern US.

HIV/AIDS in the Southern United States

Among all regions in the US, the southern US is disproportionately impacted by HIV/AIDS, with most of the states in this region having the highest HIV/AIDS rates (CDCj, 2012). This region also accounted for 45% of new AIDS diagnoses in 2010 (CDCj, 2012) though only 37% of the US population reside in this region (US Census Bureau, 2012). Also in 2010, this region reported the greatest number (40%) of adults and adolescents living with an AIDS diagnosis, the second highest HIV/AIDS rates nationally, as well as the greatest number of AIDS deaths (CDCj, 2012). HIV positive persons in this region were also significantly less likely to have started HAART therapy in comparison to people living with HIV in other geographic regions (Armstrong & del Rio, 2011). Over the past 20 years, this region has consistently had the highest percentage increases in deaths due to HIV infection despite stagnant or receding numbers in other regions (CDCj, 2012). Of the top 10 states impacted by HIV/AIDS, six states are in the south (SCDHEC, 2013). Similarly of the top ten metropolitan statistical areas (MSAs) impacted by HIV/AIDS, nine are in the south (SCDHEC, 2013).

HIV/AIDS racial disparities also exist within the south, with African Americans disproportionately impacted (Reif, Geonnotti, & Whetten, 2006; Adimora, Schoenbach, & Doherty, 2006). Sixty-two percent of people receiving an AIDS diagnoses in the south in 2010 were African American, the largest proportion of African Americans living with HIV nationally (CDCj, 2012). Among men and women receiving new diagnoses of HIV in the south, African Americans accounted for 50% and 71% respectively (CDCq, 2011).

Between 2006 and 2009, there was an increase in the incidence of HIV infections among MSM in the south, particularly among African American MSM, with as many as one in five African American MSM living with HIV (Prejean, Song, Hernandez, et al, 2011; Lieb, Prejean, Thompson, et al, 2009).

Prior research has alluded to the contributory effect of some factors to the elevated HIV/AIDS burden in the southern US in general and African Americans within this region in particular. Poverty has been associated with the prevalence of HIV/AIDS (CDCb, 2013; CDCc, 2013; CDCd, 2013). In the southern US, lack of viable employment, quality education, access to medical care, decent housing, and economic inequalities among African Americans have been shown to promote and perpetuate health disparities, including HIV (Adimora, Schoenbach & Doherty, 2006; Reif, Geonnotti, & Whetten, 2006). These factors all represent pathways to poverty.

Additionally, the southern US has the highest rate of sexually transmitted infections (STI) nationally (CDCk, 2010; CDCl, 2010; CDCm, 2010). This has also been posited as a potential cause for the disproportionate burden of HIV/AIDS cases (Aral, O'Leary & Baker, 2006), as concurrent STIs are believed to increase susceptibility to infection with HIV (Nushbaum, Wallace, Slatt, & Kondrad, 2004). Other factors identified include the highly stigmatizing nature of HIV in the south that deters HIV testing and treatment (Elmore, 2006; Lichtenstein, 2003), the culture in the south that discourages the open discussion of sex as well as the migration to the south by individuals who test positive for HIV in other parts of the country in order to re-unite with their families (Elmore, 2006). The prevalence of abstinence-based sex education in this region has also been associated because of the limitation it places on HIV prevention

and risk reduction strategies (Southern HIV/AIDS Strategy Initiative, 2011). Finally, the historical distrust of the healthcare system by African Americans, particularly in the south given the Tuskegee study, is also believed to make African Americans reluctant to seek and receive HIV/AIDS-related preventive and medical services and resources, potentially contributing to these numbers (Thomas & Quinn, 1991; Bogart & Thorburn, 2005).

Within the southern US, the southeastern sub-region appears to be the brunt of the HIV/AIDS burden. The national rankings of the HIV/AIDS disease burden of all US states and territories suggest this. Of the six southern states and nine southern Metropolitan Statistical Areas (MSAs) among the top 10 states and MSAs impacted by HIV/AIDS, two states and five MSAs are in the southeastern US (SCDHEC, 2010), hence our focus on this sub-region. For the purposes of this study, the southeastern US will refer to the following states – North Carolina, South Carolina, Georgia, Florida, Alabama, Tennessee, and Mississippi. We will use this data and data from the state of South Carolina to represent the public health significance and impact of HIV/AIDS in this region.

HIV/AIDS in South Carolina

Currently, South Carolina (SC) ranks eight in HIV/AIDS case rates nationally while the SC cities of Columbia, Charleston and Greenville, rank sixth, 15th, and 45th respectively in HIV/AIDS case rates among MSAs (SCDHEC, 2013). Columbia moved up to sixth from ninth in the national HIV/AIDS case rate rankings from 2008 to 2010 (SCDHEC, 2010), suggesting an increasing disease burden. The HIV/AIDS case rates in SC have also been consistently higher than the national average over the past decade

(CDC NCHHSTP Atlas, 2013). Since the first case of HIV/AIDS was identified, SC has recorded approximately 23,000 cases, and of this number, about 8,500 represent deceased cases (SCDHEC, 2010). Like the national data, racial and ethnic minorities are also disproportionately impacted in the state. African Americans in SC account for 73% of all HIV/AIDS cases, with an HIV incidence rate seven times that of Whites (SCDHEC, 2013). For the past decade in SC, African American men and women have annually accounted for the highest and second highest proportion of HIV/AIDS cases respectively (SCDHEC, 2013). Additionally, MSM account for the group most impacted by HIV/AIDS in SC, with young African American MSM especially impacted (SCDHEC, 2013). The foregoing clearly shows that MSM, especially young African American MSM living in SC and the southern US are enormously impacted by HIV/AIDS.

Current Efforts to Address HIV/AIDS among MSM

The CDC has made concerted efforts to address HIV/AIDS among MSM. These include collaborating with prevention partners to implement programs such as testing initiatives, biomedical and behavioral interventions, prevention education, treatment programs, and social marketing campaigns such as *Act Against AIDS* and *Testing Makes Us Stronger* (CDCn, 2013; CDCo, 2013). Overall, these efforts are designed to encourage consistent and correct condom use, seeking treatment if one is HIV positive, and combating stigma, homophobia, discrimination and racism (CDCn, 2013; CDCo, 2013). Furthermore, the behavioral interventions address sexual dynamics with a focus on traditional meeting locations for MSM such as gay bars, gay clubs, bathhouses, gay parades and pride festivals with little to no discussion of the internet as a sex seeking community (CDCi, 2011). This is despite research that has shown that the Internet is

rapidly becoming a popular meeting point where many MSM can seek and meet other men for sex (Bolding, Hart, Sherr, & Elford, 2007; Klausner, Wolf, Fischer-Ponce, & Zolt, 2000; McFarlane, Bull, & Reitmeijer, 2000; Benotsch, Kalichman, & Cage, 2002) and currently outranks these traditional meeting places as avenues for meeting other men (Mckirnan, Houston & Tolou-Shams, 2007). Therefore, if these current efforts are to address HIV/AIDS among MSM, they need to evolve to keep with the changing dynamics of sex seeking behavior among MSM.

MSM, the Internet and Sex Seeking Behavior

Approximately 70% of all households in the US are equipped with Internet access (US Census Bureau, 2010) with 147 million adults in the US reporting using the Internet for some purpose (Pew Research Center, 2010). The Internet's ubiquity, affordability, anonymity and ease of access, has impacted every facet of human life, including sexual behavior and the way we access sexual health resources and information (Garofalo, Herrick, Mustanski, & Donenberg, 2007; Mustanski, 2007). This is especially true for MSM, as it has come to not only represent a means to exchange information and discuss social issues, but a community to place and respond to personal advertisements (Cooper, 1997; Cooper 1998; Shaw,1997; Tikkanen & Ross, 2000). Evidence also suggests that the Internet has become a virtual community for individuals seeking sex, including MSM, thus presenting a potential risk for acquiring STIs such as HIV (Bull & McFarlane 2000; McFarlane, Bull, & Rietmeijer, 2000; Klausner, Wolf, Fischer-Ponce, Zolt & Katz, 2000). A meta-analysis of the literature reported that about 40% of MSM reported online sex-seeking behavior (Liau, Millet, & Marks, 2006) while another study reported that between 82% and 97% of MSM had sought sex online (Mustanski, 2007).

These virtual communities offer fast and anonymous avenues that may result in repeated sexual encounters that can lead to the establishment of virtual sexual networks which may then become the epicenter for an STI epidemic. The outbreak of a syphilis epidemic among an online virtual community of MSM in San Francisco underscores the potential of these networks to promote the transmission of STIs, HIV inclusive, if left unchecked (Klausner, Wolf, Fischer-Ponce, Zolt & Katz, 2000). The anonymity and safety of the Internet may also provide the opportunity for non-gay identified MSM as well as individuals who suffer gay-related stigma to meet sexual partners with ease (Bull & Mcfarlane, 2000; Garofalo, Herrick, Mustanski, & Donenberg, 2007). Additionally, the Internet reduces the risk of sexual rejection and exposes users to a larger social group with similar sexual preferences, experiences and lifestyles (Benotosch, Kalichman, & Cage, 2002; Garofalo, Herrick, Mustanski, & Donenberg, 2007).

Against the backdrop of the aforementioned regional and racial disparities in HIV/AIDS, it is critical that research focused on Internet sex seeking behavior among MSM explore its association with risky sexual behavior, IH, health protective sexual communication, and perception of partners' sexual risk - factors implicated HIV/AIDS transmission among MSM (CDCe, 2013; Millet, Malebranche, & Peterson, 2007).

Risky Sexual Behavior and the Internet

Risky sexual behavior is any act or behavior that increases the risk of contracting HIV. This includes behaviors such as unprotected anal sex, particularly with persons of unknown HIV status, casual sex, drug and alcohol use during or just prior to sex, and multiple casual sex encounters, all of which increase an individual's risk of contracting HIV (Valeroy, 2000), and may account for the disproportionate HIV/AIDS disease

burden among MSM (CDCe, 2013). There are numerous studies that have focused on the association between Internet sex seeking behavior and risky sexual behavior; however, the results of these studies have been mixed.

A secondary analysis was conducted by Berry and colleagues (2008) on 1,574 MSM recruited in San Francisco and drawn from the US National HIV Behavioral Surveillance (NHBS). Study findings showed that HIV negative MSM who met sexual partners online were more likely to have UAI with sero-discordant partners compared with those met at bars or clubs (Berry, Raymond, Kellogg, & McFarland, 2008). Garofalo and colleagues conducted a similar study on 270 ethnically diverse young MSM (16 -24 years) recruited from Lesbian, Gay, Bisexual, and Transgendered (LGBT) friendly services and agencies in Chicago, Illinois. The study purposed to examine Internet sex seeking and its association with HIV risk behaviors. Results of this study showed that Internet sex seeking behavior was significantly associated with UAI and multiple sexual partners (Garofalo, Herrick, Mustanski, & Donenberg, 2007). Concurring with these findings, Ogilvie and associates analyzed data on 2,312 MSM recruited from a pride event in British Columbia (Ogilvie et al, 2008). Results showed that MSM who sought partners online were more likely to report significantly more sexual partners than MSM who did not, engage in sexual activity in public venues, and more likely to be from non-urban regions.

Another study conducted in San Francisco recruited 391 predominantly White MSM from an STI clinic (Kim, Kent, McFarland, & Klausner, 2001). Results of this study indicated that MSM who used the Internet to meet sexual partners were more likely to engage in UAI, more likely to report casual partners, and report sex with an HIV-

positive person than MSM who did not. HIV-negative MSM with online partners were also more likely to have to have received money or drugs for sex in the past year. A similar study was conducted by Mettey and colleagues (2003). One hundred and sixty-four MSM (mean age=40.7) recruited from a resort completed a survey about sexual behavior and Internet sex seeking behavior (Mettey, Crosby, DiClemente, & Holtgrave, 2003). MSM who sought sex online were more likely to report group sex and drug use during sex.

Results of some other studies have however contradicted these findings, suggesting that the prevalence of risky sexual behavior between online and offline sex seeking MSM may not be significantly different. For example, the Mettey and colleagues (2003) study described above failed to find significant differences in UAI and number of sexual partners between MSM who seek sex online and those who do not. Similar results were reported by Hospers and colleagues (2005) who reruited 4,984 Dutch MSM (mean age=33.2) into their study (Hospers, Kok, Harterink, & Zwart, 2005). Findings suggested that MSM who sought sex online were no more likely to engage in risky sexual behavior than MSM who did not. Chiasson and colleagues analyzed data from 1,683 MSM recruited using an online behavioral survey. Participants in this study were recruited from the US and Canada (Chiasson et al, 2007). Results showed MSM who met their last sexual partner online were more likely to contract an STI but did not significantly differ in reporting a history of UAI from MSM who met their last sexual partner offline.

Though these studies present differing conclusions, they nonetheless provide insight into the prevalence of risky sexual behavior among MSM who seek sex online. The differences in the outcomes of these studies could lie in the age group, racial make-

up, and mode of recruitment, site of recruitment of the sample respondents or their operationalization of Internet sex seeking behavior. Despite the strengths of these studies e.g. large sample size, they do have some limitations. None of these studies examined these associations in the southern US, a region with very high HIV/AIDS rates. Furthermore, study samples were not diverse, did not examine the influence of race on Internet sex seeking behavior and with the exception of the study by Garofalo and colleagues, none of the studies focused young MSM, a subpopulation heavily impacted by HIV/AIDS. These are gaps the current study will fill. This study will recruit a diverse sample of young MSM from the southern US to examine the association between Internet sex seeking behavior and risky sexual behavior as well as the influence of race on this relationship.

Internalized Homonegativity (Homophobia)

IH, also known as internal stigma, refers to the internalization of society's opposition to an identity or characteristic which manifests as self- devaluation, low self-esteem, and feelings of worthlessness (Williamson, 2000; Herek, Gillis, & Cogan, 2009). In essence, it is a reflection of the external stigma MSM face in society as a result of their gay identity. In order to better understand IH and its relationship to external stigma, I will provide a brief overview of external stigma.

External stigma, originated by the Greeks, referred to body signs designed to expose something unusual and bad about the moral status of the signifier (Goffman, 1963, p.1). Signs were cut and burnt into the body to suggest that the bearer was a slave or criminal. Over time, the term stigma has come to refer to the disgrace rather than any bodily evidence of it (Goffman, 1963, p.1). Goffman (1963), one of the seminal authors

on stigma describes stigma as an attribute that extensively discredits an individual, reducing him or her "from a whole and usual person to a tainted, discounted one" (p.3).

Stigma can also be considered a social construct, one that defines what is acceptable and what is not, as well as the consequences of the unacceptable trait (Crocker et al 1998; Jones et al, 1984). This trait could be controllable or uncontrollable; it could be linked to an appearance (body size), group membership (race, LGBT), a behavior (same-sex behavior), a lifestyle (substance use), a physical characteristic (psoriasis/HIV/epilepsy), or a mental (mental health illness) characteristic (Goffman, 1963). Furthermore, being a social construct, it is determined by the society at that point and is dynamic, i.e. the trait could become acceptable in the future and resentment towards it could change (Yang, Kleinman, Link, Phelan, Lee, & Good, 2007). Stigma classifies attributes that are incongruous with the accepted norms as deviance and perpetrators of this behavior deviant. This drives the attendant stereotype and stigma thus forming the basis for exclusion (Das, 2001). The driving force behind the development and perpetuation of stigma varies and could include precepts (religious and/or cultural), societal values, norms and expectations, fear of disease (e.g. AIDS) and the media (Yang, Kleinman, Link, Phelan, Lee, & Good, 2007).

Link and Phelan (2006) describe the evolution of stigma and suggest that it comes about in chronological phases. Labeling, the first phase, is the identification and labeling of human differences. This is followed by stereotyping where the dominant beliefs associate labeled individuals with the deviant characteristics. Separation is the process by which labeled persons are placed in distinct groups or categories, creating a scenario of "us" versus "them." This sequence leads to discrimination, a point where labeled or

deviant persons experience status loss, marginalization, rejection, shame, and exclusion leading to unequal outcomes and unequal access to resources.

Studies have shown the effects of stigma to have far-reaching consequences on its target (Crocker, Major, Steele, 1998). For example, external stigma has been linked to physical illness, academic underachievement, infant mortality, low social status, poverty, and reduced access to housing, education, and jobs (Allison, 1998; Braddock & McPartland, 1987; Yinger, 1994). It has also been linked to depression, low self-esteem, feelings of worthlessness, anxiety, self-deprecation and a spectrum of other mental health outcomes, all features that characterize internalized homonegativity (Crocker, Major, Steele, 1998; Herek, 1991; Williamson, 2000).

IH and Gay-related External Stigma

Although the US society may have become increasingly accepting of gay individuals and certain rights of gay individuals are protected by law, it is still a predominantly heterosexist society with same-gender loving men and women facing enormous societal challenges (Herek, 1995). This dichotomy has created a chasm between heterosexism and homosexuality, particularly in the south (Shaw, 2008; Herek, 1991). This manifests as stigma, discrimination and hostility towards gay individuals and other sexual minorities (DiPlacido & Herek, 1998; Herek, 1998; Herek, 1991; D'Aguelli, 1989; Meyer, 2003) and is broadly defined as gay-related stigma.

Gay-related stigma is still strong and has immense consequences on sexual health in particular and overall health in general (Cochran & Mays, 1994). Like stigma in general, gay-related stigma can also be classified into two parts – external and internal stigma. Gay-related external stigma is stigma that arises as a result of society's shared

belief system through which homosexuality is denigrated, discredited, and constructed as invalid in relation to heterosexuality (Herek, Chopp & Strohl, 2007). External stigma potentially influences the decision by MSM to openly self-identify as gay or not. For example if an individual lives in a community where the residents have a strong resentment towards a gay identity among men, an MSM who resides in this community may not openly identify as gay for fear of facing stigma and recrimination. Research has shown that external stigma to a gay identity has resulted in violence and even exclusion from social groups such as churches and friend networks (Herek, 1991).

On the other hand, IH occurs when MSM internalize and indoctrinate society's negative ideology and attitudes towards a gay identity and same-sex relationships. This results in the direction of these negative feelings and attitudes towards one's self that could manifest as shame, depression, problems with intimacy, high risk sexual behavior, drug and alcohol abuse, suicidal tendencies, hostility towards self and other gay people and loss of self-esteem, (Igartua, Gill & Montoro, 2003; Allen & Oleson, 1999; Meyer, Dean & Herek, 1998; Herek, Cogan, Gillis & Glunt, 1997; Nicholson & Long, 1990; Meyer, 1995; Cabaj, 1996). Other manifestations include unwillingness to disclose one's gay identity, reluctance to be members of gay organization and acceptance of societal stereotypes about homosexuality (Herek, Cogan, Gillis & Glunt, 1997). These manifestations corroborate the research of Martin, Dean, Garcia and Hall, (1989) who state that IH 'influences identity formation, self-esteem, the elaborations of defenses, and psychological integrity." This process may also impact how MSM with varying levels of IH meet other men.

IH and Internet Sex Seeking Behavior among MSM

Among MSM, the relationship between IH and various health behaviors or health outcomes have been studied, however only three studies to my knowledge have examined the relationship between IH and sex-seeking behavior among MSM. Stokes and Peterson (1998) conducted a qualitative study examining the relationship between external stigma, IH and sex seeking behavior among a sample of African American respondents. The study was a qualitative study conducted with African American MSM between the ages of 18 and 29. Interviews were conducted with 76 MSM drawn from two cities using open-ended questions to enquire about homophobia, IH and the risk for HIV among respondents. All respondents reported meeting men offline, i.e. in physical locations. Results showed that respondents perceived a greater degree of external stigma towards a gay identity in the African American community than in the White community. This external stigma and resentment towards being gay was internalized by some African American gay men that manifested as loss of self-esteem, depression, psychological distress, lack of self-worth, social isolation, and loss of self-efficacy in negotiating safe sex. This was in turn associated with attempts at concealing their sexual identity by engaging in discreet and risky sexual relationships with other men in neighboring towns. The study concluded by suggesting that addressing the influence of IH among minority MSM, may play a role in reducing the transmission of HIV in these communities.

Another study examining IH was conducted by Poon, Ho, Wong, Wong, & Lee (2005). These researchers examined a sample of MSM of Asian ethnicity in Toronto, Canada who use the Internet to seek sex. The focus of this study was to examine their lived and psychosocial experiences as well as factors that influence their sex seeking

behavior. This study was a qualitative study and was conducted via Internet chat in real time. Twenty one respondents took part in the study. Interviewers enquired about respondents' reasons for using the Internet to seek sex, family and social support, dating and relationships, experiences in the chat room, and safer sex practices. Interviews were anonymous and confidential as the interviewers never physically met the respondents. Results of the study showed that many men reported using the Internet to seek sex because, considering their Asian ethnicity, there were very few social outlets they could go to as the clubs primarily catered to White MSM. IH was also identified as a reason for seeking sex online. Many respondents reported feelings of social isolation, not being open about their sexual identity, lack of support from family and the larger Asian community and discretion as other reasons for seeking sex online. Conclusions of the Poon et al study relevant to the current study suggest that levels of IH are high among online sex-seekers, somewhat reflective of marginalization of Asian MSM within the mainstream gay community and the larger heterosexist society.

The Mustanski, Lyons, & Garcia (2011) study qualitatively examined the relationship between the Internet and IH. The study was conducted in Chicago and had a diverse sample. Sixteen participants were interviewed face-to-face and questions enquiring about their use of the Internet and stigma (external and internal) were asked. Participants in the study reported facing external stigma, feeling closeted and oppressed but also reported using the Internet to mitigate this by finding and meeting other people like themselves to network, make friends, date and have sexual relationships (Mustanski, Lyons, & Garcia, 2011).

The aforementioned studies highlight the unique position IH plays in sex seeking behavior as well as the unique challenges of being gay and a member of a minority racial/ethnic group (Preston and Stokes, 1998; Mustanski, Lyons, Garcia, 2010). They suggest that MSM in general face challenges because of the sexual orientation from the larger community and minority MSM in particular are torn between being part of a racial/ethnic minority that discriminates against them because of their gay identity and the larger gay community that is predominantly White (Preston and Stokes, 1998; Poon, Ho, Wong, Wong, & Lee, 2005). White MSM do not appear to face this kind of identity crisis from the White community or the general society (Bonilla & Porter, 1990). In addition to the perception of incongruity between a masculine identity and a gay identity in the African American community, the pivotal role of the church in the African American community and its largely anti-homosexual stance has also been identified as playing a role in perpetuating the external stigma and IH that are associated with being gay (Miller, 2007). This external stigma serves as a stressor that manifests as internal stress which manifests as low self-esteem, low self-worth, a lack of confidence, shame, feelings of loneliness etc. Therefore, MSM with high IH may utilize the Internet to meet other men, explore their identities and establish sexual and platonic relationships while concealing their own gay identities.

Despite the findings of these studies which contribute to the literature on IH, they have some limitations which the current study will address. The studies draw samples that are not representative of the southern US. In addition, all studies are qualitative, composed of small sample sizes, and do not use validated scales. None of these studies uses any statistical test of association and may also be less generalizable to the larger

population. Furthermore, the Stokes and Peterson study was conducted about 13 years ago, and over the course of this time, some of the conclusions of this study may no longer be relevant to or accurate about this population. This study therefore hopes to advance and extend previous research on IH and sex seeking behavior.

Gay Acculturation

Another concept integral to the study and the understanding of IH is gay acculturation. Acculturation represents the process of transition or acquiring the customs of an alternate community (Mendoza, 1989; Seibt et al, 1995). In the case of gay acculturation, this alternate community is the gay community - it represents a transition from a mainstream heterosexual culture to a gay sexual identity (Seibt et al, 1995). Therefore, MSM with high levels of gay acculturation may be open about their sexual identity, patronize gay affiliated businesses, and utilize gay affiliated resources (Seibt et al, 1995). The ease or otherwise of transition is frequently influenced by social factors that may embrace or resent a gay identity. The resentment of a gay identity may be intricately related to or driven by stigma. For example, a high level of external or internal gay-related stigma may slow or directly prevent the process of gay acculturation. Similarly, IH is also related to gay acculturation. The feelings of external stigma may become internalized and manifest as feelings of shame, resentment, and low self-esteem, all characteristics of IH. These feelings may lead one to resent public gay-related activities or membership of gay-oriented organizations, thus inhibiting the acculturation process. Conversely one may use the Internet to establish and maintain a connection with the gay community (Mustanski, Lyons, & Garcia, 2010). IH and gay acculturation are similar but distinct with IH representing the internalization of external gay-related stigma

while gay acculturation represents the degree of connectedness to the larger gay community.

Health-Protective Sexual Communication

Health-protective sexual communication refers to that aspect of communication that is limited to health discussion aimed at ensuring safe sexual health (Catania, 1995). It includes communication about sexual history, condom use, number of past sexual partners, STI history and discussion about getting tested for HIV (Catania, 1995; Catania, 2010). Health- protective sexual communication plays an important role in understanding the dynamics of communication on sexual risk behavior as it can influence the adoption of safe sex behavior, with implications for safe sex, STI and HIV prevention (Dolcini, Coates, Catania, Kegeles, & Hauck, 1995). In contrast to sexual communication and sexual negotiation, health-protective sexual communication does not include communication about sexual preferences or sexual desires. The importance of health-protective sexual communication is underscored by the elevated prevalence of HIV among MSM and the fact that if partners adopt it, it may be a risk reduction strategy that may lead to measures that promote safe sexual behavior.

Despite its utility, only a few studies have examined health-protective sexual communication and its impact on sexual health (Rojas-Guyler, Ellis, & Sanders, 2005; van der Straten, Catania, & Pollack, 1998; Dolcini, Coates, Catania, Kegeles, & Hauck, 1995) and to our knowledge no study has examined health-protective sexual communication among MSM. Although communication has been examined among MSM, it has largely been restricted to sexual communication (Crepaz & Marks, 2003; Molitor, Facer, & Ruiz, 1999; Elwood, Green, & Carter, 2003), sexual negotiation (Crawford, Rodden, Kippax, & Van de Ven, 2001) or efficacy about condom negotiation

(O'Leary et al, 2005). Of these, only two have examined the relationship between sexual negotiation (Carballo-Dieguez et al, 2006) and sexual communication (Horvath, Oakes, Rosser, 2007) and Internet sex seeking among MSM.

Carballo-Dieguez and colleagues (2006) examined sexual negotiation, (operationalized as HIV sero-staus disclosure), among a nationwide sample of Latino MSM who seek sex online. Study participants were drawn from The Men's Internet Study (MINTS) for HIV prevention, a three- year study of Internet-using Latino MSM. Participants in this study were recruited from banners placed on gay websites such as Gay.com. All participants had to be Latino, 18 years or older, have had sex with another man at least once in their lives, and live in the US. A random sample of 200 surveys of men who reported being HIV negative were drawn and 50 surveys were of men who reported to be HIV positive. Data regarding demographics, risky sexual behavior, HIV status, and patterns of communication were obtained. Results showed that in comparison to HIV-negative MSM, HIV-positive MSM were significantly less likely to disclose their sero-status to a potential partner. Forty-one percent of HIV positive men also acknowledged misrepresenting their sero-status to a prospective sexual partner met over the Internet.

Like the Carballo-Dieguez study, Horvath and colleagues (2007) examined the relationship between sexual communication among MSM who meet other men online and their HIV testing status. Testing status was operationalized as never tested for HIV, had been tested at least once for HIV, and had tested positive for HIV. Sexual communication was operationalized as sero-status disclosure and condom use. Eligibility criteria for this study included male gender, being at least 18 years of age, residing in the

US, and a history of sex with a man in the previous three months. Participants were recruited over a three month period through banner advertisements placed on gay websites. A total of 2,716 participants were eligible to take part in the study. Demographic data, communication patterns, and HIV status were all collected. Results showed that 75% of the tested and 72% of the never tested groups disclosed an HIV-negative status in all of their online profiles. Likewise, 17% of HIV-positive participants also reported a HIV-negative status in their profiles. The study also found that HIV status disclosure was highest among the tested group, while HIV-positive men were most likely to negotiate UAI. Some studies also evaluate sexual communication by using online profiles and preferences as proxies for sexual communication, sexual negotiation, and health-protective sexual communication (Blackwell, 2009; Downing, 2011). These studies will not be discussed because they are not representative of health-protective sexual communication.

While both studies may have some implications for HIV prevention among MSM who seek sex online, they do have some limitations. Both studies conceptualized sexual communication as condom use, HIV sero-status disclosure and discussion of sexual acts only. Although condom use and knowledge of partners' HIV status are important in maintaining safe sexual health, alone, they do not assure safe sexual health; neither do they provide enough information to engage in safe sexual health. History of STIs, number of previous partners, discussing HIV testing, and past use of injecting drug use, are also important variables that play a role in adopting and maintaining safe sexual health and behavior (Dolcini, Coates, Catania, Kegeles, Hauck, 1995). For example, if at the start of a relationship a couple decides to use condoms initially and take each other's word as

proof of their HIV status, as the relationship progresses, they may stop using condoms. This eradicates the protection that condoms confer, particularly if one partner has an STI; akin to delaying risk rather than eliminating or reducing risk. This is of importance, particularly as the most commonly reported method for determining partner's HIV status by online sex seeking MSM was checking online profiles (Horvath, Nygaard, Rosser, 2009).

Another limitation identified in both studies was the lack of a known validated or reliable scale used in measuring sexual communication, with implications on the accuracy of the results. The present study seeks to address these limitations by evaluating health dimension of sexual communication i.e. health communication that has solely health-related consequences using a reliable and validated scale (Catania, 2010).

Perception of Partners' Sexual Risk

Sexual risk perception can be defined as the degree to which one evaluates themselves or a partner as susceptible to a sexual risk such as contracting an STI under particular conditions (Valeroy, 2000). Factors that influence how one evaluates their sexual risk or their partners' sexual risk include demographic profiles, psychological/psychosocial functioning, sex-related preference measures, and attitudes towards condom use (Klein, 2011). The way an individual perceives sexual risk has been linked to sexual risk behavior, HIV and other STIs (Valeroy, 2000). It has also been described as a fundamental piece in addressing risky sexual behavior as it could provide some motivation for adopting safe sex behavior (Thornton, Gibons, & Gerrard, 2002). For example, if an individual does not perceive sexual practices like unprotected anal sex and multiple casual sex partners as risky, they may be more likely to engage in those

behaviors, and less likely to be precautionary. This puts them at risk for contracting HIV. The converse occurs if they have a high perception of risk.

Another important, yet understudied part of sexual risk perception involves perception of partner risk (Stoner et al, 2003; Reisen & Poppen, 1999; Ellen et al, 2002). Similar to the aforementioned example, if an individual does not perceive his partner is at risk for contracting HIV or some other STIs, he may not engage in safe sexual behavior with that partner. A cursory review of the online profiles on these websites reveals various expressions of partner preferences. Examples include "I want a disease-free partner;" "No HIV, no STIs;" "I want a clean partner;" "I am into barebacking;" and "Party and play." These preferences suggest a level of risk and sexual preferences these individuals may be willing to tolerate. Based on these examples, it is vital to understand if perception of partner risk varies between online and offline sex-seeking MSM i.e. to determine if one group feels more or less tolerant about engaging in risky sexual behavior.

To date, few studies have examined how MSM perceive their sexual partners' risk, and fewer still have examined perception of partner risk among MSM who seek sex online (Poon et al, 2005). In the Poon and colleagues (2005) study, 21 MSM of Asian ethnicity were recruited and interviewed via online chatting (Poon, Ho, Wong, Wong, & Lee, 2005). Participants were required to respond to open-ended questions related to perception of partner risk. Results showed that respondents perceived partners' risk in terms of personal traits such as partner age and occupation. Among the MSM sampled, individuals who were younger and had high paying jobs were perceived as less likely to be HIV positive than older individuals and individuals who had lower incomes. Other

respondents reported intuition as a means of perceiving sexual risk. Yet, some other participants perceived sexual risk based on a partners desire to engage in UAI.

While Poon's study may be seminal in assessing partners' sexual risk among MSM who seek sex online, it also points to a dearth of information by US investigators on this topic in these virtual communities where high risk sexual behavior occurs. The limitations of the Poon (2005) study include the fact that participants were ethnically homogenous population and recruited in Canada. This may preclude the generalization of study results. All participants were also recruited online with no comparison group suggesting that they may all have the same or similar characteristics which might influence study outcomes. The small sample size of the study is another limitation. This study aims to build on the Poon study by recruiting a racially diverse and larger sample from online and offline sources.

Access to STI Testing and Condoms

Much research into correlates of sexual behavior has focused on the immediate or individual factors that influence it (Pinkleton, Austin, Cohen, Chen, & Fitzgerald, 2008; Berten, van Rossem, & 2009; Marks, Crepaz, Senterfitt, Walton, Janssen, Robert, 2005; Davis, Sloan, MacMaster, Kilbourne, 2007). Although the environment is inextricably linked to health behavior (Bandura, 1986; Bronfenbrenner, 1992), few studies have looked at the influence of the environment on safe sexual behavior, particularly access to STI testing and condoms (Diclemente, Salazar, Crosby, Rosenthal, 2005; Morisky, Pena, Tiglao, Liu, 2002).

Access to STI testing services and condoms remains a crucial step in addressing the burden of HIV/AIDS among MSM. The CDC has identified a lack of knowledge about HIV status as one factor responsible for the disproportionate HIV/AIDS disease

burden among MSM (CDCe, 2013). Access to testing may encourage MSM to get tested and become aware of their HIV status (CDCe, 2013). This is turn may enable MSM to take steps to ensure that they remain HIV-free, if they are HIV negative; or commence HAART and engage in safe sex if they are positive.

Besides access to STI testing, access and availability to condoms plays an important role in HIV prevention, as consistent and correct condom remains the most effective way of preventing HIV among sexually active MSM (CDCp, 2013). Our examination of environmental factors, particularly the physical environment, is borne out of its influence on health behavior. In evaluating access, we will be examining the presence of these services, the ease of accessibility and affordability of procuring these services.

Contribution to the Literature

As the Internet begins to represent new avenues to meet other men in the gay community, interventions targeting this population will be increasingly needed. The findings of this study could potentially be used to develop new and innovative HIV prevention interventions targeted towards MSM of different races who might face different and unique challenges about their sexual identity from themselves, their communities and their families. More specifically, these online interventions may be targeted at the individual level or at the level of sexual networks since there is some evidence that sexual networks do exist over the Internet (Klausner, Wolf, Fischer-Ponce, & Zolt, 2000). Other findings may also be incorporated into established offline interventions in order to make them meet the needs of the growing number of young MSM who seek sex online. These interventions may equip participating MSM with the

tools to ensure safe sexual health as they navigate these virtual communities while seeking sex. This study may also identify hitherto unidentified risk factors that may influence sex- seeking behavior among MSM. Interventions addressing these risk factors may therefore know where to focus or concentrate their efforts in order to address these factors. For example, if IH is more common among men who seek sex online, it may be expedient to plan and implement online interventions to address this issue, rather than utilizing offline interventions, particularly in resource-poor settings.

Results of this study may also provide public health practitioners and researchers a summary of the factors that underlie online and offline sex-seeking behavior among MSM in the southeastern US. It may form the foundation for future studies and inquiries into other characteristics that may influence sex seeking behavior and contribute to the HIV/AIDS disease burden among this population. Study findings may also lend credence to developing online, mobile and other technology-based HIV/AIDS and STI prevention messages and resources. Finally, findings may present an opportunity to start the process of reversing the disparate HIV/AIDS burden borne by this population in South Carolina in particular and the southeastern US in general.

Chapter Summary

This chapter reviewed the impact of HIV/AIDS nationally, regionally and in the state of South Carolina. The Internet as a risk environment for MSM was discussed. The strengths and limitations of current studies that have examined the relationship between the Internet and risky sexual behavior, IH, health protective sexual communication, and perception of partners' risk were highlighted. Lastly, a description of how this study will improve on these limitations and contribute to the literature was presented.

The next chapter will discuss the conceptual model that will guide this study, study design, study protocol, data collection, data management and data analysis.

CHAPTER 3

RESEARCH DESIGN AND METHODS

Introduction

This chapter will present an overview of the conceptual model, research design and methods that will guide this study. It will outline the constructs that underpin this study, recruitment methods, inclusion criteria, survey instrumentation and measures, and statistical methods to evaluate the study's research questions.

Conceptual Model

The constructs that will be utilized in this study will be drawn from the Social Cognitive Theory (SCT) (Bandura, 1986) and Ecological Systems Theory (EST) (Brofenbrenner, 1992). The SCT is a theory that explains how people adopt and maintain certain behaviors and behavioral patterns while also providing the basis for planning and implementing intervention programs. The SCT posits that behavior is a function of a dynamic model depicting the reciprocal interaction of personal factors, environmental factors and behavioral factors, also known as reciprocal determinism (Bandura, 1986). The EST posits that behavior is a function the individual's attitudes, belief, and knowledge as well as family stems, normative attitudes and access and availability of resources in the environment.

Figure 3.1 shows the conceptual model that underpins the SCT and ECT and the interaction between all three factors. This triadic reciprocity is one of the major

assumptions of the SCT. Personal agency is another assumption of SCT. Personal agency refers to an individual's ability or self-efficacy to influence their behavior and behavioral patterns. The SCT also assumes that people can learn a behavior by watching others (observational learning or modeling) and that this may or may not lead to behavior change. In other words, it posits that learning and behavior change are related but distinct processes. These assumptions are embedded in the interaction between the factors described.

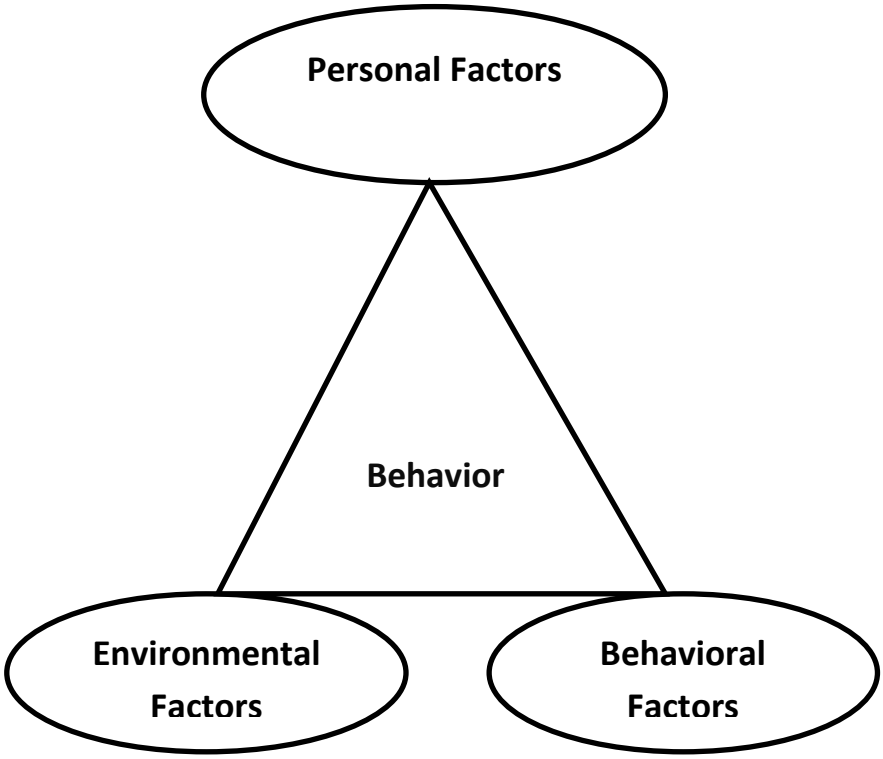


Figure 3.1. Model of Social Cognitive Theory

Personal factors refer to influences primarily under the individual's control that influence the individual's cognition of the behavior, its merits and demerits of adopting or rejecting the recommended behaviors (Bandura, 1986). Broadly, personal factors, depending on the behavior in question, have cognitive, biological and affective dimensions. These include knowledge, expectations and attitudes. Knowledge refers to cognitive understating of the behavior; expectations refer to anticipated outcomes when a behavior is adopted; while attitudes refer to ones evaluation of the consequences or lack thereof when a behavior is adopted.

Behavioral factors include external or internal influences that enable or inhibit the likelihood of adopting the recommended behavior (Bandura, 1986). Behavioral factors include skills, practice, self-efficacy, and behavioral capabilities. Skills refer to the act of successfully performing the recommended behavior; self-efficacy refers to the individual's confidence in performing a particular behavior.

Environmental factors refer to physical, structural, social or normative influences within the environment but external to the individual that may affect the adoption of the recommended behavior (Bandura, 1986). Physical and structural environment refers to the structural characteristics of the environment that promote or inhibit a behavior. They include the presence of salutogenic factors such as access and availability of services, resources or structures that promote a behavior. The social environment includes family members, friends, peers, colleagues, culture, social norms, and the influence of others on adopting the behavior. The environmental factor is also linked to the environmental access and availability of resources in the EST.

Strategies for improving human behavior can be targeted at any of these factors i.e. improving or emphasizing cognitive, affective or biologic processes, altering the social or physical conditions under which people live or work, or increasing behavioral competencies. For example, an individual may use condoms if he has an expectation that it will protect him from STIs, while also being aware of resources within his community that provide free or affordable condoms for use. This illustrates the focus of SCT in describing behavior as a confluence of the person and the environment.

As stated earlier, behavioral factors include skills, practice, self-efficacy, and behavioral capabilities. This construct will underlie sex seeking behavior, sexual behavior, and health protective sexual communication. Sex seeking behavior is operationalized as a description of how participants meet other men for sex i.e. Internet (online) or offline. Risky sexual behavior will be conceptualized as UAI, casual sex, and a history of STI. Health protective sexual communication is another component of behavioral factors, and the study will address the degree to which respondents engage in this practice.

Environmental factors, another construct of the SCT applicable to this study includes access to STI testing services and facilities that provide free condoms in the community. Personal factors include knowledge, expectations, attitudes etc. In this study, this includes perception of partners' risk and IH. Perception of partners' risk will include the respondents' opinion or expectation of their risk of contracting an STI from their partner. IH describes respondents' negative attitudes towards their own gay-identity. Table 3.1 presents the constructs from the SCT and the corresponding study variables.

Figure 3.2 represents the conceptual model with the corresponding constructs included and how race (African American vs. White) moderates these relationships.

Table 3.1. SCT constructs and study variables

Factors/Constructs	**Dimensions**	**Corresponding Study Variables**
Behavioral	Skills Practice Self-efficacy Behavioral capabilities	Sexual behavior Health protective sexual communication
Environmental	Physical & structural environment Social norms Access & availability	Access to STI testing and condoms
Personal Factors	Knowledge Expectations Attitudes	Internalized homonegativity, Perception of partners' sexual risk

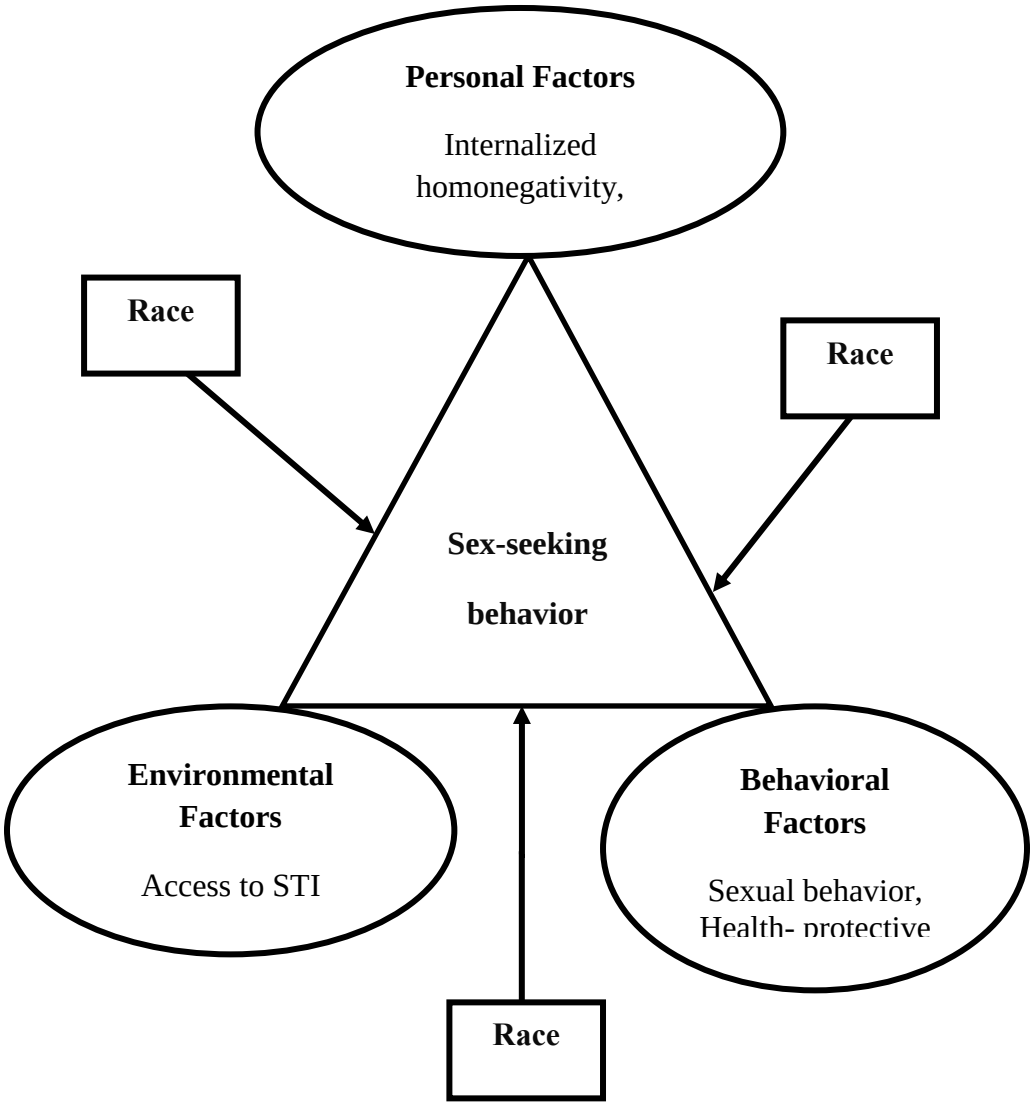


Figure 3.2. Study model that shows the hypothesized relationship between the variables and constructs.

The specific aims and research questions that demonstrate the relationship between these variables as well as the accompanying hypotheses are below.

Specific Aims/Research Questions/Hypotheses

a) Specific Aim 1 (SA1): Examine the association between sex-seeking behavior and IH among MSM.

Research Question 1 (RQ1): Among MSM, is there a relationship between online and offline sex-seeking behavior and IH?

- ***Hypothesis 1:*** *MSM who seek sex online will have higher levels of IH than MSM who seek sex offline.*

Research Question 2 (RQ2): Among MSM, is the relationship between online and offline sex-seeking behavior and IH moderated by race?

- ***Hypothesis 2:*** *African American MSM who seek sex online will have higher levels of IH than White MSM who seek sex online.*

b) Specific Aim 2 (SA2): Examine the association between sex-seeking behavior and risky sexual behavior among MSM.

Research Question 1 (RQ1): Among MSM, is there a relationship between online and offline sex-seeking behavior and risky sexual behavior?

- ***Hypothesis 1:*** *MSM who seek sex online will engage in riskier sexual behaviors than MSM who seek sex offline.*

Research Question 2 (RQ2): Among MSM, is the relationship between online and offline sex-seeking behavior and risky sexual behavior moderated by race?

- ***Hypothesis 2:*** *White MSM who seek sex online will engage in riskier sexual behaviors than African American MSM who seek sex online.*

c) <u>Specific Aim 3 (SA3):</u> Examine the association between sex-seeking behavior and health-protective sexual communication among MSM.

Research Question 1 (RQ1): Among MSM, is there a relationship between online and offline sex-seeking behavior and health-protective sexual communication?

- ***Hypothesis 1:*** *MSM who seek sex online will have lower levels of health-protective sexual communication than MSM who seek sex offline.*

Research Question 2 (RQ2): Among MSM, is the relationship between online and offline sex-seeking behavior and health-protective sexual communication moderated by race?

- ***Hypothesis 2:*** *African American MSM who seek sex online will have lower levels of health-protective sexual communication than White MSM who seek sex online.*

d) <u>Specific Aim 4 (SA4):</u> Examine the association between sex-seeking behavior and perception of partners' risk among MSM.

Research Question 2 (RQ2): Among MSM, is there a relationship between online and offline sex-seeking behavior and perception of partners' risk?

- ***Hypothesis 1:*** *MSM who seek sex online have a lower perception of partners' risk than MSM who seek sex offline.*

Research Question 2 (RQ2): Among MSM, is the relationship between online and offline sex-seeking behavior and perception of partners' sexual risk moderated by race?

- ***Hypothesis 2:*** *White MSM will have a lower perception of partners' risk than African American MSM.*

Study Design & Institutional Review

The study employs a cross-sectional study design using a quantitative approach to examine the relationship between sex seeking behavior (Internet and offline) and the outcome variables. Institutional review board (IRB) approval from the University of South Carolina (USC) was obtained after review of the study's protocol, survey, and recruitment material. All participants (recruited online and offline) were required to read a letter of invitation that explained the study's purpose and benefits and risks of participating in this study. All participants were assured of the anonymity and confidentiality of all responses and that no identifying information would be collected

Participants, Recruitment, and Study Procedure

Criteria for inclusion in the study were that participants should be male, have had a previous history of sex with another man, be between the ages of 18 and 29 years, and reside in the southeastern US. Select states in the southeastern US included South Carolina, North Carolina, Tennessee, Georgia, Florida, Mississippi, and Alabama. Participants were also recruited from both offline and online sources. Two hundred and sixty three MSM were successfully recruited to take part in this study.

Offline Recruitment

Offline participants were recruited from various organizations and service agencies. These included the LGBTQ associations from colleges in SC, Gay Pride events, Black Pride events, AIDS Service Organizations (ASOs), LGBTQ centers, testing events, and from public venues frequented by, or that cater to a predominantly MSM population

such as bars and clubs. Participants were also recruited via snowball technique and personal referrals, i.e. individuals who had taken the survey invited other people and they were in turn evaluated by the principal investigator (PI) to determine if they met the study's inclusion criteria. Funding limitations restricted offline recruitment to South Carolina and North Carolina.

Online Recruitment

Online sources of recruitment were utilized to reach both gay-identified and non-gay-identified MSM outside the PI's geographical location as well as those outside the aforementioned places of recruitment. Online recruitment primarily focused on all target states except North Carolina and South Carolina. The online survey was used to reach gay-identified and non-gay identified MSM who may fit the criteria to take part in the survey.

The survey was made available online using SurveyMonkey® as the host websites. Participants were recruited from two gay social websites, www.adam4adam and www.bgclive.com. MSM using these websites were filtered by age and state of residency. After this was done, an introductory email was sent to all filtered users. This email contained a description of the survey, a link to the survey's website, and the PI's contact information. Informed consent was not obtained per IRB's request. Privacy of the information collected as well as confidentiality and anonymity of all participants was also emphasized. The PIs contact information was listed for participants who may have questions or concerns about the study or survey.

Instrumentation

The survey consisted of eight sections. The first section collected general socio-demographic information, like age, sex, race, educational level, annual income, sexual identity, and enquired about sexual identity disclosure to at least one parent. The second section enquired about sexual behavior such as UAI, history of casual sex, history of STI, HIV sero-status, UAI with a main partner and a causal partner. These questions were adapted from the Benotsch, Kalichman, & Cage (2002) study. Information on Internet sex seeking behavior was obtained. This included frequency and recency of Internet sex seeking behavior, number of Internet sexual partners, history of using the Internet to meet other men, history of physically meeting other men after initial online contact, possessing a current online profile on a website dedicated to meeting other men, ever had an Internet sexual partner, and number of Internet sexual partners. Some of these questions were formulated based on the PI's prior qualitative study and the Bauermeister (2010a) study.

The attitudes towards condom use scale (DeHart, & Birkimer, 1997), health protective sexual communication scale (Catania, 1995), and the gay acculturation scale (Vanable, Mckirnan, & Stokes, 1998) were also included in the survey. The survey also contained the internalized homonegativity inventory (IHNI) (Mayfield, 2001) as well as questions enquiring about access, availability and accessibility to STI testing facilities and condoms. The survey was pilot tested with two members of the target population and changes were made before it was used in collecting data for the study. These changes included the way survey items were presented to participants.

Data Collection

Primary data were collected for this study using surveys (pencil and paper and electronic formats). Surveys were made available to all participants recruited offline and online. Offline and online surveys were exactly the same in content and sequence of questions. Participants' recruited offline completed pencil and paper surveys while participants recruited online completed the surveys electronically. Data were collected from February, 2012 to September, 2012. It took participants about 15 minutes to complete the survey.

Internet Protocol (IP) addresses from online participants were collected and used to identify duplicate surveys. The collection of this information was done in keeping with ethical standards of not collecting personally identifiable information because IP addresses are considered anonymous information and not personally identifiable information in the US (Chellappa & Sin, 2005; Anton, Earp, & Young, 2010). All participants who completed the surveys were given the option of receiving a $10 incentive, forfeiting the incentive, or making a donation to an ASO of their choice selected from a list of ASOs that was provided (Appendix A). Offline participants were offered cash incentives upon completion of the survey while online participants received their $10 incentive via *PayPal*®, a secure and electronic method of making payments.

Variables, Measures, and Description of Survey

Survey questions assessed demographic profiles of participants, IH, sexual behavior, health-protective sexual communication and perception of partners' sexual risk among other variables. Detailed descriptions of survey items are provided below.

Socio-demographic Characteristics, Sexual Identity, and Sexual Identity Disclosure

Data on participants' age, current gender, annual income, highest level of education, current state of residence, race, and ethnicity were obtained. These measures were adapted from the Benotsch, Kalichman, & Cage (2002) study. Participants were asked to report their sexual self-identification (gay, bisexual, transgender, questioning, heterosexual, or other), sexual self-attraction (males, females, or both males and females), and if they disclosed their sexual identity (at least one parent being aware of their sexual identity). This was used in describing sexual identity based on prior ethnographic work by the PI which suggested that disclosing their sexual identity to a parent was an important milestone in the 'coming out" process.

Internet Use and Online Sex-seeking Behavior

Questions were asked regarding participants' ownership of an online profile on a social website dedicated to meeting other men, whether they had ever tried to use the Internet to meet other men, if they had ever had sex with an Internet partner, ever physically met a man after initial contact on the Internet, their frequency of Internet use to seek sex, and the recency of their Internet use to seek sex. Other questions included history of sexual intercourse (oral or anal) with any of these men, history of UAI with an Internet sexual partner, and number of different Internet sexual partners they had.

Internalized Homonegativity (IH)

IH was measured using the IIHNI (Mayfield, 2001). This scale is a 23-item scale with an acceptable internal consistency of 0.91 overall and 0.70 or greater for each subscale (Mayfield, 2001). It has three subscales, namely, Personal Homonegativity, Gay Affirmation, and Morality of Homosexuality. Examples of questions from the Personal

Homonegativity subscale include "I feel ashamed of my homosexuality" and "When people around me talk about homosexuality, I get nervous." Examples of questions from the Gay Affirmation subscale include "I see my homosexuality as a gift" and "In general, I believe that homosexuality is as fulfilling as heterosexuality." Some questions from the Morality of Homosexuality subscale include "I believe it is morally wrong for men to be attracted to each other' and "In general, I believe that gay men are more immoral than straight men." Scores for this scale were based on the mean cumulative response to all items. Items 1, 6,8,9,12,21, and 22 of the IHNI were reverse coded. Lower scale scores indicated indicate lower levels of IH while higher scale scores indicated higher levels of IH. Response options include 1= strongly disagree, 2= slightly disagree, 3 =disagree, 4 = agree, 5 = slightly agree, and 6=strongly agree. A copy of the IHNI scale is included (Appendix B).

Gay Acculturation

Gay acculturation, described above and intricately linked to IH was evaluated using the Identification and Involvement with the Gay Community Scale (Gay Acculturation Scale). This scale has an acceptable internal consistency of 0.78. Sample questions from this scale include "I feel very distant from the gay community" and "Being gay makes me feel part of a community." Item 4 on this scale was reverse coded. Response options include 1(do not agree at all) to 5 (strongly agree), with higher scores representing higher levels of gay acculturation/affirmation. Scores for this scale were based on the mean cumulative response to all scalar items. A copy of this scale is shown (Appendix C).

Sexual Behavior and Sexual Identity

Sexual behavior was measured across various dimensions. Participants will be asked to report their sexual behavior with males and/or females. Other questions included current sexual activity, age at first sexual intercourse, history of UAI, whether UAI occurred at last sexual encounter with a main and casual sex partner, last time tested for HIV, current HIV sero-status, history of STI, and drug and alcohol use three hours before sex in the last three months. These questions were adapted from the Bauermeister study (2011a; 2011b) and the Kauth, St. Lawrence, & Kelly study (1991). Outcome measures of risky sexual behavior include UAI, casual sex (sex with a partner you do not consider exclusive and/or a main/steady partner), and history of STI (proxy for risk profile).

Health-Protective Sexual Communication

Health-protective sexual communication was assessed using the health-protective sexual communication scale (Catania, 2010). This scale has an acceptable internal consistency of 0.80 (Catania, 2010). It assesses the dimension of sexual communication that is concerned with safe sexual health as opposed to sexual communication which may, in addition to a health component, include communication about preferences for sexual acts driven by pleasure. Example items in the scale include "How often do you discuss with a new sex partner the need for both of you to get tested for HIV (the AIDS virus) before having sex" and "How often do you ask a new sex partner how he feels about using condoms before you have intercourse." Response options will include 1 = always, 2 = almost always, 3=sometimes, 4=never, and 5 = don't know. A copy of this scale is shown (Appendix D). Scores for this scale were based on the mean cumulative response to all items. Higher scores indicated a lower level of health protective sexual

communication while lower scores indicated a higher level of health protective sexual communication.

Perception of Partner's Sexual Risk

To our knowledge there is no known reliable and validated scale that has been developed to evaluate perception of sexual partners' risk. Therefore we measured variables that we believe may serve as proxies for this (Klein, 2011). Our proxy variable will be attitudes towards condom use during sex with last partner (Klein, 2011). Attitudes towards condom use with their last partner were assessed using the Sexual Risks Scale – Attitudes toward Condom Use Scale (DeHart & Birkimer, 1997) (Appendix E). Example items on this scale include "Condoms ruin the natural sex act," and "With condoms, you can't really give yourself over to your partner." Response options include 1= strongly disagree, 2=disagree, 3=agree, and 4 = strongly agree. Items 2, 4 and 10 will be reverse coded. Internal consistency for the scale measuring attitudes towards condom use is acceptable (α=0.88). The reliability and validity of the objective measure of perception of partners' risk is unknown. Scores for the attitudes toward condom use scale were calculated based on the mean cumulative response to all items. Lower scores indicated more favorable attitudes towards condom use while higher scores indicated less favorable attitudes towards condom use. Additionally, participants were also asked to subjectively rate their risk of contracting HIV or other STIs from their partner. Response options to the question asking participants to rate their risk of contract HIV or other STIs will range from 1= a lot 2= some, 3= a little, 4=none and 5=don't know.

Access to STI Testing and Condoms

This variable was evaluated by asking participants if they were aware of facilities or locations within their residential or school communities where they could obtain free HIV testing or free condoms. They were also asked if these facilities were easily accessible to them and if they had ever utilized any of these services (free STI testing and condoms). Response options to this question would be yes and no.

Ancillary Measures and Variables

Ancillary measures and variables assessed included how participants most commonly determined their sexual partner's HIV status, how they heard about the study, and whether they completed the survey online or offline. A sample survey (Appendix F), letter of invitation (Appendix G), and IRB approval letter (Appendix H) are included in this document.

Data Management

All surveys, upon completion by respondents, were collected and stored in a locked filing cabinet only accessible by the PI. Subsequently, completed surveys were converted to electronic records by the PI and stored in an Statistical Program for Social Sciences (SPSS) v. 21 file. These electronic records were stored on a password protected computer. Back-up copies of these electronic records were stored on a password-protected external storage device, only accessible by the PI. Surveys completed online were initially stored on an account on the encrypted and secure site of SurveyMonkey®, only accessible by the PI. The PI would periodically download these electronic surveys and merge them with the electronic records of the offline surveys. Identifying information was not collected so the surveys did not need to be further de-identified.

Upon reaching the targeted sample size, the data were examined for missingness and valid responses. Missing data was handled using multiple imputation. Multiple imputation is a procedure where missing values in a dataset are replaced by a set of plausible values that represent the uncertainty about the right value to impute (Yuan, 2000).

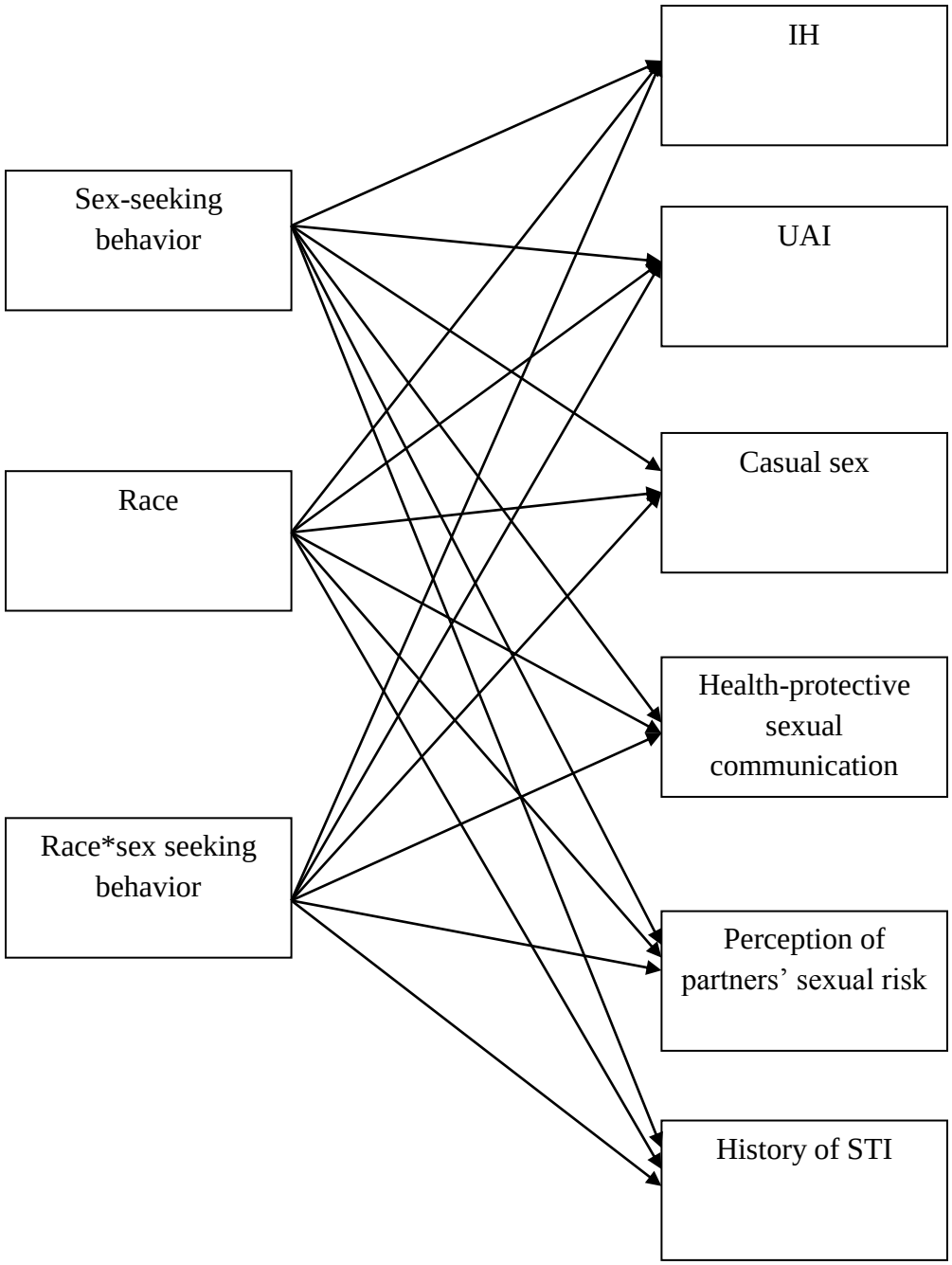
Data Analysis

SPSS version 21 and Mplus version 7 were used in the analyses of the data. Descriptive analyses, frequencies, chi-square, Mann-Whitney tests, and hierarchical linear regressions were conducted using SPSS while path analysis was conducted using Mplus. Path analysis, a type of structural equation modeling (SEM), where only observed variables are considered, is a form of regression where multiple outcome variables with the same predictor variables can be analyzed simultaneously rather than running multiple and separate regression models. This reduces the type 1 error rate and allows for correlations among observed variables. The relationship between these variables is illustrated in a path model (Figure 3). An a-priori power analysis was conducted to determine the sample size that will be required to achieve our desired power of 0.8. This is essential as increased power improves the ability to detect effects given they exist. Using proc power in SAS and an alpha level of .05, we arrived at a sample size of 151 to achieve a power of .8. In order to account for a 20% rate of incomplete surveys or missing data, we increased our targeted sample size to 193.

Our outcome variables are, a) sexual risk behavior operationalized as UAI, casual sex, and history of STI, b) perception of partners' sexual risk, c) IH, and, d) health-protective sexual communication. Sex seeking behavior and race (White and African

American) are the predictor variables while age, highest level of education, sexual identity disclosure, annual income, and gay acculturation are covariates. The interaction term, race X sex seeking behavior will be included in this model to assess racial differences in the outcome variables.

Descriptive analyses and frequencies were conducted to determine characteristics of sample participants. Chi-square and Mann-Whitney tests were also conducted to determine significant differences in outcome variables by race and sex-seeking behavior. Path analyses were also conducted to evaluate the research questions.



Covariates: age, highest level of education, annual income, sexual identity, & gay acculturation

Figure 3.3. Path model

Dissemination Plan

The PI is committed to disseminating findings of this study. To this end, results from the dissertation research will be disseminated to the academic community, community partners, and funding agencies. Study findings will be presented to USC faculty, staff, and students to fulfill doctoral program requirements. Results of the study will also be submitted to peer-reviewed journals for publishing in order to contribute to the literature surrounding the correlates of Internet sex seeking among young MSM in the southern US. It is anticipated that manuscript submission will be made to the *American Journal of Public Health* and *AIDS and Behavior*. Oral and poster presentations of the study findings will also be made at local and national public health and sexual health conferences.

Presentations and submissions will also be made to community partners such as the Youth Advisory Board of the South Carolina HIV/AIDS Council, the Regional AIDS Interfaith Network, an ASO in North Carolina, the LGBTQ association of the University of South Carolina, and Student Health Services. In addition to these presentations, brochures will be provided to these partners so that they may make the information available to their staff and clients. Finally, a presentation of study findings will be made to the Institute for African American Research (IAAR), University of South Carolina, during one of the monthly IAAR meetings. These meetings bring together faculty, staff, students as well as IAAR community partners to listen and watch researchers present their work.

Chapter Summary

This chapter reviewed the conceptual model of the study, study design, recruitment procedures, instrumentation, data management and data analytical methods that will be used to evaluate the research questions. The next chapter will present two manuscripts that have been prepared from the data collected.

CHAPTER 4

MANUSCRIPT 1

PREVALENCE AND CORRELATES OF INTERNET SEX SEEKING BEHAVIOR AMONG YOUNG MEN WHO HAVE SEX WITH MEN: IS THERE MORE HIV/STI RISK?[1]

[1]Abara, W.E, Annang, L, Spencer, S.M, Fairchild, A.J, and D. Billings. To be submitted to *American Journal of Public Health*

Abstract

Objectives. We examined the prevalence and correlates of Internet sex seeking behavior and its association with risky sexual behavior among young men who have sex with men (MSM) between 18 and 29 years in the southeastern US.

Methods. A sample of 263 MSM recruited from online and offline sources completed electronic and pencil and paper surveys respectively. We used bivariate analyses (chi square and Mann-Whitney) to assess correlates of Internet sex seeking behavior and sequential hierarchical regression to evaluate the relationship between Internet sex seeking behavior and risky sexual behavior.

Results. Internet sex seeking behavior was prevalent in this sample. Significant correlates of Internet sex seeking behavior included unprotected anal intercourse (UAI), casual sex, history of sexually transmitted infection (STI), increasing annual income, lower levels of health protective sexual communication, self-identifying as gay, and disclosing a gay sexual identity. Regression analyses showed Internet sex seeking behavior was associated with risky sexual behaviors like UAI, casual sex, and history of STI.

Conclusions. Internet sex seeking behavior among young MSM is high. There is a consistent relationship between Internet sex seeking behavior and risky sexual behavior that put MSM at risk for HIV and other STIs. Prevention efforts should equip MSM with the skills and efficacy to navigate these online communities, engage in risk reduction practices with Internet sexual partners, and emphasize the risk associated with Internet sex seeking behavior. We also shed light on the concept of Internet sex seeking behavior and suggest ways to operationalize it for future research.

INTRODUCTION

Men who have sex with men (MSM) continue to be disproportionately impacted by HIV. MSM represent approximately 7% of the US population but account for 61% of all incident HIV infections as well as 79% of incident HIV infections among all men.[1] Nationally, the estimated number of new HIV infections among MSM also increased by 12% between 2008 and 2010[1] with 51% of all AIDS diagnoses occurring among MSM.[2] Further, the rates of HIV diagnosis in MSM is 44 times greater than that of other men and 40 times that of other women.[3]

Racial disparities also occur in the burden of HIV among MSM.[3] Among all MSM, black MSM accounted for 37% of all new cases of HIV, just behind white MSM (39%).[1] However, this burden appears to be more severe among blacks, considering that blacks make up approximately 13% of the US population in comparison to whites who make up 78% of the population.[4] Further, among young MSM between the ages of 13 and 29, incident HIV infection increased 34% between 2006 and 2009.[2] This increase was particularly high for young black MSM (48%) and Hispanic/Latino MSM (45%).[2] In addition to racial disparities, regional disparities exist in the HIV/AIDS burden with the southern US bearing the brunt.[5] In 2009, this region reported the highest rate of new HIV infections, half of all new AIDS diagnoses, and worst clinical outcomes in individuals receiving an HIV diagnosis.[6]

Traditionally, bath houses and other public cruising areas have been associated with sex seeking behavior among MSM.[7] However, in the last decade, the Internet has emerged as a popular venue utilized by MSM to seek sexual partners.[8-11] The popularity of the Internet for seeking sex with other men has been attributed to its ubiquity,

affordability, anonymity, and ease of access.[11-13] Approximately 70% of all households in the US are equipped with Internet access[14] with 147 million adults in the US reporting using the Internet for some purpose.[15] An estimated 89% of young adults maintain an online presence;[16] one that has increased over the last decade.[14] This increase has also corresponded with the increase in the number of MSM who report meeting their first sexual partner online,[17] prompting an increased interest in the association between the Internet and sex seeking behavior among MSM.

Similarly, over the last decade, the prevalence of Internet (online) sex seeking behavior has steadily increased with current research suggesting that the Internet has become one of the most popular venues for MSM to meet new partners.[18] A meta-analysis conducted in 2006 by Liau concluded that approximately 40% of MSM recruited offline reported using the Internet to seek sex partners and 30% reported having sex with men they had met online.[19] Another meta-analysis conducted by Mustanki in 2007 on studies that recruited MSM online reported that between 82% and 97% of MSM reported Internet sex seeking behavior.[20]

Given the concurrent increases in HIV/AIDS rates among MSM, attention has turned to the role that the Internet and the virtual communities it creates play in establishing unsafe sexual networks and risky sexual behavior. The outbreak of a syphilis epidemic among an online virtual community of MSM underscores this.[21] In this study conducted among MSM visiting a sexually transmitted infection (STI) clinic in San Francisco, MSM who reported meeting sexual partners on the Internet were more likely to receive a syphilis diagnosis that those who did not.[21]

Regarding the relationship between Internet sex seeking behavior and risky sexual behavior, the findings of existing research have been mixed. For example, some studies have reported that MSM who seek sex online or meet sexual partners using the Internet are more likely to exhibit sexually risky behaviors such as unprotected anal intercourse (UAI),[11, 22, 23] multiple partners,[11,22,24] drug and alcohol intoxication before sex,[23,25] group sex,[25] previous STI,[26] casual sex,[27] and sex with HIV positive persons.[27] Other studies have contradicted these findings. For example, Mettey and colleagues did not find any significant difference between UAI and number of sexual partners among MSM who seek sex online and those who do not.[25] Other studies have supported these findings, observing no differences in the number of sexual partners,[28] occurrence of UAI,[29] and occurrence of UAI with partners of unknown or discordant HIV sero-status[17] between MSM who seek sex online and those who do not.

Although these studies have differing conclusions, these differences may lie in their use of various proxies in assessing Internet sex seeking behaviors. For example, some studies conceptualize Internet sex seeking as just the act of seeking sex online.[17,23-26,28] Others define it as having sex with a partner they met online[11,27] and still others operationalize it as meeting their last sexual partner online.[29] Further, many of these studies were conducted outside the southern US,[22] though the region bears the greatest burden of HIV/AIDS nationally.[6] Additionally, most of these studies failed to focus on young MSM, the age group with the recent largest increases in the HIV/AIDS incidence.[2]

In an attempt to address current and critical gaps in the literature, the current study aims to identify the prevalence and correlates of Internet sex seeking behavior among young MSM between 18 and 29 years in the southeastern US. Secondly, it will

investigate the relationship between Internet sex seeking behavior and risky sexual behavior. This study will attempt to accommodate the dynamic nature of Internet sex seeking behavior by defining it in four ways i) ever tried to use the Internet to seek sex, ii) own a current profile on a website dedicated to meeting other men, iii) ever physically met a man you initially met via the Internet and, iv) ever had sex with a man you met online.

METHODS

Sample

The study sample included 267 MSM recruited from the southeastern region of the US between February 2012 and September 2012. Four individuals were subsequently excluded from the sample because they failed to meet the inclusion criteria resulting in a final study sample of 263. Individuals were eligible for the study if they, (1) identified as male, (2) reported sexual intercourse (oral or anal) with a man, (3) were between the ages of 18 and 29 years, and (4) resided in any of the following states in the southeastern US - South Carolina, North Carolina, Tennessee, Georgia, Florida, or Alabama.

Recruitment Procedure

Participants were recruited via online and offline sources. Offline participants were recruited from Lesbian, Gay, Bisexual, Transgendered & Questioning (LGBTQ) associations, gay pride events, AIDS Service Organizations (ASOs), LGBTQ community centers, HIV/AIDS testing events, and from public venues frequented by or that cater to a predominantly MSM population such as bars and clubs. Other methods of offline recruitment included personal referrals and the snowball technique. The snowball technique describes a recruitment procedure where referrals are made among people who

share or know of others who possess a characteristic that is of research interest.[30] It is particularly useful where the focus of the study is on a sensitive issue or requires the knowledge of insiders to locate participants for a study.[30]

Online recruitment was done using SurveyMonkey® as a host website. SurveyMonkey® is a web survey development tool which a researcher may use to develop their survey and make available online so that prospective participants may complete it. Two gay-affiliated social websites, www.adam4adam.com and www.bgclive.com were used in recruiting participants online. MSM who had profiles on these websites were filtered according to the study's inclusion criteria. Participants who met the selection criteria were sent an introductory email. This email contained a letter of invitation, a description of the survey, study goals, a link to the survey's website, and the principal investigator's (PI's) contact information. Privacy of the information collected as well as confidentiality and anonymity of all participants was also emphasized.

Offline participants completed a pencil and paper survey while online participants completed an electronic survey. Online and offline surveys were completely identical in the type of questions and sequence of questions. Internet protocol addresses of participants who were recruited online were recorded to reduce the incidence of duplicate entries. All participants received a $10 incentive, which they could accept, decline or donate to an ASO of their choice from a list provided (South Carolina HIV/AIDS Council, Columbia, SC; AIDS Alabama, Birmingham, AL; AIDS Atlanta. Atlanta, GA; Nashville Cares, Nashville, TN; South Beach AIDS Project, Miami, FL; Building Bridges, Jackson, MS; Chattanooga C.A.R.E.S, Chattanooga, TN). Offline participants received $10 cash incentive while online participants were paid via *PayPal*®, an

electronic method of payment. Approval for the study was obtained from the institutional review board of the University of South Carolina.

Instrumentation

General socio-demographic information like age, sex, race, highest level of education, and sexual identity were collected. Participants were asked to report if they had disclosed their sexual identity to at least one parent. Participants were also asked to report frequency of Internet use to seek sex, recency of Internet use to seek sex, UAI with a sexual partner they met online, and UAI with a sexual partner they met online in the past 12 months. These survey items were adapted from the Centers for Disease Control and Prevention's National HIV Behavioral Surveillance Survey MSM cycle[31] and studies by Bauermeister.[32-34] Sexual behaviors like UAI, casual sex, history of STI, age at first sexual intercourse, and current HIV sero-status were reported. These items were adapted from Bauermeister study,[32,33] and the Kauth, St Lawrence, & Kelly study.[35] Gay acculturation and attitudes towards condom use were other variables of interest. Gay acculturation was evaluated using the gay acculturation scale with an acceptable internal consistency of 0.78.[36] Attitudes towards condom use was assessed using the attitudes towards condom use scale with an acceptable internal consistency of 0.88.[37] Finally, health protective sexual communication, a measure of the health dimension of sexual communication scale was assessed with health protective sexual communication Scale.[38] This scale has an acceptable internal consistency of 0.80.[38]

Measures

Socio-demographic Characteristics, Sexual Identity, and Sexual Identity Disclosure: Demographic characteristics (age, current gender, annual income, highest level of education, and race) were obtained. Questions regarding sexual identity (gay, bisexual, transgender, questioning, heterosexual, or other) and disclosure of sexual identity (at least one parent being aware of their sexual identity) were enquired.

Internet Use and Sex Seeking Behavior: Questions enquiring about Internet sex seeking behavior were asked in four ways, 1) current ownership of a profile on a social website dedicated to meeting other men, 2) history of ever using the Internet to seek sex, 3) ever physically meeting a man they initially met online, and 4) ever having sexual intercourse with a man they initially met online. These definitions were included in the study to accommodate the dynamic nature of Internet sex seeking. Participants were also specifically asked to report if they had ever had UAI with an Internet sexual partner they met online, UAI with an Internet sexual partner in the past 12 months, frequency of Internet use to seek sex, and recency of Internet use to seek sex.

Sexual Behavior and Attitudes: Questions regarding participants' current sexual activity (sex in the past three months), age at first sexual intercourse (oral or anal), gender of sexual partners (only men or men and women), history of UAI, current HIV sero-status, and history of STI. UAI was defined as anal sex without a condom. Casual sex was defined as sex with a partner the respondent was not committed to, did not consider to be in an exclusive sexual relationship, and did not regard as a main/steady partner. Attitudes towards condom use were measured using the attitudes towards condom scale.[37] This scale is comprised of 13 items. Example items on this scale include "Condoms ruin

the natural sex act," and "With condoms, you can't really give yourself over to your partner." Response options were scored on a Likert point scale and scores were summed to produce a mean scale score. Lower scores indicated more favorable attitudes towards condom use while higher scores indicated less favorable attitudes towards condom use.

Gay acculturation: Gay acculturation, a measure of the degree of connection to the gay community, was evaluated using the gay acculturation scale comprised of eight items.[36] Some sample questions from this scale include "I feel very distant from the gay community" and "Being gay makes me feel part of a community." Responses were scored on a Likert point scale. Scores were summed to produce a mean scale score with higher scores representing higher levels of gay acculturation.

Health protective sexual communication: This was measured using the health protective sexual communication scale.[38] It includes eight items and response options were scored on a Likert point scale with scores summed to produce a mean scale score. Some items included in the scale are "In the past 12 months, how often do you discuss with a new sex partner the need for both of you to get tested for HIV (the AIDS virus) before having sex" and "In the past 12 months, how often do you ask a new sex partner how he feels about using condoms before you have intercourse." Scores for this scale were based on the mean cumulative response to all items. Higher scores indicate a lower level of health protective sexual communication while lower scores indicate a higher level of health protective sexual communication.

Data Analysis

The IBM Statistical Package for the Social Sciences (SPSS) version 20 was used to perform all analyses and statistical significance was determined at the $p<0.05$ level.

Rate of data missingness was low (<7%) and missing data was handled with multiple imputation.

The primary outcomes of interest included UAI, casual sex, and a reported history of STI and the independent variable of interest was Internet sex seeking behavior. Descriptive analyses were calculated for all variables. Online sex seekers were compared to offline sex-seekers on all variables using chi-square analyses (for categorical variables) and the Mann-Whitney test (for continuous variables). The Mann-Whitney test, a non-parametric test, was chosen because the assumption of normality was violated in this sample.

In addition, a series of hierarchical sequential logistic regression models were fit to determine the independent influence of Internet sex seeking behavior on the primary outcome variables. Race (black and white), age, age at first sexual intercourse, educational level, annual income, and health protective sexual communication were covariates included in the analyses. These three models were fit as follows: i) Model 1: socio-demographic variables were entered as control variables, including age, age at first sexual intercourse, race, highest level of education, and annual income, ii) Model 2: Health protective sexual communication was entered in the model, iii) Model 3: Internet sex seeking behavior was entered in the model, adjusting for all other variables. Goodness of fit statistics were calculated for each fitted model.

RESULTS

Descriptive statistics

Table 4.1 shows the sample's socio-demographic characteristics and risk behaviors. Overall, participants ranged in age from 18 to 29 years (M=21.80, SD=2.8) with 70% reporting black race. Eighty percent of study participants were recruited from

South Carolina, 94% of all participants were recruited from online sources, 77% of the sample reported at least some college education and 65% reported an annual income less than $10000. Seventy-seven percent of the sample identified as gay, 78% reported that at least one parent was aware of their sexual self-identification, and 31% reported past sexual activity with both males and females.

Most participants were currently sexually active (84%). Mean age at first sexual intercourse was 15.6 (SD=2.9) with a range between 7 and 26 years. Seventy-five percent of participants reported previous UAI, 20% reported a previous STI, 88% reported previous casual sex, and 26% reported failure to use a condom at last casual sex encounter. Of those participants aware of their HIV status, 15% were HIV positive.

A high number of sample participants (80%) reported a history of Internet use to meet other men with 47% reporting Internet use for this purpose in the preceding two weeks. Fifty percent reported owning an online profile on a website dedicated to meeting other men at the time of completing the survey. Seventy-one percent of participants reported physically meeting other men they initially met over the Internet with 86% reporting a sexual encounter and 47% reporting UAI. Of those reporting a UAI with an Internet sex partner, 78% engaged in UAI in the past year. The number of different sexual partners met via the Internet ranged from 1 to 50 (M= 8.17, SD=10.4).

Table 4.1 - Descriptive Statistics of Socio-demographic Characteristics of Study Sample (n=263)

Variable	*f*	%
Gender		
Male	258	98.1
Transgender	3	1.1
Transitioning	2	0.8
Annual income		
≤$5000	120	45.6
$5000 - %10000	53	20.2
$10001 - $25000	60	22.9
>25000	29	11.1
Highest level of education		
Some high school	19	7.2
High school/GED	68	25.9
Some college	135	51.3
College graduate	32	12.2
Graduate school	9	3.4
Race		
African American	183	69.6
American Indian/Alaska Native	4	1.5
Asian	2	0.8
White	61	23.2
Multiracial	13	4.9
Sexual self-identification		
Gay/homosexual	199	76.5
Heterosexual/straight	1	0.4
Bisexual	48	18.5
Transgender	7	2.7
Questioning	3	1.2
Queer	1	0.4
Other	1	0.4
Out to parents about being LGBTQ		
Yes	166	64.3
No	57	22.1
Out to only one of my parents	35	13.6
Gender of previous sexual partners		
Males only	176	66.9
Males and Females	80	31.3
Currently sexually active		
Yes	218	84.2
No	41	15.5

Table 4.1 - Descriptive Statistics of Socio-demographic Characteristics of Study Sample (n=263) *(cont'd.)*

Variable	*f*	%
Ever had casual sex	226	87.5
Yes	32	12.4
No		
Condom use at last intercourse with most recent casual male partner		
Yes	183	73.5
No	66	26.5
Current HIV status		
Positive	35	13.7
Negative	201	78.8
Don't know	19	7.4
Ever had an STI		
Yes	50	19.5
No	207	80.5
Ever had UAI		
Yes	191	74.9
No	64	25.1
Ever tried to use the Internet to meet other men		
Yes	206	79.5
No	53	20.5
Last time used the Internet to meet other men		
≤2 weeks	117	46.8
>2 weeks – 2 months	25	10
>2 months – 6 months	47	18.8
>6 months – 1 year	19	7.6
Frequency of Internet use to meet other men in the past 12 months		
2-6 times a week/at least once a day	34	13.1
Often (once a week)	38	14.6
Sometimes (2-3 times a month)	55	21.2
Rarely (once a month)	73	27.8
Never	60	23.1
Ever physically met with a man you initially met online		
Yes	186	70.7
No	74	28.5
Ever had sex with a man you met online		
Yes	159	61.4
No	100	38.6

Table 4.1 - Descriptive Statistics of Socio-demographic Characteristics of Study Sample (n=263) *(cont'd.)*

Variable	*f*	*%*
Ever had UAI with a man you met online		
Yes	74	28.6
No	185	70.3
Had UAI with a man you met online in the past 12 months		
Yes	58	22.1
No	202	77.7
Current profile on a website dedicated to meeting other men		
Yes	129	50
No	129	50
Most common way to determine sexual partners' HIV status		
He told me	133	51.8
I saw his HIV report	70	27.2
I do not know his status	37	14.4
I just guessed	8	3.1
I got it from his online profile	8	3.1
Recruitment		
Offline	94	247
Online	6	16
Age		
Range	18 - 29	
Mean *(SD)*	21.87 (2.81)	
Age at first sexual intercourse		
Range	7 - 26	
Mean *(SD)*	15.6 (2.89)	
Number of different men you have had sex with that you met online		
Range	1 - 50	
Mean *(SD)*	8.17 (10.41)	

Correlates of Internet sex seeking behavior

Bivariate (chi-square and Mann-Whitney) associations between all four definitions of online sex seeking behavior and the primary outcome variables (UAI, casual sex, and history of STI), as well as other variables (age, age at first intercourse, race, annual income, highest level of education, sexual self-identity, disclosure of sexual identity, health protective sexual communication, gay acculturation and attitudes towards condom use) were conducted. Table 4.2 shows the results of the analysis of these variables.

Internet sex seeking behavior (currently own a profile on a website dedicated to meeting other men)

Internet sex seeking behavior was significantly associated with UAI ($p<.05$) and casual sex ($p<.001$) but was not significantly associated with history of STI. There were no significant associations with age, age at first sexual intercourse, annual income, race, highest level of education, sexual self-identity, disclosing sexual identity, health protective sexual communication, gay acculturation and attitudes towards condom use.

Internet sex seeking behavior (ever had sex with a man you met online)

Internet sex seeking behavior was significantly associated with UAI ($p<.001$), increasing annual income ($p<.05$), history of STI ($p<.001$), casual sex ($p<.001$), self-identifying as gay ($p<.01$), disclosing a gay identity ($p<.01$), and lower levels of health protective sexual communication ($p<.01$). It was not significantly associated with age, age at first sexual intercourse, race, highest level of education, gay acculturation and attitudes towards condom use.

Table 4.2-Internet Sex Seeking Behavior by Socio-demographic Characteristics and Sexual Behavior (n=244)

Variable	Currently own an online profile		Ever had sex a man you met online		Ever physically met a man you met online		Ever used the Internet to meet other men	
	Yes	No	Yes	No	Yes	No	Yes	No
Race								
Black	45.8	54.2	56.7	43.3	66.9	33.1*	76.7	23.3
White	58.3	41.7	70	30	81.7	18.3	85	15
Annual income								
≤$10000	42.7	57.3*	52.5	47.5**	62.7	37.3**	74.6	25.4
>$10000	56.4	43.6	69.3	30.7	79.4	20.6	83.6	16.4
Education								
≤High school graduate /GED	75.3	24.7	56.3	43.7	63.2	36.8*	74.7	25.3
>High school graduate /GED	82.8	17.2	64	36	74.7	24.3	82	18
Sexual self-identity								
Gay	52.6	47.4	65	35**	76.6	23.4***	84.2	15.8**
Non-gay	43.8	56.2	43.8	56.2	52.1	47.9	64.6	35.4
Disclosed sexual identity								
Yes	73.5	26.5	66.3	33.7**	78	22***	81.4	18.6
No	81.4	18.6	43.6	56.4	49.1	50.9	70.9	29.1
UAI								
Yes	54	46*	69.5	30.5***	77.5	22.5***	83.7	16.3*
No	39.1	60.9	39.1	60.9	56.2	43.8	70.3	29.1
Casual sex								
Yes	53.6	46.4**	68	32***	77	23***	83.6	16.4***
No	21.9	78.1	12.5	87.5	31.2	68.8	50	50
History of STI								
Yes	52	48	86	14***	88	12**	92	8*
No	49.8	50.2	55.3	44.7	67.6	32.4	76.7	23.2
Health protective sexual communication	2.42	2.27	2.46	2.17**	2.43	2.17*	2.43	2.09*
Gay acculturation	2.86	2.78	2.85	2.77	2.87	2.71*	2.85	2.72
Attitudes towards condom use	2.29	2.42	2.39	2.30	2.35	2.37	2.35	2.38
Age	22.14	21.56	23.25	21.50	21.96	21.54	21.98	21.32
Age at first sexual intercourse	15.63	15.61	15.35	16.00	15.58	15.64	15.64	15.42

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

Internet sex seeking behavior (ever physically met with a man you initially met online)

Significant associations were found between Internet sex seeking behavior and UAI ($p<.001$), higher educational level ($p<.01$), increasing annual income ($p<.05$), history of STI ($p<.005$), casual sex ($p<.001$), self-identifying as gay ($p<.001$), white race ($p<.05$), disclosing their sexual identity ($p<.001$), and lower levels of health protective sexual communication ($p<.05$). There was no significant relationship with age, age at first sexual intercourse, race, disclosing sexual identity, gay acculturation and attitudes towards condom use.

Internet sex seeking behavior (have you ever tried to use the Internet or any online means to meet other men)

Internet sex seeking behavior was significantly associated with UAI ($p<.05$), increasing annual income ($p<.05$), history of STI ($p<.05$), casual sex ($p<.001$), self-identifying as gay ($p<.01$), and lower levels of health protective sexual communication ($p<.05$). There was no significant association with age, age at first sexual intercourse, race, highest level of education, sexual self-identity, disclosing sexual identity, gay acculturation and attitudes towards condom use.

Bivariate association of outcome variables: UAI, casual sex, and history of STI

Bivariate associations (chi-square and Mann-Whitney) between the primary outcome variables and socio-demographic characteristics, gay acculturation, and health protective sexual communication were analyzed. In the bivariate analyses, UAI was significantly associated with increased annual income ($p<.05$), disclosing sexual identity ($p<.0001$), lower levels of health protective sexual communication ($p<.05$), increasing age ($p<.05$), and younger age of first sexual experience ($p<.05$). Casual sex was

significantly associated with higher levels of health protective sexual communication (p<.05) and younger age of first sexual experience (p<.01). Past history of STI was significantly associated with increasing age (p<.05), and younger age of first sexual experience (p<.05). See Table 4.3 for results.

Table 4.3- Bivariate Associations of UAI, Casual Sex, and History of STI by Socio-demographic Characteristics (n=244)

Variable	UAI		Casual Sex		History of STI	
	Yes	No	Yes	No	Yes	No
Race						
Black	72.3	27.7	87.8	12.2	20.7	79.3
White	76.3	23.7	84.7	15.3	15.3	84.7
Annual Income						
≤$10000	69.5	30.5**	88.9	11.1	18.3	81.7
>$10000	85.1	14.9	84.9	15.1	21.8	78.2
Education						
≤High school graduate graduate/GED	74.1	25.9	88.5	11.5	16.1	83.9
>High school	75.3	24.7	87.1	12.9	21.2	78.8
Sexual self-identity						
Gay	76.8	23.2	87.8	12.2	19.4	80.6
Non-gay	64.6	35.4	87.5	12.5	18.8	81.2
Disclosed sexual identity						
Yes	79.6	20.4***	87.9	12.1	21.7	78.3
No	56.4	43.6	85.5	14.5	10.9	89.1
Health protective sexual communication	2.42	2.13*	2.40	2.04*	2.36	2.34
Gay acculturation	2.81	2.83	2.82	2.82	2.76	2.83
Attitudes towards condom u	2.40	2.23	2.35	2.03	2.26	2.37
Age	22.08	21.06*	21.89	21.13	24.17	21.54***
Age at first sexual intercour	15.34	16.33*	15.41	17.04**	14.46	15.87**

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

Sequentially-fitted Hierarchical Logistic Regression

Following the results of the bivariate analysis, statistically significant variables were identified. A series of sequential logistic regression models were fit to determine the independent influence of Internet sex seeking behavior on the primary outcome variables after controlling for socio-demographics and variables found to be associated with the primary outcomes.

Primary Outcome: UAI

Model 1: In this model, age at first sexual intercourse and annual income were significantly associated with UAI. Participants who reported an older age of first sexual intercourse ($p<.05$) were less likely to report UAI and participants reporting greater annual income ($p<.05$) were more likely to report UAI. None of the other covariates were significant. However because of their conceptual significance as potential confounders they were retained in the subsequent models.

Model 2: Health protective communication was entered in the second step and significantly added to the model's prediction of UAI [$\chi^2(6, N=221)=23.27$, $p=.001$] above and beyond all variables in step 1. Participants with a lower level of health protective sexual communication were significantly more likely to engage in UAI (aOR=1.65, $p<.05$).

Model 3:

Independent Variable: Internet sex seeking behavior (currently own a profile on a website dedicated to meeting other men)

Internet sex seeking behavior was added in the third step and significantly added to the prediction of UAI [$\chi^2(7, N=221)=24.02$, $p=.001$] above and beyond all variables in step 2.

However, Internet sex seeking behavior did not significantly influence UAI. Age at first sexual experience ($p<.05$), greater annual income ($p<.05$) and health protective sexual communication ($p<.05$) all remained significantly associated with UAI.

Independent Variable: Internet sex seeking behavior (ever had sex with another man you met online)

Internet sex seeking behavior was added in the third step and significantly added to the prediction of UAI [$\chi^2(7, N=222)=31.01$, $p<.001$] above and beyond all variables in step 2. Internet sex seeking behavior was significantly associated with UAI (aOR=2.56, p=.006, CI=1.315 - 4.96) after controlling for demographic variables and other factors significantly associated with UAI.

***Independent Variable: Internet sex seeking behavior* (ever physically met with a man you initially met online)**

Internet sex seeking behavior was added in the third step and significantly added to the prediction of UAI [$\chi^2(7, N=222)=25.607$, $p=.001$] above and beyond all variables in step 2. However, Internet sex seeking behavior was not significantly associated with UAI (p=.123) after controlling for demographic variables and other factors significantly associated with UAI.

***Independent Variable: Internet sex seeking behavior* (ever tried to meet men online)**

Internet sex seeking was added in the third step and significantly added to the prediction of UAI [$\chi^2(7, N=222)=26.21$, $p<.001$] above and beyond all variables in step 2. Internet sex seeking behavior was not significantly associated with UAI (p=.095) after controlling for demographic variables and other factors significantly associated with

UAI. Table 4.4 shows the results of the sequentially-fitted hierarchical logistic regression models for UAI as well and the goodness of fit statistics associated with each model.

Table 4.4- Sequential Logistic Regression Predicting UAI (n=244)

Variables	Model 1	Model 2	Model 3			
Step 1	OR (95%CI)	aOR(95% CI)	aOR(95%CI)			
Race						
White	1	1	1	1	1	1
Black	0.65(0.29 -1.43)	0.76 (0.34-1.70)	0.92(0.71 -1.20)	0.93(0.71 -1.23)	0.92(0.70 -1.21)	0.91(0.70 -1.20)
Age	1.09(0.95 -1.24)	1.08(0.94-1.23)	1.07(0.94 -1.23	1.07(0.94 -1.22)	1.08(0.95 -1.24)	1.07(0.94 -1.23)
Age of first sexual intercourse	**0.85(0.76 -0.97)***	**0.86(0.75-0.97)***	**0.86(0.76 -0.97)***	**0.87(0.77 -0.99)***	0.86(0.75 -0.97)	**0.85(0.75 -0.97)***
Level of education						
≤High school graduate/GED	1	1	1	1	1	1
>High school graduate/GED	0.95(0.48 -1.89)	1.06(0.52-2.16)	1.03(0.50 -2.09)	0.97(0.47 -2.01)	1.01(0.49 -2.08)	0.99(0.49 -2.04)
Annual Income						
≤$10,000	1	1	1	1		
>$10,000	**2.47(1.09 -5.57)***	**2.38(1.05-5.41)***	**2.38(1.04 -5.41)***	**2.60(1.12 -6.05)***	**2.31(1.01 -5.30)***	**2.5691.11 -5.90)***
Step 2						
Health protective sexual communication		**1.65(1.09-2.20)***	**1.62(1.06 -2.45)***	1.49(0.97 -2.29)	**1.55(1.01 -2.36)***	**1.55(1.02 -2.37)***
Step 3						
Currently own an online profile						
No			1	-	-	-
Yes			1.44(0.75 -2.75)	-	-	-

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

Table 4.4- Sequential Logistic Regression Predicting UAI (n=244) *(cont'd.)*

Variables	Model 1 OR (95%CI)	Model 2 aOR (95%CI)	Model 3 aOR (95%CI)			
Ever had sex with a man you met online						
No			-	1	-	-
Yes			-	**2.55(1.31-4.96)****	-	-
Ever physically met a man you met online						
No			-	-	1	-
Yes			-	-	1.73(0.86-3.47)	-
Ever used the Internet to meet other men						
No			-	-	-	1
Yes			-	-	-	1.90(0.89-4.04)
Model Goodness of Fit Statistics						
Δ-2LL	-	**5.91****	**7.26****	**13.65*****	**8.25****	**9.45*****
R^2	0.111	0.146	0.151	0.192	0.160	0.164
p value (Hosmer-Lemeshow test)	0.600	0.894	0.054	0.377	0.602	0.485

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

Primary Outcome: **casual sex**

Model 1: Control variables like age, age at first sexual intercourse, race, level of education, and annual income were included in this model. This model significantly predicted casual sex [$\chi^2(5, N=225)=11.28$, $p<.046$].In this model, participants who reported an older age of sexual intercourse (aOR=.802, p=.01 CI =0.678 - 0.948) were less likely to report casual sex. None of the other variables were significant. However they were retained as potential confounders.

Model 2: Health protective communication was entered in the second step and significantly added to the model's prediction of UAI [$\chi^2(6, N=225)=19.92$, $p=.003$] above and beyond all variables in step 1. Results showed that having a lower level of health protective sexual communication score was significantly associated with casual sex (aOR=2.317, p=.006 CI=1.27- 4.22).

Model 3:

Independent Variable: Internet sex seeking behavior (currently own a profile on a website dedicated to meeting other men)

Internet sex seeking behavior was added in the third step and significantly added to the prediction of casual sex [$\chi^2(7, N=221)=28.39$, $p<.001$] above and beyond all variables in step 2, with Internet sex seeking behavior significantly predicting casual sex (aOR=4.18, P=.006, CI=1.49 – 11.71).

Independent Variable: Internet sex seeking behavior (ever had sex with another man you met online)

Internet sex seeking behavior significantly added to the prediction of casual sex [$\chi^2(7, N=225)=40.23$, $p<.001$] above and beyond all variables in step 2, and in this model,

it significantly predicted casual sex (aOR=9.65, p<.001, CI=3.07 -30.34). Age of first sexual intercourse remained significant.

Independent Variable: Internet sex seeking behavior (ever physically met with a man you initially met online)

The addition of Internet sex seeking behavior significantly added to the prediction of UAI [χ^2(7, N=225)=34.19, p<.001] above and beyond all variables in step 2. Internet sex seeking behavior significantly predicted casual sex (aOR=5.835, p<.001, CI=2.27 – 14.99).

Independent Variable: Internet sex seeking behavior (ever tried to meet men online)

Internet sex seeking behavior was added in the third step and significantly added to the prediction of UAI [χ^2(7, N=224)=30.96, p<.001] above and beyond all variables in step 2, and significantly predicted casual sex (aOR=4.76, p=.001, CI=1.91-11.88). Table 4.5 shows the results of the sequentially-fitted hierarchical logistic regression models for casual sex and the goodness of fit statistics associated with each model.

Primary Outcome: **history of STI**

Model 1: Similar to the previous outcome variables, age, age at first sexual intercourse, race, level of education, and annual income were included as control variables in this model. Though this model significantly predicted casual sex [χ^2(5, N=224)=19.163, p=.002], the Hosmer and Lemeshow test was significant (p=.026) suggesting a lack of fit. We hypothesize that the large imbalance in response options ("yes" response =19% vs "no" responses=81%) may be responsible for the significant association. Since model 1 did not include Internet sex seeking behavior, the independent variable of interest, additional regression analyses were conducted.

Table 4.5- Sequential Logistic Regression Predicting Casual Sex (n=244)

Variables	Model 1	Model 2	Model 3			
Step 1	OR (95%CI)	aOR (95%CI)	aOR(95%CI)			
Race						
White	1	1	1	1	1	1
Black	0.97(0.37-2.51)	1.22(0.45-3.30)	1.57(0.56-4.44)	1.55(0.53-4.65)	1.42(0.48-4.17)	133(0.47-3.80)
Age	1.16(0.96-1.41)	1.15(0.94-1.39)	1.11(0.91-1.36)	1.12(0.92-1.36)	1.16(0.95-1.43)	1.13(0.92-1.39)
Age of first sexual intercourse	**0.80(0.68-0.95)***	**0.79(0.67-0.94)****	**0.78(0.65-0.93)***	**0.84(0.70-0.99)***	**0.78(0.66-0.94)****	**0.77(0.65-0.93)****
Level of education						
≤High school graduate/GED	1					
>High school graduate/GED	1.39(0.55-3.53)	1.79(0.67-4.78)	1.69(0.61-4.68)	1.85(0.62-5.53)	1.77(0.62-5.08)	1.66(0.59-4.65)
Annual Income						
≤$10,000	1	1	1	1	1	1
>$10,000	0.54(0.20-1.44)	0.47(0.17-1.31)	0.49(0.17-1.38)	0.47(0.16-1.41)	0.38(0.13-1.14)	0.53(0.18-0.52)
Step 2						
Health protective sexual communication		**2.32(1.27-4.22)****	**2.23(1.20-4.15)***	1.82(0.95-3.46)	1.80(0.96-3.36)	**1.99(1.06-3.75)***
Step 3						
Currently own an online profile						
No			1	1	1	1
Yes			**4.18(1.49-11.71)****			

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

Table 4.5- Sequential Logistic Regression Predicting Casual Sex (n=244) *(cont'd)*

Variables	Model 1	Model 2	Model 3			
	OR (95%CI)	aOR (95%CI)	aOR (95%CI)			
Ever had sex with a man you met online						
No			-	1	-	-
Yes			-	**9.65(3.07-30.34)*** **	-	-
Ever physically met a man you met online						
No			-	-	1	-
Yes			-	-	**5.84 (2.27-14.99)*** **	-
Ever used the Internet to meet other men						
No			-	-	-	1
Yes			-	-	-	**4.76(1.91-11.88)** **
Model Goodness of Fit Statistics						
Δ-2LL	-	**8.64** **	**17.38*** **	**28.95*** **	**22.92*** **	**19.94*** **
R^2	0.094	0.163	0.229	0.315	0.271	0.248
p value (Hosmer-Lemeshow test)	0.565	0.382	0.103	0.394	0.053	0.694

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

Model 2: Health protective sexual communication was entered in the second step and significantly contributed to the overall model's ability to predict history of an STI [χ^2(6, N=224)=20.07, p=.003] above and beyond all variables in step 1. Health protective sexual communication did not significantly predict previous history of STI (p=.339).

Model 3:

Independent Variable: Internet sex seeking behavior (currently own a profile on a website dedicated to meeting other men)

Internet sex seeking behavior was included in the third step and significantly added to the model's prediction of a history of STI [χ^2(7, N=223)=20.50, p=.005] above and beyond all variables in step 2. Results showed Internet sex seeking behavior did not significantly influence a history of STI (p=.970).

Independent Variable: Internet sex seeking behavior (ever had sex with another man you met online)

Internet sex seeking behavior was added in the third step and significantly added to the model's prediction of history of STI [χ^2(7, N=224)=33.472, p<.001] above and beyond all variables in step 2, and it significantly predicted a history of STI (aOR=5.094, p=.001, CI=1.92-13.52).

Independent Variable: Internet sex seeking behavior (ever physically met with a man you initially met online)

The inclusion of Internet sex-seeking behavior in the third step significantly added to the model's prediction of a history of STI [χ^2(7, N=224)=26.96, p<.001] above and beyond all variables in step 2. Findings revealed Internet sex seeking behavior significantly predicted reporting a history of STI (aOR=3.63, p=.017, CI=1.26 – 10.46).

Independent Variable: Internet sex seeking behavior **(ever tried to meet men online)**

Internet sex seeking behavior significantly added to the model's prediction of a history of STI [$\chi^2(7, N=223)=24.32$, p=.001] above and beyond all variables in step 2, but did not significantly predict a history of STI (p=.06). Table 4.6 shows the results of the sequentially-fitted hierarchical logistic regression models for history of STI as well as the goodness of fit statistics associated with each model.

Four models using various operationalizations of Internet sex seeking behavior were used in evaluating the association between Internet sex seeking behavior and risky sexual behavior. To determine the most appropriate regression model to use in evaluating these associations, we assessed the goodness of fit statistics which showed the change in the Akaike information criteria (AIC) from model 2 (model that included covariates and significant correlates) to model 3 (model that included the independent variable, Internet sex seeking behavior). The model which defined Internet sex seeking behavior as "ever had sex with a man you met online" had the lowest AIC value and therefore the greatest change in AIC from model 2 with all outcome variables of interest (UAI, casual sex, history of STI) suggesting that this model had the best fit.[39] This operationalization of Internet sex seeking behavior was therefore used in evaluating its relationship to the primary outcome variables.

Table 4.6- Sequential Logistic Regression Predicting History of STI (n=244)

Variables	Model 1	Model 2	Model 3			
Step 1	OR (95%CI)	aOR(95%CI)	aOR(95%CI)			
Race						
White	1	1	1	1	1	1
Black	1.12(0.82-1.52)	1.14(0.84-1.55)	1.14(0.84-1.55)	1.20(0.87-1.66)	1.16(0.85-1.59)	1.15(0.84-1.57)
Age	**1.19(1.05-1.34)****	**1.18(1.04-1.34)****	**1.17(1.04-1.34)***	**1.20(1.05-1.37)****	**1.19(1.05-1.36)****	**1.17(1.03-1.33)***
Age of first sexual intercourse	**0.86(0.76-0.97)***	**0.86(0.76-0.97)***	**0.85(0.76-0.97)***	**0.87(0.77-0.99)***	**0.87(0.76-0.99)***	**0.86(0.76-0.97)***
Level of education						
≤High school graduate/GED	1					
>High school graduate/GED	1.76(0.79-3.94)	1.85(0.82-4.19)	1.81(0.81-4.08)	1.60(0.70-3.65)	1.59(0.70-3.61)	1.73(0.76-3.92)
Annual Income						
≤$10,000	1	1	1	1	1	1
>$10,000	0.88(0.40-1.93)	0.87(0.40-1.92)	0.87(0.39-1.91)	0.88(0.39-1.97)	0.75(0.34-1.68)	0.87(0.40-1.93)
Step 2						
Health protective sexual communication		1.23(0.81-1.87)	1.26(0.82-1.93)	1.02(0.66-1.59)	1.11(0.71-1.71)	1.14(0.75-1.75)
Step 3						
Currently own an online profile						
No			1	-	-	-
Yes			0.99(0.49-2.00)	-	-	-

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

Table 4.6- Sequential Logistic Regression Predicting History of STI (n=244) *(cont'd)*

Variables	Model 1	Model 2	Model 3			
Step 3						
Ever had sex with a man you met online						
No			-	1	-	-
Yes			-	**5.09(1.9-13.52)*** **	-	-
Ever physically met a man you met online						
No			-	-	1	-
Yes			-	-	**3.63(1.26-10.46)***	-
Ever used the Internet to meet other men						
No			-	-	-	1
Yes			-	-	-	3.00 (0.96-9.44)
Model Goodness of Fit Statistics						
Δ-2LL	-	**0.91****	**1.78****	**14.31****	**7.80*****	**5.60****
R^2	0.130	0.136	0.140	0.221	0.180	0.164
p value (Hosmer-Lemeshow test)	0.026	0.767	0.563	0.852	0.615	0.962

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

DISCUSSION

Consistent with current literature,[19,20] the prevalence of Internet sex seeking behavior among young MSM in our sample is high. Furthermore, many young MSM also appear to be engaging in risky sexual behaviors like UAI and casual sex with sexual partners that they meet online. In examining the relationship between Internet sex seeking behavior and risky sexual behavior, this study utilized four dimensions of Internet sex seeking behavior and examined their individual effects on risky sexual behavior. For example, in this study, 80% of all respondents reported using the Internet at some point to meet other men; 71% reported physically meeting a man they initially met online; 61% reported having sex with a partner they initially met online, and 50% reported owning a profile on an online website dedicated to meeting other men at the time of completing the survey. These figures suggest that the prevalence of Internet sex seeking behavior may vary according to how it's operationalized, potentially impacting its association with outcomes.

After model fit statistics were assessed, the variable "ever had sex with a man you met online" was selected as the best measure of Internet sex seeking behavior. Using this measure, significant bivariate correlates of Internet sex seeking behavior included increasing annual income, self-identifying as gay, disclosing a gay identity, low levels of health protective sexual communication, UAI, casual sex, and history of STI. The association between Internet sex seeking behavior and increasing annual income may suggest that MSM with a greater annual income may be more likely to have access to computers and mobile devices and pay to maintain their subscriptions, thus facilitating Internet sex seeking. Sexually identifying as gay and disclosing a gay sexual identity

were other significant bivariate correlates of Internet sex seeking behavior, consistent with other studies.[42] MSM who disclose their sexuality and are comfortable with their sexuality may be more willing and comfortable to meet and have sex with a prospective partner than MSM who do not identify as gay, either sexually or openly. Gay acculturation and attitudes towards condom use did not differ significantly by sex seeking behavior, similar to the findings from the 2002 study by Benotsch, Kalichman and Cage.[22] This finding may be an artifact of the study since gay affirmative networks like ASOs, LGBTQ associations and community centers were used in recruitment. This method of recruitment may have inadvertently appealed to MSM with higher levels of gay acculturation overall. Internet sex seeking MSM also had lower levels of health protective sexual communication than MSM who did not meet partners online. A reliance on the online profile of prospective partners which may include their sexual preferences (sexual act, HIV sero-status and safe sex) may be responsible for this. This is worrisome considering that Internet sex seeking MSM in this study reported more UAI and HIV positive MSM who seek sex online have acknowledged falsifying their HIV sero-status.[22]

Regression analyses showed that Internet sex seeking behavior was significantly associated with UAI, consistent with other studies[11,22] and casual sex, also consistent with the 2005 study by Hospers and colleagues.[28] However the significant relationship between UAI and Internet sex seeking behavior also countered the findings of the study by Hospers and colleagues,[28] probably due to the fact that their sample was drawn from Holland. No study to our knowledge with a similar operationalization of Internet sex seeking behavior has demonstrated a relationship with history of STI. The 2000 study by McFarlane, Bull, and Reitmeijier which demonstrated a significant association between

Internet sex seeking behavior and history of STI was conducted on a diverse sample of men and women and used a different operationalization of Internet sex seeking behavior.[26] The significant associations between Internet sex seeking behavior and risky sexual behavior is no doubt facilitated by the ease with which sexual partnerships are formed, the ready availability and accessibility to the Internet, and the presence of MSM of diverse risk profiles online.

Other significant associations with Internet sex seeking behavior in the multivariate model were lower health protective sexual communication, increasing annual income, and younger age of first sexual intercourse (UAI), younger age of first sexual intercourse onset and increasing health protective sexual communication (casual sex), and younger age of first sexual intercourse and older age (history of STI). Our data show a consistent relationship between Internet sex seeking behavior and UAI, casual sex, and history of an STI. These relationships have implications for the continued transmission of HIV and other STIs. Considering that the Internet includes individuals with various risk profiles, these virtual sexual networks may serve as bridge populations. MSM who meet sex partners on the Internet may contract and transmit HIV and other STIs from Internet sexual partners, perpetuating the increased burden and transmission rates of HIV among MSM. This is important because other studies have shown that MSM who meet sexual partners online also meet sexual partners in traditional places like bars and clubs offline.[11, 24,39]

This association also has implications for the availability and accessibility of HIV/AIDS healthcare within the southeastern region. This region already receives less Ryan White funding for HIV/AIDS on average, than other regions.[40] An increase in

behavior that increases the likelihood of contracting HIV and HIV resistance through viriologic mixing, may mean that those who become infected may continue to be infectious, drive disparities and disproportionate impact of HIV among MSM within this region.

On the other hand, given the high prevalence of Internet sex seeking behavior among young MSM, the Internet may also present an opportunity to address HIV/AIDS in this population.[21,22] This lends credence to developing and tailoring competent online and mobile HIV/AIDS and STI prevention messages and resources.[21,22] As sex seeking behaviors among MSM have evolved, it is imperative that public health interventions do the same. For example, equipping young MSM with the skills to safely navigate these online virtual sex seeking communities and inculcating these into existing HIV/AIDS intervention is vital. In this study, Internet sex seeking MSM consistently had lower levels of health protective sexual communication than MSM who did not seek sex online. This may point to an inability to engage in discussions about safe sex online. Internet sex seeking MSM may not be knowledgeable about the time, place, or "appropriateness" to engage in health protective sexual communication. Current interventions may benefit by incorporating interactive skill building workshops and demonstrations aimed at increasing the efficacy of MSM to confidently engage in health protective sexual communication while online. This approach is similar to the intervention advocated by Benostch and colleagues where they suggest participants receive feedback based on their current level of sexual risk, are urged to identify behaviors that should be changed, and are offered ways to mitigate this risk.[22]

Further, emphasizing the Internet as an environment where various other MSM of unknown risk profiles meet and stressing the importance of actively taking measures to mitigate risk is essential in current interventions. Almost 20% of study participants reported being unaware, guessing, or relying on online profiles as a method in determining a prospective partners' HIV sero-status. Given this figure, continued emphasis on consistent and correct condom use, delaying sexual contact and initiation until HIV testing is done, as well as other risk reduction strategies in current public health interventions is warranted.

Some other research has proposed that the Internet may be option for MSM who may not openly disclose their sexual orientation ("down low") to meet sexual partners and have encouraged interventions to target this population.[41] However, findings of this study show that MSM who self-identify as gay and disclose their sexual identity are more likely to use the Internet to meet sexual partners, suggesting a focus of online HIV/AIDS prevention messages on the "down low" MSM subpopulation while neglecting or relegating MSM who identify as gay and openly disclose their sexual identity may not be warranted.

Our study has several advantages compared to other studies examining the role of the Internet in risky sexual behavior among MSM. It is one of the few studies to focus on the southeastern US where there has been a dearth of studies focusing on MSM. Also, unlike many other studies, this study focuses on young MSM between 18 and 29, a population burdened by increasing incidence in HIV. Finally, it conceptualizes Internet sex seeking behavior as a latent variable with multiple dimensions and compares the

relationship of these dimensions on risky sexual behavior, drawing inferences from the model with the best fit.

The findings of this study should however be interpreted within the context of its limitations. The cross-sectional study design prohibits casual inferences, therefore it is impossible to say that Internet sex seeking behavior predicts UAI or vice versa. Socially desirable responses may also be a factor especially among participants who completed the surveys offline. This may have led to under-reporting of risky sexual behavior and Internet sex seeking behavior. The nature of the data collection which included utilizing gay affirmative networks may have unknowingly predisposed respondents with higher levels of some variables such as gay acculturation and disclosure of sexual identity to partake in the study. Though efforts were made to obtain a more diverse racial sample, most respondents (75%) identified as black. This may have also impacted the influence of race on the associations. Participants were also not randomly selected but were based on a convenience sampling, potentially limiting the generalizability of the study findings.

Despite these limitations, the consistent relationship between risky sexual behavior and Internet sex seeking behavior after controlling for other socio-demographic suggests a relationship that requires further research. Furthermore, given the various dimensions of evaluating Internet sex seeking behavior and the various associations with our outcome variables, we suggest greater clarity regarding the assessment of Internet sex seeking behavior in future studies and interpretation of findings within the context of its assessment. These various relationships suggest that Internet sex seeking behavior may be a spectrum having various dimensions i.e. having a current online profile, meeting a potential sex partner, engaging in sexual activity, and deactivating the online profile after

some time. Therefore the risk associated with each outcome variable may vary with the MSM's position on the spectrum. This may also be responsible for the contradictory findings previous researchers have presented on the relationship between Internet sex seeking behavior and risky sexual behavior. However, we suggest that the measure, ever had sex with a man they met online may be the best proxy for Internet sex seeking behavior as it is directly related to HIV and other STI risk. Finally, whether the Internet attracts more risk-taking MSM or the Internet is inherently a risk environment because of the ease with which sexual liaisons are established remains inconclusive. What is conclusive is that concerted preventative interventions that target MSM who seek sex and meet sexual partners online are urgently needed.

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MANUSCRIPT 2

THE RELATIONSHIP BETWEEN INTERNALIZED HOMONEGATIVITY, RACE, AND INTERNET USE AMONG YOUNG MEN WHO HAVE SEX WITH MEN[2]

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Abstract

Research has shown that racial differences exist in the gay-related stigma white and black men who have sex with men (MSM) face and the levels of internalized homonegativity (IH) they report. Given this, many young MSM have been known to use the Internet to gain self-acceptance and network with other gay peers while remaining anonymous. However the focus of many Internet studies on MSM is almost always restricted to its association to risky sexual behavior with little emphasis on factors such as IH that may be associated with Internet use. This study evaluates the association between IH and Internet sex seeking behavior, sexual risk behavior, and race among a diverse sample of young MSM. Two hundred and sixty three participants were recruited to take part in this study. Participants were predominantly black (70%), identified as gay (77%), and used the Internet to meet other men for sex (80%). Results of hierarchical linear regression show that black MSM reported significantly higher levels of IH than white MSM and MSM who were not out about their sexual identity reported significantly higher levels of IH than MSM who were out. Also, MSM with higher levels of IH reported less favorable attitudes towards condom use. IH was not associated with Internet sex seeking behavior or unprotected anal intercourse. Due to the highly significant differences in IH between black and white MSM ($p<.001$), further analyses were conducted only on black MSM. Results showed black MSM with high IH had less favorable attitudes towards condom use and were more likely not to disclose their sexual identity. Findings describe ways in which IH may contribute to the racial disparity in the HIV/AIDS burden among MSM and provide suggestions that can inform HIV prevention efforts that target black MSM.

Keywords HIV/AIDS · MSM · Internalized homonegativity · Internet sex seeking behavior · Sexual Identity · Stigma

INTRODUCTION

Men who have sex with men (MSM) remain the group most affected by HIV/AIDS in the United States (US).[1] MSM currently account for about 61% of all incident HIV infections and 79% of infections among newly infected men.[1] MSM are 44 and 40 times more likely to receive a diagnosis of HIV than heterosexual men and women, respectively.[2] The prevalence of HIV is also high, with one in five MSM infected with HIV, and of this, nearly half are unaware of their infection.[3] Incident infections among young MSM ages 13 to 29 years are on the rise, increasing by 34% between 2006 and 2009.[1] Black MSM are also at high risk of HIV infection.[4] They currently make up 72% of new infections among all black men, 36% of new HIV infections among all MSM[1] and young black MSM accounted for the highest proportionate increases (48%) among all young MSM in 2009.[1]

According to the Centers for Disease Control (CDC), stigma and internalized homonegativty/homophobia (IH), have been identified as contributory factors to the burden of HIV/AIDS among MSM.[1] IH refers to the internalization of society's opposition to a gay identity which manifests as self-devaluation, low self-esteem, and feelings of worthlessness.[4-7] In other words, IH is a reflection of the internalization of the stigma MSM face in the society.[5] Cultural influences defined by race and region have been known to drive IH and stigma among MSM.[9-12] In the southern US, negative attitudes towards gay persons are common and promoted by conservative dogma that assigns negative attributes to a gay identifty.[9] Similarly, within the black community, cultural influences that define masculinity in terms of heterosexuality and a strong disapproval of homosexuality are also prevalent,[11,12] despite a general decline in negative

societal attitudes towards the gay community over the past three decades.[12,13] Correspondingly, black MSM are more likely to identify as heterosexual[11] and report higher levels of IH than white MSM,[12] prompting some researchers to theorize that IH may play a role in the racial disparities in HIV/AIDS among MSM.[12,14,15]

The relationship between IH and risky sexual behavior that predispose persons to HIV transmission has been previously documented.[16,17] IH has been directly associated with unprotected anal intercourse (UAI),[16] heightened desire for anonymous partners,[18] reluctance to obtain HIV testing,[12] and drug and alcohol use which may impair sexual descion-making.[16] The indirect effect of IH on risky sexual behavior has also been explored. Research has suggested that IH via sexual compulsion,[17] low self-esteem,[4] anxiety,[18] and a reduced affiliation to the gay community[4] increases the propensity to engage in risky sexual behavior.

In essence, IH appears related to a spectrum of mental and sexual health outcomes that may arise from a feeling of shame and guilt associated with being an MSM.[19,20] This phenomenon may be worse among young MSM, considering that IH is typically more acute early in the development of sexual identity.[21-23] In response, many young MSM have been known to use the Internet to gain self-acceptance, define and develop their sexual identity, connect to the gay community, and network with other gay peers while maintaining their anonymity.[24] However, the focus of many Internet studies has almost been solely on its association with risky sexual behavior,[27-31] without examining psychological factors such as IH that may be associated with Internet use among MSM.

Given the racial influences on IH and the discretion the Internet provides, MSM with high IH, especially black MSM, may be more likely to meet other men online.

Further, these MSM may also be more likely to engage in risky sexual behavior or meet other MSM with risky sexual profiles because of the ease with which sexual partnerships are formed online. It is important that these relationships be examined because its findings may have implications for understanding and addressing racial disparities in the HIV/AIDS burden. Thus, the purpose of this study is to assess the relationship between using the Internet to meet other men and race on IH among young MSM in the southern US. Additionally, we will explore the relationship between IH and sexual behavior and attitudes towards condom use in this population. We hypothesize that MSM who use the Internet to meet other men will have higher levels of IH than MSM who do not meet other men online. We also hypothesize that black MSM would display higher levels of IH than white MSM and that MSM with high levels of IH will report engaging in risky sexual behavior as well as report less favorable attitudes towards condom use.

METHODS

Sample

Data were collected between February 2012 and September 2012. Individuals were eligible for the study if they, (1) identified as male, (2) reported sexual intercourse (oral or anal) with a man, (3) were between the ages of 18 and 29 years, and (4) resided in any of the following states in the southeastern US - South Carolina, North Carolina, Tennessee, Georgia, Florida, Mississippi, or Alabama. Two hundred and sixty seven participants completed the survey but four participants were subsequently dropped because they failed to meet the study's inclusion criteria.

Recruitment Procedure

Participants were recruited from via the Internet and from offline sources. Offline sources of recruitment included AIDS Service Organizations (ASO), Lesbian, Gay, Bisexual, Transgendered & Questioning (LGBTQ) community centers, HIV/AIDS testing events, gay pride events, and from public venues and businesses that cater to the MSM community such as bars and clubs. Participants were also recruited by the snowball technique. The snowball technique is a method of recruitment where the study sample is based on referrals made by people who share or are aware of others who fit the characteristics of research interests.[32]

Online recruitment was facilitated using SurveyMonkey® as a host website. SurveyMonkey® is a web survey development tool which a researcher may use to develop their survey and make available online so that prospective participants may complete it. Two gay social websites, www.adam4adam.com and www.bgclive.com, were used to recruit participants online. The study's inclusion criteria were used in filtering MSM with online profiles. MSM who met recruitment criteria were sent introductory emails. The email included the purpose and description of the survey, details of data protection, an emphasis on participants' anonymity and confidentiality of information provided, participants' right to withdraw from the study, the principal investigator's (PIs) contact information, and a link to the survey on SurveyMonkey®.

Participants recruited offline and online completed identical surveys. Offline participants completed pencil and paper surveys while online participants completed an electronic survey. Internet protocol addresses of participants who were recruited online were recorded to reduce the incidence of duplicate entries.

All participants received a $10 incentive which they could accept, decline, or donate to an ASO selected from a list provided ((South Carolina HIV/AIDS Council, Columbia, SC; AIDS Alabama, Birmingham, AL; AIDS Atlanta. Atlanta, GA; Nashville Cares, Nashville, TN; South Beach AIDS Project, Miami, FL; Chattanooga C.A.R.E.S, Chattanooga, TN). Offline participants who elected to receive the incentive were given the cash incentive upon completion of the surveys while online participants were paid via *PayPal*®, an electronic method of payment. The study was approved by the University of South Carolina Institutional Review Board.

Instrumentation

Demographic information about age, highest level of education, race, ethnic identity, and annual income were obtained. Sexual identity and behavior variables were also collected. These included sexual self-identity, disclosure of sexual identity, age of first sexual experience, history of STI, unprotected anal intercourse (UAI), and casual sex. Questions regarding Internet use and sexual risk behavior were enquired and included frequency of Internet use, recency of Internet use, owning an online profile on a website dedicated to meeting other men, ever using the Internet to meet other men, physically meeting a man after contact online, meeting a sexual partner online, UAI with an Internet sexual partner, number of different Internet sexual partners, and UAI with an Internet sexual partner in the past 12 months. These items were adapted from the CDC's National HIV Behavioral Surveillance Survey, MSM cycle,[33] the Bauermeister study,[34-36] and the Kauth, St Lawrence, & Kelly study.[37]

Health protective sexual communication, a measure of the health dimension of sexual communication, was assessed using the health protective sexual communication

scale. This scale has an acceptable internal consistency of 0.80.[38] Attitudes towards condom use was assessed using the attitudes towards condom use scale with an acceptable internal consistency of 0.88.[39] The Internalized Homonegativity Inventory (IHNI) developed by Wayne Mayfield in 2001 was used to assess IH. This scale has an acceptable internal consistency of 0.91 overall.[40] The gay acculturation scale was used in evaluating gay acculturation. This scale has an acceptable internal consistency of 0.78.[41]

Measures

Socio-demographic Characteristics, Sexual Identity, and Sexual Identity Disclosure: Information regarding age, current gender, annual income (>$5000, $5001-$10000, $10001-$25000, <$25000), highest level of education, and race, sexual identity (gay, bisexual, transgender, questioning, heterosexual, or other), and disclosure of sexual identity or "out" (at least one parent being aware of their sexual identity) were collected.

Sexual Behavior and Attitudes towards Condom Use: Survey items enquired about UAI, casual sex, history of STI, age of first sexual experience, gender of sexual partners (males only or males and females), HIV sero-status, and attitudes towards condom use. UAI was defined as anal sex without a condom. Casual sex was defined as sex with a partner the respondent was not committed to, did not consider to be in an exclusive sexual relationship, and did not regard as a main/steady partner. Participants were also asked to report the most common way of determining a sexual partners' sero-status. Attitudes towards condom use were measured using the attitudes towards condom scale, comprised of 13 items.[39] Examples of items on this scale include "Condoms ruin the natural sex act," and "With condoms, you can't really give yourself over to your partner." Response options were scored on a Likert point scale from 1(strongly disagree)

to 6 (strongly agree) and scores were summed to produce a mean scale score. Lower scores indicated more favorable attitudes towards condom use while higher scores indicated less favorable attitudes towards condom use.

Gay Acculturation: A function of connectedness to the gay community, gay acculturation was measured using the gay acculturation scale. This scale is comprised of eight items. Some of the items include "It is very important that at least some of my friends are bisexual or gay" and "Being gay makes me feel part of a community." Responses were scored on a Likert point scale from 1 (strongly disagree) to 5 (strongly agree). Scores were summed to produce a mean scale score with higher scores representing higher levels of gay acculturation.

Internalized Homonegativity (IH): This was measured using the IHNI. This scale is made up of 23 items and response options were scored on a Likert point scale from 1(strongly disagree) to 6 (strongly agree). Items 1, 6, 8, 9, 12, 21, and 22 were reverse coded.[40] Examples of survey items from the IHNI include "When I think about my attraction towards men, I feel unhappy" and "I am disturbed when people can tell I'm gay." Scores were summed to produce a mean scale score with higher scores indicative of higher levels of IH.

Internet Use and Sex Seeking Behavior: Study participants were asked to report if they had ever tried using the Internet to meet other men, if they had ever physically met a man they initially met online, if they ever had sex (oral or anal) with a man they met online, and if they currently had an online profile on a website dedicated to meeting other men. Participants were also specifically asked to report if they had ever had UAI with an Internet sexual partner, ever had UAI with an Internet sexual partner in the last 12

months, number of different Internet sexual partners, and recency of Internet use to seek sex.

Health protective sexual communication: This was measured using the health protective sexual communication scale.[38] This scale is comprised of eight items and response options were scored on a Likert point scale with scores from 1 (always) to 4 (never). Scores were summed to produce a mean scale score. Example items from the scale include "In the past 12 months, how often do you discuss with a new sex partner the need for both of you to get tested for HIV (the AIDS virus) before having sex" and "In the past 12 months, how often do you ask a new sex partner how he feels about using condoms before you have intercourse." Scores for this scale were based on the mean cumulative response to all items. Higher scores were representative of a lower level of health protective sexual communication while lower scores represented a higher level of health protective sexual communication.

Data Analyses

The IBM Statistical Package for the Social Sciences (SPSS) version 20 was used to perform all analyses. Statistical significance was determined at the $p<0.05$ level. Rate of missingness was low (<7%) and missing data were handled with multiple imputation. Descriptive statistics, bivariate analyses and multivariate analyses were conducted. The dependent variable was IH. Independent variables were race and ever using the Internet to meet other men. Covariates included age, annual income, and level of education. Other correlates of IH such as UAI, health protective sexual communication, attitudes towards condom use and "outness" were included in the regression models. As mentioned earlier, respondents were classified as "out" if they disclosed that they were MSM to at least one

parent. Bivariate analyses were conducted to evaluate the association between IH and demographic characteristics, sexual behavior, correlates of IH and independent variables. Mann-Whitney analyses were used to test the relationship between IH and the categorical variables and Pearson's correlation was used in evaluating the relationship between IH and the continuous variables. The Mann-Whitney test was used instead of a t-test because the data were not normally distributed.

A hierarchical multivariate regression analysis was conducted to determine the independent influence of the Internet sex seeking behavior and race on IH after controlling for demographic and behavioral covariates. The first step in the model included the demographic variables. The second step included significant correlates of IH and the third step included ever using the Internet to meet other men and race.

RESULTS

Table 4.7 shows socio-demographic characteristics of study participants, sexual behaviors and Internet use to meet other men. The mean age of participants was 21.87 (SD=2.81) and ranged from 18 to 29 years. The sample included 183 (69.6%) black men and 61(23.2%) white men. The majority of participants (76.5%) identified as gay while 48 (18.5%) identified as bisexual. Overall, 33% of the sample reported a high school education as the highest form of education, 51% had received some college education and 16% had completed a college education or above. Sixty five percent of participants reported an annual income of $10,000 or below. Ninety-four percent of the participants were recruited from offline sources. The reported annual income was not surprising given that the sample comprised predominantly of college students and participants were recruited from sites frequented by college students. Seventy-eight percent of participants

were out. Relying on partners self-reported HIV status was the most common (52%) way of determining a partner's HIV status. Among participants who were aware of their HIV status, 14.8% were HIV positive.

Regarding their sexual behavior, 88% had previously had casual sex, 20% reported a previous history of a sexually transmitted infection, 75% had engaged in UAI, and 74% had UAI with their last casual sex partner. Eighty percent of participants reported using the Internet to meet other men in the past and 50% reported doing this in the two weeks prior to completing the survey. Of all participants, 50% currently (at the time of completing the survey) had active online profiles on websites dedicated to meeting other men and 71% had physically met with a man they initially met online. Of these meetings, 85% of men reported a sexual encounter with 46% reporting UAI. The mean number of sexual partners participants had met over the Internet was 8.17 (SD=10.41) with a range between 1 and 50.

Table 4.7 - Descriptive Statistics of Socio-demographic Characteristics of Study Sample (n=263)

Variable	*f*	%
Gender		
Male	258	98.1
Transgender	3	1.1
Transitioning	2	0.8
Annual income		
≤$5000	120	45.6
$5000 - %10000	53	20.2
$10001 - $25000	60	22.9
>25000	29	11.1
Highest level of education		
Some high school	19	7.2
High school/GED	68	25.9
Some college	135	51.3
College graduate	32	12.2
Graduate school	9	3.4
Race		
African American	183	69.6
American Indian/Alaska Native	4	1.5
Asian	2	0.8
White	61	23.2
Multiracial	13	4.9
Sexual self-identification		
Gay/homosexual	199	76.5
Heterosexual/straight	1	0.4
Bisexual	48	18.5
Transgender	7	2.7
Questioning	3	1.2
Queer	1	0.4
Other	1	0.4
Out to parents about being LGBTQ		
Yes	166	64.3
No	57	22.1
Out to only one of my parents	35	13.6
Gender of previous sexual partners		
Males only	176	66.9
Males and Females	80	31.3
Ever had casual sex		
Yes	226	87.5
No	32	12.4

Table 4.7 - Descriptive Statistics of Socio-demographic Characteristics of Study Sample (n=263) *(cont'd.)*

Variable	*f*	%
Current HIV status		
Positive	35	13.7
Negative	201	78.8
Don't know	19	7.4
Ever had an STI		
Yes	50	19.5
No	207	80.5
Ever had UAI		
Yes	191	74.9
No	64	25.1
Ever tried to use the Internet to meet other men		
Yes	206	79.5
No	53	20.5
Last time used the Internet to meet other men		
≤2 weeks	117	46.8
>2 weeks – 2 months	25	10
>2 months – 6 months	47	18.8
>6 months – 1 year	19	7.6
Ever physically met with a man you initially met online		
Yes	186	70.7
No	74	28.5
Ever had sex with a man you met online		
Yes	159	61.4
No	100	38.6
Ever had UAI with a man you met online		
Yes	74	28.6
No	185	70.3
Had UAI with a man you met online in the past 12 months		
Yes	58	22.1
No	202	77.7
Current profile on a website dedicated to meeting other men		
Yes	129	50
No	129	50
Most common way to determine sexual partners' HIV status		
He told me	133	51.8
I saw his HIV report	70	27.2
I do not know his status	37	14.4
I just guessed	8	3.1
I got it from his online profile	8	3.1

Table 4.7 - Descriptive Statistics of Socio-demographic Characteristics of Study Sample (n=263) *(cont'd.)*

Variable	*f*	%
Recruitment		
Offline	247	94
Online	16	6
Age		
Range	18 - 29	
Mean *(SD)*	21.87 (2.81)	
Age at first sexual intercourse		
Range	7 - 26	
Mean *(SD)*	15.6 (2.89)	
Number of different men you have had sex with that you met online		
Range	1 - 50	
Mean *(SD)*	8.17 (10.41)	

Results of Mann-Whitney analyses (Table 4.8) showed that IH was significantly associated with black race ($p<0.001$), not out ($p<0.001$), not identifying as gay ($p<0.001$), behaviorally bisexual (sex with males and females) ($p<0.05$), never using the Internet to meet other men online ($p<0.05$), and reporting a history of physically meeting a man they initially met online ($p<0.05$). IH was also significantly but inversely associated with UAI ($p<0.05$). IH was not significantly associated with annual income, educational level, having sex with a partner respondents met online, and currently having an online profile on a website dedicated to meeting other men. Pearson's correlation (Table not shown) showed that IH was significantly correlated with attitudes towards condom use ($p<0.05$) but not significantly associated with age and health protective sexual communication.

Hierarchical linear regression was subsequently conducted. Despite their non-significant association in bivariate analyses, the demographic covariates age, highest level of education, and annual income were included because of their conceptual significance as confounders. UAI, out about sexual identity and attitudes towards

condom use were included in step 2. In order to avoid multi-collinearity with the variable, sexual self-identification and bisexual behavior were not included in step 2 despite their significant bivariate association with IH. Race (white and African American) and using the Internet to meet other men were entered in step 3.

Results of the hierarchical linear regression show that less favorable attitudes towards condom use ($p<.01$), not out about sexual identity ($p<.001$), and black race ($p<.001$) were all significantly associated with IH. The final model accounted for 20.5% of the variance in IH. IH was not significantly associated with using the Internet to meet other men. See Table 4.9 for results and model goodness of fit statistics. Due to the significantly higher levels of IH among black MSM ($p<.001$), hierarchical regression analyses were conducted to determine if significant associations between IH and these variables existed among black MSM. Results showed that less favorable attitudes towards condom use ($p<.01$) and not out about sexual identity ($p<.001$) remained significantly associated with IH. The final model accounted for 16.6% of the variance in IH. See Table 4.10 for results and model goodness of fit statistics.

Table 4.8- Association between IH and Socio-demographic, Internet Use, and Sexual Risk Variables

Variable	IH score	*p-value*
Annual income		
≤$1000	2.25	.209
>$10000	2.10	
Race		
Black	2.34	.000**
White	1.75	
Highest level of education		
High school	2.20	.527
College level	2.21	
UAI		
Yes	2.15	.017*
No	2.41	
Out about sexuality		
Yes	2.07	.000**
No	2.68	
Sexual self-identity		
Gay	2.08	.000**
Bisexual	2.69	
Gender of sexual partners		
Male only	2.12	.026*
Male and female	2.36	
Casual sex		
Yes	2.18	.431
No	2.26	
Ever tried to meet men using the internet		
Yes	2.15	.046*
No	2.37	
Ever had sex with a man you met online		
Yes	2.25	.216
No	2.17	
Current online profile on a website dedicated to meeting other men		
Yes	2.14	.336
No	2.26	
Ever physically met with a man you met online		
Yes	2.12	.017*
No	2.39	

**p<.05 **p<.001*

Table 4.9- Hierarchical Regression showing Associations of IH among Young Men Who have Sex with Men (n=263)

Variables	β	95%CI	SE	β	95%CI	SE	β	95%CI	SE
		Model 1			**Model 2**			**Model 3**	
Age	.05	-.03-.06	.02	.04	.03-.06	.02	.03	-.03-.05	.02
Annual Income									
≤$10000	1			1			1		
>$10000	-.12	-.51-.04	.14	-.07	-.40-.12	.13	-.04	-.34-.18	.13
Highest Level of education									
<=high school/GED	1			1			1		
>high school	.02	-.21-.31	.13	.02	-21-.28	.13	.07	-.11-.37	.12
UAI									
yes				1			1		
no				-.09	-.45-.09	.14	-.09	-.44-.08	.13
Attitudes towards condom use				**.16***	.05-.34	.08	**.19****	.08-.37	.07
Out about sexuality									
yes				1			1		
no				**.27*****	.32-.86	.14	.23***	.24-.77	.14
Race									
white							1		
black							**.28*****	.11-.28	.04
Ever tried to meet men using the Internet									
no							1		
yes							-.06	-.41-.13	.14
Model Goodness of Fit									
ΔF	.96			9.95***			10.52***		
R^2	.013			.129			.205		
Adjusted R^2	.000			.106			.176		
Δ R^2	.013			.117			.076		

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

Table 4.10- Hierarchical Regression showing Associations of IH among Young Black Men Who have Sex with Men (n=183)

Variables	β	95%CI	SE	β	95%CI	SE	β	95%CI	SE
		Model 1			**Model 2**			**Model 3**	
Age	.05	-.03-.07	.03	.08	-.02-.08	.03	.09	-.02-.08	.03
Annual Income									
≤$10000	1						1		
>$10000	-.07	-.47-.18	.17	-.02	-.35-.27	.16	-.02	-.35-.26	.16
Highest Level of education									
<=high school/GED	1						1		
>high school	.11	-.09-.51	.15	.09	-.09-.47	.14	.10	-.08-.48	.14
UAI									
yes				1			1		
no				-.11	-.54-.09	.16	-.09	-.51-.12	.16
Attitudes towards condom use				**.20***	.08-.43	.09	**.20***	.07-.43	.09
Out about sexuality									
yes							1		
no				**.28****	.27-.91	.16	**.27****	.26-.89	.16
Ever tried to meet men using the Internet									
no							1		
yes							-.09	-.54-.11	.16
Model Goodness of Fit									
ΔF	.90			**9.35****			1.68		
R^2	.016			.158			.166		
Adjusted R^2	-.002			.128			.131		
Δ R^2	.016			.142			.009		

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

DISCUSSION

Study findings suggest that many respondents engage in high risk sexual behavior, especially with sexual partners that they meet online. The high prevalence of Internet use by the sample to meet men also corroborates previous research that suggests that the Internet is becoming an avenue for MSM to meet other men for various purposes that include establishing sexual partnerships.[24-31] In this study, multivariate analyses revealed no difference in IH between MSM who reported using the Internet to meet other men and MSM who did not report using the Internet to meet other men. This lack of a significant association may be explained by the overall elevated prevalence of Internet use in this sample, so much so that Internet use to meet other men does not vary by IH. However, supporting our hypothesis, findings in this study showed that black MSM were significantly more likely to report higher levels of IH than white MSM, consistent with other studies.[12-15] This difference may be due to twin barriers that young black MSM face - living in a predominantly southern heterosexist society that identifies masculinity with a heterosexual identify, as well as the disapproval and lack of support for a gay identity prevalent within the black community relative to the white community.

UAI was not significantly associated with IH in the multivariate analyses though there was a significant but inverse association in the bivariate analysis. Other studies examining this relationship have produced mixed results with some supporting a relationship while others have failed to demonstrate a significant relationship.[19,43] Self-esteem, anxiety, and difficulty in intimacy, all potentially mediating variables which this study did not account for, may be advanced as reasons for the absence of any significant relationship. MSM who failed to disclose their sexual identity to at least one parent were

also more likely to report higher IH than those who did. This may point to the importance of family support among MSM in becoming comfortable with their sexual identity. Further, family systems may serve as a buffering mechanism against negative societal stereotypes and serve as an emotional, personality, and cultural affirming resource for MSM. On the other hand, this may also indicate that these MSM may be comfortable enough to disclose their sexual identity to their family members irrespective of whether they receive support from them or not.

Attitudes towards condom use were also associated with IH. MSM with high levels of IH were significantly less likely to report favorable attitudes towards condom use. This finding may have implications for the incidence and risk of contracting HIV among MSM with high IH. IH also did not differ by educational level, annual income or age contradicting Ross et al.[16] This could suggest that educational level, annual income, and age, which may serve as a bulwark against many other health outcomes may not have the same effect on IH. MSM, irrespective of age and social privilege, may internalize societal stereotypes. Unsurprisingly, independent associations showed that behaviorally bisexual MSM reported significantly higher levels of IH than MSM who reported only same gender sexual partners, concurring with findings from other studies.[17] This may suggest that behaviorally bisexual MSM may perceive a greater degree of shame and guilt about their sexual behavior. Consequently, and as other researchers have noted, they may therefore be less likely to disclose their same-sex encounters to females and engage in sexual risk-reduction practices.[44]

Findings from the analysis conducted among black MSM mirror that of the entire sample. IH did not differ by Internet use to meet other men. Also, black MSM with high

levels of IH had less favorable attitudes towards condom use and were more likely to fail to disclose their sexual orientation to at least one parent. UAI, income, age, and educational level were also not significantly associated with IH. Among black MSM, behaviorally bisexual men were also more likely to report higher levels of IH than MSM who only engaged in same-sex encounters. These findings have ramifications for strategies to combat the continued transmission of HIV among this subpopulation of MSM. Black gay men with positive sexual identity and racial impressions are more likely to have elevated levels of self-esteem and HIV prevention self-efficacy.[45] In contrast, black MSM with higher levels of IH may therefore be less likely to adopt behaviors such as HIV testing, negotiating safe sex, and condom use which reduce their risk of contracting HIV.

Most current prevention and education efforts appear to focus on addressing sexual risk behaviors, and rightly so.[46] However, little emphasis is placed on variables such as IH that also impact risk reduction efforts. The association of IH with factors that may mediate risky sexual behavior suggests that prevention interventions targeting MSM should be comprehensive, addressing IH and sexual behavior. Resources that provide supportive and affirmative messages, build self-esteem, self-efficacy, and personal confidence should be core parts of these interventions. Interventions that target black MSM should also focus on messages that affirm a positive sexual identity especially among behaviorally bisexual black MSM. Prevention facilitators should also be made aware of the effects of IH and trained to identify MSM with high levels of IH. They should be trained to assist affected MSM to overcome these negative stereotypes that can potentially impact their sexual health. They should also be equipped to provide resources

or referrals to resources that may mitigate IH among MSM such as mental health, safe havens, and safe zone allies.

Furthermore, interventions should be developed which incorporate and emphasize favorable attitudes towards condom use and dispel myths surrounding UAI among MSM if efforts to stem the epidemic within this subpopulation are to succeed. Equipping MSM to successfully marshal these virtual communities is key, given the prevalence of Internet sex seeking behavior in this population. Interventions may also want to include skill building sessions that focus on sexual identity disclosure to family members that young MSM may utilize when they are ready to disclose to their family members.

Like other studies, this study has its limitations. Our sample was a convenience sample in a geographically restricted area, not a generalized random sample therefore results may not be generalized to all MSM. Recruitment techniques targeted gay affirmative networks, inadvertently resulting in the elimination of closeted gay men that may have biased results. Data were based on self-reports, with no way of independently validating participants' responses. Socially desirable responses by study participants present another limitation, considering some of the questions included sexual behavior. Despite these limitations, this is the first study to examine the association between the Internet, a novel and burgeoning meeting place for MSM anonymously, and IH, an important correlate of HIV/AIDS, among young MSM. We are confident that the findings of this study may inform future HIV/AIDS prevention efforts that target MSM. We encourage further studies that examine IH among MSM, especially as it relates to Internet use because of its implications for the overall wellbeing of the population most impacted by HIV.

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CHAPTER 5

DISCUSSION

Introduction

The purpose of this chapter is to provide an overview of the specific aims and research questions that guide this study and present results of the analyses conducted to evaluate them. This chapter will additionally present a discussion of the conclusions, limitations of this study, and lessons learned from this study.

Path analysis was conducted using MPlus software to determine the effect of Internet sex seeking behavior on IH, UAI, casual sex, history of STI, health protective sexual communication, and perception of sexual partners' risk,. The study also aimed to determine if race (White vs. African American) moderated this relationship. Other covariates included in this model include age, highest level of education, sexual self-identity, annual income, and gay acculturation. As is the purpose of path analysis, I used this procedure to simultaneously regress all of my dependent variables (IH, UAI, casual sex, history of STI, health protective sexual communication, and perception of sexual partners' risk) on a set of predictors (Internet sex seeking behavior and race). Results of the path analysis are provided in Table 5.1 followed by a response to each research question and hypothesis.

Table 5.1. Path Analysis Predicting IH, UAI, Casual Sex, History of STI, Health Protective Sexual Communication and Perception of Partners' Risk (n=244)

	Variables	Estimate	SE	Test statistic	p-value
IH	Age	0.008	0.021	0.379	0.704
	Highest level of education				
	≤high school/GED	1			
	>high school	**0.240**	**0.112**	**2.138**	**0.033**
	Race				
	White	1			
	African American	**0.132**	**0.042**	**3.143**	**0.002**
	Sexual self-identity				
	non-gay	1			
	gay	**-0.486**	**0.132**	**-3.676**	**0.000**
	Annual income				
	≤$10000	1			
	>$10000	-0.135	0.130	-1.040	0.298
	Gay acculturation	**-0.287**	**0.082**	**-3.504**	**0.000**
	Internet sex seeking				
	no	1			
	yes	0.024	0.104	0.231	0.817
	Race*Internet sex seeking	0.002	0.001	1.917	0.055
UAI	Age	0.091	0.064	1.421	0.155
	Highest level of education				
	≤high school/GED	1			
	>high school	-0.308	0.355	-0.866	0.386
	Race				
	White	1			
	African American	-0.032	0.140	-0.227	0.821
	Sexual self-identity				
	non-gay	1			
	gay	0.555	0.417	1.330	0.184
	Annual income				
	≤$10000	1			
	>$10000	**0.894**	**0.416**	**2.148**	**0.032**
	Gay acculturation	-0.277	0.270	-1.028	0.304
	Internet sex seeking				
	no	1			
	yes	**1.176**	**0.319**	**3.693**	**0.000**
	Race*Internet sex seeking	**0.012**	**0.005**	**2.273**	**0.023**

Table 5.1. Path Analysis Predicting IH, UAI, Casual Sex, History of STI, Health Protective Sexual Communication and Perception of Partners' Risk (n=244) *(cont'd.)*

	Variables	Estimate	SE	Test statistic	p-value
Casual sex	Age	0.120	0.081	1.484	0.138
	Highest level of education				
	≤high school/GED	1			
	>high school	-0.062	0.540	-0.115	0.908
	Race				
	White				
	African American	0.143	0.194	0.736	0.462
	Sexual self-identity				
	non-gay				
	gay	-0.339	0.554	-0.612	0.541
	Annual income				
	≤$10000				
	>$10000	-0.720	0.490	-1.469	0.142
	Gay acculturation	0.136	0.391	0.347	0.729
	Internet sex seeking				
	no	1			
	yes	**2.745**	**0.559**	**4.906**	**0.000**
	Race*Internet sex seeking	0.012	0.007	1.664	0.096
History of STI	Age	**0.214**	**0.056**	**3.827**	**0.000**
	Highest level of education				
	≤high school/GED	1			
	>high school	0.337	0.384	0.878	0.380
	Race				
	White	1			
	African American	0.224	0.152	1.468	0.142
	Sexual self-identity				
	non-gay	1			
	gay	-0.158	0.477	-0.331	0.741
	Annual income				
	≤$10000	1			
	>$10000	-0.225	0.386	-0.583	0.560
	Gay acculturation	-0.266	0.278	-0.958	0.338
	Internet sex seeking				
	no	1			
	yes	**1.709**	**0.451**	**3.790**	**0.000**
	Race*Internet sex seeking	-0.004	0.005	-0.914	0.361

Table 5.1. Path Analysis Predicting IH, UAI, Casual Sex, History of STI, Health Protective Sexual Communication and Perception of Partners' Risk (n=244) *(cont'd.)*

	Variables	Estimate	SE	Test statistic	p-value
Perception of partners' risk	Age	-0.007	0.020	-0.336	0.737
	Highest level of education				
	≤high school/GED	1			
	>high school	-0.104	0.107	-0.966	0.334
	Race				
	White	1			
	African American	-0.048	0.041	-1.192	0.233
	Sexual self-identity				
	non-gay	1			
	gay	-0.037	0.126	-0.291	0.771
	Annual income				
	≤$10000	1			
	>$10000	-0.076	0.116	-0.655	0.512
	Gay acculturation	0.035	0.083	0.415	0.678
	Internet sex seeking				
	no	1			
	yes	0.106	0.094	1.119	0.263
	Race*Internet sex seeking	**-0.001**	**0.001**	**-2.084**	**0.037**
Health protective sexual communication	Age	0.027	0.019	1.422	0.155
	Highest level of education				
	≤high school/GED	1			
	>high school	-0.218	0.115	-1.885	0.059
	Race				
	White	1			
	African American	**-0.138**	**0.045**	**-3.105**	**0.002**
	Sexual self-identity				
	non-gay	1			
	gay	-0.042	0.136	-0.312	0.755
	Annual income				
	≤$10000	1			
	>$10000	-0.043	0.121	-0.358	0.720
	Gay acculturation	-0.147	0.091	-1.624	0.104
	Internet sex seeking				
	no	1			
	yes	**0.247**	**0.110**	**2.252**	**0.024**
	Race*Internet sex seeking	**0.004**	**0.001**	**5.484**	**0.000**

Specific Aims and Research Questions

a) Specific Aim 1 (SA1): Examine the association between sex seeking behavior, race, and IH among MSM.

Research Question 1 (RQ1): Among MSM, is there a relationship between online and offline sex seeking behavior and IH?

Hypothesis 1: *MSM who seek sex online will have higher levels of IH than MSM who seek sex offline.*

Results of the path analysis suggested that IH did not differ significantly by Internet sex seeking behavior ($p=0.817$). However, MSM who reported African American race ($p<0.01$), higher level of education ($p<0.05$), non-gay sexual self-identity ($p<0.001$), and lower levels of gay acculturation ($p<0.001$) were more likely to have higher levels of IH that those who did not.

Research Question 2 (RQ2): Among MSM, is the relationship between online and offline sex seeking behavior and IH moderated by race?

Hypothesis 2: *African American MSM who seek sex online will have higher levels of IH than White MSM who seek sex online.*

Race did not significantly moderate the relationship between Internet sex seeking behavior and IH ($p=0.055$), although it approached significance.

b) Specific Aim 2 (SA2): Examine the association between sex seeking behavior, race, and risky sexual behavior (operationalized as UAI, casual sex, and history of STI) among MSM.

Research Question 1a (RQ1a): Among MSM, is there a relationship between online and offline sex seeking behavior and UAI?

Hypothesis 1a: *MSM who seek sex online will be more likely to report UAI than MSM who seek sex offline.*

MSM who sought sex online were significantly more likely to report UAI than MSM who did not seek sex online ($p<0.001$). In addition, MSM with increasing income were more likely to engage in UAI ($p<0.05$).

Research Question 2a (RQ2a): Among MSM, is the relationship between online and offline sex seeking behavior and UAI moderated by race?

Hypothesis 2a: *White MSM who seek sex online will be more likely to report UAI than African American MSM who seek sex online.*

Race significantly moderated the relationship between Internet sex seeking behavior and UAI. African American MSM who sought sex online were significantly more likely to report UAI than White MSM who sought sex online ($p<0.05$).

Research Question 1b (RQ1b): Among MSM, is there a relationship between online and offline sex seeking behavior and casual sex?

Hypothesis 1b: *MSM who seek sex online will be more likely to report casual sex than MSM who seek sex offline.*

MSM who sought sex online were significantly more likely to report casual sex than MSM who did not seek sex online ($p<0.001$).

Research Question 2b (RQ2b): Among MSM, is the relationship between online and offline sex seeking behavior and casual sex moderated by race?

Hypothesis 2b: *White MSM who seek sex online will be more likely to report casual sex than African American MSM who seek sex online.*

Race did not significantly influence the relationship between Internet sex seeking behavior and casual sex (*p=0.096*).

Research Question 1c (RQ1c): Among MSM, is there a relationship between online and offline sex seeking behavior and history of STI?

Hypothesis 1c: *MSM who seek sex online will be more likely to report a history of STI than MSM who seek sex offline.*

Internet sex seeking MSM were more likely to report a history of STI than MSM who did not seek sex online (*p<.001*). Increasing age was also significantly associated with a history of STI (*p<0.001*).

Research Question 2c (RQ2c): Among MSM, is the relationship between online and offline sex seeking behavior and risky sexual behavior moderated by race?

Hypothesis 2c: *White MSM who seek sex online will be more likely to report a history of STI than African American MSM who seek sex online.*

Race did not significantly moderate the relationship between Internet sex seeking behavior and history of STI (*p=0.361*).

c) <u>Specific Aim 3 (SA3):</u> Examine the association between sex seeking behavior, race, and health protective sexual communication among MSM.

Research Question 1 (RQ1): Among MSM, is there a relationship between online and offline sex seeking behavior and health protective sexual communication?

Hypothesis 1: *MSM who seek sex online will have lower levels of health-protective sexual communication than MSM who seek sex offline.*

MSM who used the Internet to seek sex were more likely to report lower levels of health protective sexual communication than MSM who did not ($p<0.05$). African American MSM were more likely to report higher levels of health protective sexual communication than White MSM ($p<.001$).

Research Question 1 (RQ1): Among MSM, is the relationship between online and offline sex seeking behavior and health protective sexual communication moderated by race?

Hypothesis 1: *African American MSM who seek sex online will have lower levels of health-protective sexual communication than White MSM who seek sex online.*

Race significantly moderated the relationship between Internet sex seeking behavior and health protective sexual communication. African American MSM who sought sex online were more likely to report lower levels of health protective sexual communication than White MSM who sought sex online ($p<.001$).

d) <u>Specific Aim 4 (SA4):</u> Examine the association between sex seeking behavior, race, and perception of partners' sexual risk among MSM.

Research Question 1 (RQ1): Among MSM, is there a relationship between online and offline sex seeking behavior and perception of partner's risk?

Hypothesis 1: *MSM who seek sex online have a lower perception of partners' risk than MSM who seek sex offline.*

There was no significant difference in perception of partner risk between MSM who sought sex online and MSM who did not ($p=0.263$).

Research Question 2 (RQ2): Among MSM, is the relationship between online and offline sex seeking behavior and perception of partner sexual risk moderated by race?

Hypothesis 2: *White MSM will have a lower perception of partners' risk than African American MSM.*

Race significantly moderated the relationship between Internet sex seeking behavior and perception of partners' sexual risk. African American MSM who sought sex online were more likely to perceive greater partner sexual risk than White MSM who sought sex online ($p<0.05$).

Conclusions and Study Implications

The Internet and sex seeking behavior have come to represent a new frontier for health educators and public health practitioners involved in addressing HIV/AIDS (Benotsch, Klaichman, & Cage, 2002). The prevalence of Internet sex seeking behavior by MSM reflects this and for efforts to address HIV in this population to achieve any success, they must evolve to accommodate these changes. As young MSM represent a growing subpopulation of MSM who seek sex online (Bolding, Davis, Hart, Sherr,& Elford), while also accounting for the disproportionate number of cases of HIV/AIDS within this population (CDCe, 2013), understanding correlates of Internet sex seeking behavior is critical to the development of effective public health programs. Likewise, understanding how these correlates of Internet sex seeking behavior vary with race may prove vital in tailoring sexual health interventions that address unique barriers to safe sexual behavior among MSM of different racial and ethnic groups.

In order to identify correlates of Internet sex seeking behavior among young MSM in the southern US, this study explored the relationship between Internet sex seeking behavior on IH, UAI, casual sex, history of STI, health protective sexual communication, and perception of partners' risk and evaluated the influence of race on these associations. Findings of this study revealed that MSM who sought sex on the Internet were more likely to engage in casual sex and report a history of STI, consistent with other studies (Hospers, Kok, Harterink, & de Zwart, 2005; McFarlane, Bull, & Rietmeijer, 2000). Further, African American MSM who sought sex online were more likely to engage in UAI than White MSM who sought sex online. African American MSM who sought sex online were also more likely to report lower levels of health protective sexual communication than White MSM who sought sex online, despite the fact that White MSM overall had lower levels of health protective sexual communication than African American MSM. Finally, African American MSM who sought sex online were more likely to perceive a greater sexual risk associated with a prospective partner than White MSM who sought sex online.

The consistent association between Internet sex seeking behavior and risky sexual behavior like UAI, casual sex and history of STIs suggest that the Internet may represent an environment where MSM are prone to engaging in risky sexual behavior that increase the likelihood of contracting HIV (Benotsch, Klaichman, & Cage, 2002; McFarlane, Bull, & Rietmeijer, 2000). The ease with which sexual partnerships are formed as well as the ready availability and accessibility to the Internet no doubt facilitates this. In concert, these factors may promote the formation of virtual sexual networks that may serve to further propagate the spread of HIV and other STIs within these online communities.

Considering that MSM who meet men online may also meet other men and women offline, these MSM may serve as a bridge population that could potentially transmit HIV and other STIs from a high risk virtual community to the low risk offline community.

The racial differences in the relationship between Internet sex seeking behavior and the outcome variables (IH, UAI, casual sex, history of STI, health protective sexual communication, and perception of partner's risk) have implications for designing future health interventions overall as well as those that target African American MSM. Study findings suggest that African American MSM who seek sex online are more likely to engage in UAI than White MSM who seek sex online, though they are also more likely to perceive a greater sexual risk associated with an Internet sexual partner. This may imply that African American MSM in this sample may not fully comprehend sexual risk. In other words, African American MSM may comprehend risk as a function of the prospective partner, as opposed to defining risk in terms of the sexual act (UAI) (Varghese, Maher, Peterman, Thomas, Branson, & Steketee, 2002). African American MSM may consider a prospective Internet sexual partner a high risk individual but may not consider UAI a risky sexual behavior when engaging in sexual intercourse with the partner. This might point to associating sexual risk with the Internet environment and not the partner. This has implications for the risk of HIV because the behavior, UAI in this case, increases the risk, not necessarily the risk environment. Public health interventions may benefit from emphasizing the association between the risk associated with meeting partners online and the subsequent risk of contracting HIV from UAI with these partners.

Other mediating factors may be responsible for the relationship between perception of partners' risk and engaging in sexual risk behavior like UAI. Although this

study did not examine health protective sexual communication as a mediator of the aforementioned relationship, it may play a role. African American MSM were more likely to report lower levels of health protective sexual communication than White MSM who sought sex online. This may point to the fact that though African American MSM may perceive greater risk associated with seeking sex on the Internet, they may engage in UAI because of a failure to communicate safe sex strategies with a prospective partner. It may therefore be beneficial if public health interventions that are tailored to African American MSM focus on increasing the efficacy of African American MSM to successfully engage in health protective sexual communication with prospective Internet sexual partners.

The influence of race on the relationship between Internet sex seeking behavior and IH was not significant, however, it approached significance ($p=0.055$) with African American MSM who seek sex online reporting higher levels of IH than White MSM who did. Interventions that focus on African American MSM may want to incorporate gay-affirmative themes that may increase self-esteem and self-worth as lower levels of IH have been associated with HIV preventive behaviors (Crawford, Allison, Zamboni, & Soto, 2002). Facilitators should also be trained to identify IH and be able to provide information about resources that may help African American MSM who may have high levels of IH.

These findings provide further evidence for the high prevalence of Internet use among MSM (Liau, Millett, & Marks, 2006; Mustanski, 2007). This suggests that the Internet may be an effective avenue to reach many young MSM. Health educators may therefore benefit from utilizing the Internet to present MSM-specific information and

resources to this population. These resources could be interactive resources that present MSM with various role–playing scenarios (online and offline) (Benotsch, Klaichman, & Cage, 2002). These activities may serve to increase self-efficacy of MSM to navigate risky sexual scenarios and engage in safe sexual behavior. Besides this, the inclusion of information regarding testing and condom distribution locations may also be of benefit. Finally, our study findings support the conceptual model that guided this study. They provide evidence for the relationship between Internet sex seeking behavior and personal factors like perception of sexual risk and behavioral factors like health protective sexual communication, UAI, casual sex, and history of STI, as well as the influence of race on these relationships.

Study Limitations

This study, like all studies, has limitations. The utilization of a convenience sample of MSM rather than a random sample predisposes the sample to selection bias. This type of sampling may skew the target population and result in recruiting MSM with very similar characteristics. These characteristics may include a higher level of comfort with their gay identity, lower levels of IH, similar social networks and sexual practices. For example, MSM with higher levels of gay acculturation or those who openly identified as gay or MSM may have been inadvertently targeted. To prevent this, we utilized facilities and media that did not solely target MSM so that MSM who may not openly identify as gay may have the opportunity to take part in the study.

Providing socially desirable responses is another limitation of the study, especially when responding to questions related to sexual behavior. In order to address this, all participants were encouraged to provide honest answers and the anonymity and

confidentiality of responses as well as the inability of the study team to trace responses to specific participants was emphasized.

The lack of validated scales to evaluate some variables directly was another limitation. In assessing perception of partners' sexual risk, a proxy scalar variable, attitudes towards condom use was used. This scale may not be a true representation of perception of partners' sexual risk and may limit the strength of inferences made using this variable, its internal validity and external validity.

External validity may be another limitation of this study. Given that the study criteria were specific to a particular sub-demographic of MSM, the findings of this study may not be generalized to all MSM populations in the US. Finally the study design used, a cross-sectional study, precludes determination of causality between these variables. Despite this, the limitations in no way reduce the significance of our study as they are limitations faced by many researchers, particularly those that study hard-to-reach populations. Furthermore, the findings of this study provide valuable insight into the correlates of Internet sex seeking behavior among young MSM in the southern US.

Lessons Learned

Several barriers and challenges faced the PI while conducting this study. Acknowledging these challenges and highlighting the lessons learned are key to improving future studies that focus on MSM and Internet sex seeking behavior. The PI faced challenges in recruiting participants from both online and offline sources. Online recruitment was done using two gay-affiliated social websites, www.adam4adam.com and www.bgclive.com. One hundred and forty prospective participants with online profiles were screened according to the study's eligibility criteria and sent introductory

emails to describe the study. They were offered $10 incentives to be paid via PayPal® and the anonymity and confidentiality of their responses was assured. Despite this, the response rate to the online survey was very low. After discussing with a senior colleague who had successfully recruited participants online, the PI learned of more successful strategies to conduct online recruitment. These included contacting the administrators of these websites, informing them of the study, and soliciting their assistance in sending out email blasts to members who fit the study criteria. It was suggested that this method may appear more legitimate to recipients and they may be more likely to click on the link as opposed to receiving an email from an unknown account.

Another online recruitment strategy included creating an option where the incentive could be applied to pay for more subscription time to the website. For websites that are free and do not have a subscription service, it was suggested that the participants should have the option of applying the incentives to pay for products that the websites sells. The PI's colleague reported successful recruitment with these strategies. Identifying key stakeholders in the LGBT community was instrumental in recruiting offline participants. Partnering with facilitators of MSM HIV/AIDS interventions at ASOs, leaders at LGBT community centers, owners of LGBT bars and clubs, the executive council of LGBTQ associations, and the Director of the University of South Carolina Office Of Multicultural Affairs were crucial in accessing the larger LGBT community. These partnerships were very influential in recruiting participants and lent credibility to the survey. Snowball sampling was another effective recruitment method. Individuals who referred other participants who fit the study inclusion criteria were offered an

incentive. This strategy served to drive study participation especially at the beginning of data collection.

Another lesson learned was that different avenues had to be used in recruiting White and African American MSM. Most of the aforementioned partnerships that were established were critical in recruiting African American MSM but not White MSM, hence the racial disparity in participants. In the future, it will be beneficial to identify, a priori, key stakeholders and locations where White MSM may be recruited so that a more racially balanced sample may be obtained.

Pilot testing the survey and conducting cognitive interviews were also very important. The surveys were pilot tested with two members of the target population. This process facilitated the crafting of survey questions in a way that the target population could easily comprehend. It enabled the inclusion of words that could better communicate the information the survey items were trying to elicit. Cognitive interviewing enabled the PI to include questions that were not initially thought of but were pertinent to the study's aim. It also enabled the PI to determine respondent burden.

Finally, understanding the concept of Internet sex seeking behavior as a spectrum was also a lesson learned. Prior to the study, the PI considered Internet sex seeking as one dimensional and characterized it as "currently owning an online profile on a website dedicated to meeting other men." However, while analyzing data, the PI recognized that Internet sex seeking behavior could also include "ever trying to meet other men on the Internet", "ever physically meeting other men online", and "ever having sex with a man you met online." Subsequently, Internet sex seeking behavior was characterized as "ever having sex with a man you met online" because the model with the best fit contained this

operationalization of Internet sex seeking behavior. This understanding came with critically reviewing the data and its association with the outcome variables of interests.

In conclusion, the study findings provided an opportunity to examine the correlates of Internet sex seeking behavior among MSM in the southern US as well as the influence of race on this relationship. It also shed light on the concept of Internet sex seeking behavior and how the way it is assessed may influence its relationship with outcome variables. It is anticipated that these findings may guide future interventions and spur further research on this relationship with this population in the southern US.

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APPENDIX A.

LIST OF AIDS Service Organization

1. South Carolina HIV/AIDS Council, Columbia, SC

2. AIDS Alabama, Birmingham, Alabama

3. AIDS Atlanta, Atlanta, Georgia

4. Nashville Cares, Nashville, Tennessee

5. South Beach AIDS Project, Miami, Florida

6. Chattanooga C.A.R.E.S, Tennessee

APPENDIX B.

INTERNALIZED HOMONEGATIVITY INVENTORY

1. I believe being gay is an important part of me.

2. I believe it is OK for men to be attracted to other men in an emotional way, but it's not OK for them to have sex with each other.

3. When I think of my homosexuality, I feel depressed.

4. I believe that it is morally wrong for men to have sex with other men.

5. I feel ashamed of my homosexuality.

6. I am thankful for my sexual orientation.

7. When I think about my attraction towards men, I feel unhappy.

8. I believe that more gay men should be shown in TV shows, movies, and commercials.

9. I see my homosexuality as a gift.

10. When people around me talk about homosexuality, I get nervous.

11. I wish I could control my feelings of attraction toward other men.

12. In general, I believe that homosexuality is as fulfilling as heterosexuality.

13. I am disturbed when people can tell I'm gay.

14. In general, I believe that gay men are more immoral than straight men.

15. Sometimes I get upset when I think about being attracted to men.

16. In my opinion, homosexuality is harmful to the order of society.

17. Sometimes I feel that I might be better off dead than gay.

18. I sometimes resent my sexual orientation.

19. I believe it is morally wrong for men to be attracted to each other.

20. I sometimes feel that my homosexuality is embarrassing.

21. I am proud to be gay.

22. I believe that public schools should teach that homosexuality is normal.

23. I believe it is unfair that I am attracted to men instead of women.

Response options:
1= strongly disagree, 2= slightly disagree, 3 =disagree, 4 = agree, 5 = slightly agree, 6=strongly agree

APPENDIX C.

GAY ACCULTURATION SCALE (IDENTIFICATION AND INVOVMENT WITH THE GAY COMMUNITY SCALE)

1. I feel very distant from the gay community.

2. It is very important that at least some of my friends are bisexual or gay.

3. Being gay makes me feel part of a community.

4. Being attracted to men is important to my sense of who I am.

Response options:
1 = strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = strongly agree

5. How often do you read a gay oriented newspaper or magazine such as "The Advocate" or other gay/bisexual newspaper?

6. How often do you attend gay organized activities such as meetings, fundraisers, or political activities?

7. How often do you go to gay bar?

Response options:
A = Never B = once a week C = several times a month D = about once a week E = several times a week to daily

8. About how many gay men would you call personal friends (as opposed to personal acquaintances)?

A = none B = 1 C =2 D = 3 E = 5 or more

APPENDIX D.

HEALTH PROTECTIVE SEXUAL COMMUNICATION SCALE

How often in the past 12 months have you……..

1. Asked a new sex partner how he felt about using condoms before you had intercourse.

2. Asked a new sex partner about the number of past sex partners he had.

3. Told a new sex partner about the number of sex partners you have had.

4. Told a new sex partner that you won't have sex unless a condom is used.

5. Discussed with a new sex partner the need for both of you to get tested for HIV (the AIDS virus) before having sex.

6. Talked with a new sex partner about not having sex until you have known each other longer.

7. Asked a new sex partner if he has ever had some type of STI (VD) like herpes, clap, syphilis, gonorrhea.

8. Asked a new sex partner if he has ever shot drugs like heroin, cocaine, or speed.

Response options:
1=always, 2 =almost always, 3=sometimes, 4 = never

APPENDIX E.

ATTITUDES TOWARD CONDOM USE SCALE

1. It is a hassle to use condoms.

2. People can get the same pleasure from "safer" sex as from unprotected sex.

3. Using condoms interrupts sex play.

4. The proper use of a condom could enhance sexual pleasure.

5. Condoms are irritating.

6. I think "safer" sex would get boring fast.

7. Safer sex reduces the mental pleasure of sex.

8. The idea of using a condom doesn't appeal to me.

9. Condoms ruin the natural sex act.

10. Generally, I am in favor of using condoms.

11. Condoms interfere with romance.

12. The sensory aspects (smell, touch, etc.) of condoms make them unpleasant.

With condoms, you can't really "give yourself over" to your partner.

Response options:
1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree

APPENDIX F.

SURVEY

Official Use:
Mode of Administration: Online/Offline ***Date of Survey __ /__ /___***

S/N: _____
Thank you for taking this survey. For questions that have options, please put a checkmark (X) in the box next to your response. For all other questions, please respond by writing in the space provided. Feel free to be open and honest as there are no right or wrong answers to these questions; we are interested in what you think and how you feel. No personal or identifying information will be collected; your responses will be confidential and will not be traced back to you. Please ask the facilitator if you have any questions. Complete this survey only once. If you have previously completed this survey please notify the facilitator and return the survey.

Online Administration
Thank you for taking this survey. For questions that have options, please put a checkmark (X) in the box next to your response. For all other questions, please respond by typing in the space provided. Feel free to be open and honest as there are no right or wrong answers to these questions; we are interested in what you think and how you feel. No personal or identifying information will be collected; your responses will be confidential and will not be traced back to you. Complete this survey only once. Do not complete this study if you have previously completed it. If you are using a public computer, ensure that you close the browser window upon completion of this survey.

A. Background Information/Demographics
This section will enquire about your background.

1. What is your age? _____

2. What is your gender?
□ Male
□ Female
□ Transgender
□ Questioning
□ Transitioning

3. What is your yearly income?
□ Less than $5,000
□ Between $5,001- 10,000
□ Between $10,001-25,000
□ Greater than $25,000

4. What is the highest level of education you have completed?
□ Some high school
□ High school graduate/GED
□ Some college
□ College graduate
□ Graduate school

5. What is your race?
□African American/Black
□American Indian/Alaska Native
□Asian/Pacific Islander
□White
□Multiracial
□Other (please specify) _____

6. What is your ethnicity?
□ Hispanic
□ Non-hispanic

7. What is your state of current residence? _____

8. How old were you when you had sex for the first time? _____

9. How do you describe yourself?
□ Gay/Homosexual
□ Heterosexual or straight
□ Bisexual
□ Transgender
□ Questioning
□ Other (please specify)_____

10. Which best describes who you are attracted to? ***(CHECK ONLY ONE)***
□ Only attracted to males
□ Mostly attracted to males
□ Equally attracted to females and males
□ Only attracted to females
□ Mostly attracted to females

11. Are you out to both parents about being gay, bisexual, transgender or questioning?
□ Yes
□ No
□ Out to only one of my parents

12. If yes, how long have you been out to your parent(s) about the fact that you are gay, bisexual, transgender, or questioning? _____

B. Sexual Behavior
This section will enquire about your sexual behavior.

1. Are you currently sexually active?
□ Yes
□ No

2. In the past, who have you had sex with? ***(CHECK ALL THAT APPLY)***
□ Men
□ Women
□ Men and women

3. Have you ever had casual sex (sex with somebody you are/were not in a relationship with; a one-night stand; a hook-up etc)? ("Sex" includes oral, vaginal, and anal sex.)
□ Yes
□ No

4. Are you currently sexually active with a main or steady male partner (somebody you are committed to and sexually exclusive with)?
□Yes
□ No
□ No current main or steady partner

5. Did you use a condom the last time you had sex with your most recent main or steady male partner?
□Yes
□ No

6. Are you currently sexually active with a casual male partner (a partner you are not in a relationship with or somebody you are just hooking-up with)?
□Yes
□ No
□ No current casual partner

7. Did you use a condom the last time you had sex with your most recent casual male partner, (a partner you are not in a relationship with or somebody you are just hooking-up with)?
□Yes
□ No

9. When was the last time you were tested for HIV?
□ Less than 6 months ago
□ 7 months - 1 year ago
□ 1 year – 2 years ago
□ Greater than 2 years ago.

10. What is your current HIV status?
□ Positive
□ Negative
□ Don't know

11. Have you ever had a sexually transmitted infection (STI)?
□Yes
□ No

12. Have you ever had unprotected anal sex?
□Yes
□ No

14. In the past 3 months, how many times have you been buzzed, tipsy, or drunk within 3 hours of having sex?
□ Every time
□ Almost every time
□ Sometimes
□ Almost never
□ Never

15. In the past 3 months, how many times have you been under the influence of drugs (marijuana, methamphetamine, ecstasy, cocaine, heroin, etc) within 3 hours of having sex?
□Every time
□Almost every time
□Sometimes
□Almost never
□Never

16. In your opinion, how much do you think you are at risk of contracting a sexually transmitted infection (STI) from your most recent main sex partner?
□A lot
□Some
□A little
□None
□Don't know

17. In your opinion, how much do you think you are at risk of contracting a sexually transmitted infection (STI) from your most recent casual sex partner?
□A lot
□Some
□A little
□None
□Don't know

C. Sexual Behavior & Internet Use

This section will enquire about your sexual behavior and your use of the Internet to meet other men.

1. Do you currently have an online profile/account on any of these websites (e.g. iPhone App (Grindr), Facebook, MySpace, adam4adam, blackgaychat, craigslist, gay.com, manhunt, Aol.com chat, Yahoo chat, BoyAhoy iPhone App, Zoosk etc?
□ Yes
□ No

2. Have you ever tried to use the Internet or any online/electronic/digital application (app) to meet other men? (e.g. iPhone App (Grindr), facebook, MySpace, adam4adam, blackgaychat, craigslist, gay.com, manhunt, Aol.com chat, Yahoo chat, BoyAhoy iPhone App, Zoosk etc).
□Yes
□ No

3. When was the last time you used any of these websites (e.g. iPhone App (Grindr), facebook, MySpace, adam4adam, blackgaychat, craigslist, gay.com, manhunt, Aol.com chat, Yahoo chat, BoyAhoy iPhone App, Zoosk etc) to meet other men?
□ About two weeks ago
□ About one month ago
□ 2months – 3 months ago
□ 4 months - 6 months ago
□ 7 months – 1 year ago
□ More than 1 year ago

4. In the past 12 months, how often have you used the Internet or a phone app (e.g. Grindr app) to meet/chat with other men?
□ Never
□ Rarely (once a month or less)
□ Sometimes (2-3 times a month)
□ Often (once a week) and
□ 2-6 times a week/about once a day/more than once a day

5. If you have used the internet or a phone app (e.g. Grindr app) to meet other men at some point in the past, how often did you do this?
□ Never
□ Rarely (once a month or less)
□ Sometimes (2-3 times a month)
□ Often (once a week) and
□ 2-6 times a week/about once a day/more than once a day

6. Have you ever **physically met** with a man you initially met on the Internet or online or through any electronic/digital means? (e.g. iPhone App (Grindr), facebook, MySpace, adam4adam, blackgaychat, craigslist, gay.com, manhunt, Aol.com chat, Yahoo chat, BoyAhoy iPhone App, Zoosk etc).
□ Yes
□ No

7. Have you ever had **sex** (oral or anal) with a guy you met on the Internet or online or through any electronic/digital means? (e.g. iPhone App (Grindr), facebook, MySpace, adam4adam, blackgaychat, craigslist, gay.com, manhunt, Aol.com chat, Yahoo chat, BoyAhoy iPhone App, Zoosk etc).
□ Yes
□ No
8. If yes, how many ***different*** men have you had sex (oral or anal) with that you met over the Internet or using a phone app (e.g. Grindr app)? _____

9. Have you **ever** had **unprotected anal sex** with a guy you met on the Internet or online or through any electronic/digital means? (e.g. iPhone App (Grindr), facebook, MySpace, adam4adam, blackgaychat, craigslist, gay.com, manhunt, Aol.com chat, Yahoo chat, BoyAhoy iPhone App, Zoosk etc).
□ Yes
□ No

10. In the past 12 months, have you had **unprotected anal sex** with a guy you met on the Internet or online or through any electronic/digital means? (e.g. iPhone App (Grindr), facebook, MySpace, adam4adam, blackgaychat, craigslist, gay.com, manhunt, Aol.com chat, Yahoo chat, BoyAhoy iPhone App, Zoosk etc).
□ Yes
□ No

11. Do you have an online profile on any of the online sites dedicated to meeting other men e.g. adam4adam, blackgaychat, craigslist, gay.com, manhunt, Aol.com chat, Yahoo chat, BoyAhoy iPhone App, Zoosk etc).
□ Yes
□ No

12. How long ago did you most recently go online or use a website to meet a guy?
_____

13. How do you most commonly determine your sexual partner's HIV status?
□ He told me
□ I saw his HIV report
□ I do not know his status
□ I just guessed
□ I got it from his online profile

D. This section will enquire your opinions about using condoms during sex.

Read each of the following statements. On a scale from 1 (Strongly Disagree) to 6 (Strongly Agree), CIRCLE the response that best describes the extent to which you agree with each statement.

1. It is a hassle to use condoms.
   1 2 3 4 5 6
2. People can get the same pleasure from "safer" sex as from unprotected sex.
   1 2 3 4 5 6
3. Using condoms interrupts sex play.
   1 2 3 4 5 6
4. The proper use of a condom could enhance sexual pleasure.
   1 2 3 4 5 6
5. Condoms are irritating.
   1 2 3 4 5 6
6. I think "safer" sex would get boring fast.
   1 2 3 4 5 6
7. Safer sex reduces the mental pleasure of sex.
   1 2 3 4 5 6
8. The idea of using a condom doesn't appeal to me.
   1 2 3 4 5 6
9. Condoms ruin the natural sex act.
   1 2 3 4 5 6
10. Generally, I am in favor of using condoms.
    1 2 3 4 5 6
11. Condoms interfere with romance.
    1 2 3 4 5 6
12. The sensory aspects (smell, touch, etc.) of condoms make them unpleasant.
    1 2 3 4 5 6

E. Health Protective Sexual Communication

This section will enquire about how you communicate with your sexual partners. Read each of the following statements. Check the response that best describes the extent to which you agree with each statement.

1. How often in the past 12 months have you asked a new sex partner how he felt about using condoms before you had intercourse?

□ ***always*** □ ***almost always*** □ ***sometimes*** □ ***never***

2. How often in the past 12 months have you asked a new sex partner about the number of past sex partners he had?

□ ***always*** □ ***almost always*** □ ***sometimes*** □ ***never***

3. How often in the past 12 months have you **told** a new sex partner about the number of sex partners you have had?

□ ***always*** □ ***almost always*** □ ***sometimes*** □ ***never***

4. How often in the past 12 months have you told a new sex partner that you won't have sex unless a condom is used?

□ ***always*** □ ***almost always*** □ ***sometimes*** □ ***never***

5. How often in the past 12 months have you discussed with a new sex partner the need for both of you to get tested for HIV (the AIDS virus) before having sex?

□ ***always*** □ ***almost always*** □ ***sometimes*** □ ***never***

6. How often in the past 12 months have you talked with a new sex partner about not having sex until you have known each other longer?

□ ***always*** □ ***almost always*** □ ***sometimes*** □ ***never***

7. How often in the past 12 months have you asked a new sex partner if he has ever had some type of STI like gonorrhea, chlamydia, herpes, syphilis, HIV etc?

□ ***always*** □ ***almost always*** □ ***sometimes*** □ ***never***

8. How often in the past 12 months have you asked a new sex partner if he has ever shot drugs like heroin, cocaine, or speed?

□ ***always*** □ ***almost always*** □ ***sometimes*** □ ***never***

F. Gay Acculturation Scale (Identification and Involvement with the Gay Community Scale)

This section will enquire about your involvement with the gay community. Read each of the following statements. Check the response that best describes the extent to which you agree with each statement.

1. I feel very distant from the gay community

□ ***strongly disagree*** □ ***disagree*** □ ***neutral*** □ ***agree*** □ ***strongly agree***

2. It is very important that at least some of my friends are bisexual or gay.

□ ***strongly disagree*** □ ***disagree*** □ ***neutral*** □ ***agree*** □ ***strongly agree***

3. Being gay makes me feel part of a community.

□ ***strongly disagree*** □ ***disagree*** □ ***neutral*** □ ***agree*** □ ***strongly agree***

4. Being attracted to men is important to my sense of who I am.

□ ***strongly disagree*** □ ***disagree*** □ ***neutral*** □ ***agree*** □ ***strongly agree***

5. How often do you read a gay oriented newspaper or magazine such as "The Advocate" or any other gay/bisexual newspaper?
□ ***never***
□ ***once a month***
□ ***several times a month***
□ ***about once a week***
□ ***several times a week or daily***

6. How often do you attend gay organized activities such as meetings, fundraisers, or political activities?
□ ***never***
□ ***once a month***
□ ***several times a month***
□ ***about once a week***
□ ***several times a week or daily***

7. How often do you go to gay bar?
□ ***never***
□ ***once a month***
□ ***several times a month***
□ ***about once a week***
□ ***several times a week or daily***

8. About how many gay men would you call personal **friends** (as opposed to personal acquaintances)?
□ none
□ 1 gay friend
□ 2 gay friends
□ 3 or 4 gay friends
□ 5 or more gay friends

G. Access to STI testing & Condoms
This section will enquire about your access to STI testing and condoms.

1. Are you aware of locations or facilities where free or affordable **Sexually Transmitted Infection** (**STI) testing** is conducted?
□Yes
□ No

2. Are these facilities or locations where free or affordable **STI testing** is conducted easily accessible to you?

□Yes

□ No

3. Have you ever utilized these **STI testing** facilities to get tested for HIV, gonorrhea, chlamydia etc?

□Yes

□ No

Access to Condoms

1. Are you aware of locations or facilities where free **condoms** are available?

□Yes

□ No

2. Are these facilities or locations where you can obtain free **condoms** easily accessible to you?

□Yes

□ No

3. Have you ever utilized any of these facilities to get free **condoms**?

□Yes

□ No

The following questions will ask about your opinions on homosexuality and being gay.

Read each of the following statements. On a scale from 1 (Strongly Disagree) to 6 (Strongly Agree), CIRCLE the response that best describes the extent to which you agree with each statement.

1. I believe being gay is an important part of me.
   1 2 3 4 5 6
2. I believe it is OK for men to be attracted to other men in an emotional way, but it's not OK for them to have sex with each other.
   1 2 3 4 5 6
3. When I think of my homosexuality, I feel depressed.
   1 2 3 4 5 6
4. I believe that it is morally wrong for men to have sex with other men.
   1 2 3 4 5 6
5. I feel ashamed of my homosexuality.
   1 2 3 4 5 6
6. I am thankful for my sexual orientation.
   1 2 3 4 5 6
7. When I think about my attraction towards men, I feel unhappy.
   1 2 3 4 5 6
8. I believed that more gay men should be shown in TV shows, movies, and commercials.
   1 2 3 4 5 6
9. I see my homosexuality as a gift.
   1 2 3 4 5 6
10. When people around me talk about homosexuality, I get nervous.
    1 2 3 4 5 6
11. I wish I could control my feelings of attraction toward other men.
    1 2 3 4 5 6
12. In general, I believe that homosexuality is as fulfilling as heterosexuality.
    1 2 3 4 5 6
13. I am disturbed when people can tell I'm gay.
    1 2 3 4 5 6
14. In general, I believe that gay men are more immoral than straight men.
    1 2 3 4 5 6
15. Sometimes I get upset when I think about being attracted to men.
    1 2 3 4 5 6
16. In my opinion, homosexuality is harmful to the order of society.
    1 2 3 4 5 6

17. Sometimes I feel that I might be better off dead than gay.

1 2 3 4 5 6

18. I sometimes resent my sexual orientation.

1 2 3 4 5 6

19. I believe it is morally wrong for men to be attracted to each other.

1 2 3 4 5 6

20. I sometimes feel that my homosexuality is embarrassing.

1 2 3 4 5 6

19. I am proud to be gay.

1 2 3 4 5 6

20. I believe that public schools should teach that homosexuality is normal.

1 2 3 4 5 6

21. I believe it is unfair that I am attracted to men instead of women.

1 2 3 4 5 6

How did you hear about this study?

□ Friend

□ Flyer

□ Brochure

□ On the Internet

The end. Thanks for your participation!!

APPENDIX G.

LETTER OF INVITATION

Hello, my name is Winston Abara and I am a doctoral student in the Department of Health Promotion, Education and Behavior at the University of South Carolina. I am conducting a research study and would like to invite you to complete a short survey.

Purpose

The purpose of this study is to gather information on how men who have sex with men (MSM) meet other men and the relationship of this to sexual communication, internal feelings about being gay, sexual behavior and their perception of their sexual partners' risk.

How you were selected

You were selected because you meet the requirements of the study. These requirements specify that each participant be a man who has had sex with a man in the past, be between the ages of 18 and 29, be able to read and understand English and currently reside in any of the following states – SC, NC, GA, AL, FL, TN & MS.

What you will be asked to do

If you choose to take part in this study, you will be asked to complete a short survey. The survey will enquire about your age, gender, income, sexual behavior, ways you meet other men, your internal feelings about being gay, sexual communication with your partner and your perception of your partners' sexual risk. All of your responses to these questions as well as your identity will remain confidential. No personally unique or identifying information will be collected. It should take about 15 minutes to complete the survey.

Risks of being in the study

One of the risks associated with being in the study is the potential for some of the questions to make you recount some past experiences, which may or may not be negative. If these experiences are negative, you may choose not to answer these questions.

Benefits of being in the study

Although you may not benefit directly from the study, you may learn about sexual health as well as the location of some sexual health resources within the community via the pamphlets I will give you at the end of the survey and interview phases. In addition, the information you provide may help in planning improved sexual health promotion programs in the future.

Keeping your answers safe and private

Safeguards will be taken to ensure that any information you provide will be kept safe and private. Interviews will be audio-recorded, with your permission. To protect privacy, you will not be required to provide your names at any point during the interview process. You will be referred to by ID numbers only throughout the study, data analysis and reporting phases. As stated earlier, all survey responses will be kept confidential and in a secure location. Your responses will not be connected to your responses in any way as only ID numbers will be used. You will however provide an email address to which details about the incentive will be sent. Study information will not be shared outside of the context of the study. The results of the study may be published or presented at professional meetings but your identity cannot and will not be known.

Payment for being in the study

You will receive a $10 VISA card upon completion of the surveys. You may choose to accept this or make a donation to a non-profit organization selected from the list provided.

Voluntary Withdrawal

You may withdraw at anytime during the study if you desire, without penalty. However you will not be eligible to receive the $10 VISA card.

Questions

I am happy to answer any questions you may have about this study. You may contact me at tintstudy@yahoo.com or 803-735-6437 if you have any study-related questions or problems. If you have any questions about your rights as a research participant, you may contact the Office of Research Compliance at the University of South Carolina at 803.777.7095.

Best,

Winston Abara, MPH

APPENDIX H.

USC IRB APPROVAL LETTER

OFFICE OF RESEARCH COMPLIANCE

February 22, 2012

Mr. Winston Abara
Arnold School of Public Health
Health Promotion, Education & Behavior
800 Sumter Street, Suite 216
Columbia, SC 29208

Re: **Pro00015961**
Study Title: *Exploring the Association between Sex-Seeking Behavior and Internalized Homonegativity, Sexual Behavior, Health-Protective Sexual Communication, and Perception of Partners' Sexual Risk*

FYI: University of South Carolina Assurance number: FWA 00000404 / IRB Registration number: 00000240

Dear Mr. Abara:

In accordance with 45 CFR 46.101(b) (**2**), the referenced study received an exemption from Human Research Subject Regulations on **2/21/2012**. This exemption is based on plans to ensure anonymity of subjects and assurances by the PI that all aspects of the study will be handled in such a way that no identifiers will be connected with subject responses.

No further action or Institutional Review Board (IRB) oversight is required, as long as the project remains the same. However, you must inform this office of any changes in procedures involving human subjects. Changes to the current research protocol could result in a reclassification of the study and further review by the IRB.

Because this project was determined to be exempt from further IRB oversight, consent document(s), if applicable, are not stamped with an expiration date.

Research related records should be retained for a minimum of three years after termination of the study.

The Office of Research Compliance is an administrative office that supports the USC Institutional Review Board. If you have questions, please contact Arlene McWhorter at arlenem@sc.edu or (803) 777-7095.

Sincerely,

Thomas A. Coggins
Director

cc: Lucy Annang