PERCEPTIONS OF RISK, SEXUAL BEHAVIORS, AND HIV PREVENTION IN COMMERCIAL AND PUBLIC SEX VENUES: A STUDY OF MSM VENUE ATTENDEES

by

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ABSTRACT

PERCEPTIONS OF RISK, SEXUAL BEHAVIORS, AND HIV PREVENTION

IN COMMERCIAL AND PUBLIC SEX VENUES:

A STUDY OF MSM VENUE ATTENDEES

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MARTIN J. DOWNING, JR.

Adviser: Professor David Chapin

In recent years there has been a resurgence of new HIV cases in the United States among men who have sex with men (MSM). Some of these men may be at an increased risk for HIV transmission by engaging in sexual encounters at commercial or public sex venues. Indeed, researchers have consistently found reports of unprotected sex among men during venue attendance. Conceptually, there is a need to understand how the physical and social context of sex venues may influence decisions to engage in high risk behaviors while emphasizing new directions for policy-oriented research that reflect the current state of sex venue use rather than a contemporary history of public health fears and controversy. This dissertation empirically examines sexual behaviors of men who attended any of seven sex venue types during the previous month relative to HIV risk perceptions, spatial preferences for public sex encounters, perceptions of venue design, and venue-specific approaches to HIV prevention. Specifically, 204 MSM—recruited online through message discussion boards and LGBT academic e-mail listservs—completed an Internet survey. The findings suggest the potential influence of both physical (private spaces, low lighting, & condom availability) and social (non-verbal communication, perceived

condom use of other venue patrons) forces on risky or safer behavior occurring at several venue types. Moreover, the results demonstrated that MSM who perceive moderate levels of behavior-specific and venue-specific HIV transmission risk still pursued risky sexual encounters during their venue attendance. This raises concern that despite some awareness of HIV risk, unprotected sex remains a health threat for those MSM who attend sex venues. In addition to these findings, two distinct frequency patterns (low and high) of Internet use to seek partners for public sex encounters were revealed through a cluster analysis. Men in the high frequency group were more likely to be HIV-positive, engage in unprotected anal-receptive intercourse, and have a preference for venues that offer opportunities to have multiple partners compared to men in the low frequency group. Knowing that some venue users initiate commercial and public sex encounters on the Internet may be useful for targeting appropriate HIV/STI interventions.

PREFACE

The data for this dissertation were provided from an Internet survey which examined behavior-specific and sex venue-specific HIV risk perceptions, sexual behaviors, and HIV prevention among men who have sex with men (MSM) attending commercial and public sex venues.

This dissertation includes an introductory literature review and three manuscripts that will be submitted for publication following the oral defense. Manuscript 1 is titled *Private Spaces, Low Lighting, and Sexual Risk: An Ecological Approach to Studying HIV Risk Behaviors among MSM in Commercial and Public Sex Venues*. Manuscript 2 is titled *An Internet Study of High Risk Behaviors and HIV Risk Perceptions among MSM who Frequent Commercial and Public Sex Venues*. Manuscript 3 is titled *Using the Internet in Pursuit of Public Sexual Encounters: Is Frequency of Use Associated with Risk Behavior among MSM?*

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Statement of the Problem

Point # 1: In recent years there has been a resurgence of new HIV cases in the United States among men who have sex with men (MSM) despite evidence of an overall global decline.

Although AIDS has remained a leading cause of death worldwide since its identification almost three decades ago, recent data shows a 17% overall reduction in new HIV infections over the past eight years (UNAIDS and World Health Organization, 2009 AIDS epidemic update). Globally, however, this disease continues to have an impact on several groups such that two-thirds of HIV infections are the result of heterosexual transmission, 11% are due to perinatal transmission, 10% from intravenous drug use, 5-10% occur in healthcare settings, and 5-10% result from sex between men (e.g., www.avert.org; Inciardi & Williams, 2005; UNAIDS, 2008). Though the global prevalence of HIV among men who have sex with men (MSM) is relatively low compared to that of heterosexuals, sex between men remains a prominent transmission route in parts of Western Europe, Latin America, as well as Australia, the United States and Canada (www.avert.org; UNAIDS, 2008).

Recent estimates suggest that 1.2 million people in the U.S. were living with HIV by the end of 2007 (UNAIDS, 2008). Men who have sex with men (MSM) accounted for almost half of this number, and remain the most affected of all HIV risk groups in the U.S. (CDC, 2009a). Despite reports of a global decline in new HIV infections, recent data suggests that the prevalence of HIV/AIDS among MSM in the U.S. increased by 13% from 2001-2005 (CDC, 2005; Jaffe, Valdiserri, & De Cock, 2007) and 26% from 2004-

2007 (CDC, 2007). Moreover, 72% of new HIV infections in adults and adolescents living in the U.S. for the year 2006 were the result of male-to-male sexual contact (CDC, 2007).

Taken together, these data demonstrate a persistent rise in HIV infections among MSM, in general and raise concern that prevention efforts (e.g., education, promoting condom use, testing) targeting MSM may no longer be as effective as they once were. Since HIV prevention campaigns often emphasize behavioral determinants of health as a way of promoting individual responsibility, they may be perceived as assigning blame (Revenson & Schiaffino, 2000). In their review of community-based health interventions, Revenson and Schiaffino argue that this perspective ignores alternative explanations of health such as socioeconomic, environmental, and political influences. They go on to suggest that "Community-based prevention efforts need to focus as strongly on societal and governmental responsibility as on individual behavior change" (p. 488). One of the factors that may be increasing HIV risk among MSM is *where* these men meet their sexual partners. Indeed, it has been suggested that to better understand sexual risk behaviors researchers might look beyond individual motivations and consider how these behaviors may be influenced by location (i.e., sex venues; Flowers, Marriott, & Hart, 2000; Lindell, 1996; Pollock & Halkitis, 2009). No one will argue that it is the individual's responsibility for choosing to attend sex venues and engage in certain types of behavior that may put their health at risk; but, it is the designers, owners, and managers who have the power to make these venues safer for all patrons without necessarily discouraging their use.

Point # 2: MSM who attend commercial and public sex venues may be at increased risk of acquiring HIV because infected men frequent those venues and unsafe sex often occurs onsite.

Scholars have paid considerable attention to the prevalence of high risk behaviors occurring in commercial and public sex venues (e.g., bathhouses, sex clubs, parks), which place those MSM who attend these venues at an increased risk for HIV/STI infection. This literature is troubling however, in that it continues to make the same point that MSM engage in unprotected anal intercourse (UAI) during sex venue attendance almost as if this were a naturally occurring and unyielding phenomenon. Indeed, researchers have consistently demonstrated that men who frequent these venues report engaging in unprotected sex (Aynalem et al., 2006; Binson et al., 2001; Church, Green, Vearnals, & Keogh, 1993; de Wit, de Vroome, Sandfort, & van Griensven, 1997; Elwood, Greene, & Carter, 2003; Elwood & Williams, 1998; Golden, Wood, Buskin, Fleming, & Harrington, 2007; Frankis & Flowers, 2005; Hospers, Debets, Ross, & Kok, 1999; Parsons & Halkitis, 2002; Reidy et al., 2009; Thiede et al., 2009; Van Beneden et al., 2002; Woods et al., 2007). Some studies have further shown that risky behaviors, in general, are higher for MSM who attend certain sex venues (e.g., bathhouses, parks, bars) compared to MSM who do not attend (Flores, Mansergh, Marks, Guzman, & Colfax, 2009; Grov, Parsons, & Bimbi, 2007; Horvath, Bowen, & Williams, 2006). Moreover, at least one study has reported that MSM who engaged in sex with partners met in both public cruising areas (e.g., parks) and bathhouses were more likely to report unprotected anal intercourse (UAI) with those partners compared to men who only had sex with men met in either

public cruising areas or bathhouses (Binson et al., 2001), thereby demonstrating the impact of multivenue use on risk behavior.

Further research has found that some HIV-positive MSM do attend commercial and public sex venues in pursuit of sexual partners (Binson et al., 2001; Golden et al., 2007; Parsons & Halkitis, 2002; Whittington et al., 2002). Moreover, it is not uncommon for HIV-positive MSM to report engaging in unprotected sex during their venue attendance (Frankis & Flowers, 2006; Parsons & Halkitis, 2002; Reidy et al., 2009; Van Beneden et al., 2002). Men who frequent sex venues often assume that attendees are HIV-positive (Haubrich, Myers, Calzavara, Ryder, & Medved, 2004), or that anyone willing to have unprotected anal-receptive intercourse is most likely infected (Elwood, 2002; Keogh & Weatherburn, 2000). Moreover, the anal-insertive sex role is often presumed by MSM to lower one's risk of infection (Elwood et al., 2003; Mutchler et al., 2003). Based on these assertions, MSM may practice strategic positioning as a mechanism for reducing the likelihood of virus transmission (Halkitis, Moeller, & Pollock, 2008; Parsons et al., 2005) when engaging in sexual activity at a venue. However, at least one study has shown that recent HIV infections among a sample of MSM were associated with having met sex partners in bathhouses or sex clubs (Thiede et al., 2009).

In order to address the continued existence of sexual risk taking that occurs among MSM who frequent sex venues, there is a need to situate behavior in the context of venue design, spatial preferences for venue encounters, and place-specific risk perceptions. Although researchers have examined these issues from a qualitative or ethnographic perspective (e.g., Douglas & Tewksbury, 2008; Elwood et al., 2003;

Haubrich et al., 2004; Holmes, O'Byrne, & Gastaldo, 2007; Kelly & Muñoz-Laboy, 2005; Keogh & Weatherburn, 2000; Mutchler et al., 2003; Parsons & Vicioso, 2005; Richters, 2007; Somlai, Kalichman, & Bagnall, 2001; Tewksbury, 2002; Warwick, Douglas, Aggleton, & Boyce, 2003), there is a paucity of quantitative data from which to draw any definitive conclusions. Further, the few studies that do provide some insight into potential environmental influences (e.g., condom availability; private spaces; social norms) on risky behavior using quantitative measures have relied on single-venue assessments or small sample sizes (see Ko et al., 2008; Reece & Dodge, 2003; Reidy et al., 2009).

Point # 3: Commercial and public sex venues are attractive for reasons that ecological and environmental psychology can help us to understand.

Given the existing literature, questions remain as to what spatial features of sex venues are attractive to potential patrons—relative to and notwithstanding—sexual intentions and behavior. Moreover, how do MSM venue users perceive the likelihood of engaging in safer behaviors when taking into account these features? Responding to a call for action posed by Flowers and colleagues (2000), the current study takes an environmental approach to investigating these questions by employing several fundamental concepts of ecological psychology. Specifically, it examines HIV risk perceptions and sexual behaviors of MSM who frequent commercial (e.g., bar backrooms, bathhouses, sex clubs, or video booths) and public (e.g., gyms, parks, or bathrooms) sex venues juxtaposed with their assessments of venue-specific physical features, social attributes, and spatial preferences. This research draws on Gibson's theory of affordances as well as Barker's conceptualization of behavior settings in order

to situate commercial and public sexual encounters—safe and unsafe—within their physical and social context. Although this study does not address existing public health policies relative to sex venue operations, the findings could inform future efforts that may ultimately shape the basis for policy recommendations (i.e., environmental modifications such as prohibiting private spaces, increased lighting, and improved condom availability).

Why Sex Venues are Attractive to MSM

> *"It seems to be well established that physical space has no 'reality' without the energy that is deployed within it."* (Lefebvre, 1992, p. 13)

Reflecting on the words of Henri Lefebvre, one might consider that space is not pre-existing, but rather emerges as a result of spatial relations (Lefebvre, 1992). Indeed, it has been argued that buildings "are formative, as much through the things that happen in them, their functional programme, as by their spatial relations and their form" (Markus, 1993, p. 11). This is particularly true for spaces of sexual behavior and expression, which are a product of the on-going social energies and practices that take place within them. Some of these spaces emerge as a resistance to the existing spatial arrangement that has its own mode of production (e.g., gyms, public bathrooms, and public parks). Nonetheless, it is the coming together of patrons that create and recreate the performance of sexual spaces. Commercial and public sex venues have been, and continue to be a critical element in the lesbian, gay, bisexual, transgender, and queer (LGBTQ) movement. By conveying a sense of homonormativity, these spaces have operated as outlets for socialization, identity development, homoeroticism, sexual and/or fetishistic release, political resistance, disease transmission, and HIV/STI education. The following

section examines the design features, social energies, and spatial preferences of both commercial and public sex venues that attract potential patrons.

Privacy by "design"

Men who desire to engage in public sexual behaviors with other men have, historically, been drawn to the privacy and security afforded by the environmental and social structure of sex venues. Sexually marginalized, gay and bisexual men sought sanctuary in bars, cabarets and bathhouses where they could socialize with minimal fear of oppression (Aldrich, 2004; Castells, 1984; Chauncey, 1994; Houlbrook, 2005). In sheltering social and sexual expression, these commercial sex venues cultivated a world with a unique character of sex that was capable of withstanding outside forces. Much of this security was a function of the environmental structure, particularly the use of discreet entrances and peripheries (Andersson, 2007; Holmes et al., 2007; Tattelman, 1997; Weinberg & Williams, 1975). Other spaces for commercial sex encounters, however, are usually detectable from the outside (e.g., pornographic movie theaters, adult video stores), often requiring patrons to scan the surrounding areas before entering and exiting (Donnelly, 1981; Sundholm, 1973).

Public sex venues—bathrooms, parks, and gyms—represent places in which public and private existences converge. Given the fluidity of these public venues (Kelly & Muñoz-Laboy, 2005) and the notion that they represent a challenge to prescribed spatial order (e.g., Lefebvre, 1992; Tewksbury, 1995; Woodhead, 1995), patrons rely on various forms of concealment to maintain a sense of privacy and security. Indeed, sexual behavior in these venues is often encouraged by the existence of physical boundaries, public perceptions that only designated functions (e.g., urination, defecation, or washing)

are performed, or methods of screening that diminish public visibility (see Frankis & Flowers, 2009 for review; Houlbrook, 2005; Humphreys, 1970/2007; Somlai et al., 2001; Tewksbury, 1995). In his remarks on the persistence of bathrooms as a source of public sex, Houlbrook (2005) states: "Constant use of urinals allowed men looking for homosex to enter and leave without arousing suspicion" (p. 49).

Once inside a commercial or public sex venue, spaces of sexual behavior and expression often afford patrons the appearance of privacy through such design features as a cubicle/stall, glory hole, video booth, or bush/shrub. Such "psychological privacy serves to maximize freedom of choice [and] permit the individual to feel free to behave in a particular manner" (Proshansky, Ittelson, & Rivlin, 1976, p. 173). Indeed, the physical layout of bathhouses is known to create uncomplicated opportunities for sexual encounters due to their cubicles or private rooms, which contain the majority of sexual behavior (Houlbrook, 2005; Holmes et al., 2007; Weinberg & Williams, 1975). Moreover, bathhouse partitions have also been prominent attributes that conceal steam and sections of public space, often facilitating sexual advancement or cruising. Pornographic video stores, an additional source of commercial sex, are known to offer patrons a private viewing area (Bapst, 2001; Downing, under review; Richters, 2007). Although much of the sexual behavior contained within these private spaces—also known as buddy booths—is solitary (i.e. masturbation), it is not uncommon to find glory holes through the walls of adjoining booths that invite sexual encounters with other patrons.

Glory holes are a common design feature of bathhouses, pornographic video stores, as well as public bathrooms. Their existence in public bathrooms is typically the

result of a deliberate act of defacement (Bapst, 2001). Communication and visualization between partners is limited by the hole, thereby heightening intensity and allowing for the projection of fantasies (Delph, 1978; Dowsett, 1996). Men have often expressed the anonymity and excitement afforded by glory holes as being a favorable quality (Bapst, 2001). Anonymous sex serves not only to heighten sensations, but also to protect an individual's privacy. This may be particularly important for men desiring to conceal their identity out of fear of stigmatization or discovery (i.e., married men; Humphreys, 1970/2007; Mason, 2002).

Men who seek out commercial or public sex encounters are often attracted to venues that enhance sexual excitement and intimacy, limit nonsexual interaction, and offer an array of potential partners (Holmes et al., 2007; Weinberg & Williams, 1975). Low lighting, also a popular design feature of bathhouses, sex clubs and bars (Andersson, 2007; Brodsky, 1993; Holmes et al., 2007; Pollak, 1993; Richters, 2007; Weinberg & Williams, 1975), can create an intimate setting for sexual encounters and may provide a sense of privacy. Moreover, a social context may exist within these venues whereby behavior patterns can be influenced by "strongly coercive" forces (Barker, 1968). Indeed, nonsexual interactions are often limited by social norms, including non-verbal communication (Frankis & Flowers, 2009; Holmes et al., 2007; Weinberg & Williams, 1975). This element also helps to maintain a sense of anonymity and can serve to protect individual identities (Humphreys, 1970/2007; Nardi, 1995). Although the availability of private space does afford some degree of verbal communication, this typically involves requests for types of sexual behavior (Weinberg & Williams, 1975).

Point # 4: The physical and social context that attracts men to sexually charged venues may influence decisions to engage in high risk behaviors.

These attractive characteristics of sex venues may contribute to risky sexual behavior among those men who attend. Indeed, recent findings have demonstrated that 28% of men who used a private room at a commercial sex venue reported engaging in unprotected anal sex whereas only 13% of those who had not used a private room reported this behavior (Reidy et al., 2009). Moreover, the effects of low lighting can make it difficult to perceive affordances in the environment (Gibson, 1986) such as available condoms or other HIV educational materials (Holmes et al., 2007). Further, limited visibility has been implicated as a hindrance to safe sex negotiation during venue attendance (Richters, 2007), and may also prevent an individual from examining a sex partner for evidence of disease (Lindell, 1996) or monitoring other venue patrons who may or may not be using condoms. Adding to these concerns are the potential effects of a pressurized social setting (i.e., social norms; Barker, 1968) that may prevent the disclosure of one's HIV status. Certainly, non-verbal communication can make it problematic to be open about one's HIV status, as researchers have demonstrated among patrons of bathhouses, sex clubs and public bathrooms (Reece & Dodge, 2003; Wohlfeiler & Potterat, 2005). Silence in a sex venue may also have a negative effect on condom negotiation (Elwood et al., 2003; Elwood & Greene, 2005; Haubrich et al., 2004; Reece & Dodge, 2003; Richters, 2007). This non-verbal culture may ultimately be used as an explanation for why condoms are not worn (Elwood et al., 2003) or why safe sex discussions are less likely to happen (Reece & Dodge, 2003).

Identification and Stigmatization of AIDS

Sexually charged establishments, including bathhouses and bar backrooms "became the first stages of a civil rights movement for gay people in the United States" (Bérubé, 1996, p. 188). During the period of gay liberation (1960s-1970s), they served as sites for social networking, community development, and political advancement. By organizing along strong spatial boundaries, primarily in urban centers such as New York City and San Francisco, the gay community gained substantial political power (Berlant & Warner, 1998; Castells, 1984; 2004; Shilts, 1982). The influence of hegemony and resistance on social order demonstrated during this time would prove to be a formidable situation in the coming years when the stigmatization of HIV/AIDS helped to sustain government silence (Ouellette Kobasa, 1990; Revenson & Schiaffino, 2000) and threatened to destroy sexual freedoms.

Point # 5: A new sexually transmitted disease made its way into the gay community setting off a moral panic and the reemergence of sex negative attitudes. Sex venues ultimately became a target of this panic, leading to irrational and empirically untested regulatory and closure policies.

In July of 1981, it was reported that 41 homosexual men in New York City and California had been diagnosed with a rare cancer known as Kaposi's sarcoma (KS), *pneumocystis* pneumonia, or both (Friedman-Kien et al., 1981). On July 3 of that year the New York Times went public with this information (Altman, 1981/2003; Black, 1985). According to the news article there was no evidence of contagion since the affected patients did not know each other. However, there was an indication that high risk sexual activity could be involved because a majority of cases reported having "multiple and

frequent sexual encounters with different partners, as many as ten sexual encounters each night up to four times a week" (Altman, 1981/2003, p. 5). In just eighteen months the number of cases would rise from 41 to 1,112, with still no causal determinants identified, let alone a cure for the disease (Kramer, 1983/2003).

Doctors were detecting compromised immune systems in the patients who were suffering from the effects of KS, pneumonia, and a number of other opportunistic infections that would become part of this syndrome. As a result of the identification of the disease initially among homosexual men, one of the earliest names for it was Gay Related Immunodeficiency—GRID (Black, 1985). However, this label directly identified the disease with homosexual men, who were not the sole group of victims. Indeed, this name was disconcerting to those who were thought to have acquired the illness from tainted blood (i.e., transfusions; clotting factors for hemophiliacs). Less attention was given to transfusion cases, perhaps in an attempt to suppress concerns for public safety (Herek & Glunt, 1991). However, the Centers for Disease Control (CDC) had grown apprehensive about the use of GRID, given their considerable evidence of additional risk groups (e.g., prostitutes, Haitians, IV drug users, and women) that were affected by this disease (Behrman, 2004; Black, 1985; Shilts, 1988). As with other pejorative terms popular during this time (e.g., gay cancer, gay plague), GRID became a stigmatizing phrase used to express fear as well as admonish behavior that many Americans came to view as immoral. The name was eventually dropped in 1982, and Acquired Immune Deficiency Syndrome (AIDS) was adopted as a more all-encompassing label. By 1983, the Human Immunodeficiency Virus (HIV) had been identified as the cause of AIDS (Barnett & Whiteside, 2002; Shilts, 1988). Researchers subsequently discovered that

direct contact with infected bodily fluids—not casual contact with someone who was infected—increased an individual's risk of transmission (Barnett & Whiteside, 2002; Rutherford & Werdegar, 1989; Shilts, 1988).

Though no longer referred to as GRID, AIDS was still affecting homosexual men at a disproportionately high level. Causal theories at the time included promiscuous sex, sadomasochistic behavior, amyl nitrate use, and frequent sexual encounters in commercial establishments—bathhouses and bar backrooms (e.g., Bazell, 1983; Black, 1985; Shilts, 1988; Weeks, 1985). A climate of sex-negative attitudes (re)emerged in an attempt to repeal the sexual freedoms that were granted by the gay liberation movement, which occurred at the end of the 1960s and continued through the 1970s (Black, 1985; Castells, 1984; Shilts, 1982; Weeks, 1985). Early dramatizations portraying this disease such as *An Early Frost* in 1985 and *Our Sons* in 1991, though groundbreaking at a time when AIDS was underrepresented in the media, failed to accurately depict the nature of homosexuality by ignoring sex altogether between central characters and suggesting that being gay was a lifestyle choice (Treichler, 2004).

Homosexual promiscuity and sadomasochism, behaviors that were intended by some to quell stereotypes of the effeminate gay man (Black, 1985; Weeks, 1985), eventually gained public attention and were regarded as threats or pollutants to society. Sexual pollution has been regarded in certain cultures as the result of promiscuous behavior, which is often punishable by death (Douglas, 1966/2002). Fears of contamination and pollution led to a strong association of AIDS "with behaviors which have been traditionally considered deviant" including those of homosexuals and intravenous drug users (Brandt, 1988, p. 367). Public concerns about sexual pollution are

certainly not unfamiliar to this country, as evidenced during WWI and WWII with the implementation of public health programs (e.g., testing, treatment, public education, condom use, quarantine) to control the spread of venereal disease, which was considered a threat to America's war efforts (Cutler & Arnold, 1988; Parascandola, 2009).

The stigmatization of those affected by AIDS resulted from a combination of factors including a physical and visible presence of illness (e.g., KS), perceptions that it was contagious, the idea that it was irreversible, and assumptions that it was the victim's fault (Herek, 1999). Indeed, many thought that persons with AIDS were to be blamed, shamed, isolated, unapproachable, and ultimately destroyed (see Sontag, 2001; Weeks, 1985). Attempts were made by several states to quarantine infected persons with the intent to curtail further transmission (Bayer, 1991), a control mechanism that was enforced in Cuba (Bayer & Healton, 1989; D'Adesky, 2004; Parameswaran, 2004). A "significant minority" of U.S. citizens expressed support for legal measures against persons with AIDS (Herek, 1999). The legitimacy for this type of control was established in part by its use in previous epidemics such as tuberculosis, venereal disease, and leprosy (Bayer, 1991; Quetel, 1992; Tayman, 2006). In fact, women deemed as promiscuous (i.e., prostitutes) and a threat to American soldiers during WWII were quarantined and treated for VD (Parascandola, 2009).

Fueling the stigmatization of persons with AIDS was a failure by the U.S. government to provide a public health response and dispel irrational fears. Indeed, when the first U.S. cases appeared, the lack of government action resulted in a series of delays and conflicts over funding research into the potential causes and treatments (Chambre, 2006; Revenson & Schiaffino, 2000; Shilts, 1988). Moreover, President Ronald Reagan

did not publicly acknowledge the existence of AIDS until 1987—six years after The New York Times published their report about the first cases (Shilts, 1988). Since the gay community was hit first and hardest, government silence led many Americans to believe that it was a homosexual disease and that no one else should worry. Reagan and his administration fueled this hatred towards gay people and behavior that many considered to be immoral. Despite evidence that AIDS was having a global impact affecting more than just gay men, financial resources for research and patient treatment remained scarce as a result of the conservative political climate (Chambre, 2006; Shilts, 1988).

Grass-roots organizations powered by a highly motivated gay community turned their anger at the lack of government response into action. In New York City the result was Gay Men's Health Crisis (GMHC), an organization established to provide assistance to people living with AIDS and raise money for research, as well as ACT UP (AIDS Coalition to Unleash Power) which maintained a pro-sex attitude to fight the stigmatization of homosexual behaviors while encouraging safe sex practices (e.g., Chambre, 2006; Ouellette Kobasa, 1990; Revenson & Schiaffino, 2000; Sommella, 1997; Wolfe, 1990/2003). ACT UP was also known for using direct action and civil disobedience to establish equality for all persons affected by this disease (Behrman, 2004; Sommella, 1997). In San Francisco, the Shanti Project offered housing support for many who had been infected (Black, 1985; Gee, 1989; Shilts, 1988). With the help of GMHC, ACT UP, the Shanti Project, and other community-based interventions, AIDS was given a face and made a legitimate concern for the United States—one that the U.S. government could no longer ignore.

Funding initiatives by GMHC and other charitable organizations that followed led the U.S. government to expand its AIDS agenda by involving the National Institutes of Health and the CDC (Chambre, 2006). In their pursuit of these federal opportunities to support AIDS research and patient care, however, GMHC became less concerned with political action (Black, 1985; Sommella, 1997). Consequently, ACT UP transformed the movement with their "in your face" approach to AIDS activism. They targeted the Food and Drug Administration (FDA) with a list of demands including: shortened review periods for HIV drug approvals; elimination of double-blind placebo tests; inclusion of all HIV affected populations; insurance coverage for patients in drug trials; and, maintaining an accessible record of all clinical trials (Crimp & Rolston, 1990/2003a). Moreover, they held demonstrations against the Catholic Church, which was opposed to condom promotion and safe-sex education (Crimp & Rolston, 1990/2003b). By emphasizing pro-sexuality and safety, ACT UP fought to maintain the civil liberties of gays and lesbians at a time when same-sex behavior was continually under attack from religious conservatives and public health officials who were considering the closure of any sexual venue that posed a potential risk of HIV transmission.

Controversy, Regulation, and Venue Closure

> *"The central dilemma in public health is balancing the rights of the individual against those of the society."* (Richards & Rathbun, 1999, p. 1)

In this section I explore the impact that HIV/AIDS has had on the existence of sexually charged establishments, particularly the placing of concerns for public health over—rather than balancing them with—an individual's right to engage in anonymous, sexual encounters at these establishments. This controversial history reminds us that

virtually no empirical work to date has been done that suggests a rational basis for policy concerning HIV prevention in both commercial and public sex venues. Its inclusion here signifies an opportunity to shift the debate away from closure versus non-closure—two untested arguments—and towards research that can lay the groundwork for an effective approach to reducing unsafe sexual encounters.

As argued by Aldrich (2004), "urban centres have been conducive to homosexual expression, whether integrated into or transgressive against social norms" (p. 1719). He introduces us to the influential connection gay men have had to cities, which historically afforded them places to socialize and identify sexually including bars, clubs and cabarets. As discussed earlier, commercial establishments have served as a secure place for men to relax, socialize, and engage in sexual activity (Bell & Weinberg, 1978; Bérubé, 1996; Castells, 2004; Chauncey, 1994; Houlbrook, 2005; Tattelman, 1997; Tewksbury, 2002; Warwick et al., 2003). However, during the 1970s when sexual freedoms were at a peak for gay men, bathhouses became known as a source of sexually transmitted diseases (Richards & Rathbun, 1999[1]). In their discussion of police power in 21st century public health enforcement, Richards and Rathbun argue that this cultural change—sexual liberation—in the 1970s "dramatically improved the efficacy of transmission of infectious diseases" and that by failing to close bathhouses during this period we may have failed to learn our lesson (p. 11).

In the wake of the AIDS epidemic commercial sex venues became targeted as a threat to public health. Indeed, the unsanitary (unhygienic) conditions of bathhouses and bar backrooms equated them with "a sexual third world" (Black, 1985). There were calls

[1] Although this manuscript was published in the journal Sexually Transmitted Diseases (Volume 26, p. 350-357), this citation refers to an Internet source as indicated in the references list.

to close gay bathhouses and other sexually charged environments by public health and city officials in both New York City and San Francisco where casual and anonymous sex was frequently sought out (Bayer, 1991; Black, 1985; Shilts, 1988; Tattelman, 1997). The ensuing fight over venue closure, however, caused significant uproar throughout much of the gay community which believed that these establishments provided an opportunity to educate patrons about safe sex (Schulman, 1994), and that closure would impose on their civil liberties.

The casual and anonymous nature of sex in commercial and public sex venues were a dominant focus of attention during those early years of the epidemic. Government agencies, city health officials, AIDS organizations, and members of the gay community at large became embroiled in a bitter struggle over whether to close venues that supported homosexual activity (Black, 1985; Disman, 2003; Shilts, 1988). As Shilts suggested:

> "the gay community's own obstructionism to early public health efforts, particularly on issues like bathhouses, had fueled the public conception that gays would flout the public health for their own interests." (p. 588)

Proponents of venue closure argued that unsafe behavior occurred in these establishments more often than not, which posed a serious threat to public health. In fact, the legal merits of closure were justified not by "epidemic or moral criticism of bathhouse patrons" but rather the depiction of anal and oral sex as behaviors that allow "the introduction of semen into cavities studded with cuts and sores" and therefore increase the risk of HIV transmission (Burris, 2003, p. 138). Opponents of closure, including the Coalition for Sexual Responsibility, ACT UP, and the Lambda Legal Defense and Education Fund, perceived sex venues as an opportunity to educate patrons about safer practices,

particularly condom use (see Bayer, 1991; Chambre, 2006; Disman, 2003; Gostin & Curran, 1987; Schulman, 1994).

A compilation of essays and articles written during the period of closure revealed fears that policies that targeted gay establishments were rooted in homophobia and would not be effective in curtailing HIV transmission (Schulman, 1994). Responding to this situation, members of ACT UP prepared a statement[2] on the importance of public sex spaces, and argued that the community rather than city or state officials should be responsible for monitoring behavior and encouraging safe sex. However, this type of monitoring from within the community may still be seen as a mechanism of discipline (regulation; enforcing safe sex) that establishes an ever-present power differential (c.f., Foucault, 1977/1995). Indeed, as Woodhead (1995) has discussed, venue intrusions—including those of gay volunteers who distribute health promotion messages—are still considered a threat that may immobilize sexual behavior and "undermine individual resistances" of those who intentionally reinterpret public spaces for sex (p. 243). Recently, in their attempts to establish an on-site dialogue with venue patrons and

[2] "A number of establishments catering to both the gay and straight communities have begun providing areas for group sex, referred to as 'backrooms'. Some 'sex clubs' exist solely for the purpose of providing a safe space where adults can engage in consensual group encounters. If these establishments promote safer sex practices, they serve a useful function in our community, providing education far more powerful than any brochure or seminar. Messages received from one's peers have been shown to carry greater weight than messages from established organizations. We, therefore, agree that sex clubs and backrooms must be allowed to continue operations as long as they comply with current city health regulations prohibiting anal and oral sex in public places. While many feel that oral sex without ejaculation is essentially safe, the controversy in this area combined with the existing regulations, lead us to call for only mutual masturbation, kissing, fondling, etc. to be allowed in these clubs. We further agree that any establishment allowing group sex to occur must provide a monitor to insure that anal and oral sex does not occur. In this way, the community will send a strong message to its own that only safer sex should be practiced. Any club that does not provide a monitor and enforce these guidelines threatens the existence of all sex spaces, and must answer to the community for its actions. We speak as a community that cares for and protects its own, and we feel it is essential that any enforcement of these guidelines be done by the community, not by city or state agencies. We will act in unison to insure that safe, healthy sex spaces remain open." ACT UP New York Records, Manuscripts and Archives Division, The New York Public Library.

disseminate safe sex messages, researchers noted the complexities of privacy, specifically concerns by patrons about perceptions of being seen or heard talking with members of the outreach team (Mullens, Staunton, Debattista, Hamernik, & Gill, 2009). Further evidence has shown that gay bar patrons are hesitant about having HIV/AIDS educational materials placed throughout environments, which serve primarily as a source of socialization (Warwick et al., 2003).

Police presence and undercover operations within commercial and public sex venues have been a consistent source of harassment and intrusion to the gay community (see Blotcher, 1996; Castells, 1984; 2004; Chauncey, 1994; Shilts, 1982; Tewksbury, 1995). Nowhere did this become more apparent than at the Stonewall Bar of New York City in June of 1969 when a police raid erupted into a riot (Castells, 1984; Shilts, 1982). This sudden "burst of gay militance" was to be a pivotal moment in the liberation of gay rights (Shilts, 1982, p. 42). More than a decade later, however, these rights were threatened by fear as well as the potential risks of AIDS. This disease brought a renewed interest in the existence of sexually charged establishments and the public health dangers they posed. But regulation or closure of these venues by city health officials would require evidence of unsafe behavior between patrons, which could only be obtained by initiating undercover police investigations (Burris, 2003).

Private investigators were sent to the 21st Street Baths, in San Francisco, searching for proof of unprotected oral and anal contact (Disman, 2003; Linebarger, 1987). The New York Native picked up the story and reported that: "bathhouse owners were accused of not properly monitoring the bath's patrons, allowing them to engage in high-risk sexual activity" (Linebarger, 1987, p. 10). Owners John Acmoody, William

Estep, and David Anderson eventually conceded defeat and shut down operations on Monday, May 4, 1987. It was the last bathhouse in San Francisco to close its doors. Mervyn Silverman, director of the city's Department of Health at the time, commissioned similar investigations a few years earlier in an attempt to regulate bathhouse behavior (Bayer, 1991; Disman, 2003). Overwhelming surveillance evidence of unsafe sexual practices led to the closure of several gay establishments that included six baths, four sex clubs, two movie theaters, and two bookstores.

Similar undercover tactics were used in New York City to close the prominent St. Mark's Baths. Closure was enforced by the public health department citing the New York State Sanitary Code (24-2.2), which includes behavior occurring in bathhouses, sex clubs, and adult video booth stores (Burris, 2003; Gostin, 2002; Gostin & Curran, 1987). The court case that subsequently followed in 1986 (City of New York v New Saint Mark's Baths) cited observations by city inspectors over a 14 day period in which 70 persons were involved in 41 acts of fellatio and 16 persons were engaging in 8 acts of anal intercourse (Gostin, 2002). By allowing these high risk behaviors to occur onsite, St. Mark's had violated the state's sanitary code thereby creating a public nuisance that endangered the public health. Although issues of surveillance and closure are beyond the realm of this dissertation, they should nevertheless be considered as part of the historical context with which they have been presented (see Ashford, 2008; Bayer, 1991; Burris, 2003; Gostin, 2002 for a more extensive discussion of public sex policy and criminalization).

Calls for the regulation or closure of sex venues are often met with controversy, particularly among AIDS activists as well as researchers (Bayer, 1991; Bérubé, 1996;

Gostin & Curran, 1987; Schulman, 1994; Shilts, 1987; Tattelman, 1997). These issues continue to have a voice in the media (Navarro, 1994; Osborne, 2008, 2009; Weinstein, 2008) and in academic literature (Ashford, 2008; Blotcher, 1996; Faissol, Swann, Kolodziejski, Griffin, & Gift, 2007; Farley & Cohen, 2005; Holmes et al., 2007; Hoover, 2003; Reidy, 2008; Thistlethwaite, 2002; Woods & Binson, 2003). Some researchers have found that MSM report more unsafe sex in a private home than inside a sex venue (de Wit, de Vroome, Sandfort, & van Griensven, 1997; Woods et al., 2007). Recently, however, Faissol and colleagues (2007) demonstrated through a mathematical model using existing data that if sexual activity—which would normally occur in a bathhouse—decreased after venue closure, HIV transmission would be slightly lowered relative to a situation where the venue remained open. This finding was partially contingent on an assumed decrease in the number of sex partners post-closure.

Critics of the model presented by Faissol and colleagues (2007) argue that men who have unprotected sex go to multiple sex venues, and that bathhouse closure would simply lead these men to conduct their behavior elsewhere (Woods, Binson, Pollack, Cotton, & Neilands, 2008), including the possibility of acting "outside the law" by utilizing public sites (e.g., cruising parks) for sexual activity (Bérubé, 1996). Given the existence of laws such as the New York State Sanitary Code (24-2.2) that already prohibit establishments from making facilities available for individuals to engage in oral and anal intercourse (Burris, 2003; Gostin, 2002; Gostin & Curran, 1987), the issue is whether people will continue to engage in outlawed behaviors, but just do them somewhere else. More importantly, if these behaviors were to continue after venue closure would they be riskier or safer? To answer this question—at least hypothetically—

one additional mathematical model was identified in the literature that used existing data out of Seattle, Washington (Reidy & Goodreau, 2010). Specifically, researchers constructed counterfactual scenarios that "replace" commercial sex venue partners based on reported sexual behaviors (of MSM who attend these venues) with partners met in non-commercial sex venues. The results demonstrated that closure of two bathhouses and one sex club may actually increase the incidence of HIV provided that former venue patrons replace at least 50% of their venue partners with partners from other venues. *Point # 6: This dissertation research seeks to empirically examine sexual risk behaviors in relation to sex venue design, spatial preferences, and HIV risk perceptions as reported by those men who have sex with men (MSM) who attend. It is intended to emphasize new directions for policy-oriented research that reflect the current state of sex venue use rather than a contemporary history of public health fears and controversy.*

The current study is not about policies and laws regarding public sex but rather about the behaviors—safe and unsafe—that exceed these realms and the availability of spaces for such behaviors. This dissertation focuses on MSM who actively engage in sexual encounters at commercial and public sex venues because they are a group that is at an increased risk for HIV infection. Employing fundamental concepts of ecological psychology, it seeks to find differences in venue use among men in this group, as well as differences in environmental elements—both within and across venues—that may contribute to risky behavior. Specifically, this research seeks to empirically examine the potential impact that sex venue design features (i.e., availability of private spaces, low lighting, condoms and other HIV education materials; spatial-related social norms such as non-verbal communication), spatial preferences of venue encounters (e.g., private,

stimulating, clean, safe, dimly lit, etc.), as well as behavior-specific and venue-specific HIV risk perceptions have on high risk behavior among those men who attend. The findings of this work could inform future efforts that may ultimately shape the basis for policy recommendations, including the possibility of research to examine the effects of environmental modifications (e.g., fewer private spaces; improved lighting; improved or more visible condom availability) on reducing riskier behaviors during venue attendance. If, as Richards and Rathbun (1999) suggested, we failed to learn our lesson by leaving bathhouses (and other commercial sex venues) open after the rampant transmission of STDs during the 1970s, then our labors should be not be directed at closure but rather at discouraging men from taking sexual risks during venue attendance. By examining specific environmental influences on unsafe sex—instead of merely the existence of such an environment—this dissertation will hopefully be seen as a rational means of addressing what continues to be a critical problem.

Dissertation Structure

Dissertations have a tendency to be lengthy, therefore making the dissemination of findings problematic for authors. Scholars have noted the challenges that newly anointed doctorates face in converting their dissertations into manuscripts intended for peer-reviewed journals (Chamberlin, 1999; Conn, 2008). However, the importance of publishing journal articles should not be underestimated. Indeed, there is some evidence that the number of publications a Ph.D. has is positively correlated with salary (Webster, 1995). Researchers suggest that peer-reviewed publications must be an important career goal (Mallette, 2007) and that graduate students should pursue their dissertation work with this goal in mind (Chamberlin, 1999).

But why prepare a dissertation for submission to peer-reviewed journals? Research has found that unpublished dissertations require substantial time to find and are often excluded from systematic literature reviews because they are considered to have minimal impact on the conclusions (Vickers & Smith, 2000). Moreover, it is no longer uncommon for degree-granting institutions to offer students the option—or requirement in some cases—to prepare their dissertations as a series of journal articles (Chamberlin, 1999; Conn, 2008). Furthermore, the Environmental Psychology program at the City University of New York—from which my doctorate degree is being granted—already requires its students to prepare and submit for publication a field research paper during their second year. Therefore, it is a logical extension of this policy for students in the writing stages of their dissertation to get a head start on a career that will most likely include extensive journal article writing. Fortunately for me, my dissertation committee agreed that the most effective and useful strategy for disseminating the results of this research endeavor would be to prepare three methodologically sound manuscripts that could be readily available to submit for publication upon completing the formal defense.

In order to comply with the American Psychological Association's publication guidelines (5th edition), each of the three manuscripts prepared for this dissertation include the following sections: Abstract, Introduction, Method, Results, and Discussion. Although a separate references section has also been prepared for each manuscript so as to ease the peer-reviewed journal submission process, a complete list of references utilized in this dissertation is provided at the end. Furthermore, all tables reporting statistical findings are presented after the corresponding manuscript so as to be more accessible to readers.

Internet Study of Risk Perceptions, Sexual Behaviors, and HIV Prevention in Commercial and Public Sex Venues

Each of the three reports presents findings from an Internet-recruited and administered study of sexually active MSM who attended commercial or public sex venues during the month prior to their participation. The Internet has become particularly useful for studying sensitive topics such as sexual behavior (Binik, Mah, & Kiesler, 1999; Cooper, Scherer, Boies, & Gordon, 1999; Rhodes, Bowie, & Hergenrather, 2003), and for accessing sexual minority groups (Bowen, 2005; Riggle, Rostosky, & Reedy, 2005; Rosser, Oakes, et al., 2007). Indeed, research has consistently shown that Internet surveys are effective to assess sexual behavior among MSM populations (Bowen, 2005; Chiasson et al., 2005; Elford, Bolding, Davis, Sherr, & Hart, 2004; Horvath, Rosser, & Remafedi, 2008; Ross, Tikkanen, & Mansson, 2000; Rosser et al., 2009). Of importance to social scientists, the Internet provides access to large numbers of potential participants and has shortened overall data collection time (Cooper, Scherer, & Mathy, 2001). Moreover, comparisons of data gathered using Internet and non-Internet surveys have revealed comparable reliability and/or validity estimates (Basnov, Kongsved, Bech, & Hjollund, 2009; Fortson, Scotti, Del Ben, & Chen, 2006; Graham & Papandonatos, 2008; Meyerson & Tryon, 2003; Ritter, Lorig, Laurent, & Matthews, 2004).

For the current study, an Internet survey was implemented using existing scales and additional items based on the extant literature. A thorough account of survey items, recruitment and data collection procedures, as well as statistical analysis has been provided within the method section of each manuscript in accordance with APA publication guidelines. Men who have sex with men (MSM) were recruited to participate

in this study about HIV risk perceptions, venue-specific attendance and sexual behaviors, as well as HIV prevention efforts relative to several types of commercial (e.g., bathhouses, sex clubs, bar backrooms, and video booth stores) and public sex venues (e.g., gyms, public bathrooms, and public parks). The decision to assess these particular venues was informed, in part, by a pilot study investigating safe sex intentions of MSM who placed advertisements on the Internet in search of public sexual encounters (Downing, under review). In the remainder of this introduction I have outlined the themes of each manuscript, which will subsequently follow in the order they were prepared.

First Manuscript: Private Spaces, Low Lighting, and Sexual Risk: An Ecological Approach to Studying HIV Risk Behaviors among MSM in Commercial and Public Sex Venues. Although some researchers have argued for the application of environmental theories to better account for factors that may influence decisions to engage in high risk sexual behaviors during sex venue attendance (Binson & Woods, 2003; Pollock & Halkitis, 2009), quantitative studies have typically not investigated design aspects of the physical structures themselves—relative to risky behavior—or have focused only on commercial venues such as bathhouses. The first manuscript of this dissertation applies an ecological psychology perspective to examine physical forces (e.g., private spaces, low visibility, condom availability, and HIV educational resources), as well as social forces (e.g., norm of non-verbal communication, visible communication of condom use by other patrons) of commercial and public sex venues in association with the sexual risk behaviors that participants engage in while at these establishments. The theoretical framework for this paper was influenced by two fundamental concepts of ecological psychology—affordances (Gibson, 1986) and behavior settings (Barker, 1968)—which

have allowed for a richer understanding of how the context (both physical and social) of a sex venue may contribute to a person's behavior. Indeed, a synthesizing of Gibson's views on perception with Barker's behavior setting theory has been previously suggested (see Heft, 2001). With the findings and implications of this work, researchers might develop more applicable interventions that emphasize individual behavior change in conjunction with environmental modifications, and that will ultimately help reduce HIV/STI transmission.

Second Manuscript: An Internet Study of High Risk Behaviors and HIV Risk Perceptions among MSM Who Frequent Commercial and Public Sex Venues. With the second manuscript, participants' perceptions of HIV risk associated with unsafe sexual behaviors (e.g., oral-receptive sex with ejaculation in the mouth, unprotected anal intercourse) as well as perceptions of risk associated with specific sex venues were investigated relative to their engagement in high risk behaviors during venue attendance. The data were examined both across and within venue use to better understand the potential impact of risk assessment on sexual behavior among MSM who frequent these types of establishments. A novel component to this research was the consideration of venue-specific HIV risk perceptions among participants and whether such perceptions were associated with an increased or decreased likelihood of engaging in unsafe sex while attending these venues. In addition to perceptions of risk, this report presents data that demonstrate the sustained existence of high risk behaviors among MSM in both commercial and public sex venues. Together, these data both support previous findings as well as highlight potential concerns that despite an awareness of HIV risk MSM continue to engage in behaviors that endanger their health.

Third Manuscript: Using the Internet in Pursuit of Public Sexual Encounters: Is Frequency of Use Associated with Risk Behavior among MSM? The third manuscript resulted from an initial attempt to identify and examine clusters pertaining to the frequency of sex venue attendance and how often MSM use the Internet to find partners for public sex encounters. Cluster analysis is an iterative process and one that is typically conducted in two stages in order to determine and validate if groups of cases exist among variables of interest (Henry, Tolan, & Gorman-Smith, 2005; Rapkin & Luke, 1993; Rosario, Schrimshaw, & Hunter, 2008). Therefore, both hierarchical clustering using Ward's method and nonhierarchical clustering using a *K*-means procedure were performed. Both of these procedures are appropriate for ordinal data that is used as continuous (Everitt, Landau, & Leese, 2001). Although no clusters emerged between frequency of venue attendance and Internet use, this analysis did reveal two primary groups of Internet frequency: low and high frequency users of the Internet to find partners willing to engage in public sex encounters. The low frequency group comprised those participants who reported using the Internet once a week or less to seek out partners for a public sexual encounter, while the high frequency group was comprised of men who reported using the Internet at least two or three times a week for this reason. The paper focuses on analyses for the Internet frequency groups, particularly statistical comparisons between these two groups in terms of sexual behaviors engaged in during any venue attendance, HIV risk perceptions, and environmental preferences when seeking out men for public sexual encounters.

Private Spaces, Low Lighting, and Sexual Risk: An Ecological Approach to Studying HIV Risk Behaviors among MSM in Commercial and Public Sex Venues

Abstract

Commercial and public sex venues can be classified as behavior settings that afford opportunities for anonymous, private and intimate sexual encounters. As such, they may facilitate HIV/STI transmission among men who have sex with men (MSM) attending these venues. Using an ecological psychology perspective, this research examines the relationship between physical forces, including any affordances (e.g., private spaces, low visibility, condoms, and HIV educational resources), as well as social forces (e.g., norm of non-verbal communication, visible communication of condom use by other patrons) of sex venues and the sexual risk behaviors that occur within them. Data were obtained using an online survey completed by 204 MSM. The perceived availability of private spaces in gyms and video booths as well as reduced lighting in gyms and public parks were associated with an increased likelihood of MSM engaging in unprotected anal intercourse (UAI). Additionally, and of particular concern, the perceived availability of condoms in gyms and public parks was associated with an increased likelihood of engaging in UAI in those venues, though it is not clear how condoms were made available in those venues. However, men who perceived that other patrons in gyms were using condoms when they had sex in the gym were more likely to have engaged in protected anal intercourse within this type of venue than men who did not perceive other gym patrons as using condoms, suggesting a potential influence of social forces on risk

behavior. Implications for HIV transmission are discussed along with suggestions for future sex venue research.

Introduction

When people have sex they do so in a particular place whether it is within the confines of a private residence or the openness of a public setting. Although sexual expressions between men in connection to public space have received considerable attention in academic literature since the identification of AIDS, there has been minimal discussion as to the impact that place and behavior have on each other. Through an ecological psychology perspective grounded in Gibson's theory of affordances (1986) and Barker's earlier theory of behavior settings (1968), this paper examines sexual risk behavior among men who have sex with men (MSM) relative to contextual features of various sex venues (e.g., bathhouse, gym, park, video booth). Understanding how the context— defined as both physical and social attributes—of a sex venue might influence a person's behavior could lead to more applicable interventions that emphasize individual behavior change in conjunction with environmental modifications, and that will ultimately help reduce HIV/STI transmission.

It is important to know one's environment and what it has to offer in order to effectively search within it and achieve primary goals (Proshansky, Ittelson, & Rivlin, 1976). The affordances of an environment are defined by the opportunities they present to a person (Gibson, 1986). Sex environments are venues that contain on-site sexual activity and often afford the appearance of privacy through such features as a cubicle (in bathhouses; Bell & Weinberg, 1978), video booth (in porn stores), or bush/shrub in the case of public parks. Such "psychological privacy serves to maximize freedom of choice [and] permit the individual to feel free to behave in a particular manner" (Proshansky et al., 1976, p. 173). One might question if privacy in a sex venue facilitates risky sex

practices. Recently, research has demonstrated that 28% of men who used a private room during a bathhouse visit reported engaging in unprotected anal sex whereas only 13% of those who had not used a private room reported this behavior (Reidy et al., 2009).

In addition to spaces of privacy, low or dim lighting in bathhouses, bars/clubs, or parks late at night may create an intimate setting for sexual encounters. This feeling of intimacy can contribute to a sense of privacy among venue attendees. However, low visibility can make it difficult to perceive and therefore utilize other affordances in the environment (Gibson, 1986), such as condoms or HIV educational materials (Holmes et al., 2007). By reducing visual perception, low or dim lighting may also prevent an individual from monitoring a sex partner or other venue patrons who may or may not be using condoms. At least one study found that risky behavior in a sex venue resulted—at least in part—from design elements and other deliberate effects created by owners (e.g., reduced lighting; Richters, 2007). Indeed, several interviewees from the study mentioned that safe sex negotiation was easier in saunas because there was "better lighting", as opposed to the environment of sex clubs where lighting is usually kept low. Dark rooms, an essential design feature of sex venues for many MSM, were described by several men as a site for unprotected behavior and allowed at least one HIV-positive man to act "without social responsibility" (p. 287-288).

Setting aside the structural opportunities and limitations of sex venues, researchers have also assessed the resources available in these venues, such as HIV educational and prevention materials. These resources, also considered affordances (Gibson, 1986), may be perceived by an individual as direct (condoms) or indirect (posters) disease prevention messages. One study revealed a significantly high rate of

free condom (100%) and lubricant (67%) distribution at U.S. bathhouses and sex clubs (Woods, Binson, Mayne, Gore, and Rebchook, 2001). This finding should be interpreted with caution, because less than half of the venues offering patrons private rooms for sexual encounters made condoms available within these rooms, but rather only made them available in public areas. Recent ethnographic observations at gay bathhouses in Canada and Taiwan found that condom and lubricant distribution routinely occurred in spaces where men were not engaging in sexual behaviors (e.g., reception area, lounge, snack bar; Holmes, O'Byrne, & Gastaldo, 2007; Ko et al., 2008), and that more than a third of patrons in one of these studies reported that their lack of condom use was due to the inaccessibility of condoms in the bathhouse (Ko et al., 2008). Inaccessibility of condoms, however, does not appear to be the only explanation for why they are not used. Researchers have shown that bathhouse patrons do not always use condoms for anal sex despite their availability (Haubrich, Myers, Calzavara, Ryder, & Medved, 2004; Tewksbury, 2002). Additionally, a recent intervention to improve condom accessibility and availability in Taiwanese gay bathhouses failed to demonstrate a significant increase in consistent condom use during anal sex among patrons at a six-month follow-up (Ko et al., 2009). Furthermore, several reports have noted that some venues were known to provide patrons with HIV/STI educational materials (e.g., fliers, posters, testing information; Holmes et al., 2007; Ko et al., 2008; Wohlfeiler & Potterat, 2005; Woods et al., 2001). Ko and colleagues (2008) reported, however, that such materials were only available in the non-sexual spaces of these venues.

Using person-environment theory, Binson and Woods (2003) argue for structural-level interventions that guide individual behavior change in a bathhouse. Binson and

Woods centered their discussion on the social climate of this venue, which they describe as being formed by the interaction of four domains including supra personal (i.e. characteristics of staff and patrons; staff and patron interactions; & interactions between patrons), institutional context (i.e. size of environment; number of staff and management), physical setting (i.e. spaces; atmosphere; decor; & HIV messages), as well as policies and services (i.e. rules, norms, HIV/STI testing opportunities, and counseling). They argue that this dynamic social climate is influential to bathhouse patrons and their decisions to engage in safe or risky sexual practices. The authors suggested that structural-level interventions, which target the four domains and direct changes in the environment, are likely to be more effective for greater numbers of people than programs already in place. While this theoretical approach may be suitable for understanding risk in commercial sex venues such as bathhouses (Ko et al., 2008) or sex clubs, it is not as persuasive an argument when considering the temporary nature of most public sex venues (e.g., parks). Public bathrooms and cruising parks do not intentionally provide spaces for sex and are not primarily operated as a site for sex (Frankis & Flowers, 2009; Woods & Binson, 2003). Gibson's theory of affordances (1986) in combination with Barker's theory of behavior settings (1968), which will be elaborated on in the next section, provide a more applicable framework for understanding sexual risk behaviors that occur throughout both commercial and public sex venues.

Sex Environments as Behavior Settings

By taking an ecological psychology approach to investigating the transmission of HIV in sex environments, the current study has expanded on the course charted by Binson and Woods (2003) for health promotion in MSM. The intentions were to highlight

the potential impact that human-environment interactions have on individual and public health. Ecological psychology provides us with a field of study that emphasizes the importance of measuring an individual's behavior in relation to the immediate environment (Barker, 1968, 1987; Gump & Adelberg, 1978; Heft, 2001). Barker's theory of behavior settings conceptualizes this relationship, thus making it a relevant approach for understanding high risk activities in sex venues. Barker defines a behavior setting as a self-regulated ecological unit located in time and space that can be encountered and re-encountered. These settings have a "standing pattern of behavior" as well as temporal, spatial, or occupancy limits (Barker, 1968, p. 18). Commercial sex venues may be considered persistent behavior settings because of their precise location and hours of operation by which patrons can observe or engage in sexual activity. Public sex venues, on the other hand, are temporary behavior settings because sexual encounters are not the intended purpose of the milieu/environment (e.g., park); and because spatial changes are known to occur making this a more fluid type of venue (Kelly & Muñoz-Laboy, 2005). Power over behavior setting functioning is variable and usually proscribed by its internal structure (Barker, 1968). In a bathhouse or sex club, for example, this power can be exerted at the reception area whereby an attendant permits entry only after an admission fee has been collected. However, it is the coming together of patrons for the purpose of—and actual engagement in—sexual activity that control the operation of sex venues as behavior settings. When considering these venues as behavior settings, it is important to remember that without the behavior (sex) *and* milieu there would be no functioning behavior setting (sex venue).

According to Barker's (1968) behavior setting theory the geographical (physical) arrangement of furniture, equipment, and other affordances in a particular setting can "enforce" or "prevent" certain behavior patterns (p. 29). Douglas and Tewksbury (2008) found through non-participant observation of adult porn theaters that patrons positioned themselves against walls or backs of seats in various ways depending on the type of sexual activity they were pursuing (e.g., oral-insertive/receptive; anal-insertive/receptive). Moreover, interviews with MSM about their experiences in sex venues have revealed a potential causal relationship between physical structure and behavior (Richters, 2007). In that study several respondents noted how setting characteristics (e.g., steps, platforms) influenced the sexual role that patrons would assume (oral-insertive vs oral-receptive). Glory holes, a design feature in such sex venues as bathhouses, public restrooms, and video booths, signal an opportunity to insert or receive penises for the purposes of masturbation, oral sex, and perhaps anal intercourse (Bapst, 2001; Flowers, Marriott, & Hart, 2000; Richters, 2007). Furthermore, sexual acts that occur in bathhouses are often contained in cubicles or private rooms (Houlbrook, 2005). Both cubicles and video booths are perceived as private spaces for engaging in sexual activity, whether alone (i.e. masturbation) or with a partner. As discussed earlier, research has shown that 28% of men who utilized private spaces during a venue visit reported unprotected anal sex while less than 15% of men who had not used a private space reported this behavior (Reidy et al., 2009).

In addition to physical forces, behavior patterns can be influenced by "strongly coercive" social forces within the behavior setting (Barker, 1968, p. 30). For instance, group orgies that take place at a sex venue may have a social power that ultimately leads

to greater participation as new individuals enter the space. Weinberg and Williams (1975) revealed that it is not uncommon for bathhouse patrons to join sexual activities already in progress. Moreover, there are internal pressures to learn and conform to a behavior pattern or else face exclusion (Barker, 1968; Gump & Adelberg, 1978). Indeed, the non-verbal culture found in certain sex venues (bathhouses; Elwood, Greene, & Carter, 2003; see Frankis & Flowers, 2009 for review of this relative to public sex venues) yields a social influence that often precludes safe sex discussion or HIV disclosure between partners. Non-verbal communication does make it problematic to be open about one's HIV status as research has demonstrated in bathhouses and sex clubs (Wohlfeiler & Potterat, 2005) as well as public bathrooms (Reece & Dodge, 2003). Silence in a sex venue can also have a negative effect on condom negotiation (Elwood et al., 2003; Elwood & Greene, 2005; Haubrich et al., 2004; Reece & Dodge, 2003; Richters, 2007). This non-verbal culture may ultimately be used as an explanation for why a condom was not worn (Elwood et al., 2003) or why safe sex discussions are less likely to happen (Reece & Dodge, 2003). Furthermore, research has found that it is not uncommon to assume that a potential partner is disease free if he does not indicate his status (Richters, 2007). Lastly, another potential social influence in sex venues that has implications for HIV/STI transmission is the visible communication of condom use by other patrons. Yet little research has examined the effect that observing one's peers engaging in safe—or unsafe—sex during venue attendance may have on an individual's behavior.

To understand HIV risk behaviors and sexual culture, researchers might look beyond individual responsibility by considering behaviors associated with locale (Flowers et al., 2000). The current report investigates whether the extent to which MSM

engage in high risk sex is associated with characteristics of different venues. Using an ecological perspective, this research examines the potential impact that physical forces, including any affordances (e.g., privacy, low visibility, condoms, and HIV education resources), as well as social forces (e.g., norm of non-verbal communication, visible communication of condom use by other patrons) of sex venues may have on sexual risk behaviors. Specifically, it was hypothesized that a perceived availability of private spaces and/or low lighting within these venues would be associated with a higher occurrence of unprotected anal sex during attendance. Moreover, based on previous research it was anticipated that the perceived availability of condoms and HIV educational materials (e.g. fliers, posters, etc.) in a sex venue would not be associated with a lower prevalence of risk behavior. Furthermore, it was hypothesized that low perceptions of condom use by other venue patrons would be associated with a higher prevalence of unprotected anal sex among the men in this study, thereby demonstrating the influence of social forces on risk behavior.

Method

Participants

A total of 260 MSM participated in an online survey about risk perceptions, sexual behaviors, and HIV prevention efforts in commercial and public sex venues. Participants were recruited almost exclusively from online solicitations including an LGBT academic listserv, Craigslist.org, and Backpage.com. However, the author made additional attempts to recruit participants from gay establishments in New York City where MSM are known to engage in sexual activities. In order to participate in the study,

men were required to be at least 18 years of age and to actively engage in sexual behavior with other men.

Of the 260 eligible men, 204 completed the surveys, which were used for this analysis. Most of the participants in this study were between the ages of 30 and 60. Specifically, men reported their age as: 18 – 24 (10.5%), 25 – 29 (9%), 30 – 40 (31%), 41 – 60 (43.5%), and over 60 (6%). Additionally, most of the men identified as being HIV-negative (85%); although a small percentage reported their status as HIV-positive (6%), or that they did not know their HIV status/refused to say (9%).

Procedure

Strategic opportunistic sampling (Harding & Peel, 2007) was one method of Internet recruitment used for this study whereby an online solicitation containing the survey link was emailed directly to a listserv for LGBT researchers, who were not exclusive to New York City. Additionally, the author posted notices in various Craigslist categories (e.g. Men Seeking Men; Casual Encounters m4m; & Volunteer) as well as in the Men seeking Men category for Backpage. These were posted primarily in the NYC metropolitan area including New Jersey and Connecticut; however, since participants from the LGBT listserv were not necessarily from NYC, several Craigslist postings were also placed in other urban centers with high percentages of gay and bisexual men. As part of the venue-based recruitment strategy, the author placed approximately 500 study invitation cards in and around the entrance areas of various gay establishments (e.g. bars, sex clubs, gyms, and the LGBT center in New York City) as well as the Ramble of Central Park, a prominent public sex site in New York City. Study invitation cards, fliers, and Internet notices indicated that this was an online survey for men at least 18 years of

age who have sex with other men, and that there was a chance to win a $50 prize. All recruitment materials instructed potential participants to e-mail the study e-mail address and ask for a link to the survey.

After receiving and accessing the survey link participants were asked to read a consent page and click their agreement. The consent page informed participants that the survey would take approximately 20 minutes to complete. Upon completing the survey, individuals were given the option to provide an e-mail address that would be entered into a random drawing for one of two $50 electronic gift certificates. This study was approved by the Institutional Review Board affiliated with the author's university.

Instrument

From May-September of 2008 an online survey was implemented using existing scales and additional items based on a thorough review of the extant literature. Using a self-administered online questionnaire allowed for a potentially more representative sample of the target population (Bourque & Fielder, 2003). The effectiveness of using Internet surveys to assess sexual behavior in MSM populations has been previously demonstrated (Chiasson et al., 2005; Ross, Tikkanen, & Mansson, 2000). The questionnaire was administered and hosted using an online survey tool (Survey Monkey). In order to reduce the potential for multiple survey submissions by a single individual, it has been suggested that researchers collect an Internet Provider (IP) address from participants (Barchard & Williams, 2008; Birnbaum, 2004; Riggle, Rostosky, & Reedy, 2005). For the current study, this mechanism was instituted through the survey host, whereby the IP address was recorded for anyone clicking on the survey link. Although IP addresses do not specifically identify individuals, they are still considered a source of

identifying information because they can be traced back to a computer with potentially one owner/user (Barchard & Williams, 2008; Nosek, Banaji, & Greenwald, 2002). This information was destroyed after checking for multiple submissions. All data were kept on a secure server. The consent page reflected participants' right to refuse to answer any questions and to quit taking the survey at any time.

Men were asked to indicate how often in the past month ("Never", "One or two times", "Once a week", "Two or three times a week", and "More than three times a week") they had frequented any of seven sex venues (e.g., gyms, public bathrooms, bathhouses, sex clubs, bar backrooms, public parks, and video booths) where they observed or engaged in sexual activity. Because the survey was designed to include skip patterns based on individual participant responses, men had to answer venue-specific questions for only those venues they had attended during the previous month. For those venues attended during the previous month, participants were subsequently asked to report the number of times they engaged in specific behaviors (e.g., insertive oral sex, receptive oral sex with ejaculation in the mouth, receptive oral sex without ejaculation in the mouth, insertive anal sex with/without a condom, and receptive anal sex with/without a condom). Recalling behavior through open response (reporting the number of behaviors) has been recommended as a way of improving self-report of sexual activity (Weinhardt, Forsyth, Carey, Jaworski, & Durant, 1998). The number of times participants engaged in oral sex (insertive, receptive with ejaculation in the mouth, receptive without ejaculation in the mouth) as well as anal sex (insertive and receptive) without a condom (unprotected) and with a condom (protected) were totaled for each participant. The data were positively skewed, and therefore dichotomized for categorical analysis. This

recoding resulted in three variables [i.e. any type of oral sex, any type of unprotected anal intercourse (UAI), and any type of protected anal intercourse (PAI)], which were used in subsequent analyses. Based on this dichotomization, the absence of UAI (0 = No) included both men who reported PAI only and men who did not report anal sex; the absence of PAI (0 = No) included both men who reported any UAI and men who did not report anal sex. Additionally, men were asked to estimate the percentage (0 – 100%) of patrons they think use condoms for anal intercourse when attending these venues. The responses were recoded for categorical analysis (0 – 50% = low, 51 – 100% = high) to examine this perception relative to participants' engagement in UAI and PAI.

In addition to venue attendance and sexual behavior questions, men were asked to indicate if condoms, HIV prevention fliers, or education posters were made available ("Never", "Sometimes", "Always") throughout each of the venues they attended. Responses to each of these items were recoded into two categories, available (always or sometimes) and never available, which were used in subsequent analyses. Men were also asked to indicate if each of the venues they attended provided private spaces for sex as well as low or dim lighting. Response choices to this item included: "Never", "Sometimes", and "Always". Follow up questions asked participants to gauge the perceived likelihood of practicing safer sex within the venue as a result of private spaces and low or dim lighting. Specifically, the response choices to these items included: "Reduces likelihood of practicing safer sex", "Has no effect", and "Increases likelihood of practicing safer sex".

Participants were also asked to rate ("Strongly agree", "Somewhat agree", "Strongly disagree", and "Somewhat disagree") a set of environmental qualities

(affordances) based on their experiences seeking out men in a public place. The statement specifically read: "When I seek out men in a public place, I prefer spaces that are _____." The set of environmental affordances included: *stimulating*, *full of adventure*, *clean*, *safe*, *private*, *public*, *non-verbal*, *full of men*, *lively*, *bright*, and *dimly lit*. Finally, using the same rating scale participants were presented with a statement that read: "When I seek out men in a public place, I am looking for _____". The preferences for this item were: *anonymous sex*, *sex with more than one partner*, *friendship*, *companionship*, and *love*. Responses to any of the environmental affordances or preferences were collapsed into two categories—agree (strongly or somewhat agree) and disagree (strongly or somewhat disagree)—which were used in subsequent analyses.

Data analysis

High risk sexual activity has been defined in previous work as any oral or anal behaviors with less than 100% condom use (Garofalo, Herrick, Mustanski, & Donenberg, 2007). The current study relied on this definition when classifying any anal sex (insertive or receptive) without a condom as unprotected and high risk. Comparisons were conducted using chi-square (e.g., availability of private spaces, low/dim lighting, environmental preferences & affordances, perceptions of condom usage among other venue patrons). A Fisher's exact test was used to determine significance for 2 x 2 chi-square analyses with any cell counts of less than 5. Environmental preferences and affordances that were significantly associated with an increased likelihood of unprotected anal sex in bivariate analyses were entered into a logistic regression model to assess their predictive power.

Results

Table 1.1 provides information on the prevalence of venue attendance, frequency of venue attendance, as well as venue-specific sexual behavior during the previous month. Within the sample, 139 (68%) participants indicated attending at least one venue during the previous month. Multivenue users accounted for 67% (n = 93) of this subsample of 139 men. Specifically, the percentages for attending multiple venues during the previous month were as follows: 1 venue users (33%), 2 venues (24%), 3 venues (21%), 4 venues (14%), and 5 venues (9%). Public parks were the most attended venue among the men in this sample followed by video booths, public bathrooms, gyms, bathhouses, bar backrooms, and sex clubs. In terms of venue frequency, a majority of men within each venue reported attending less than once a week during the previous month. As shown in Table 1.1, it is interesting to note that the percentages of venue attendance, oral sex, and unprotected anal intercourse (UAI) were remarkably similar across venues. Although bathhouses were attended by only 25% of the subsample, this venue had the highest percentage of reported UAI (26%) and oral sex (89%). Furthermore, the two most frequented venues by this sample—public parks and video booths—were also sites where at least one in five men reported UAI. Overall, however, the percentages of UAI were considerably lower than those of oral sex.

Perceived Availability of Private Spaces and Low Lighting Relative to Sexual Behavior

The significant outcomes for the relationship between perceived availability of private spaces within sex venues and the likelihood of engaging in UAI are reported in Table 1.2. Among those who attended a gym, unprotected anal intercourse (UAI) was more likely to be reported by men who perceived that private spaces were available

always (50%) or sometimes (26%), compared to men who perceived that private spaces were never available (4%), χ^2 (2) = 7.6, $p < .05$. An omnibus chi-square test examining the association between UAI and perceptions of private space availability in video booths could not be interpreted because no one who perceived that these spaces were never available reported UAI. However, post-hoc observations revealed among those who frequented a video booth, that UAI was more likely to be reported by men who perceived that private spaces were always available (36%), compared to men who perceived that private spaces were sometimes available (14%), though this finding was only marginally significant ($p < .08$, Fisher's exact). There were no significant findings for the relationship between perceived private space availability and UAI among men who frequented public bathrooms, bathhouses, sex clubs, bar backrooms, or public parks. Furthermore, there were no significant outcomes to report for the relationship between the perceived availability of private spaces and the likelihood of protected anal intercourse (PAI) for any of the venues.

The significant outcomes for the relationship between perceived availability of low or dim lighting within sex venues and the likelihood of engaging in UAI are reported in Table 1.3. Among those who attended a gym, UAI was more likely to be reported by men who perceived that low or dim lighting was always available (50%), compared to men who perceived that low or dim lighting was never (14%) or sometimes (9%) available, χ^2 (2) = 7.5, $p < .05$. In addition, among those who frequented a public park, UAI was more likely to be reported by men who perceived that low or dim lighting was always available (46%), compared to those men who perceived that low or dim lighting was never available (11%), χ^2 (2) = 6.1, $p < .05$. There were no significant associations to

report, however, between perceived availability of low or dim lighting and UAI among men who frequented public bathrooms, bathhouses, sex clubs, bar backrooms, or video booths. Finally, there were no significant associations between the perceived availability of low lighting and the likelihood of PAI for any of the venues.

Further analyses sought to assess the perceived availability of private spaces on oral sex. Among those who attended a public park, oral sex was more likely to be reported by men who perceived that private spaces were never available (84%), compared to those men who perceived that private spaces were always available (38%), χ^2 (2) = 7.4, $p < .05$. Furthermore, post-hoc observations revealed among public park attendees, that oral sex was more likely to be reported by men who perceived that private spaces were sometimes available (74%) as compared to men who perceived these spaces as always available (38%), though this finding was only marginally significant ($p < .10$, Fisher's exact). Also, all men who attended bathhouses and perceived that private spaces were available reported engaging in oral sex. Therefore, bivariate analysis was not conducted, as at least one expected cell count would be zero. Lastly, there were no significant associations between perceived private space availability and the likelihood of oral sex among men who attended the remaining venues.

Oral sex behaviors were also examined relative to the perceived availability of low or dim lighting within venues. The findings revealed among those who attended sex clubs, oral sex was more likely to be reported by men who perceived that low or dim lighting was always available (95%), compared to those men who perceived that low or dim lighting was sometimes available (40%), χ^2 (2) = 10.7, $p < .01$. An omnibus chi-square test examining the association between oral sex and perceived availability of low

or dim lighting in video booths could not be interpreted because at least one expected cell count was zero. However, post-hoc observations revealed among those who attended a video booth, that oral sex was more likely to be reported by men who perceived that low or dim lighting was always available (81%) as compared to men who perceived that low or dim lighting was sometimes available (50%), though this finding was only marginally significant ($p < .10$, Fisher's exact). Also, all men who attended bathhouses and perceived that low or dim lighting was available reported engaging in oral sex. Therefore, bivariate analysis was not conducted, as at least one expected cell count would be zero. Lastly, there were no significant findings to report, however, for the relationship between perceived availability of low or dim lighting and the likelihood of oral sex among men who attended the remaining venues.

Perceived Effects of Private Spaces and Low Lighting on Practicing Safer Sex

Men who perceived available private spaces within any of the sex venues were further asked to indicate what effect this environmental feature was perceived to have on practicing safer sex. As shown in Table 1.4, with the exception of men who attended bar backrooms, the majority of men in each of the venues perceived this feature as having no effect on practicing safer sex. Comparisons of the proportion of men who perceived that private spaces increases versus reduces the likelihood of practicing safer sex found only one significant difference; among men in bathhouses, a greater proportion perceived private spaces as increasing the likelihood (30%) rather than reducing the likelihood (6%) of practicing safer sex (McNemar test, $p < .05$). Further, bivariate analyses found no relationship between reports of UAI during venue attendance and any of the perceived

effects (has no effect, reduces likelihood, increases likelihood) that private spaces may have on practicing safer sex.

Men who perceived that low or dim lighting was available within any of the venues were further asked to indicate what effect this environmental feature was perceived to have on practicing safer sex. As shown in Table 1.4, the majority of men in each of the venues perceived this feature as having no effect on practicing safer sex. However, comparisons of the proportion of men who perceived that low lighting increases versus reduces the likelihood of practicing safer sex found several significant differences. Among men who attended public bathrooms, more perceived low lighting as reducing the likelihood (29%) of practicing safer sex rather than increasing the likelihood (0%; McNemar test, $p < .01$). Also, more men who attended bar backrooms perceived low lighting as reducing the likelihood (43%) of practicing safer sex rather than increasing the likelihood (7%; McNemar test, $p < .05$). Further, more men who attended video booths perceived low lighting as reducing the likelihood (25%) of practicing safer sex relative to increasing the likelihood (7%; McNemar test, $p < .05$). Lastly, bivariate analyses found no relationship between reports of UAI during venue attendance and any of the perceived effects that low lighting may have on practicing safer sex.

Perceived Availability of Condoms and HIV Educational Materials and the Likelihood of Engaging in Risk Behavior

Perceptions of condom availability varied by venue, with a higher prevalence of men reporting this for bathhouses (97%) and sex clubs (90%) than the remaining venues: bar backrooms (52%), video booths (42%), gyms (32%), public bathrooms (26%), and public parks (7%). Table 1.5 reports the significant outcomes for the relationship between

perceived availability of condoms within sex venues and the likelihood of engaging in UAI. The data revealed, among those who attended a gym, UAI was reported by a greater percentage of men who perceived condoms to be available in this venue (35%), compared to men who perceived that condoms were never available (8%), χ^2 (1) = 5.95, $p < .05$. A similar result emerged among men who frequented public parks, as reported in Table 1.5. There were no significant relationships between condom availability and the likelihood of UAI for the remaining venues.

Perceptions of HIV poster availability varied by venue, with a higher prevalence of men reporting this for bathhouses (89%) and sex clubs (69%) than the remaining venues: video booths (34%), bar backrooms (31%), gyms (31%), public bathrooms (13%), and public parks (4%). Among those who attended a gym, UAI was reported by a greater percentage of men who perceived available HIV posters (38%), compared to men who perceived that HIV posters were never available (8%), χ^2 (1) = 6.6, $p < .05$. There were no further significant relationships between the perceived availability of HIV posters and UAI to report. Additionally, perceptions of HIV flier availability also varied by venue, with a higher prevalence of men reporting this for bathhouses (86%) and sex clubs (75%) than the remaining venues: video booths (36%), bar backrooms (30%), gyms (29%), public bathrooms (6%), and public parks (1%). Bivariate analyses revealed no significant relationships between the perceived availability of HIV fliers and the likelihood of UAI for any of the sex venues.

Reports of protected anal intercourse (PAI) were also assessed in relation to the perceived availability of condoms and HIV educational materials (e.g., fliers & posters) within each of the venues. Among those who attended a gym, PAI was reported by a

greater percentage of men who perceived available HIV posters (44%), compared to men who perceived that HIV posters were never available (17%), χ^2 (1) = 4.3, $p < .05$. Additionally, among gym attendees, PAI was reported by a greater percentage of men who perceived condoms to be available in this venue (41%) as compared to men who perceived that condoms were never available (17%), though this finding was marginally significant, χ^2 (1) = 3.7, $p = .05$. Moreover, among gym attendees, PAI was also reported by a greater percentage of men who perceived available HIV fliers (40%) as compared to men who perceived that HIV fliers were never available (16%), though this finding was marginally significant, χ^2 (1) = 3.4, $p < .07$. Within the remaining venues, there were no significant findings to report for relationships between PAI and the perceived availability of condoms or HIV educational materials.

Perceived Condom Use among Other Venue Patrons and Risk Behavior

Participants were asked to rate the percentage (0 – 100%) of patrons using condoms for anal intercourse when attending these venues. Contrary to expectations, there were no significant findings for the relationship between perceiving low condom use among other patrons and participants' engagement in UAI. However, among those who frequented public parks, UAI was marginally more likely to be reported by men who perceived a low use of condoms by other patrons, compared to men who perceived a high use of condoms by other patrons, χ^2 (1) = 3.3, $p = .10$. Conversely, among those who attended a gym, PAI was marginally more likely to be reported by men who perceived a high use of condoms by other patrons (46%) as compared to men who perceived a low use of condoms by other patrons (19%), χ^2 (1) = 3.7, $p = .05$. There were no significant

findings for the relationship between perceived condom use among other patrons and participants' engagement in PAI for the remaining venues.

Preferences When Seeking Out Men in Public Places and the Likelihood of Engaging in High Risk Behavior

When asked about a set of preferences for public sexual encounters in general (regardless of venue), more than half of the men in the full sample (N = 204) reported that they looked for: thrills (87%), anonymous sex (81%), and sex with more than one person (57%). Among the venue attendees (n = 139), bivariate analyses revealed that men who engaged in UAI at a sex venue were almost more likely to prefer public sexual encounters involving sex with more than one person (78%) compared to men who did not report UAI (59%), χ^2 (1) = 3.8, $p < .06$ (see Table 6). Additionally, when asked about a set of environmental affordances of sex venues, a majority of men in this study reported a preference for public spaces that were: stimulating (86%), full of adventure (81%), clean (87%), safe (88%), private (76%), non-verbal (66%), full of men (74%), lively (67%), and dimly lit (81%). These environmental affordances were further examined among venue attendees in relation to UAI. Men who engaged in UAI at a sex venue were less likely to prefer stimulating spaces for seeking out men in public (77%) as compared to men who did not report UAI (91%), χ^2 (1) = 3.98, $p < .05$. Similarly, men who engaged in UAI at a sex venue were less likely to prefer safe spaces for seeking out men in public (78%), compared to men who did not report UAI (91%), χ^2 (1) = 3.9, $p < .05$.

The three environmental affordances or preferences for seeking out men in public places that were significant during bivariate analyses were then included in a logistic regression model. The dependent variable was UAI. The full model containing all

predictors was statistically significant, χ^2 (3, N = 139) = 9.3, p < .03, indicating that the model was able to distinguish between UAI and no UAI. The model as a whole explained between 7% (Cox and Snell R square) and 10.4% (Nagelkerke R square) of the variance in UAI, and did correctly classify 77% of cases. Table 1.6 demonstrates the role of each predictor in the model. Men who prefer sex with more than one person when seeking out men in public places were almost more likely to report UAI compared to men who did not prefer this type of encounter (p < .06). Men who preferred public spaces that were stimulating had two-thirds less the odds of reporting that they had engaged in UAI compared to men who did not prefer public spaces that were stimulating. Finally, a preference for public spaces that were safe was not significantly associated with UAI in the multivariate analysis.

Discussion

This report has evaluated self-reported risk practices as well as the perceived availability of condoms and HIV educational materials within seven distinct types of sex venues. A novel attempt was undertaken to examine the potential role of different contextual factors in these environments on sexual behaviors that increase or decrease the risk of HIV/STI transmission. Findings revealed that men who perceived private spaces to be available in gyms and video booths were more likely to report engaging in risky sexual behavior. This finding adds to recent work which demonstrated an association between using a private room at a sex venue and engaging in unprotected anal sex (Reidy et al., 2009). Additionally, men who perceived low lighting to be available in gyms and public parks were more likely to report engaging in risky sexual behavior. Conversely, the data failed to find an association between the perceived availability of these two

design features within sex venues and engaging in protected anal sex. These results raise the possibility that such environmental elements may be influencing riskier rather than protective sexual behaviors. However, it is also possible that these design features decrease the likelihood of engaging in anal sex, thereby decreasing risk without necessarily increasing protected anal sex. Moreover, men overwhelmingly reported a preference for public places that offered private and dimly lit spaces for sexual encounters. A number of men who frequented public bathrooms, bar backrooms, and video booths further implicated reduced lighting as having a negative effect on practicing safer sex. Taken together these findings suggest that physical forces of sex venues, including the intimacy afforded by low lighting, may play a role in decisions to engage in unprotected anal sex. Due to the non-causal nature of these findings, however, MSM may be seeking out venues that afford private spaces and low lighting when they desire to engage in anal sex. This decision to have anal sex (unprotected or protected), therefore, may factor into an individual's choice to attend a sex venue that offers these design effects. Future research efforts might consider the desire for anal sex in public sex encounters and how this affects venue selection.

The findings in this study also revealed associations between physical forces of sex venues and the likelihood of engaging in oral sex. Specifically, relationships were demonstrated between the perceived availability of private spaces and the likelihood of engaging in oral sex among men who frequented public parks. Additionally, the perceived availability of low or dim lighting was associated with an increased likelihood of engaging in oral sex in sex clubs, and video booths. As with UAI, the physical forces of these sex venues appear to be supporting greater opportunities for oral sex. However,

as noted earlier for UAI, the data do not allow for causal conclusions. An individual may choose to attend venues that afford private spaces and/or low lighting when they desire to engage in oral sex. Therefore, it is not necessarily that these design effects play a role in an individual's decision to engage in oral sex.

Perceiving that other patrons are using condoms for anal sex while attending a sex venue may influence an individual's decision to use a condom or participate in low-risk behaviors. The findings in this study revealed that perceptions of low condom use among other men in public parks were marginally associated with an increased likelihood of unprotected anal sex. Conversely, perceiving high condom use among other men in gyms was associated with participants' reports of protected anal sex. Therefore, high condom use may be promoting safer behaviors among men who engage in sex at the gym. Furthermore, the non-verbal space(s) of sex venues were overwhelmingly preferred by participants when they seek out public sex encounters, though this preference was not associated with UAI. The norm of silence in certain sex venues (e.g., bathhouses) is often enforced by fellow patrons (Elwood et al., 2003; Somlai, Kalichman, & Bagnoll, 2001) and reliance on non-verbal communication is typically adhered to, but it can have a negative effect on negotiating condom use (Elwood et al., 2003; Elwood & Greene, 2005; Haubrich et al., 2004; Richters, 2007). Together, these findings suggest the existence of social forces within sex venues and that they may play a role in safe sex decisions, though more research is needed to directly assess how social influences such as peer norms affect risk behavior.

The perceived availability of environmental affordances (Gibson, 1986) such as condoms and HIV education materials within these venues as reported by participants is

consistent with previous research (Helquist & Osmon, 2003a, b; Holmes et al., 2007; Ko et al., 2008; Tewksbury, 2002; Warwick, Douglas, Aggleton, & Boyce, 2003; Wohlfeiler & Potterat, 2005; Woods et al., 2001). However, men who reported that condoms were available in gyms and public parks still engaged in UAI in those venues more so than men who indicated that condoms were never available, which supports and expands previous research done on bathhouses (Haubrich et al., 2004; Ko et al., 2009; Tewksbury, 2002). This should be interpreted with caution though because the availability of condoms in gyms was marginally associated with PAI as well, among men in that venue. Given that gyms and parks are temporary sex venues, it is interesting to find that some participants perceived these items as being readily available within the environment. Though, men who engage in anal sex when attending sex venues may be more aware of condom availability than those who engage in low-risk behaviors (e.g., mutual masturbation). What remains unclear is where in the gyms and parks these condoms were positioned or if they could be obtained from staff or other venue patrons, as well as what effect this accessibility (or inaccessibility) may have had on engaging in risky behaviors. Research in bathhouses has shown that condoms are often distributed in non-sexual spaces (Holmes et al., 2007; Ko et al., 2008), which can have a negative effect on their use. In addition, gay bar patrons often have to ask for them through bartenders who keep them behind the bar rather than in a more public space, which can inhibit their access—and use (Warwick et al., 2003).

The presence of HIV fliers in gyms was closely associated with an increased likelihood of engaging in protected anal sex, though it is not clear where or how this type of information was disseminated in that venue. Moreover, men who perceived available

HIV posters in gyms were more likely to report protected anal sex than men who did not perceive these posters; however, the perceived availability of HIV posters in gyms was also associated with participants' reports of engaging in UAI. Given this inconsistency in the findings, one cannot speculate about a uniform effect of educational materials in promoting safer sex behaviors among men in gyms. Furthermore, since the perceived availability of these materials was not associated with risky or protected anal sex in any of the remaining venues, their presence does not appear to be a consistent means of behavioral change in sex environments. This conclusion adds to previous work done in gay bars that found patrons to be hesitant about having HIV/AIDS educational materials placed in a venue that serves—for them—as a primary source of socialization (Warwick et al., 2003). Future studies might explore the opinions that MSM have about being confronted with safe sex messages during their attendance at different venues, and how this is associated with their venue-specific sexual behaviors.

One goal of this research was to apply ecological psychology theory to the study of high risk behaviors within sex venues. The use of behavior setting theory (Barker, 1968) in combination with Gibson's (1986) views on perception—a synthesis that has been proposed before (see Heft, 2001)—has expanded previous work (Binson & Woods, 2003; Ko et al., 2008) by allowing for the assessment of both commercial and public venue types. Traditional commercial sex establishments, including bathhouses, sex clubs and video booth stores are a persistent source of sexual behavior because of their precise location, hours of operation, and designated sexual spaces. Gyms, public bathrooms and parks, which were frequented by a large number of men in this study, represent temporary public sex venues given that the sexual spaces are contested and ever-

changing. Moreover, these venues do not maintain comparably motivated staff, management, and social rules or norms pertaining to sexual behavior, all of which are commonly found in commercial sex venues. One might consider the Ramble, a woodland area located within New York City's Central Park, which functions daily as an ecological niche for rare bird watching. After sunset, however, it often functions as a temporary milieu for homosexual activity. Although public parks—like bars, clubs, and bathhouses—have been sites for HIV outreach (e.g., condom distribution, testing referrals, dissemination of education materials; French, Power, & Mitchell, 2000; Somlai et al., 2001), such interventions are not a constant presence within this venue because of its temporary status. Consistent with Barker's theory, both commercial and public sex venues as behavior settings are contingent upon behavior (sex) and milieu (sex venue).

In his theory of behavior settings (or ecologies), Barker often emphasized the behavior within the setting more than the individual. With his expansion of Barker's work, Wicker (1987) sets up the idea of reciprocity in human-environment relationships. He reminds us that our behavior leaves its mark on our physical surroundings as well as the occupants. This was evident in the current study whereby perceptions of high condom usage among other patrons in gyms were associated with participants' engagement in protected anal sex. This adds another dimension to the social context of behavior settings examined by Barker. Wicker also concerned himself with the cyclical nature of behavior settings, particularly how they develop across four stages (e.g., preconvergence, convergence, continued existence, & divergence). Of significance to this paper is the continued existence of a sex venue, which depends on its ability to maintain patron satisfactions and to adapt during changing times (e.g., new management, staff, or

occupants; altered physical space or location; prohibitive laws regarding public sex). Here again we can speculate about the importance of reciprocity in whether a sex venue remains a thriving establishment for its patrons. Specifically, a continued occurrence of unsafe behavior may prompt public health officials to consider environmental modifications to lower HIV/STI risk, which in turn could lead to reduced attendance by patrons who actively seek out venues to engage in risky sex (Elwood & Greene, 2005), or encourage MSM to find alternative venues.

Implications

The research presented here has demonstrated the continued existence of risky sexual behaviors among men who have sex with men who frequent traditionally investigated sex venues (e.g., bathhouses, sex clubs, bar backrooms, public parks, & public bathrooms) as well as lesser-studied venues such as gyms and video booths. The findings suggest that private and/or dimly lit spaces of some sex venue types may be implicated in the continued presence of these high risk behaviors. Additionally, some men perceived low lighting as having the potential to reduce safe sex practices among venue patrons. This evidence could be used to generate more in depth studies that address this situation relative to current sex venue policies. But first there is a need to better understand existing policies regarding private spaces and low lighting within these venues. Then researchers can begin to examine the effects of these policies on patrons' engagement in risky behaviors. The results of those empirical efforts could lead to environmental interventions that alter the physical landscape to discourage riskier sex practices (e.g., brighter lights, fewer private spaces). Such modifications may, however, deter patronage and drive risky sex from one venue to another or into homes and other

private spaces. Behavior—sexual or otherwise—is not place-specific (Barker, 1987), as evidenced by the large proportion of multivenue users in this study (67%). Furthermore, research efforts may ultimately prompt public health officials to institute other mechanisms (e.g., monitoring of sexual behavior within venues) aimed at reducing HIV/STI transmission.

The exploratory nature of this research warrants a discussion of limitations and possible recommendations for future studies. First, the sample was modest in size, although there were sufficient numbers of participants attending each venue to detect some within-group differences. Second, the survey instrument was online for only a four-month period during summer months. However, this assessment window was considered to be optimal for including public parks, which may be less frequented during colder months. Third, there were not enough men who reported being HIV-positive to further examine the potential effect their status could have on their sexual behaviors within these venues. Fourth, statistical comparisons between behavior(s) in one venue versus another venue would only be conducted among those participants who had attended both venues (otherwise they would have missing data for the second venue). Such analyses would have restricted the findings to only multivenue users, potentially biasing the findings. Fifth, racial diversity should be assessed in a larger scale study so as to rule out any confounding effects on venue attendance. Lastly, behavior setting theory typically relies on observational techniques of data collection. However, it would not have been practical, permissible, or ethical to attempt the observation of condom use among venue patrons who were using private spaces. Further, the potential effects of low lighting would have also had a negative impact on data collection. The reliance on participants'

self-report in this study adds to the utility of Barker's theory. Indeed, behavior setting work often results in the development of an instrument with which to assess qualities of the environment. In this study, it was the participant who completed the instrument rather than the researcher.

Conclusions

This research applied an ecological psychology approach to understanding the pervasiveness of HIV risk behaviors among men who have sex with men in commercial and public sex venues. The current report has demonstrated the existence of physical forces which may be influencing the sexual behaviors of MSM who attend. Specifically, the perceived availability of private spaces and low lighting in certain venues was associated with an increased likelihood of MSM engaging in high risk behavior during venue attendance. The findings also revealed that unprotected anal sex continues to occur in commercial and public sex venues despite the availability of HIV/STI prevention affordances such as condoms, educational posters, and fliers. Although reports of low condom use among other patrons were marginally associated with an increased likelihood of UAI in public parks, the opposite was found for men who frequented gyms. Specifically, perceiving high condom use among other patrons was associated with an increased likelihood of engaging in protected anal intercourse while attending gyms. Together, this suggests the existence of social forces within sex venues whereby peer behaviors may have an influence on participation in risky and protective behaviors. Given that HIV rates continue to rise among men who have sex with men (Jaffe, Valdiserri, & DeCock, 2007) and that recent HIV infections among this population have been associated with meeting sexual partners in sex venues (Thiede et al., 2009), future

work could examine the prevalence of high risk behaviors relative to policies that permit sex venues to operate under these physical and social forces. This research might lead to more effective interventions that target both the individual and the place.

Table 1.1

Venue-Specific Attendance and Prevalence of Unprotected Anal Intercourse and Oral Sex

Sex Venue	(N = 204)	(N = 139)[a]	< 1x/week	At least 1x/week	> 3x/week	UAI	Oral
Gym or health club	53 (26)	53 (38)	36 (68)	17 (32)	5 (9)	9 (17)	42 (79)
Public bathroom	54 (27)	54 (39)	39 (72)	15 (28)	3 (6)	8 (15)	40 (74)
Bathhouse	35 (17)	35 (25)	30 (86)	5 (14)	1 (3)	9 (26)	31 (89)
Sex club	29 (14)	29 (21)	24 (83)	5 (17)	0 (0)	6 (21)	22 (76)
Bar backroom	30 (15)	30 (22)	27 (90)	3 (10)	0 (0)	4 (13)	22 (73)
Public park	71 (35)	71 (51)	56 (79)	15 (21)	3 (4)	14 (20)	53 (75)
Video/buddy booth	64 (31)	64 (46)	45 (70)	19 (30)	2 (3)	15 (23)	46 (72)
No venue	65 (32)						

Note: n (%) presented; [a] Percentages of venue attendance among venue users only

Table 1.2

Perceived Availability of Private Spaces and the Likelihood of Engaging in Risk Behavior

	Gym (N = 53)				Video Booth (N = 64)			
Perceived Availability of Private Spaces	n	Number who engaged in UAI	(%)	χ^2	n	Number who engaged in UAI	(%)	χ^2
Never	26	1	4[a]	7.6*	5	0	0	5.5[†]
Sometimes	23	6	26[b]		22	3	14	
Always	4	2	50[b]		33	12	36	
Total		9	17			15	23	

Note: *$p < .05$, [†]$p < .08$; Percentages with different superscripts differ significantly at $p < .05$ upon post-hoc observations. $df = 2$

Table 1.3

Perceived Availability of Low Lighting and the Likelihood of Engaging in Risk Behavior

	Gym (N = 53)				Public Park (N = 71)			
Perceived Availability of Low Lighting	n	Number who engaged in UAI	(%)	χ^2	n	Number who engaged in UAI	(%)	χ^2
Never	22	3	14[b]	7.5*	28	3	11[b]	6.1*
Sometimes	23	2	9[b]		32	6	19	
Always	8	4	50[a]		11	5	46[a]	
Total		9	17			14	20	

Notes: *$p < .05$; Percentages with different superscripts differ significantly at $p < .05$ upon post-hoc observations. $df = 2$

Table 1.4

Perceived Effects of Private Spaces and Low Lighting on Practicing Safer Sex

	Has no effect		Reduces likelihood		Increases likelihood	
	Private Spaces	Low Lighting	Private Spaces	Low Lighting	Private Spaces	Low Lighting
Venue						
Gym	15 (56)	23 (74)	4 (15)	5 (16)	8 (30)	3 (10)
Public bathroom	22 (56)	20 (71)	8 (21)	8 (29)	9 (23)	0 (0)
Bathhouse	21 (64)	23 (70)	2 (6)	7 (21)	10 (30)	3 (9)
Sex club	17 (65)	21 (72)	7 (27)	6 (21)	2 (8)	2 (7)
Bar backroom	4 (44)	14 (50)	3 (33)	12 (43)	2 (22)	2 (7)
Public park	25 (64)	30 (70)	6 (15)	9 (21)	8 (21)	4 (9)
Video booth	37 (67)	39 (68)	8 (15)	14 (25)	10 (18)	4 (7)

Note: *n* (%) presented

Table 1.5

Perceived Availability of Condoms and the Likelihood of Engaging in Risk Behavior

	Gym (N = 53)				Public Park (N = 71)			
Perceived Availability of Condoms	n	Number who engaged in UAI	(%)	χ^2	n	Number who engaged in UAI	(%)	χ^2
Never available	36	3	8	5.95*	66	11	17	5.5*
Available	17	6	35		5	3	60	
Total		9	17			14	20	

Note: *$p < .05$; $df = 1$

Table 1.6

Preferences When Seeking Out Men in Public Places and the Likelihood of Engaging in High Risk Behavior

	Any UAI (n = 33)	No UAI (n = 106)	Venue Total (N = 139)	χ^2	OR [95% CI]
	Agree	Agree	Agree		
Preferences	n (%)	n (%)	n (%)		
Thrills	27 (87)	95 (94)	122 (92)	1.64	
Anonymous Sex	30 (94)	90 (90)	120 (91)	0.41	
Sex with more than one person	25 (78)	59 (59)	84 (64)	3.83†	2.72† [.974 to 7.574]
Friendship	7 (23)	26 (26)	33 (25)	0.15	
Companionship	10 (31)	27 (27)	37 (28)	0.22	
Love	1 (3)	12 (12)	13 (10)	2.15	
Affordances					
Stimulating	24 (77)	90 (91)	114 (88)	3.98*	0.27* [.083 to .887]

Full of adventure	25 (78)	85 (85)	110 (83)	0.83	
Clean	26 (84)	93 (92)	119 (90)	1.80	
Safe	25 (78)	92 (91)	117 (88)	3.86*	0.62 [.186 to 2.065]
Private	25 (78)	77 (77)	102 (77)	0.02	
Public	23 (72)	64 (65)	87 (66)	0.57	
Non-verbal	24 (77)	73 (72)	97 (74)	0.32	
Full of men	28 (88)	76 (75)	104 (78)	2.14	
Lively	20 (63)	70 (70)	90 (68)	0.63	
Bright	7 (23)	25 (25)	32 (25)	0.05	
Dimly lit	30 (94)	83 (82)	113 (85)	2.55	

Note: * $p < .05$, † $p < .06$; $df = 1$; CI = Confidence interval; OR = Adjusted odds ratio

An Internet Study of High Risk Behaviors and HIV Risk Perceptions among MSM Who Frequent Commercial and Public Sex Venues

Abstract

Commercial and public sex venues often afford opportunities for high risk, casual sex encounters that may facilitate HIV/STI transmission. The current report presents findings from an Internet-based study of 139 sexually active MSM who attended commercial or public sex venues. To build on previous research that investigated the relationship between HIV risk perceptions and engaging in unsafe sex, this paper examines venue-specific and behavior-specific risk assessments relative to high risk behaviors of MSM that occur in these venues. The findings in this study revealed, across sex venue users, several factors that may be contributing to an increased likelihood of high risk behaviors including attending multiple venues, being HIV-positive, perceiving only a moderate risk of HIV transmission as a result of engaging in unprotected anal sex, and perceiving some risk of becoming infected with HIV or another STI. Venue-specific comparisons between HIV risk perceptions and reports of high risk behaviors revealed that perceiving a moderate risk of HIV transmission as a result of anal sex without a condom increased the likelihood of engaging in unprotected anal sex among men who attended gyms, bathhouses, sex clubs, or video booths, as well as increased the likelihood of engaging in oral-receptive sex with ejaculation in the mouth among men who attended video booths. Moreover, the results suggest that MSM who perceive modest levels of HIV transmission risk associated with having sex—overall—in commercial or public sex venues still pursued sexual encounters during their attendance. Together, these findings highlight

concerns that despite some awareness of HIV risk, unprotected sex remains a health threat for those MSM who attend sex venues.

Introduction

Commercial and public sex venues are known to provide men who have sex with men (MSM) easy access to sexual encounters that are typically casual and anonymous. Such environments (e.g. bathhouses, sex clubs, and parks) afford particular behavior patterns, which may facilitate the transmission of HIV and other sexually transmitted infections (STI). The Centers for Disease Control and Prevention (CDC, 2008) reported that almost 50% of diagnosed and undiagnosed cases of HIV in the U.S. at the end of 2006 were among MSM. Moreover, HIV/AIDS cases among MSM in the U.S. increased 13% from 2001-2005 (CDC, 2005; Jaffe, Valdiserri, & De Cock, 2007) and 26% from 2004-2007 (CDC, 2007), suggesting that prevention efforts directed at this population may not be working. Furthermore, at least one study has shown that recent HIV infections among a sample of MSM were associated with having met sex partners in bathhouses or sex clubs (Thiede et al., 2009). The current paper reports on findings from a study of high risk behavior and HIV risk perceptions among MSM at seven types of sex venues (e.g. gym, bathhouse, bar backroom, sex club, video booth, public bathroom, & public park), as well as perceived HIV transmission risks within these venues.

HIV Risk Behaviors in Commercial and Public Sex Venues

Considerable attention in the literature has been paid to the prevalence of HIV risk behaviors within commercial sex venues. Researchers have consistently demonstrated that men who frequent this type of venue report engaging in unprotected sex (Aynalem et al., 2006; Elwood, Greene, & Carter, 2003; Elwood & Williams, 1998; Golden et al., 2007; Reidy et al., 2009; Van Beneden et al., 2002; Woods et al., 2007), and that reports of risky behaviors are higher for MSM who attend sex venues compared

to MSM who do not attend them (Flores, Mansergh, Marks, Guzman, & Colfax, 2009; Grov, Parsons, & Bimbi, 2007; Horvath, Bowen, & Williams, 2006). Additionally, men have indicated a preference for commercial sex venues precisely because they facilitate anonymous encounters along with unprotected anal intercourse (UAI; Richters, 2007). Finally, there is evidence to suggest that men who engage in riskier behaviors such as UAI are more likely to have sex in a bathhouse or public cruising area than men who refrain from this behavior (Binson et al., 2001; Diaz, Stall, Hoff, Daigle, & Coates, 1996).

Public sex venues have also served as prominent sites for sexual encounters between men, particularly during "times of clandestine homosexuality" when such behaviors were considered illegal (Aldrich, 2004, p. 1721). In their review of studies focusing on this type of venue, Frankis and Flowers (2005) acknowledged that there is still much to be learned about the sexual practices and sexual health of MSM in public spaces. Although the prevalence of anal sex in public sex venues is often lower than those of oral sex and mutual masturbation (Frankis & Flowers, 2005), researchers have demonstrated that some MSM report UAI during attendance at public sex venues (Binson et al., 2001; Church, Green, Vearnals, & Keogh, 1993; de Wit, de Vroome, Sandfort, & van Griensven, 1997; Frankis & Flowers, 2006; Hospers, Debets, Ross, & Kok, 1999). However, the frequency of unprotected sexual activities has not necessarily been significantly higher among attendees as compared to non-attendees (Parsons & Halkitis, 2002). Gyms and health clubs have been an understudied venue, though recent research has revealed among a sample of MSM who frequented gyms/health clubs in New York City that almost half reported engaging in sexual activities that led to orgasm within this

type of venue (Halkitis, Moeller, & Pollock, 2008). Finally, comparisons across commercial and public sex venues have revealed that bathhouse patrons are more likely to engage in UAI than men who only frequented public cruising areas (Binson et al., 2001).

Researchers have also found that HIV-positive MSM do report attending commercial and public sex venues in pursuit of sexual partners (Binson et al., 2001; Golden, Wood, Buskin, Fleming, & Harrington, 2007; Halkitis et al., 2008; Parsons & Halkitis, 2002; Whittington et al., 2002). Moreover, Frankis and Flowers (2006) found that HIV-positive MSM in southern England were more likely to report having UAI in a public sex venue during the previous year than men who had not been tested or were known to be HIV-negative. Furthermore, at least one study has found that HIV-positive MSM who attended venues reported lower levels of perceived responsibility to protect sexual partners from HIV compared to those who did not attend (Parsons & Halkitis, 2002). Lastly, comparisons across commercial and public sex venues have shown that bathhouse patrons are more likely to be HIV-positive than men who only frequented public cruising areas (Binson et al., 2001).

HIV Risk Perceptions of Men Who Have Sex with Men

Researchers have considered the relationship between HIV risk perceptions of MSM and engaging in risky behaviors. Several studies before and after the advent of highly active antiretroviral therapy (HAART) reported that personal estimates of HIV risk among MSM were higher among men who engaged in UAI compared to those who did not, or found that having a high perceived risk of HIV infection was associated with engaging in UAI (Kelly et al., 1990; Kelly et al., 1995; MacKellar et al., 2007; Molitor,

Facer, & Ruiz, 1999). However, researchers have also found that men who engage in high risk behavior report lower risk estimates regarding their personal likelihood of becoming infected with HIV (Adams et al., 2003; MacKellar et al., 2005). Additional work has shown that MSM enrolled in a longitudinal study who reported a lower perceived severity of HIV infection had an increased likelihood of being diagnosed with HIV or an STI (van der Snoek et al., 2006). During the last decade, combination therapies have shifted views about HIV/AIDS from that of an incurable and deadly disease to a chronic illness (Siegel & Lekas, 2002). In light of these medications, people living with HIV tend to have an optimistic outlook (Bogart et al., 2000; Catz & Kelly, 2001; Schrimshaw, Siegel, & Lekas, 2005), decreased viral loads (Palella et al., 1998; Piacenti, 2006; Siegel & Lekas, 2002), and are leading sexually active lives (Bogart et al., 2000; Ostrow et al., 2008). Although there is evidence to suggest that having lower perceived risks of virus transmission as a result of these treatment advances is associated with MSM engaging in risky sexual behaviors (Halkitis, Zade, Shrem, & Marmor, 2004; Kalichman et al., 2007; Ostrow et al., 2002; Vanable, Ostrow, McKirnan, Taywaditep, & Hope, 2000), this literature is not specific to MSM who frequent sex venues.

Some research has investigated HIV risk perceptions in the context of sex venues. A recent study found that MSM who attended bathhouses reported being concerned about the possibility of becoming HIV-infected by another bathhouse patron (Bingham et al., 2008). There is further evidence to suggest that male partners found in cruising areas (e.g., parks) are typically perceived as being risky relative to their perceived susceptibility to HIV and STIs (Longfield, Astatke, Smith, McPeak, & Ayers, 2007). Men who frequent sex venues often make risk assumptions about other patrons and

potential sex partners. Typically, these include the idea that attendees are HIV-positive (Haubrich, Myers, Calzavara, Ryder, & Medved, 2004), or that anyone willing to have unprotected anal-receptive intercourse is probably infected (Elwood, 2002; Keogh & Weatherburn, 2000). Finally, two studies have examined venue-specific HIV risk perceptions and found that men perceive HIV risk in bathhouses as being comparable to, if not greater than, that of other venues where they engage in similar sexual activity (Bingham et al., 2008; Elwood & Williams, 1998). However, more research is needed to understand these venue-specific risk perceptions relative to the sexual behaviors that MSM engage in during attendance.

The current report presents findings from a study of sexually active MSM who attended commercial and public sex venues. It adds to previous research by providing a glimpse into the continued existence of risky sexual behaviors in traditionally studied venues (e.g., bathhouses, public parks, public bathrooms, sex clubs, & bar backrooms), but also examines these behaviors occurring in places that have received considerably less attention in the literature (e.g., gyms, video booths). To build on what is already known about the relationship between HIV risk perceptions and engaging in unsafe sex, this paper also examines venue-specific and behavior-specific risk assessments relative to high risk behaviors of MSM that occur in these venues. Specifically, this study addresses how venue users perceive the risk of HIV transmission from having sex—overall—at each venue assessed as well as from engaging in unprotected oral sex and unprotected anal sex, in relation to the sexual behaviors that these men engage in during venue attendance. It was expected that men who perceived a higher risk of HIV transmission from unprotected oral sex would be less likely to report engaging in this behavior. It was

also expected that men who perceived a higher risk of HIV transmission from unprotected anal sex would be less likely to report engaging in this behavior, and more likely to report protected anal sex during venue attendance. On the other hand, participants who do engage in unsafe behavior may perceive their future risk of becoming infected as higher than those who engage in lower risk behaviors. Therefore, participants who perceived that there was some likelihood of becoming infected with HIV or another STI during the next six months, year, or in their lifetime were expected to report higher rates of unprotected sex compared to those who perceived an unlikely risk of future infection. All of these issues will be addressed across venue use and within each venue.

Method

Participants

A total of 260 MSM participated in an online survey about risk perceptions, sexual behaviors, and HIV prevention efforts in commercial and public sex venues. Participants were recruited almost exclusively from online solicitations including an LGBT academic listserv, Craigslist.org, and Backpage.com. However, the author made additional attempts to recruit participants from gay establishments in New York City where MSM are known to engage in sexual activities. In order to participate in the study, men were required to be at least 18 years of age and to actively engage in sexual behavior with other men.

Although 260 surveys were initiated, 204 (79%) were completed and used for analysis. Among the sample of 204, 139 men (68%) indicated that they had attended at least one venue during the previous month. The current report will focus on this subsample of venue users. The majority of venue users were between the ages of 30 and

60. Specifically, men reported their age as: 18 – 29 (13%), 30 – 40 (34%), 41 – 60 (49%), and over 60 (4.5%). Furthermore, most of the men identified as being HIV-negative (79%), although a small percentage reported their status as HIV-positive (7%) or that they did not know their HIV status/refused to say (14%).

Procedure

Strategic opportunistic sampling (Harding & Peel, 2007) was one method of Internet recruitment used for this study whereby an online solicitation containing the survey link was emailed directly to a listserv for LGBT researchers, who were not exclusive to New York City. Additionally, the author posted notices in various Craigslist categories (e.g. Men Seeking Men; Casual Encounters m4m; & Volunteer) as well as in the Men seeking Men category for Backpage. These were posted primarily in the NYC metropolitan area including New Jersey and Connecticut; however, since participants from the LGBT listserv were not necessarily from NYC, several Craigslist postings were also placed in other urban centers with high percentages of gay and bisexual men. As part of the venue-based recruitment strategy, the author placed approximately 500 study invitation cards in and around the entrance areas of various gay establishments (e.g. bars, sex clubs, gyms, and the LGBT center in New York City) as well as the Ramble of Central Park, a prominent site in New York City. Study invitation cards, fliers, and Internet notices indicated that this was an online survey for men at least 18 years of age who have sex with other men in public places, and that there was a chance to win a $50 prize. All recruitment materials instructed potential participants to e-mail the study e-mail address and ask for a link to the survey.

After receiving and accessing the survey link participants were asked to read a consent page and click their agreement. The consent page informed participants that the survey would take approximately 20 minutes to complete. Upon completing the survey, individuals were given the option to provide an e-mail address that would be entered into a random drawing for one of two $50 electronic gift certificates. The Institutional Review Board affiliated with the author's university approved this study.

From May-September of 2008 an online survey was implemented using existing scales and additional items based on a thorough review of the extant literature. The effectiveness of using Internet surveys to assess sexual behavior among MSM has been demonstrated (Chiasson et al., 2005; Ross, Tikkanen, & Mansson, 2000; Rosser et al., 2009). This type of research removes potential interviewer effects that can occur when attempting to collect data on sexual behavior, which may strengthen internal validity (Mustanski, 2001). After receiving and accessing the survey link participants were asked to read a consent page and acknowledge their agreement. The consent page informed participants that the survey would take approximately 20 minutes to complete. Upon completing the survey, individuals were given the option to provide an email address that would be entered into a random drawing for one of two $50 e-gift certificates. Electronic gift certificates have been suggested as a potential incentive for survey research with this population (Riggle, Rostosky, & Reedy, 2005).

Instrument

The questionnaire was administered and hosted using an online survey tool (Survey Monkey). In order to reduce the potential for multiple survey submissions by a single individual, researchers are advised to collect an Internet Provider (IP) address from

participants (Barchard & Williams, 2008; Birnbaum, 2004; Mustanski, 2001; Riggle, Rostosky, & Reedy, 2005). For the current study, this mechanism was instituted through the survey host, whereby the IP address was recorded for anyone clicking on the survey URL. Although IP addresses do not specifically identify individuals, they are still considered a source of identifying information because they can be traced back to a computer with potentially one owner/user (Barchard & Williams, 2008; Nosek, Banaji, & Greenwald, 2002). This information was destroyed after checking for multiple submissions. Several duplicate submissions were noted; however, these surveys had not been completed and therefore were removed during data cleaning. The consent page informed participants that an IP address would be collected, which may have discouraged certain individuals from taking part in the study. Participants were also informed on the consent page of their right to refuse to answer any questions and to quit taking the survey at any time.

The survey included three sections: (1) an assessment of the perceived risk of HIV transmission as a result of oral sex without a condom and anal sex without a condom, (2) venue-specific attendance and sexual behavior questions, and (3) an assessment of the perceived likelihood of becoming infected with HIV or an STI. The first section asked participants to rate the risk of HIV transmission on a scale from 1 ("Not risky at all") to 10 ("Extremely risky") with regard to specific risk behaviors (i.e., oral sex without a condom, anal sex without a condom). Although risk perceptions of HIV transmission were assessed as a continuous variable, the distributions required recoding. The perceived risk of HIV transmission from anal sex without a condom was negatively skewed. Therefore it was recoded as moderate risk (i.e., rating of 6-9, 16.5%

of venue users) and high risk (i.e., rating of 10, 83.5% of venue users) for categorical analysis. The perceived risk of HIV transmission from oral sex without a condom, though normally distributed, was also categorized in order to remain consistent with analysis of the perceived risk of HIV transmission from anal sex without a condom. This item was recoded as low risk (i.e., rating of 1-3, 43% of venue users), moderate risk (i.e., rating of 4-6, 39% of venue users), and high risk (i.e., rating of 7-10, 18% of venue users). As a result of this recoding, what is considered a moderate or high risk perception of HIV transmission from anal sex without a condom can not be equated with a moderate or high risk perception of HIV transmission from oral sex without a condom.

In the second section of the survey, men were asked to indicate how often they had frequented any of seven potential sex venues (gyms, public bathrooms, bathhouses, sex clubs, bar backrooms, public parks, and video booths) during the previous month where they observed or engaged in sexual activity. Responses to this item included: "Never", "One of two times", "Once a week", "Two or three times a week", and "More than three times a week". The data obtained from this question were positively skewed for each venue and therefore dichotomized (0 = No attendance; 1 = Attended) for bivariate analyses. The number of venues attended by each participant was also totaled and dichotomized (One venue user, Multivenue user) to examine potential effects of multivenue use on high risk behavior.

Whenever attendance at a particular venue was indicated, participants were asked to report the number of times they engaged in specific sexual behaviors in that venue type including oral-insertive sex, oral-receptive sex with ejaculation in the mouth (ORE), oral-receptive sex without ejaculation in the mouth, anal-insertive sex with/without a condom,

and anal-receptive sex with/without a condom. This technique of recalling behavior through open response (reporting the number of times) has been recommended as a way of improving self-report of sexual activity (Weinhardt, Forsyth, Carey, Jaworski, & Durant, 1998). For the current report, the number of times participants engaged in a behavior were totaled for each participant—by venue and across venues—and dichotomized for categorical analysis. All three oral sex behaviors were combined and recoded as oral sex. However, ORE was further examined separately in the analysis as a high risk behavior. All four anal sex behaviors were also combined and recoded as anal sex. However, insertive and receptive anal sex without a condom were combined and recoded as UAI. Additionally, insertive and receptive anal sex with a condom were combined and recoded as PAI. Based on these dichotomizations, the absence of UAI (0 = No) included both men who reported PAI only and men who did not report anal sex; the absence of PAI (0 = No) included both men who reported any UAI and men who did not report anal sex. Finally, men were asked to rate on a scale from 1 ("Not risky at all") to 10 ("Extremely risky"), relative to HIV transmission, how risky they believed sex—overall (*in general*)—to be in the specific venue(s) they frequented. The distributions were highly variable for each venue, and therefore considered a continuous variable in bivariate analyses.

The last section of the survey included items that assessed participants' perceived likelihood [1 ("Very unlikely") – 10 ("Very likely")] of becoming infected with HIV during (1) the next six months, (2) the next year, and (3) in their lifetime. Additional items were included to assess participants' perceived likelihood [1 ("Very unlikely") – 10 ("Very likely")] of becoming infected with an STI other than HIV during (1) the next six

months, (2) the next year, and (3) in their lifetime. The perceived likelihood of becoming infected with HIV or another STI during the next six months, year, or lifetime was positively skewed. As a result of the distributions, these items were recoded as very unlikely (i.e., rating of 1) and somewhat likely (i.e., rating of 2-10) for categorical analysis. Participants' age and HIV status were also assessed in the last section.

According to the Gay Men's Health Crisis (GMHC, 2003) anal, vaginal, or oral penetration without a condom is considered unprotected sex. High risk sexual activity has been defined in the literature as any oral or anal behaviors with less than 100% condom use (Garofalo, Herrick, Mustanski, & Donenberg, 2007). The current study relies on GMHC guidelines and the definition of high risk oral and anal sex used by Garofalo and colleagues (2007). Condom use for oral sex was not assessed in this study, though men were asked if they engaged in oral-receptive intercourse with ejaculation in the mouth (ORE). Because this behavior involves bodily fluid exchange, it will be considered high risk along with anal sex without a condom.

Data analysis

Data from the survey were uploaded to SPSS for subsequent analysis. All comparisons were conducted using chi-square (χ^2) for categorical variables and ANOVA for continuous variables. Comparisons were done both across venues as well as within venues. Statistically significant associations for all analyses were defined by a p value of .05 or less. A Fisher's exact test was also used to determine significance for 2 X 2 chi-square cell counts of less than 5. Effect sizes were calculated using eta squared (η^2) for ANOVA tests. Variables that were significantly associated with an increased likelihood

of ORE and UAI among all venue users in bivariate analyses were entered into a logistic regression model to assess their predictive power.

Results

Venue Attendance and Venue-Specific Sexual Behaviors

Table 2.1 provides information on the prevalence of venue attendance as well as venue-specific sexual behaviors reported for the previous month. Among venue users, 67% reported that they had attended more than one venue during the previous month, with twelve participants attending as many as five venues. Public parks were the most attended venue followed by video booths, public bathrooms, gyms, bathhouses, bar backrooms, and sex clubs. Among all venue users, 83% reported engaging in some form of oral sex and 43% reported engaging in some form of anal sex. Within each venue, more than two-thirds of men attending reported oral sex (Table 2.1). Of those, more than one-third in each venue reported that they had engaged in ORE during venue attendance. Oral-receptive sex with ejaculation in the mouth was highest among men who reported oral sex in bathhouses (65%) and lowest among those who reported oral sex in bar backrooms (36%). Although the prevalence of oral sex behaviors was relatively high, no more than one-third of the men in each of these venues reported engaging in anal sex during venue attendance, with the exception of bathhouses (54%) and sex clubs (48%). Of those reporting anal sex, more than one-third in each venue reported that they had engaged in UAI during their visit(s). Unprotected anal sex was highest among men who reported anal sex in video booths (68%) and lowest among those who reported anal sex in sex clubs (43%). Additionally, at least half of the men in each venue who engaged in any anal sex reported that they had engaged in PAI during their visit(s). Protected anal sex

was highest among men who reported anal sex in gyms (81%) and lowest among those who reported anal sex in bar backrooms (50%).

Predictors of High Risk Behavior across Venues

In considering the subsample of venue users (N = 139), further analyses were done to examine what factors increased the likelihood of engaging in UAI during venue attendance. The findings revealed that men who attended more than one venue during the previous month were more likely to report engaging in UAI (31%), compared to those who only attended one venue (9%), χ^2 (1, N = 139) = 8.6, $p < .01$. Moreover, men who engaged in ORE during venue attendance were more likely to report UAI (40%), compared to those who did not engage in ORE (11%), χ^2 (1, N = 139) = 15.4, $p < .001$. Additionally, men who reported being HIV-positive were more likely to report UAI during venue attendance (50%), compared to men who reported being HIV-negative (19%), $p < .05$. Furthermore, men who perceived anal sex without a condom as being a moderate risk behavior were more likely to report engaging in UAI during venue attendance (52%) when compared to those who perceived this behavior as high risk (18%), χ^2 (1, N = 139) = 12.3, $p < .001$. Lastly, no significant findings emerged for age or the perceived risk of becoming infected with HIV/STI and the likelihood of engaging in UAI.

The variables found to be significant during bivariate analyses were then included in a logistic regression model. The dependent variable was UAI. The full model containing all predictors was statistically significant, χ^2 (3, N = 139) = 32.6, $p < .001$, indicating that the model was able to distinguish between UAI and no UAI. The model as a whole explained between 21% (Cox and Snell R square) and 31% (Nagelkerke R

square) of the variance in UAI, and did correctly classify 81% of cases. Table 2.2 demonstrates the role of each predictor in the model. Men who attended more than one venue during the previous month had almost three times more the odds of reporting that they had engaged in UAI compared to men who attended only one venue. Additionally, men who engaged in ORE during venue attendance had over four times more the odds of reporting that they had also engaged in UAI compared to men who did not engage in ORE. Finally, men who perceived anal sex without a condom as a high risk behavior for HIV transmission had almost one-fifth less the odds of reporting UAI compared to men who perceived this as a moderate risk behavior.

Additional analyses were done to examine what factors may increase the likelihood of engaging in ORE during venue attendance. Men who attended more than one venue during the previous month were more likely to report engaging in ORE (56%) when compared to those men who only attended one venue (17%), χ^2 (1, N = 139) = 18.6, $p < .001$. Men who engaged in UAI were more likely to report ORE (73%), compared to those who did not engage in UAI (34%), χ^2 (1, N = 139) = 15.4, $p < .001$. Additionally, ORE was more likely to be reported by men who perceived their risk of becoming infected with HIV in the next six months as somewhat likely (57%), compared to men who perceived their risk as very unlikely (35%), χ^2 (1, N = 124) = 4.4, $p < .05$. Furthermore, ORE was also more likely to be reported by men who perceived their risk of becoming infected with HIV in the next year as somewhat likely (55%) when compared to those men who perceived their risk as very unlikely (33%), χ^2 (1, N = 124) = 5.3, $p < .05$. Finally, no significant findings emerged for age, HIV status, or the perceived

risk of HIV transmission from oral sex without a condom and the likelihood of engaging in ORE.

The variables found to be significant during bivariate analyses were then included in a logistic regression model. The dependent variable was ORE. The full model containing all predictors was statistically significant, χ^2 (3, N = 139) = 31.7, p < .001, indicating that the model was able to distinguish between ORE and no ORE. The model as a whole explained between 23% (Cox and Snell R square) and 31% (Nagelkerke R square) of the variance in UAI, and did correctly classify 73% of cases. Table 2.2 demonstrates the role of each predictor in the model. Men who attended more than one venue during the previous month had over six times more the odds of reporting that they engaged in ORE compared to men who attended only one venue. Additionally, men who engaged in UAI during venue attendance had almost 3.5 times more the odds of reporting that they had also engaged in ORE compared to men who did not engage in UAI. Finally, men who perceived their risk of becoming infected with HIV during the next year as somewhat likely had almost three times more the odds of reporting ORE as compared to those who perceived their risk as very unlikely.

Perceptions of HIV Risk and the Likelihood of Engaging in Venue-Specific Behaviors

There were no associations found between the perceived risk of HIV transmission from having oral sex without a condom and the likelihood of engaging in ORE or UAI for any of the venues. However, among those who attended a video booth, ORE was reported by a greater percentage of men who perceived anal sex without a condom to be a moderate risk behavior for HIV transmission (67%), compared to those men who perceived this as a high risk behavior (31%), χ^2 (1, N = 64) = 5.4, p < .05. Several

significant findings emerged between the perceived risk of HIV transmission from anal sex without a condom and the likelihood of engaging in UAI during venue attendance. Among those who attended gyms, bathhouses, sex clubs, or video booths, UAI was reported by a greater percentage of men who perceived anal sex without a condom as a moderate risk behavior for HIV transmission, compared to men who perceived this as a high risk behavior (see Table 2.3). No significant findings emerged between the perceived risk of HIV transmission from engaging in anal sex without a condom and the likelihood of engaging in PAI for any of the venues, which failed to support the hypothesis that perceiving anal sex without a condom as a high risk behavior would increase the likelihood of engaging in PAI during venue attendance.

Perceptions of Becoming Infected with HIV/STI and the Likelihood of Engaging in Venue-Specific Behaviors

Men were asked to indicate how likely they were to become infected with HIV in the next six months, year, and during their lifetime. Among those who attended a sex club, UAI was more likely to be reported by men who perceived their risk of becoming infected with HIV in their lifetime as somewhat likely (44%), compared to men who perceived their risk as very unlikely (7%), χ^2 (1, N = 24) = 4.9, $p < .05$. Similarly, among those who frequented a bathhouse, UAI was more likely to be reported by men who perceived their risk of becoming infected with HIV in the next six months as somewhat likely (60%), compared to men who perceived their risk as very unlikely (13%), though this finding was marginally significant χ^2 (1, N = 28) = 5.4, p = .05. Moreover, among those who frequented a bar backroom, UAI was more likely to be reported by men who perceived their risk of becoming infected with HIV in the next six months as somewhat

likely (38%), compared to those men who perceived their risk as very unlikely (5%), though this finding was also marginally significant, χ^2 (1, N = 29) = 5.2, p < .06. Finally, no significant findings emerged between the perceived risk of becoming infected with HIV and the likelihood of engaging in PAI.

Table 2.4 reports the significant outcomes for the relationship between perceived risk of becoming infected with HIV and the likelihood of engaging in ORE. Among those who attended a public bathroom, ORE was more likely to be reported by men who perceived their risk of becoming infected with HIV in the next six months, year, and lifetime as somewhat likely, compared to men who perceived their risk as very unlikely. Moreover, among those who attended a bathhouse, ORE was more likely to be reported by men who perceived their risk of becoming infected with HIV in the six months or year as somewhat likely when compared to those men who perceived their risk as very unlikely. Finally, among those who attended public parks, ORE was more likely to be reported by men who perceived their risk of becoming infected with HIV in the next six months or year as somewhat likely, compared to men who perceived their risk as very unlikely. There were no significant findings between the perceived risk of becoming infected with HIV and the likelihood of engaging in ORE for the remaining venues.

Men were also asked to indicate how likely they were to become infected with an STI other than HIV in the next six months, year, and during their lifetime. Among those who attended a video booth, UAI was more likely to be reported by men who perceived their risk of becoming infected with an STI during their lifetime as very unlikely (47%), compared to those men who perceived their risk as somewhat likely (13%), χ^2 (1, N = 58) = 8.3, p < .01. Conversely, among those who attended a bathhouse, ORE was more likely

to be reported by men who perceived their risk of becoming infected with an STI in the next six months or year as somewhat likely when compared to those men who perceived their risk as very unlikely, though these findings were marginally significant ($p \leq .06$). Finally, no significant findings emerged between the perceived risk of becoming infected with an STI other than HIV and the likelihood of engaging in PAI.

MSM Perceptions of Venue-Specific HIV Transmission Risk

Men were also asked how risky they perceived sex—overall—to be for each of the venues they attended relative to HIV transmission. The mean risk levels were modest [possible range = 1 to 10] for all venues: sex clubs ($M = 6.41$, $SD = 2.08$), bathhouses ($M = 6.23$, $SD = 2.30$), public parks ($M = 6.16$, $SD = 2.45$), video booths ($M = 6.08$, $SD = 2.31$), public bathrooms ($M = 5.89$, $SD = 2.62$), bar backrooms ($M = 5.77$, $SD = 2.67$), and gyms/health clubs ($M = 5.13$, $SD = 2.23$). Bivariate analyses revealed that among those who attended a gym, perceptions of HIV transmission risk in a gym were higher for men who reported engaging in ORE ($M = 6.06$, $SD = 2.1$) compared to men who did not report ORE ($M = 4.73$, $SD = 2.2$; $F\ (1, 53) = 4.247$, $p < .05$, $\eta^2 = .08$). Conversely, among those who attended a public park, perceptions of HIV transmission risk in a public park were almost significantly lower for men who reported engaging in ORE ($M = 5.48$, $SD = 2.0$) compared to men who did not report ORE ($M = 6.53$, $SD = 2.6$; $p < .09$). Moreover, among those who attended a video booth, perceptions of HIV transmission risk in a public park were almost significantly lower for men who reported engaging in ORE ($M = 5.46$, $SD = 2.2$) compared to men who did not report ORE ($M = 6.51$, $SD = 2.3$; $p < .09$). No other significant findings emerged between venue-specific perceptions of HIV transmission risk and reports of ORE among men who attended public bathrooms,

bathhouses, sex clubs, or bar backrooms. Furthermore, comparisons between venue-specific perceptions of HIV transmission risk and engaging in UAI or PAI revealed no significant findings among men in any of the venues.

Discussion

The findings in this study revealed, across sex venues, several factors that may be contributing to an increased likelihood of high risk behaviors. Attending multiple venues during the previous month was predictive of MSM engaging in ORE, and marginally predictive of engaging in UAI, which is consistent with prior research (Binson et al., 2001; Reidy et al., 2009; Van Beneden et al., 2002). Additionally, both high risk behaviors (ORE and UAI) were predictive of each other across venue users. Moreover, men who indicated being HIV-positive were more likely to report engaging in UAI compared to those who were HIV-negative, though this relationship did not maintain significance in regression analyses. This finding supports previous studies which have shown that HIV-positive men do attend sex venues (Golden et al., 2007; Whittington et al., 2002) where some engage in risky behavior (Binson et al., 2001; Binson et al., 2009; Parsons & Halkitis, 2002), and highlights a persistent concern that these men may be putting their venue partners at risk for HIV transmission.

This study has also demonstrated, across venues, that men who perceived a moderate risk of HIV transmission from anal sex without a condom reported engaging in this behavior at a commercial or public sex venue during the past month. However, men who perceived this to be a high risk behavior were less likely to have reported an instance of it when attending any of these venues, which indicates that a certain level of HIV awareness did exist in the sample. This finding is inconsistent with previous research on

MSM that found higher HIV risk perceptions to be associated with engaging in risky behavior (Kelly et al., 1990; Kelly et al., 1995; MacKellar et al., 2007; Molitor et al., 1999). This conclusion should be interpreted with caution, however, given that a high risk perception in the current report was based on a negatively skewed distribution and may not be equivalent to that of other studies. Additionally, venue users who perceived some risk of becoming infected with HIV in the next six months or year were more likely to have reported engaging in oral-receptive sex with ejaculation in the mouth (ORE) during venue attendance compared to men who perceived their risk of future infection as very unlikely. Although this finding suggests that men who engage in ORE are aware of their increased risk of HIV infection in the near future, there were no significant outcomes between the perceived risk of HIV transmission from oral sex without a condom and participants' reports of ORE. Therefore, future research should directly assess the perceived risk of oral-receptive sex with ejaculation in the mouth relative to engaging in venue-specific high risk behaviors.

Comparisons of HIV Risk Perceptions and High Risk Behaviors Within Venues

Venue-specific comparisons between HIV risk perceptions and reports of high risk behaviors revealed that among men who attended gyms, bathhouses, sex clubs, or video booths, perceiving a moderate risk of HIV transmission as a result of anal sex without a condom increased the likelihood of engaging in UAI. Additionally, perceiving a moderate risk of HIV transmission from anal sex without a condom also increased the likelihood of engaging in ORE among men who attended video booths. Similar to the findings across venues, these results are inconsistent with previous research on MSM that found higher HIV risk perceptions to be predictive of engaging in risky behavior (Kelly

et al., 1990; Kelly et al., 1995; MacKellar et al., 2007; Molitor et al., 1999). But again, this conclusion must be interpreted with caution since a high risk perception in the current report may not be equivalent to that of other studies. Further analysis also revealed that higher perceptions of HIV transmission risk from anal sex without a condom were not associated with an increased likelihood of engaging in PAI at any of the venues, which does raise concern that there is some disconnect whereby risk perceptions may not necessarily correspond to behavior.

Men in this study perceived their risk of becoming infected with HIV as relatively unlikely, no matter which venues they attended. However, perceiving some likelihood of a future HIV infection was associated with an increased likelihood of engaging in UAI while attending sex clubs, bathhouses, or bar backrooms. Moreover, men who perceived some likelihood of a future HIV infection were also more likely to have engaged in ORE during attendance at public bathrooms, bathhouses, or public parks. Similarly, perceiving some likelihood of a future STI infection other than HIV was associated with an increased likelihood of UAI among men in video booths, and ORE among men in bathhouses. These findings do provide some support for previous work on HIV risk perceptions and high risk behaviors of MSM (Kelly et al., 1990; Kelly et al., 1995; MacKellar et al., 2007; Molitor et al., 1999), but have gone a step further by assessing venue-specific behaviors. Taken together these results suggest that some men do equate their risk of HIV/STI transmission with actual behavior, though it is still unclear why these men continue to put themselves at risk.

A novel component to this study was the assessment of venue-specific HIV risk perceptions. The results demonstrate that MSM participating in this study perceived

modest levels of HIV transmission risk associated with having sex—overall—in commercial or public sex venues, and yet still pursued sexual encounters during their attendance. This finding adds to previous research which has shown that men do make risk assumptions regarding venue encounters (Bingham et al., 2008; Elwood & Williams, 1998; Haubrich et al., 2004; Longfield et al., 2007). Although these perceptions did not reveal any significant relationships with unprotected or protected anal sex, the findings did reveal that among men who attended a gym, a higher perceived risk of HIV transmission from having sex in that venue was associated with an increased likelihood of engaging in ORE. A possible explanation for this finding is that men with a higher risk perception of this venue chose to engage in unprotected oral sex, which they may consider to be a lower risk behavior compared to any anal sex, whereby the level of risk increases (CDC, 2008). Additional studies are needed to fully address behavioral motivations and outcomes as they relate to sex venue HIV risk perceptions.

Implications

The results of this study have demonstrated the continued existence of high risk behaviors among MSM in both commercial and public sex venues providing support for previous research (Aynalem et al., 2006; Binson et al., 2001; Church et al., 1993; de Wit et al., 1997; Diaz et al., 1996; Elwood et al., 2003; Elwood & Williams, 1998; Frankis & Flowers, 2005; Golden et al., 2007; Hospers et al., 1999; Parsons & Halkitis, 2002; Reidy et al., 2009; Richwald et al., 1988; Smith, Grierson, Pitts, & Pattison, 2006; Van Beneden et al., 2002; Woods et al., 2007). Indeed much of this behavior occurred among men who perceived a moderate risk of HIV transmission from unprotected anal sex, as well as perceived some risk of becoming infected with HIV or another STI in the future.

Although anal sex occurred in each of the venues, it was more prominent among men in bathhouses and sex clubs. Reports of UAI were relatively low for most of the venues, though at least one in five men who attended a bathhouse, sex club, or video booth during the previous month engaged in this high risk behavior. This proportion is considerably higher than what has been reported in prior studies of bathhouses (Bingham et al., 2008; Richwald et al., 1988; Van Beneden et al., 2002; Woods et al., 2007). Furthermore, among venue users who engaged in any anal sex during venue attendance, more than one-third of men in each venue reported UAI. These findings highlight potential concerns that prevention efforts directed at MSM who have sex in commercial or public sex venues may not working.

Though the risk of HIV transmission from oral-genital contact is often considered to be lower than that of anal penetration (Centers for Disease Control and Prevention, 2009b), more engagement in this behavior could result in greater numbers of HIV infections (Vittinghoff et al., 1999). There have been several reports in the literature of HIV seroconversion among MSM resulting from unprotected oral sex (Gilbart, Evans, & Dougan, 2004; Lane, Holmberg, & Jaffe, 1991; Lifson et al., 1990; Richters, Grulich, Ellard, Hendry, & Kippax, 2003; Schacker, Collier, Hughes, Shea, & Corey, 1996). Even though condom use for oral sex was not assessed in the current study, men did report modest levels (27% - 57%) of oral-receptive sex with ejaculation in the mouth (ORE) during venue attendance, placing them at risk for HIV/STI infection. Among all venue users who engaged in any oral sex during venue attendance, more than a third of men in each venue reported oral-receptive intercourse with ejaculation in the mouth (ORE). Moreover, among all venue users, engaging in ORE was predictive of having also

engaged in unprotected anal sex during venue attendance. Previous research has suggested that rates of unprotected oral sex have increased among MSM, while UAI rates have maintained (Goldbaum, Yu, & Wood, 1996), which may explain these findings. Therefore, any potential risk reduction associated with oral sex may have been negated for some men by accepting ejaculatory fluids in the mouth or by engaging in both ORE and unprotected anal sex. Perhaps venue-based prevention programs are needed to better inform MSM of the potential risks associated with ORE without discouraging other safer sex strategies (e.g., PAI)

The exploratory nature of this research warrants a discussion of limitations and possible recommendations for future studies. First, the data presented in this paper are based on self-reports from a small convenience sample of MSM. However, the online nature of this survey may have increased participant truthfulness in disclosure of sexual behaviors by removing potential interviewer effects (Mustanski, 2001). Second, the survey instrument was online for only a four-month period during summer months. However, this assessment window was considered to be optimal for including public parks, which may be less frequented during colder months. Third, several observed frequencies reported for Pearson chi-square analyses were less than 5 and any significant findings for those should be interpreted with caution. However, a Fisher's exact test was utilized for 2 X 2 chi-square analyses to better account for significance. Lastly, racial and ethnic breakdowns as well as socioeconomic differences should be accounted for in a larger scale study so as to rule out any confounding effects on venue attendance.

Conclusions

This study is one of the few to assess high risk behaviors and HIV risk perceptions among men who have sex with men in the context of seven types of sex venues. It builds on previous research that investigated the relationship between HIV risk perceptions and engaging in unsafe sex by examining venue-specific and behavior-specific risk assessments relative to high risk behaviors of MSM that occur in these venues. The findings in this study revealed, across sex venue users, several factors that may be contributing to an increased likelihood of high risk behaviors including attending multiple venues, being HIV-positive, perceiving a moderate risk of HIV transmission as a result of engaging in unprotected anal sex, and perceiving some risk of becoming infected with HIV or another STI. Venue-specific comparisons between HIV risk perceptions and reports of high risk behaviors revealed that perceiving a moderate risk of HIV transmission as a result of anal sex without a condom increased the likelihood of engaging in unprotected anal sex among men who attended gyms, bathhouses, sex clubs, or video booths, as well as increased the likelihood of engaging in oral-receptive sex with ejaculation in the mouth among men who attended video booths. Moreover, venue users who perceived anal sex with a condom as being a high risk behavior for HIV transmission were no more likely to engage in protected anal sex. This finding, however, may be due in part to the low reports of any anal sex during venue attendance. Additionally, the results suggest that MSM who perceive modest levels of HIV transmission risk associated with having sex—overall—in commercial or public sex venues still pursued sexual encounters during their attendance. Lastly, the findings from

this study have highlighted concerns that despite an awareness of HIV risk, unprotected sex remains a health threat for those MSM who attend commercial and public sex venues.

Table 2.1

*Venue Attendance and Venue-Specific Sexual Behavior*s

Variable	Gym	Public Bathroom	Bathhouse	Sex Club	Bar Backroom	Public Park	Video Booth
Venue attendance (Full sample, N = 204)	53 (26)	54 (27)	35 (17)	29 (14)	30 (15)	71 (35)	64 (31)
Venue attendance (Venue users only, N = 139)	53 (38)	54 (39)	35 (25)	29 (21)	30 (22)	71 (51)	64 (46)
Any Oral	42 (79)	40 (74)	31 (89)	22 (76)	22 (73)	53 (75)	46 (72)
Any Anal	16 (30)	14 (26)	19 (54)	14 (48)	6 (20)	24 (34)	22 (34)
ORE	16 (30)	23 (43)	20 (57)	13 (45)	8 (27)	25 (35)	24 (38)
ORE (% within oral)	38	58	65	59	36	47	52
UAI	9 (17)	8 (15)	9 (26)	6 (21)	4 (13)	13 (18)	15 (23)
UAI (% within anal)	56	57	47	43	67	54	68
PAI	13 (25)	9 (17)	15 (43)	11 (38)	3 (10)	14 (20)	13 (20)
PAI (% within anal)	81	64	79	79	50	58	59

Note: n (%) presented

Table 2.2

Logistic Regression Analysis Predicting High Risk Behavior across Venue Users

Behavior	Predictor	*OR*	95% CI
UAI			
	"High risk" perception of anal sex without a condom	.188**	[.064, .553]
	HIV Status		
	HIV-Positive[a]	2.746	[.659, 11.437]
	Does not know HIV status[a]	2.319	[.685, 7.851]
	Multivenue use	2.886[†]	[.838, 9.938]
	ORE	4.151**	[1.562, 11.033]
ORE			
	"Somewhat likely" perception of becoming infected with HIV in the next year	2.672*	[1.110, 6.428]
	UAI	3.464*	[1.290, 9.301]
	Multivenue use	6.159**	[2.209, 17.178]

Notes: *$p < .05$; **$p < .01$; [†]$p < .10$; [a]HIV-negative was the contrast category; OR = adjusted odds ratio; CI = confidence interval

Table 2.3

Perceptions of HIV Risk and the Likelihood of Engaging in High Risk Behavior

Venue	Perceived Risk of HIV Transmission from Anal Sex without a condom	n	Number who engaged in UAI	(%)	χ^2
Gym (N = 53)	Moderate	7	4	57	9.2*
	High	46	5	11	
Bathhouse (N = 35)	Moderate	8	5	63	7.3*
	High	27	4	15	
Sex Club (N = 29)	Moderate	7	4	57	7.5*
	High	22	2	9	
Video Booth (N = 64)	Moderate	12	6	50	5.8*
	High	52	9	17	

Notes: *$p < .05$ based on Fisher's exact test; $df = 1$

Table 2.4

Perceptions of Becoming Infected with HIV and the Likelihood of Engaging in Venue-Specific Oral-Receptive Sex with Ejaculation in the Mouth

	Six Months				One Year				Lifetime			
Perceived Risk of Future Infection	n	# who engaged in ORE	(%)	χ^2	n	# who engaged in ORE	(%)	χ^2	n	# who engaged in ORE	(%)	χ^2
Public Bathroom												
Very unlikely	32	8	25	13.0**	29	7	24	11.1**	23	5	22	8.6**
Somewhat likely	18	14	78		21	15	71		27	17	63	
Total	50	22	44		50	22	44		50	15	23	
Bathhouse												
Very unlikely	23	10	44	5.3*	20	8	40	5.2*	14	7	50	0.14

Somewhat likely	5	5	100		8	7	88		14	8	57	
Total	28	15	54		28	15	54		28	15	54	
Public Park												
Very unlikely	49	11	22	7.5**	43	9	21	6.5*	30	7	23	1.6
Somewhat likely	15	9	60		21	11	52		34	13	38	
Total	64	20	31		64	20	31		64	20	31	

Notes: *$p < .05$; **$p < .01$; $df = 1$

Using the Internet in Pursuit of Public Sexual Encounters: Is Frequency of Use Associated with Risk Behavior among MSM?

Abstract

Recent research has shown that some men who have sex with men (MSM) may be using the Internet in search of public sexual encounters. However, it is unclear what sexual behaviors occur during venue attendance among these men. A total of 139 MSM who indicated that they had attended at least one sex venue (e.g., gym/health club, public bathroom, bathhouse, sex club, public park, or video booth) during the previous month completed an online survey that assessed how often they used the Internet to find partners for public sex, sexual behaviors engaged in during venue attendance, HIV risk perceptions, and preferences for having sexual encounters in public places. Two distinct patterns of Internet use (i.e. low frequency and high frequency) among men who go online in search of partners for public sexual encounters were classified following an initial cluster analysis. Although frequency of attendance at any of the physical venues did not cluster with frequency of Internet use to find partners for public sex, there was a trend among high frequency Internet users to attend gyms/health clubs, public bathrooms, and sex clubs more than low frequency users. Moreover, men in the high frequency group were more likely to be HIV-positive, engage in unprotected anal-receptive intercourse across venue attendance, and have a preference for sex venues that offer opportunities to engage in sex with multiple partners compared to men in the low frequency group. Interestingly, men in either frequency group who indicated that they took condoms to sex venues at least some of the time during the previous month were more likely to report

engaging in unprotected oral sex and protected anal sex than men who did not take condoms with them to a venue. Knowing that some venue users initiate public sex encounters on the Internet may be useful in targeting appropriate HIV/STI interventions.

Introduction

The Internet has become a valuable source through which to gain information across the globe, and it also serves an integral communicative and networking function (Castells, 1996; Kraut et al., 2002). Online services such as e-mail, instant messaging, blogging, message boards (i.e., Craigslist) and programs that afford direct voice and video contact help to open and maintain lines of communication between friends, relatives, colleagues, and even people who have never met (Stevens & Morris, 2007). The Internet has become a means for people to meet romantic or sexual partners (Cooper & Sportolari, 1997; Couch & Liamputtong, 2008). Online dating has become a common way of finding potential sex partners (casual or long-term), and is a rapidly growing phenomenon among sexually marginalized groups (Hospers, Kok, Harterink, & de Zwart, 2005; McKirnan, Houston, & Tolou-Shams, 2007; Payne, 2007). Moreover, the Internet provides a venue for people to be selective—search for others with similar sexual interests, including public sex, barebacking, and various fetishes (see Ashford, 2006; Carballo-Diéguez et al., 2006; Chiasson et al., 2006; Downing, under review; Grov, DeBusk et al., 2007). Indeed, the web offers a host of sites designed to attract potential users based on any number of these shared interests.

Sexual Risk and the Internet

Researchers have suggested that meeting sex partners online may be associated with risky sexual behavior among MSM. First, it has been noted that Internet sex seekers report greater numbers of partners when compared to those men who found partners offline (Benotsch, Kalichman, & Cage, 2002; Horvath, Bowen, & Williams, 2006; McFarlane et al., 2000; McKirnan et al., 2007; Ogilvie et al., 2008). Additionally, several

studies have found that seeking sexual partners online was associated with inconsistent condom use and unprotected anal intercourse (UAI) among MSM in general (Benotsch et al., 2002; Bolding, Davis, Sherr, Hart, & Elford, 2004; Elford, Bolding, & Sherr, 2001; Garofolo, Herrick, Mustanski, & Donenberg, 2007; Grov, Parsons, & Bimbi, 2007; Horvath et al., 2006; Liau, Millett, & Marks, 2006; McKirnan et al., 2007; Taylor et al., 2004). However, at least one study found that online sex seekers were more likely to have used condoms during their most recent sexual encounter with an Internet partner compared to men who found male partners in other venues (McFarlane, Bull, & Rietmeijer, 2000). Direct comparisons of sexual risk behaviors among MSM with partners met online versus behaviors with partners met in other venues have revealed somewhat contradictory findings. Some researchers have found that meeting sex partners both online and offline (i.e., in other venues) predicted unprotected anal sex compared to men who exclusively met their partners online or offline (Hirshfield, Remien, Humberstone, Walavalkar, & Chiasson, 2004; Horvath, Rosser, & Remafedi, 2008; Zhang et al., 2007). However, two additional studies found no differences in the rates of UAI that men reported with their Internet and non-Internet partners (Bolding, Davis, Hart, Sherr, & Elford, 2005; Chiasson et al., 2007).

Researchers have also examined the risk behaviors of MSM with their Internet partners relative to HIV status. A recent report showed that men, all of whom identified as HIV-positive, were more likely to have episodes of UAI with their Internet partners of serodiscordant or unknown HIV status relative to partners met offline (Wilson, Cook, McGaskey, Rowe, & Dennis, 2008). Other researchers have noted that HIV-negative MSM were more likely to engage in UAI with online partners of opposite or unknown

HIV serostatus when compared to those partners met in a bar or club (Berry, Raymond, Kellogg, & McFarland, 2008). Although this literature, taken together, provides insight into the sexual behaviors that MSM engage in with partners met online versus in other venues, it is limited by a lack of data regarding where these sexual encounters with Internet partners occurred and how that may be associated with HIV/STI risk.

In contrast to the above noted studies that examined whether use of the Internet—yes or no—was associated with sexual risk, other studies have examined the frequency that men use the Internet to seek out sexual partners relative to risk behaviors. At least two studies found that more time spent engaging in online sexual behavior was associated with risky sexual behavior among men who have sex with men (Bolding et al., 2004; Horvath et al., 2008). Additionally, men who identified as being a barebacker (i.e. someone who engages in intentional unprotected anal sex) were more likely than non-barebackers to spend more time on the Internet looking for sex and dates (Grov, DeBusk et al., 2007). Other research, however, has reported no differences in the number of reported unprotected anal sex acts with male partners (either steady or casual) during the past year between frequent users of gay chat rooms and those who never or occasionally use them (Tikkanen & Ross, 2003).

Using the Internet to Pursue Public Sex

There is evidence to suggest that MSM who use the Internet in pursuit of sexual partners are also frequenting commercial and public sex environments (e.g., bathhouses, sex clubs, bathrooms, parks; Bolding, Davis, Hart, Sherr, & Elford, 2005; Elford, 2006; Garofalo et al., 2007; McKirnan et al., 2007; Mettey et al., 2003; Ogilvie et al., 2008; Ross, Tikkanen, & Mansson, 2000; Taylor et al., 2004). Moreover, the Internet not only

serves as a venue for locating potential sex partners, but it also offers opportunities for men to coordinate physical encounters at commercial or public sex venues (Ashford, 2006). There has been very little research to examine this phenomenon; however, one study reported that 86% of men engaged in sexual encounters at a public bathroom with other men after initially meeting these partners on the Internet (Bull, McFarlane, Lloyd, & Rietmeijer, 2004). Additional work has demonstrated that some MSM use the Internet to advertise specifically for partners who are willing to meet and engage in sexual encounters in several types of venues, including video booths, gyms, parks, and sex clubs (Downing, under review).

Given the persistence of high risk behaviors among MSM who frequent sex venues (e.g., Binson et al., 2001; Frankis & Flowers, 2005; Parsons & Halkitis, 2002; Reidy et al., 2009) as well as the Internet to meet sex partners (e.g., Horvath et al., 2006; Liau et al., 2006; McKirnan et al., 2007), there are pressing reasons to study the potential risks associated with using the Internet to coordinate sexual encounters in public venues. Some key questions here include, are men who use the Internet more often to search for public sexual encounters more likely to attend certain types of sex venues compared to those who use the Internet less often to find partners for public sex? What sexual behaviors do men who use the Internet to find partners for public encounters engage in during their venue visit(s)? Do men who use the Internet more often to find public sexual encounters engage in riskier behavior during any venue attendance compared to those who use the Internet less often? Furthermore, what preferences do MSM who use the Internet to find sex venue partners have for types of public sex encounters? Addressing these questions, this analysis sought to assess how often men use the Internet to find

partners for public sex encounters relative to the venues they attend (and how often), sexual behaviors engaged in during venue attendance (across all venues), HIV risk perceptions, and the reasons men give for preferring sex in public places. The current study expands our knowledge about this subgroup of MSM who use the Internet to find public sex partners; particularly, where they engage in public sexual activity, and whether their behaviors are associated with an increased risk of HIV/STI transmission.

Method

Participants

A total of 204 MSM completed an online survey about risk perceptions, sexual behaviors, and HIV prevention in commercial and public sex venues, wherein 139 (68%) indicated that they had attended at least one of seven sex venues (e.g., gym/health club, public bathroom, bathhouse, sex club, bar backroom, public park, & video/buddy booth) during the previous month. In order to participate in the study, men were required to be at least 18 years of age and to actively engage in sexual behavior with other men.

Procedure

Participants were recruited primarily from online solicitations (e.g., Craigslist, Backpage, LGBT listservs). Though attempts were made to recruit men from gay bars and clubs in New York City by distributing study invitation cards in these venues, only two participants (approximately 1% of the sample) took part in the study after receiving a study card. Recruitment notices indicated that this was an online survey for men at least 18 years of age who have sex with other men in public places, that there was a chance to win a $50 prize, and instructed potential participants to email the study email address asking for a link (URL) to the survey. After receiving and accessing the survey link

participants were asked to read a consent page and acknowledge their agreement. The consent page informed participants that the survey would take approximately 20 minutes to complete. At the end of the survey, individuals were given the option to provide an e-mail address that would be entered into a random drawing for one of two $50 e-gift certificates. Electronic gift certificates have been suggested as a potential incentive for survey research with sexual minorities (Riggle, Rostosky, & Reedy, 2005). With approval from the Institutional Review Board affiliated with the author's university, data collection occurred from May through September, 2008.

The effectiveness of using Internet surveys to assess sexual behavior in MSM populations has been previously demonstrated (Chiasson et al., 2005; Ross, Tikkanen, & Mansson, 2000; Rosser et al., 2009). This type of research removes potential interviewer effects that can occur when attempting to collect data on sexual behavior, which may strengthen internal validity (Mustanski, 2001). The questionnaire was administered using an online survey host (www.surveymonkey.com). This survey host recorded an IP address for anyone clicking on the survey URL. This mechanism was implemented in order to reduce the potential for multiple survey submissions by a single individual (Barchard & Williams, 2008; Birnbaum, 2004; Mustanski, 2001; Riggle, Rostosky, & Reedy, 2005). Although IP addresses do not specifically identify individuals, they are still considered a source of identifying information because they can be traced back to a computer with potentially one owner/user (Barchard & Williams, 2008; Nosek, Banaji, & Greenwald, 2002). Several duplicate submissions were noted during data cleaning; however, these surveys were already found to be incomplete and subsequently discarded. All IP addresses were destroyed after data transfer and cleaning. The consent page

reflected the participant's right to refuse to answer any questions and to quit taking the survey at any time.

Instrument

The online survey asked men to indicate how often in the past month they had used the Internet as a way of finding men to meet in a public place for sex. Responses to this item included: "Never", "One or two times", "Once a week", "Two or three times a week", "More than three times a week", and "Everyday". Data obtained for this item were normally distributed. Additionally, participants were asked to rate the perceived risk of HIV transmission on a ten-point scale [1 ("Not risky at all") – 10 ("Extremely risky")] with regard to specific sexual behaviors (e.g., mutual masturbation, oral sex without a condom, anal sex with a condom, & anal sex without a condom). Although risk perceptions of HIV transmission were assessed as a continuous variable, the data required recoding because of skewed distributions. The perceived risk of HIV transmission from anal sex without a condom was negatively skewed. Therefore it was dichotomized and recoded as moderate risk (i.e., rating of 6-9) and high risk (i.e., rating of 10) for categorical analysis. The perceived risk of HIV transmission from mutual masturbation was positively skewed, and thus dichotomized and recoded as no risk (i.e., rating of 1) and low risk (i.e., rating of 2-6). Furthermore, the perceived risk of HIV transmission from both oral sex without a condom and anal sex with a condom were normally distributed and therefore analyzed as continuous variables.

The survey also included items to assess how often men had attended any of seven sex venues (e.g., gyms/health clubs, public bathrooms, bathhouses, sex clubs, bar backrooms, public parks, and video booths) during the past month. Responses to this item

included: “Never”, “One of two times”, “Once a week”, “Two or three times a week”, and “More than three times a week”. The data obtained from this question were positively skewed for each venue and therefore dichotomized (0 = No attendance; 1 = Attended) for bivariate analyses. Because the survey was designed to include skip patterns based on individual participant responses, men answered venue-specific questions for only those venues they had been to during the previous month. Whenever attendance at a particular venue was indicated, participants were subsequently asked to report the number of times they engaged in specific behaviors at that venue (e.g., masturbation/mutual masturbation, insertive oral sex, receptive oral sex with/without ejaculation in the mouth, & insertive/receptive anal sex with or without a condom) during the previous month. Recalling behavior through open response has been recommended as a way of improving self-report of sexual activity (Weinhardt, Forsyth, Carey, Jaworski, & Durant, 1998). For the current report, the number of times participants engaged in a particular behavior were totaled across venues for each participant. Reports of sexual behaviors were positively skewed; therefore, these variables were dichotomized for categorical analysis. Insertive and receptive anal sex with a condom were recoded as PIAI and PRAI, respectively. These two behaviors were also combined and recoded as PAI to reflect occurrence of any protected anal intercourse. Insertive and receptive anal sex without a condom were recoded as UIAI and URAI, respectively. These two behaviors were also combined and recoded as UAI to reflect occurrence of any unprotected anal intercourse.

Additionally, men were asked to indicate how often they took condoms to a sex venue with the intent to use them for sexual activity. Responses to this question included

"Never", "Some of the time", "Most of the time", and "All of the time". For the current report, any participant who indicated that he had taken condoms to at least one sex venue "Some of the time", Most of the time", or "All of the time" was considered to have taken condoms at least some of the time. Therefore, in order to examine this item across venues, responses were dichotomized and recoded as: 0 = "Never" and 1 = "At least some of the time".

The last section of the survey included items that assessed participants' perceived likelihood from 1 ("Very unlikely") to 10 ("Very likely") of becoming infected with HIV or another type of STI during the next six months, the next year, or in their lifetime. The distributions for each of these items were positively skewed. As a result, the items were dichotomized and recoded as very unlikely (i.e., rating of 1) and somewhat likely (i.e., rating of 2-10) for categorical analysis. Men were also asked in this section to rate ("Strongly agree", "Somewhat agree", "Strongly disagree", and "Somewhat disagree") their preference for a list of environmental qualities based on their experiences seeking out men in a public place. The statement specifically read: "When I seek out men in a public place, I prefer spaces that are _____." Environmental qualities included: *Stimulating*, *Full of adventure*, *Clean*, *Safe*, *Private*, *Public*, *Non-verbal*, *Full of men*, *Lively*, *Bright*, and *Dimly lit*. Additionally, participants were asked to rate, using the same rating scale, their preference for types of public encounters (sexual or otherwise). The statement read: "When I seek out men in a public place, I am looking for _____." The preferences for this item included: *Anonymous sex*, *Sex with more than one partner*, *Friendship*, *Companionship*, and *Love*. Responses to any of the environmental qualities or preferences were collapsed into two categories—agree

(strongly or somewhat agree) and disagree (strongly or somewhat disagree)—which were used in subsequent categorical analyses. Finally, age and HIV status were assessed in this last section.

Data Analysis

A cluster analysis was initially performed in order to identify subgroups of sex venue attendees with regard to how often they attend any of the venues as well as how often they use the Internet to find partners for public sexual encounters. This type of analysis is iterative and should be conducted in a two-step process to determine and validate if groups of cases exist among variables of interest (Henry, Tolan, & Gorman-Smith, 2005; Rapkin & Luke, 1993; Rosario, Schrimshaw, & Hunter, 2008). Although the data obtained for each venue regarding how often participants attended during the previous month were positively skewed, the distributions revealed a trend of three groupings (no frequency of attendance, attended one or two times, and all other higher levels of frequency). Therefore, these data were entered into the cluster analysis prior to dichotomization along with how often participants used the Internet to find partners for public sexual encounters, which was normally distributed.

The first step of the cluster analysis, hierarchical clustering using Ward's method, was pursued to identify the number of clusters based on several variables: how often participants attended any of the seven commercial or public sex venues as well as how often participants used the Internet to find a partner for a public sex encounter. Ward's method is an appropriate procedure when ordinal data is used as continuous (Everitt, Landau, & Leese, 2001). The raw data obtained for each of these variables were included. Three groups of cases were revealed in a dendogram, and no outliers were noted.

Therefore, a second step of cluster analysis—the *K*-means procedure—was used to validate and explain the three groups that were shown in the dendogram. Three clusters were specified in SPSS and the iterative process (6 iterations in total) assigned all of the cases into one of three clusters based on their similarity among the variables of interest. Comparison of the dendogram (hierarchical cluster results) and the *K*-means output (nonhierarchical cluster results) were very similar, which suggests validity within these findings. Upon further observation, it was revealed that the cases within each of the clusters were defined only by how often participants used the Internet during the previous month to search for a partner for a public sex encounter rather than a pattern of Internet use and venue attendance.

Bivariate analyses (Independent samples t-test for continuous variables, chi-square for categorical variables) were used to examine differences between the Internet frequency groups identified in the cluster analysis with regard to physical venue attendance, sexual behaviors across venues, HIV status, HIV risk perceptions, and preferences for why men seek out public sexual encounters as well as preferences within public spaces for these encounters. Statistically significant associations for all analyses were defined by a *p* value of .05 or less. A Fisher's exact test was used to determine significance for 2 x 2 chi-square analyses with any cell counts of less than 5.

Results

Those participants who indicated that they had attended a sex venue in the past month (N = 139) were asked how often in the previous month they had used the Internet to find a partner for a public sexual encounter. A cluster analysis was initially performed in order to identify subgroups of sex venue attendees with respect to how often they

attended any of the sex venues and how often they used the Internet to find partners for public sexual encounters. Although this process did not detect any patterns between these variables, it did reveal two groups of Internet frequency use. A low frequency group (N = 54) was identified, which comprised those participants who reported using the Internet once a week or less during the previous month to find a partner for a public sexual encounter (e.g., "Never", "One or two times", "Once a week"); while a high frequency group (N = 58) was comprised of men who reported using the Internet at least two or three times a week (e.g., "Two or three times a week", "More than three times a week", "Everyday") for this reason. Finally, a third group was identified that consisted of men who declined to answer the survey item regarding their frequency of Internet usage to find partners for public sexual encounters (N = 27). Since no assumptions can be made about this third group, these cases were removed from subsequent analyses. The remainder of this section will report demographics for men in the low and high frequency groups (N = 112) as well as analyses that compare these two groups on venues attended, sexual behaviors across venues, HIV risk perceptions, and preferences for public sexual encounters.

Most participants across the two Internet frequency groups (N = 112) were between the ages of 30 and 60. Specifically, men reported their age as: 18 – 24 (4%), 25 – 29 (6%), 30 – 40 (32%), 41 – 60 (53%), and over 60 (5%). Additionally, most of the men identified as being HIV-negative (82%); although a small percentage reported their status as HIV-positive (7%) or that they did not know their HIV status/refused to say (11%).

Table 3.1 reports the number of sex venues attended by each Internet frequency group, as well as the average number of venues attended by these two groups. There were twice as many men who attended four or more venues to report a high frequency of Internet use to find partners for public sex encounters than men who reported a low frequency of Internet use. This tendency notwithstanding, most of the men in both groups reported attending three or fewer venues during the previous month. Indeed, both groups had an average venue attendance of less than three (Table 3.1). Moreover, an independent samples t-test revealed no differences in the number of sex venues attended between the two Internet frequency groups, t (110) = -1.127, p = .26.

Table 3.2 reports the proportion of men—by Internet frequency group—attending each of the venues. The proportion of men in the high frequency group attending gyms/health clubs, public bathrooms, and sex clubs was slightly higher than men in the low frequency group. Attendance was fairly similar for both groups among the remaining venues. Moreover, a chi-square test found that neither group was more likely to attend any one venue type during the previous month. Indeed, both groups reported public parks, video booths, and public bathrooms as the venues they frequented most.

There were no significant differences in age between the two Internet usage groups. Additionally, of the 112 venue attendees who reported using the Internet to find partners for public sexual encounters, eight reported being HIV-positive, while another 12 did not know their status or refused to answer this question. The HIV-positive men were more likely to have reported high frequency use of the Internet to find partners for public sexual encounters (88%) than HIV-negative men in that same group (46%), χ^2 (2, N = 112) = 8.1, $p < .05$. Moreover, men who reported not knowing their HIV status or

who refused to say were marginally more likely to have reported high frequency use of the Internet to find partners for public sexual encounters than HIV-negative men in that same group ($p = .07$).

Risk Behaviors Across Venues by Frequency of Internet Use to Find Partners for Public Sexual Encounters

Table 3.3 provides a breakdown of the percentages of participants reporting sexual behaviors at any venue(s) during the previous month based on Internet frequency group. With the exception of oral-insertive, reports of all other sexual behaviors were higher for men in the high frequency Internet group. The occurrence of sexual behaviors among participants in the low and high frequency Internet usage groups were compared to determine if either group was more likely to engage in risk behaviors. The findings revealed that men who were in the high frequency Internet group were more likely to report unprotected anal-receptive intercourse (URAI) during sex venue attendance within the previous month (26%) than men in the low frequency Internet group (9%), χ^2 (1, N = 112) = 5.3, $p < .03$. There were no other significant outcomes to report for the remaining sexual behaviors.

Also, men were asked to indicate how often they took condoms to those sex venues they had frequented in the past month with the intent to use them for sexual activity. Half of the men in the high frequency group reported taking condoms at least some of the time (50%) with the other half reporting that they never took them. Similarly, 46% of men in the low frequency group reported taking condoms at least some of the time, with the remaining 54% indicating that they never took them. Chi-square analyses revealed that neither group was more likely to report this behavior.

Within-group differences were further examined between taking condoms to a sex venue and engaging in risky or safer behaviors using chi-square analyses (Table 3.4). Men in the low frequency group who reported taking condoms to a venue at least some of the time during the previous month were more likely to report engaging in PRAI and PAI compared to men who indicated that they never took condoms. Men in this same group who reported taking condoms to a venue were marginally more likely to report engaging in oral-receptive with ejaculation in the mouth (ORE) compared to men who indicated that they never took condoms. Participants in the high frequency group who reported taking condoms to a sex venue at least some of the time were more likely to report engaging in ORE, PIAI, PRAI, and PAI compared to men who indicated that they never took condoms.

Risk Perceptions by Frequency of Internet Use to Find Partners for Public Sexual Encounters

Participants were asked to rate how risky they believed specific sexual behaviors (e.g., mutual masturbation, oral sex without a condom, anal sex with a condom, & anal sex without a condom) to be in terms of HIV transmission. The low and high frequency groups of Internet users were compared on each of these risk perceptions. Men in the low frequency group were marginally more likely to perceive some risk of HIV transmission as a result of mutual masturbation compared to men in the high frequency group (p = .09). There were no significant outcomes to report for risk perceptions of the remaining sexual behaviors. Finally, the survey assessed an individual's perceived likelihood of becoming infected with HIV or another STI during the next six months, year, or in their

lifetime. Comparisons between the Internet frequency groups were conducted; however, no significant outcomes were observed.

Partner and Venue Preferences by Frequency of Internet Use to Find Partners for Public Sexual Encounters

The two Internet frequency groups were also compared on a set of preferences for why they seek out public sexual encounters as well as preferences within public spaces (i.e. environmental qualities) for these encounters. Participants in the high frequency group were more likely to agree that they prefer public sexual encounters involving "Sex with more than one person" compared to those men in the low frequency group, χ^2 (1, N = 110) = 4.1, $p < .05$. Additionally, men who were in the high frequency group were more likely to agree that they preferred spaces for public sexual encounters that were "Full of men" when compared to those men who were in the low frequency group, χ^2 (1, N = 111) = 12.1, $p = .001$. There were no significant associations for the remaining preferences.

Discussion

This study is one of the first to directly assess how often MSM use the Internet in search of partners for public sexual encounters relative to their risk behaviors within various sex venues. A cluster analysis was initially performed to identify subgroups of sex venue attendees with respect to how often they attended any of seven types of venues as well as how often they used the Internet in search of partners for public sexual encounters. The cluster analysis revealed two distinct groups of men who search for partners through the Internet who are willing to engage in sexual activity with them in a public place. The groups were based on categorical frequency of Internet use to seek

partners for public sex encounters such that men who participated in this online activity once a week or less were classified as low frequency users and men who performed this online activity at least two or three times a week were considered to be high frequency users. Bivariate analyses further revealed that both low and high frequency Internet usage groups attended similar numbers of physical venues during the previous month, and that neither group was more likely to attend any one venue. However, potential trends in higher attendance at gyms, public bathrooms, and sex clubs were noted among those who reported high frequency Internet use to find partners for public sex encounters relative to the other venues.

The analyses found that respondents who reported using the Internet more often in search of partners for public sex encounters engaged in more unprotected anal-receptive sex while attending a venue compared to those men who search online for public sex partners less often. This result is particularly alarming given that only half of the men in this high frequency group reported taking condoms with them to a sex venue during the past month. However, this is confounded by the finding that men in the high frequency group who took condoms at least some of the time were more likely to report protected anal sex compared to those men who did not take condoms to any of the venues. Additionally, men in the low frequency group who reported taking condoms to a sex venue in the past month at least some of the time were more likely to report protected anal sex compared to those men who did not take condoms. Furthermore, men who indicated that they took condoms when attending a sex venue, regardless of Internet frequency, had higher rates of unprotected oral sex (i.e., oral-receptive intercourse with ejaculation in the mouth). These data suggest that safe sex intentions (taking condoms

with them to sex venues) among men who use the Internet to find partners for public sexual encounters may correspond to safer anal sex, but not safer oral sex, once they are at the venue. Though the risk of HIV transmission from oral-genital contact is often considered to be lower than that of anal penetration (Centers for Disease Control and Prevention, 2009), more engagement in this behavior could result in greater numbers of HIV infections (Vittinghoff et al., 1999) or other sexually transmitted diseases. Perhaps Internet and venue-based prevention programs are needed to better inform MSM of the potential risks associated with ORE without discouraging other safe sex strategies (e.g., PAI).

Although only a small percentage of men in this study reported being HIV-positive, most of these men were in the high frequency Internet use group. Though speculative, these findings suggest that high frequency users of the Internet—to find partners for public sex encounters—who are more likely to be HIV-positive and more likely to have unprotected anal sex at a venue may therefore have a greater potential for HIV transmission. These results support previous studies which found that HIV-positive MSM spend more time online—or were more likely to use the Internet—in search of sex partners than men who were HIV-negative (Bolding et al., 2004; Elford, Bolding, Davis, Sherr, & Hart, 2004; Grov, DeBusk et al., 2007). Knowing that some sex venue users who frequently initiate public sex encounters on the Internet are HIV-positive and may be engaging in risky sexual behaviors during sex venue attendance could be useful in designing appropriate HIV/STI interventions that reach this population before their encounters go offline.

The findings presented in this paper have demonstrated that men who use the Internet to find male sex partners also attend commercial and public sex venues, which confirms previous studies (Bolding et al., 2005; Garofalo et al., 2007; McKirnan et al., 2007; Mettey et al., 2003; Ogilvie et al., 2008; Ross et al., 2000; Taylor et al., 2004). This study has gone a step further by establishing that some men initially seek partners for public sexual encounters online with varying levels of frequency. Furthermore, it provides support for prior research suggesting that higher frequency of online use by MSM to find sex partners is associated with risky sexual behaviors (Bolding et al., 2004; Horvath et al., 2008). The current study highlights the importance of understanding how successful men are in meeting their Internet partners at sex venues as well as their risk behaviors with those specific partners.

A novel component to this study was the assessment of preferences that MSM have in pursuing public sexual encounters. The findings overwhelmingly demonstrate that men who frequently use the Internet in search of public sex also desire encounters with multiple sex partners and venues that offer ample numbers of men. Evidence has shown that men who use the Internet to find male partners typically report greater numbers of partners than men using non-Internet sources (Benotsch et al., 2002; McFarlane et al., 2000; McKirnan et al., 2007), and that having multiple sex partners increases an individual's risk of HIV/STI transmission (Centers for Disease Control and Prevention, n.d.; Hirshfield et al., 2004; Rosario, Schrimshaw, & Hunter, 2006). Therefore, future research with a larger sample may want to account for the number of partners that men have when attending public sex venues including partners initially met online, as well as the extent to which they engage in risky behaviors with those men.

This research raises important questions about the use of Internet resources to coordinate public sexual encounters. First, is this subgroup of MSM riskier than men who engage in sex with online partners at a private residence? Second, do these men engage in riskier behaviors in sex venues with their Internet partners relative to those men who initially met partners at a physical venue? Future research and interventions that target MSM who search for sex partners online should be aware of the places that these men ultimately engage in sexual encounters with these partners. An analysis of a popular cruising website produced by and for men who are interested in commercial or public sex encounters—where to go, where not to go—has revealed additional venues (e.g., retail store restrooms, college campuses) beyond those traditionally studied (i.e., bathhouses, public parks) that may call for risk reduction interventions (Tewksbury, 2008). Public health efforts could benefit from knowing where men engage in sex with their Internet partners and by having more data on condom negotiation and risk behaviors between venue partners who initiated their sexual encounters online.

Nevertheless, the findings presented in this paper must be interpreted within the context of the study's limitations. First, responses to how often participants attended any of the physical venues were positively skewed and could explain why no patterns were found between venue attendance and frequency of Internet use to find partners for public sex encounters. Second, this study is limited by its relatively small sample size, which may also explain why no patterns of venue attendance and Internet frequency were detected among this group of MSM. Third, because of survey length considerations, items regarding ethnic/racial background, socioeconomic status, and education were not included. Therefore, future research addressing this group of Internet users should

account for these variables, all of which would be potentially useful in describing these men. Fourth, two of the expected cell counts were less than 5 for the chi-square analysis comparing HIV status and Internet frequency group. However, a Fisher's exact test confirmed the significant outcome that HIV-positive men in the full sample of venue attendees were more likely to be in high frequency group than HIV-negative men. Fifth, almost all of the participants were recruited online. Additional work conducted at sex venues could assess if any venue partners were initially met online, which may provide a better understanding of this phenomenon. In addition, sexual behaviors were not assessed for a specific venue partner so it is impossible to know if any of the public sexual encounters occurred with someone who was initially met on the Internet. Furthermore, a small percentage of men failed to respond to the question regarding their use of the Internet to seek out public sex. As a result, the data obtained from these men were excluded from analyses, which decreased the sample size. Finally, the study was also limited by the low numbers of men under the age of 30 participating, which may have accounted for the lack of Internet frequency differences based on age.

Conclusions

The current report found that men who engage in high frequency use of the Internet to find partners for public sexual encounters are more likely to be HIV-positive, engage in unprotected anal-receptive intercourse, and have a preference for sex venues that offer opportunities to have sex with multiple male partners as compared to those men who engage in low frequency use of the Internet to find partners for public sex. Although no physical venues were associated with the high frequency group, there was a trend among these men to attend gyms/health clubs, public bathrooms, and sex clubs. Future

studies with a larger sample size may be able to detect patterns of venue attendance within this subgroup of Internet users who actively seek partners for public sex encounters. Knowing where these men engage in sexual behaviors with their Internet-specific partners will benefit public health officials in tailoring HIV/STI interventions.

Table 3.1

Number of Sex Venues Attended during the Previous Month by Internet Frequency Group

		Low Frequency (N = 54)	High Frequency (N = 58)
Number of Sex Venues Attended			
	1	15 (28)	14 (24)
	2	12 (22)	13 (22)
	3	17 (32)	11 (19)
	4	6 (11)	13 (22)
	5	4 (7)	7 (12)
	M (*SD*)	2.48 (1.23)	2.76 (1.37)

Note: *n* (%) presented

Table 3.2

Sex Venues Attended In the Past Month by Men in High and Low Frequency Internet Groups

	Low Frequency	High Frequency
Sex Venue		
Gym/Health Club	20 (37)	26 (45)
Public Bathroom	21 (39)	28 (48)
Bathhouse	14 (26)	14 (24)
Sex Club	10 (19)	15 (26)
Bar Backroom	12 (22)	14 (24)
Public Park	32 (59)	34 (59)
Video/Buddy Booth	25 (46)	29 (50)

Notes: n (%) presented; Percentages do not total 100% due to multivenue users; Chi-square analyses revealed no significant outcomes for venues attended by Internet frequency group

Table 3.3

Percentage of Participants Reporting Sexual Behaviors by Internet Frequency

Behavior	Low Frequency (N = 54)	High Frequency (N = 58)
Masturbation/Mutual Masturbation	39 (72)	47 (81)
Any Oral	45 (83)	49 (85)
Any Anal	22 (41)	29 (50)
Oral Insertive	41 (76)	42 (72)
Oral Receptive with Ejaculation in the Mouth	23 (43)	32 (55)
Oral Receptive without Ejaculation in the Mouth	32 (59)	38 (66)
UIAI	8 (15)	12 (21)
URAI	5 (9)	15 (26)
UAI	10 (19)	18 (31)
PIAI	11 (20)	14 (24)
PRAI	12 (22)	16 (28)
PAI	15 (28)	21 (36)
UAI (among any Anal)	10 (46)	18 (62)
PAI (among any Anal)	15 (68)	21 (72)

Note: n (%) presented

Table 3.4

Comparisons of Sexual Behaviors by Frequency of Taking Condoms to Sex Venues: Separate Analyses by Internet Frequency Group

	Frequency of Taking Condoms to the Venue	
Behavior	Never	At least some of the time
Low Frequency (N = 54)		
ORE	9 (31)	14 (56)†
UAI	4 (14)	6 (24)
UIAI	3 (10)	5 (20)
URAI	1 (3)	4 (16)
PAI	4 (14)	11 (44)*
PIAI	3 (10)	8 (32)††
PRAI	3 (10)	9 (36)*
High Frequency (N = 58)		
ORE	10 (35)	22 (76)**
UAI	7 (24)	11 (38)
UIAI	5 (17)	7 (24)
URAI	5 (17)	10 (35)
PAI	3 (10)	18 (62)**
PIAI	2 (7)	12 (41)**
PRAI	3 (10)	13 (45)**

Notes: n (%) presented within Internet frequency group; Chi-square analyses revealed several significant outcomes; *$p < .05$; **$p < .01$; $^{\dagger}p < .07$; $^{\dagger\dagger}p < .10$; $df = 1$

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