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Predicting HIV/AIDS-Related Risk Behavior Among Men Who Have Sex With Men: An Examination of Psychosocial Perspectives

by Todd M. Sabato

Men who have sex with men (MSM) continue to be disproportionately affected by the HIV/AIDS epidemic. They represent more than half of all persons living with HIV and over 60% of HIV-infected men. Although as a group MSM no longer account for the majority of new HIV infections, they are estimated to account for 43% of all new infections — more than any other group. Using Social Cognitive Theory as a conceptual framework, this study examined the influence of both psychosocial and demographic features on the sexual risk-taking behaviors of self-identified MSM.

AIDS has taken a tremendous toll in the United States. Since the first case was identified in 1981, 956,019 cases of AIDS have been reported (Centers for Disease Control and Prevention [CDC], 2006a), and approximately 550,000 Americans have died (CDC, 2006a) from the disease. The disease continues to have a tragic impact, not only on those who are living with Human Immunodeficiency Virus (HIV) infection, but also on the many friends, families, and entire communities that have been forever changed by the epidemic. An estimated 1.7 million people in the United States have been infected with HIV (Henry J. Kaiser Family Foundation, 2006), and another 426,000 people are living with AIDS (CDC, 2006a).

The epidemic continues to disproportionately affect men who have sex with men (MSM). MSM have taken great strides to protect themselves from HIV infection; however, as is the case in many areas of health related behavior change, MSM have been unsuccessful in maintaining protected sexual behaviors over long periods of time (Becker & Joseph, 1988; Ekstrand & Coates, 1990; Kelly et al., 1990b; Prieur, 1990; Roffman, Gillmore, Gilchrist, Mathias, & Krueger, 1990; Stall, Ekstrand, Pollack, McKusick, & Coates, 1990; Valdiserri et al., 1988). An estimated 365,000 to 535,000 MSM in the United States are infected with HIV (Karon et al., 1996), representing nearly half of all persons living with HIV and approximately 61% of HIV-infected men (CDC, 2006a). given that only an estimated 5% to 7% of American men have had sex with another man during adulthood (Binson et al., 1995; Rogers & Turner, 1991), these figures are overwhelming. As a group, MSM account for 45% of all new infections °V more than any other group (CDC, 2006b). Of AIDS cases diagnosed in 2005 in men, 58% were estimated to be in men who have sex with men, and an additional 7% were estimated to be among MSM/injection drug users (CDC, 2006a). Although rates of new HIV infection declined among MSM in the United States between the mid-1980s and the mid-1990s, (Institute of Medicine, 2000; Quan et al., 2000), data suggests that rates of new infections may be increasing (McFarland et al., 2000; San Francisco Department of Public Health and AIDS Research Institute, 2000). Similarly, studies conducted by the Centers for Disease Control, which examined anonymous blood samples of over 40,000 high-risk patients of all ages, confirms this trend (Linley, 2002). The study found the rate of new infections for MSM to be nine times higher than for women and heterosexual men. New AIDS cases related to MSM have also increased each year since 2000, rising a total of 10.4% in that time (Health Resources and Services Administration, 2005).

Reducing the risk of HIV/AIDS among MSM requires identifying the psychosocial and behavioral factors, such as alcohol and drug use, that are associated with HIV (Avins et al., 1994) and HIV-related sexual risk-taking (Wingood & DiClemente, 1998). Further review of the HIV/AIDS literature has identified psychosocial factors that have been shown to differentiate between gay and bisexual men who report lower HIV risk behaviors and those who do not. These factors include age, substance use, depression, internalized homophobia, and exposure to the HIV/AIDS culture. More specifically, evidence suggests that, similar to other groups, greater use of alcohol and illicit substances (Kalichman, Heckman, & Kelly, 1996; Robins, Dew, Kingsley, & Becker, 1997) are key social factors associated with high-risk sexual behavior among gay and bisexual men. There is also evidence that internalized homophobia is an important psychological predictor of unprotected anal intercourse among gay and bisexual men (Folkman, Chesney, Pollack, & Phillips, 1992; Meyer, 1995; Meyer & Dean, 1995). Few studies, however, have examined the impact of control, perception, and attribution on HIV risk-related behaviors. It was therefore essential to address these characteristics, and their potential individual and combined impact

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upon HIV/AIDS-related risk sexual behavior.

Locus of Control. Previous studies indicate that external locus of control predicts engagement in high-risk sexual behavior (Aspinwall, Kemeny, Taylor, Schneider, & Dudley, 1991; Kelly, St. Lawrence, & Brasfield, 1991; Kelly et al., 1990a). Using Bandura's (1977) self-efficacy framework as a predictor of AIDS risk reduction behavior, Aspinwall et al. (1991) found that self-reported self-efficacy regarding consistent condom use, perceived risk, response efficacy, and prior sexual behavior accounted for 70% of the variance in the total number of sexual partners and the number of anonymous partners over a 6-month interval. Kelly et al. (1991) conducted a 16-month longitudinal study to assess change in high-risk sexual behavior after providing subjects with educational interventions. Resumption of high-risk sexual behavior was significantly associated with the belief that HIV infection was determined by external factors, such as chance and luck (Kelly et al., 1991). Such results support the findings of St. Lawrence, Jefferson, Alleyne, and Brasfield (1995) that decreases in high-risk sexual activity were associated with an internal locus of control.

In a second study, Kelly et al., (1990a) found that high-risk takers were more likely to view their health as being attributable to chance or luck, and less likely to perceive themselves as having control over their well-being. Participants were more likely to adopt a passive stance toward taking care of themselves, thereby demonstrating an external locus of control. Similarly, Powell, Dolan, and Wessely (1990) found that, among subjects with chronic fatigue syndrome, external locus of control was significantly correlated with pessimistic attributional style, lower self-esteem, and greater guilt.

Learned Helplessness and Attributional Style. Although attributional style has not been directly linked to high-risk sex, the present research focused on whether a pessimistic attributional style would predict engagement in risky behavior. The construct of learned helplessness is prerequisite to understanding attributional style.

Learned helplessness theory was first described by animal researchers (Overmeir & Seligman, 1967; Seligman & Maier, 1967). Dogs who received inescapable shock showed striking motivational, cognitive, and emotional deficits and appeared helpless when given future opportunities to escape shock in the laboratory (Peterson & Seligman, 1984). Such deficits typically are interpreted in cognitive terms (Maier, Seligman, & Soloman, 1969; Peterson & Bossio, 1989; Seligman, Maier, & Soloman, 1971). That is, during exposure to the shocks, the dogs learned that the shocks were independent of their responses and that, regardless of what the dogs did or didn't do, the shocks occurred. This learning has been explained as an expectation of future response-outcome independence (i.e., the perception of uncontrollability) that generalized to new situations to produce the above-mentioned deficits (Peterson & Seligman, 1984).

Psychologists have linked the learned helplessness construct to a variety of failures in human action. Wortman and Brehm (1975) first investigated the basic helplessness phenomenon in the laboratory with human subjects. Garber and Seligman (1980) used helplessness theory to explain a variety of human difficulties, including academic failure and premature death. Perhaps the best known of these studies is Seligman's work (1972, 1975) and his suggestion that learned helplessness may model depression with respect to symptoms, causes, preventions, and cures. Symptoms of helplessness include passivity, cognitive deficits, emotional deficits (including sadness, anxiety, and hostility), a lowering of aggression, a lowering of appetite, neurochemical deficits, and an increase in susceptibility to disease (Peterson & Seligman, 1984).

Two problems emerged with the original helplessness model when applied to human helplessness in the laboratory and to human depression (Peterson & Seligman, 1984). First, the model failed to differentiate boundary conditions for the generalizability of helplessness. Sometimes helplessness generalized to novel situations (Hiroto & Seligman, 1975), and sometimes it was circumscribed or limited to the laboratory setting (Cole & Coyne, 1977). Additionally, aversive events inconsistently precipitated depressive reactions (Lloyd, 1980).

Second, the original model of helplessness did not explain the loss of self-esteem among depressives, frequently observed by Beck (1967). Abramson and Sackeim (1977) found that depressed individuals blamed themselves for events even when they perceived no control over events. This finding replicated individuals' perceptions of uncontrollability previously observed by Maier et al. (1969) and Seligman et al. (1971). However, learned helplessness theory did not adequately address how causal explanations for aversive events influenced self-esteem.

To address the above mentioned shortcomings, Abramson, Seligman, and Teasdale (1978) revised helplessness theory to include causal explanations for bad events. According to this revision, when people face uncontrollable bad events, they ask why. The answers that they tell themselves affect how they react to the events. Abramson et al. (1978) argued that three explanatory dimensions are relevant. First, the cause may be explained at something about the person (internal explanation) or it may be something about the situation or circumstance (external explanation). Second, the cause may be a factor that persists across time (stable explanation) or it may be transient (unstable explanation). Third, the cause may affect a variety of outcomes (global explanation) or it may be limited to the event of concern (specific explanation) (Abramson et al., 1978; Peterson & Seligman, 1984).

Whatever particular explanation is made, humans tend to habitually choose certain kinds of explanation for both good and bad events (Peterson & Seligman, 1984), a phenomenon termed attributional style (Abramson et al., 1978). An internal, stable, and global attributional style (i.e., pessimistic attributional style) has been empirically demonstrated in depressed individuals (Eaves & Rush, 1984; Persons & Rao, 1981; Raps, Peterson, Reinhard, Abramson, & Seligman, 1982). Furthermore, causal explanations for an event and expectations about the consequences of an event have similar properties (that is, internal, stable, and global) (Peterson & Seligman, 1984). Knowing an individual's attributional style does, therefore, assist clinicians in predicting helplessness deficits, much the same as other known risk factors for psychological and physical illnesses (Peterson, 1988; Peterson, Maier, & Seligman, 1993; Peterson & Seligman, 1984, 1987).

Peterson (1982) suggested that perceived control was central to health and wellness, and Peterson and Seligman (1987) suggested six possible pathways by which attributional style may mediate illness. First, individuals who offer internal, stable, and global explanations may become passive in the face of disease. Failure to seek or follow medical advice are considered two helpless responses that may exacerbate illness (Seligman, 1975). Second, individuals with a pessimistic attributional style may neglect the basics of health care, because they see no connection between anything they might do and the onset or progression of illness (Becker, 1974).

Third, people who offer internal, stable, and global explanations for bad events may not be good problem-solvers following uncontrollability (Alloy, Peterson, Abramson, & Seligman, 1984). Fourth, loneliness may be a possible factor linking attributional style to illness (Anderson, Horowitz, & French, 1983). The individual who makes internal, stable, and global explanations for bad events is socially withdrawn. Since supportive contacts with others may buffer illness (Cobb, 1976), the path from attributional style to illness may lead through social withdrawal and loneliness.

Fifth, depression may be a link between attributional style and illness. Schleifer, Keller, Sirus, Davis, and Stein (1985) found that depressed individuals were at increased risk for disease. Finally, pessimistic attributional style may affect an individual's physiology. Rodin and Langer (1977) found that the strongest correlates of immunosuppression among the institutionalized aged were stressful life events and the individual's sense of no control over these events. More recently, negative attributional style predicted faster immune decline in HIV-positive gay men (Segerstrom, Taylor, Kemeny, Reed, & Visscher, 1996). Internal, stable, and global attributions for negative events accounted for 8% of the variance in T-cell decline after controlling for all other variables.

A Model of High-Risk Sexual Behavior in HIV-Negative Gay Men

The basics of learned helplessness theory (Seligman, 1975) refer to several related cognitive and behavioral aspects of personality which lead to inappropriate and maladaptive passive behavior. People or animals are considered helpless if, through their inactivity, they fail to control outcomes that are objectively responsive to their actions (Hiroto & Seligman, 1975; Overmier & Seligman, 1967; Seligman & Maier, 1967). Learned helplessness also refers to the role of noncontingent events in producing passivity and to the cognitive mediation of passivity (Overmier & Seligman, 1967; Peterson & Seligman, 1987). During exposure to noncontingent events, helpless people learn that outcomes occur independently of their behavior. Regardless of what they do or do not do, the events take place. They come to expect that future events also will be uncontrollable and this explanation leads to helpless behavior (Peterson & Seligman, 1987).

The reformulated model of learned helplessness (Abramson et al., 1978) explains observed human variation in response to uncontrollability. This model suggests that individual's expectations of future helplessness are shaped first by their perception that events are noncontingent and second by their causal explanation, or habitual attributional style, for both good and bad events (Peterson & Seligman, 1987). An internal, stable, and global causal explanation is the most debilitating account of bad events (Abramson et al., 1978) and is important because it affects an individual's expectations about control and self-efficacy (Peterson & Seligman, 1987).

Self-Efficacy and Regulatory Control

Self-regulation is extremely important for directed behavior change in that it allows the gradual substitution of internal controls for external controls of behavior. This substitution is gradual, however, and is not guaranteed. Several factors may hinder an individual's ability to exhibit regulatory control, including a lack of self-efficacy, self-control, and one's emotional state. Such hindrances often lead to risk behaviors.

Loss of self-regulatory control, characterized by a lack of self-efficacy and self-control or locus of control, has been found to be a key indicator of HIV risk behaviors such as substance use and high-risk sex. Previous studies indicate that external locus of control predicts engagement in high-risk sexual behavior (Aspinwall et al., 1991; Kelly et al., 1991; Kelly et al., 1990a). High-risk takers have been found to be more likely to view their health as being attributable to chance or luck, and less likely to perceive themselves as having control over their well-being. Further, decreases in high-risk sexual activity have been associated with an internal locus of control (St. Lawrence et al., 1995). The results of such research lend credence to the foundation of both Learned Helplessness Theory and Social cognitive Theory — that expectations of behavior, and subsequent action, can be shaped by perception, as well as by causal explanation. In short, perception and causality impact an individual's expectations about control and self-efficacy.

An existing link between self-regulatory control, self-efficacy, and depression may lead one to engage in unhealthy behaviors. Self-regulatory systems mediate external influences and provide a basis for purposeful action, which allows for personal control over thoughts, feelings, motivations, and actions (Bandura, 1989). A lack of self-regulatory control is indicated by decreased self-motivation and subsequent self-efficacy, both of which are symptoms of clinical depression (American Psychiatric Association, 1994). Adults who suffer from anxiety and depression are much more likely to engage in high-risk activities such as prostitution, both injection and non-injection drug use, and choosing high-risk partners (Stiffman et al., 1995). In addition, depression has been significantly correlated with risky behavior among both men and women at risk for HIV infection (Valente et al., 1993).

Social cognitive Theory and High-Risk Behaviors

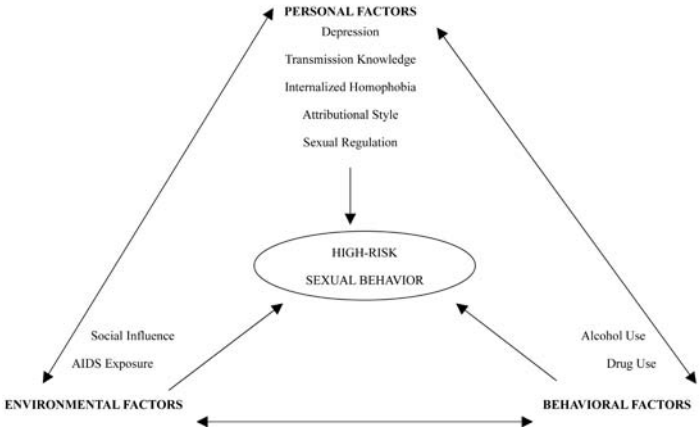
While the model of learned helplessness contributes greatly to the understanding of human behavior in response to uncontrollability, it is essential to examine the impact of numerous concepts over which an individual may exercise personal control. Both personal and environmental factors may provide cues to behavior. The Social Cognitive Theory addresses such psychosocial dynamics influencing health behaviors.

The Social Cognitive Theory defines human behavior as a triadic, dynamic, and reciprocal interaction of personal factors, behavior, and the environment (Bandura, 1977, 1986, 1989). According

to the theory, an individual's behavior is uniquely determined by each of these three factors. While the Social Cognitive Theory upholds the notion that response consequences mediate behavior, it contends that behavior is largely regulated antecedently through cognitive processes. Therefore, response consequences of a behavior are used to form expectations of behavioral outcomes. It is the ability to form these expectations that gives humans the capability to predict the outcomes of their behavior before the behavior is performed. In addition, the Social Cognitive Theory posits that most behavior is learned vicariously.

Based upon the premise that unhealthy behaviors are maintained through periodic social reinforcement, environmental cures, and in some cases psychological and physiological reinforcement, numerous explanations exist for the continued HIV-related risk behaviors that occur among men who have sex with men. Figure 1 briefly outlines these interactions and their resulting health consequences.

Figure 1. *Social Cognitive Theory and Risk Factors for HIV*



Several studies among gay men have reported significant associations between high-risk sexual behavior and external locus of control (Aspinwall et al., 1991; Kelly et al., 1990a; Kelly et al., 1991) and internalized homophobia (Folkman et al., 1992; Meyer, 1995; Meyer & Dean, 1995). As well, both alcohol and drug use have predicted high-risk sexual behavior in the general population (Shillington, Cottler, Compton, & Spitznagel, 1995) and among gay men (Mulry, Kalichman, & Kelly, 1994). Depression has also been found to be predictive of engagement in high-risk sexual behavior in HIV-negative men (Perkins, Leserman, Murphy, & Evans, 1993). Although the psychosocial factors discussed above have been examined separately as predictors of mood state, self-esteem, and high-risk sexual behavior, there has been no integrated examination of these factors in a single study. The present study integrated those factors, along with conceptually-based predictors (attributional style) to examine their respective influences on high-risk sexual behavior.

Methodology

Sample

The sample consisted of self-identified men who have sex with men. For research purposes, "men who have sex with men" was operationalized as men who either (a) have sex only with men, or (b) have sex with both men and women, as indicated by their response to a demographic item addressing the respondent's sexual preference. This definition is consistent with the Centers for Disease Control's surveillance and data reporting techniques (CDC, 1999). While all men were encouraged to complete the questionnaires, only those who identified as MSM were included as part of the data analysis. Responses of men who self-identified as only having sex with women were excluded from data analysis.

Recruitment

Participants were recruited in collaboration with a regional not-for-profit organization whose purpose is to provide that affected by HIV with information and support needed to make well-informed choices about their lives through advocacy, education, peer support, and activism. Data collection took place at an annual fundraising event that promotes unity, visibility, and self-esteem among the sexual minority community. Trained data collectors were stationed at data collection points located near the entrance to the festival, as well as high-traffic areas throughout the venue.

Instrumentation

Demographic Questionnaire. The 10-item demographic questionnaire solicited information on age, race, educational level, employment and socioeconomic status, experience with counseling/psychotherapy, and participant's history of HIV testing.

Attributional Style. The Attributional Style Questionnaire (ASQ) (Peterson et al., 1982) was administered to all participants. The ASQ yield scores for the exploration of events for internal versus external, stable versus unstable, and global versus specific causes, and has been found to correlate positively with self-esteem and the symptoms of learned helplessness (Peterson & Seligman, 1984). The instrument described four hypothetical events and asked participants to generate their own cause for each event, and to rate themselves along a 7-point scale. The three attributional dimensions (internality, stability, and globality) are associated with each event, thereby producing a total of 12 items. Participants ranked themselves on each item in the direction of increasing internality, stability, and globality (i.e., 1=lowest and 7=highest). The sum of the items represented each person's score on this scale. In previous research (Peterson & Seligman, 1984), Cronbach's alpha ranged from .72 to to .75. Construct validity has ranged from .71 to .79 (Peterson et al., 1982). In the present study, reliability for the ASQ was .86

Sexual Regulation / Locus of Control. The Dyadic Sexual Regulation scale (DSR) items were developed from open-ended interviews with heterosexual and homosexual couples (Catania, McDermott, & Wood, 1984). Each of the scale's 11 items were assessed on a 7-point Likert-type scale. Concurrent validity of the DSR is evidenced by results showing that the DSR is significantly related to dyadic sexual behaviors, cognitions, and affect. Increasing perceptions of internal control, as measured by the DSR, have been found to be associated with increasing frequencies of intercourse, oral sex from partners, sexual relations (an aggregate of sexual behaviors), affectionate behaviors, increasing levels of dyadic sexual satisfaction, and decreasing levels of dyadic sexual anxiety. The consistency of these findings indicates that the DSR is reliably sensitive to the reward properties of dyadic sexual situations and also indicates that perceptions of control may play a

role in attaining dyadic sexual satisfaction. Reliability coefficients have previously ranged from .74 to .83 (Catania, McDermott, & Wood, 1984), and was .78 in the present study.

High-Risk Sexual Behavior. High-risk sexual behavior was assessed using the UCSF Center for AIDS Prevention Studies Sexual Behaviors Questionnaire (Chesney, 1997). This 20-item scale asked participants to report the number of men they had had sex with over the preceding three months. Participants were also asked to respond yes or no to questions about condom usage, insertive anal / receptive anal sex, and insertive/receptive oral sex. As described below, two different scoring systems were used to measure sexual behavior.

UCSF-Defined Risk. Following the scoring system developed by the UCSF Center for AIDS Prevention Studies, participants were ranked on a 4 point scale based on their responses to 12 items regarding anal intercourse only. Scores could range from 0 to 32. This scoring system measures high-risk behavior defined strictly as unprotected anal intercourse. As such, only participants who engaged in unprotected anal sex would be deemed to be high-risk takers.

Multi-Indexed Definition of Risk. To broaden the definition of high-risk sexual behavior in accordance with the continuum of behavior articulated earlier, a second scoring system was developed by the author and used with participants' responses. In this system, participants were scored dichotomously on all items involving unprotected oral and anal sex. The sum of the 18 items constituted each participant's total score for high-risk sexual behavior, ranging from 0 to 18. The scoring system preserved all of the information obtainable from the 20-item scale.

In addition to the constructs addressed above, a series of questionnaires were also utilized to gain a proxy measure of substance use (Brief Michigan Alcohol Screening Test, α = .72) (Pokorny, Miller, & Kaplan, 1972), HIV risk knowledge (Brief HIv Knowledge Questionnaire, α = .88) (Carey & Schroder, 2002), depression (Center for Epidemiologic Studies Depression Scale, α = .90) (Radloff, 1977), and internalized homophobia (Internalized Homophobia Scale, α = .94) (Martin & Deam, 1988).

Table 1. ***Demographic Information of Self-Identified Men Who Have Sex With Men (n=223)***

	Frequency	%*
Age (range = 18 – 62 years)	M = 32.8yrs	SD=10.7yrs
Race/Ethnicity		
Caucasian	121	*55.8*
African American	71	*32.7*
Other	25	*11.5*
Level of Education		
High school graduate or less	46	*21.1*
Some college	58	*26.6*
College degree	114	*52.3*
Employment Status		
Not employed	36	*16.5*
Employed	182	*83.5*
Previous Year's Income		
$15,000 or less	52	*24.0*
$15,001 - $34,999	74	*34.1*
$35,000 or greater	91	*41.9*
Sexual Preference		
Sexual activity with men only	177	*81.2*
Sexual activity with men & women	42	*18.8*
History of Counseling		
Has previously received counseling	94	*43.3*
Has not previously received counseling	123	*56.7*
Length of Time Since Previous HIV Test		
Has never been tested for HIV	54	*25.0*
Has been tested for HIV in past 9 months	84	*38.9*
Has been tested for HIV more than 9 months ago	78	*36.1*
Number of HIV Tests in Last Five Years		
Has not been tested in last five years	61	*28.6*
1 – 5 times in last five years	117	*54.9*
More than five times in last five years	35	*16.4*

* Percentages may not add up to 100 due to missing data

Results

Descriptive Statistics

A total of 225 men completed the paper-and-pencil survey. Two subjects were excluded from the analyses because of a failure to meet one of the study's inclusion criteria of sexual preference (male or both male and female). The final sample therefore consisted of 223 self-identified men who have sex with men. Table 1 describes the demographic information provided by these men.

Sexual Regulation. Dyadic Sexual Regulation scores were computed by summing across items so that higher scores indicated a greater degree of external control. The range of possible scores was between 11 (internal responses for each item) and 55 (external responses for each item). The mean score was 29.5, an indication that participants were neither internally nor externally regulated, but rather a combination of both factors. Two-thirds (67.6%) of the respondents "agreed" or "strongly agreed" with the statement "During some sexual encounters I find it pleasurable to be passive while my partner is the active person." Greater than half of the participants responded "agree" or "strongly agree" with the statements "When I am not interested in sexual activity I feel free to reject sexual advances by my partner." (52.5%), "I often take the initiative in beginning sexual activity." (55.7%), and "I find it pleasurable at times to be the active member during sexual relations while my partner takes a passive role." (59.4%). Respondents were most opposed to the statement "If my sexual relations are not satisfying there is little I can do to improve the situation." More than six out of every ten participants (61.2%) "disagreed" or "strongly disagreed" with this statement.

Attributional Style. The Attributional Style Questionnaire yielded scores for the exploration of events for internal versus external, stable versus unstable, and global versus specific causes. Participants ranked themselves on each item in the direction of increasing internality, stability, and globality, with possible scores ranging from 12 to 84. The mean score on the questionnaire was 49.3, indicating a trend toward internality, stability, and globality,

the three elements that contribute to pessimistic attributional style.

Sexual Behavior. As discussed previously, two different scoring systems were used to measure sexual behaviors. Following the scoring system developed by the UCSF Center for AIDS Prevention Studies, participants were ranked on a 4 point scale based on their responses to 12 items regarding anal intercourse only. Responses to each of the items were summed to create a composite score for sexual risk. Scores could range from 0 to 32. Again, this scoring system measured high-risk behavior defined strictly as unprotected anal intercourse. As such, only participants who engaged in unprotected anal sex were deemed to be high risk takers. The mean score was 7.1

A second system of scoring broadened the definition of high-risk behavior. The Multi-Indexed scoring system scored participants dichotomously (0 = no, 1 = yes) on all items involving unprotected oral and anal sex. That is, participants who indicated engaging in either behavior without a condom received one point for each behavior. The mean score was 4.6.

Associations Among Independent Study Variables

Pearson's correlations were utilized as a means to examine the relationship between each of the study variables. Many of the correlations proved to be statistically significant, with the vast majority being moderately positive.

Attributional Style. As seen in previous research, internal, stable, and global attributional style (i.e., pessimistic attributional style) was positively correlated with many psychosocial factors related to increased HIV/AIDS risk. Most notably, a pessimistic attributional style was associated with increased levels of internalized homophobia (r=.22, $p<0.01$) and depressive symptoms (r=.27, $p<0.01$). Further, pessimistic attributional style was positively associated with both alcohol and illicit drug use (r=.21, $p<0.01$ and r= .20, $p<0.01$, respectively).

Depression. Despite the relatively low levels of depression exhibited by respondents (M=7.1, SD=5.7), many associations were found between depression and other psychosocial variables. Levels of depression were positively correlated with internalized homophobia (r=.39, $p<0.01$), suggesting that respondents with higher levels of depression also experienced a greater degree of internalized homophobia. Further, levels of depression were positively associated with alcohol use (r=.43, $p<0.01$), implying that persons with more depressive symptoms may consume greater quantities of alcohol.

A very strong correlation was found between depression and levels of sexual regulation, as measured by the Dyadic Sexual Regulation Scale (r=.50, $p<0.01$), suggesting that depressed persons are less willing exert personal control when engaging in sexual behaviors. More specifically, the finding draws a relationship between depression and external control, similar to the previous finding between depression and pessimistic attributional style. A relationship also existed between depression and HIV/AIDS-related sexual behavior, measured by the Multi-Indexed definition of risk (r=.16, $p<.05$).

High-Risk Sex as a Function of Psychosocial Variables

A series of independent sample t-tests were conducted to examine the hypothesis that levels of HIV/AIDS-related sexual risk taking could be explained by any of the independent variables (attributional style, depression, sexual regulation, alcohol use, internalized homophobia, drug use, and HIV transmission knowledge). Participants were classified as practicing low- or high-risk sexual behaviors based on their Sexual Behavior Questionnaire scores. Participants whose scores were one standard deviation above the sample mean were defined, a priori, as engaging in high-risk sex. On both measures, twelve to thirteen percent of the sample indicated that they had engaged in high-risk behaviors over the past three months.

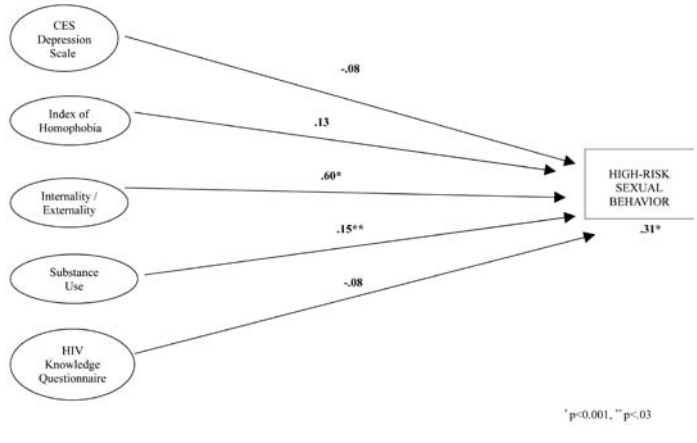
Two separate t-tests were calculated for each independent variable, in order to address both the UCSF and Multi-Indexed definitions of risk. Heavy alcohol use was consistently associated with high-risk sexual behavior ($p<.02$ for both the UCSF and Multi-Indexed definitions). Depression was also associated with high-risk behavior. Individuals who were classified as engaging in high-risk sex reported significantly higher levels of depression when compared to their lower-risk counterparts. ($p<0.05$ for the UCSF measure).

Similar to the findings of the Pearson's correlation, persons engaging in higher-risk sexual activities indicated more pessimistic attributional tyle ($p<0.001$ for both measures of risk). Although attributional style has yet to be directly linked to high-risk sex, the present results suggest that a pessimistic attributional style would predict engagement in risky behavior.

Modeling High-Risk Sexual Behavior

Using correlation coefficients, relationships were examined between (a) depression (b) internalized homophobia (c) internality/externality (d) substance use (e) HIV transmission knowledge, and (f) an observed, dependent variable (high-risk sexual behavior). The hypothesized model, presented in Figure 2, illustrates the hypothesis that depression, internalized homophobia, internality/externality, substance use, and HIV transmission knowledge directly affect high-risk sexual behavior.

Figure 2 *Results of Multiple Linear Regression Predicting High-Risk Sexual Behavior Utilizing UCSF Scoring Technique*



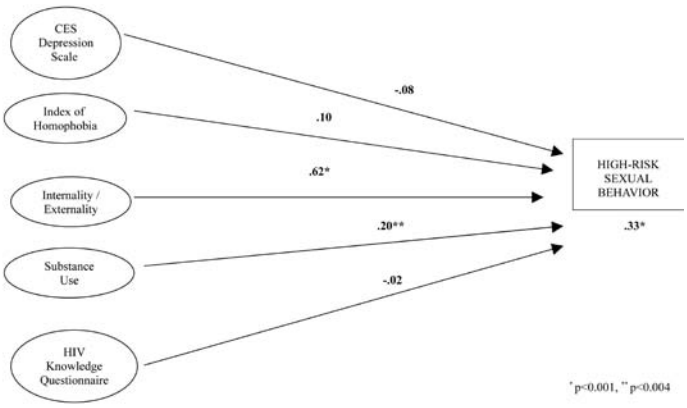
A hierarchal multiple linear regression was conducted in which all variables were simultaneously entered as factors predicting the dependent variable, over and above the effect of the demographic variables. Two separate analyses were conducted given the two scoring methods used to compute the dependent variable. For each dependent variable, the hypothesis was tested that men who

exhibited greater levels of depression, internalized homophobia, substance use, externality (i.e., pessimistic attributional style and external sexual control), and lower levels of HIV transmission knowledge would report higher engagement in high-risk sexual behavior.

UCSF Defined Risk. First, the model was tested using the scoring system developed by UCSF to define high-risk sexual behavior. As shown in Figure 2, a multiple regression, simultaneously entering all indicators and variables, revealed that 31% of the variance in the dependent variable was accounted for by the predictors (p,0.001). Variables were then examined for individual significance. As hypothesized, participants who exhibited greater degrees of externality engaged in riskier sexual behaviors (ß = .60, p,0.001), as did persons engaging in substance abuse (ß = .15, p<0.03). Internalized homophobia also predicted a trend in the same direction (ß = .13, p<0.06). Contrary to prediction, the remaining variables (depression and HIV transmission knowledge) did not emerge as significant predictors of high-risk sex.

Multi-Indexed Definition of Risk. As shown in Figure 3, , thirty-four percent of the variance in the dependent variable was accounted for by the predictors (p<0.001). Internality/externality (ß = .62, p<0.001) and drug abuse (ß = .20, p<0.004) contributed significantly to the proportion of variance in high-risk sexual behavior. Contrary to prediction, the remaining variables did not emerge as significant predictors of high-risk sex.

Figure 3 *Results of Multiple Linear Regression Predicting High-Risk Sexual Behavior Utilizing Multi-Indexed Scoring Technique*



Discussion

Sexual behavior, including avoidance of anal intercourse, condom usage, and number of sexual partners may not be stable over time (Abid, Joseph, Ostrow, Tal, & Schwartz, 1991; Joseph, Abid, Loopman, & Ostrow, 1990; Stall et al., 1990). Studies have revealed that MSM engage in different levels of risky sexual activity at different times in their lives and also have shown that there are fluctuations with regard to the number of sexual partners MSM may have over time. To the extent that high-risk sexual behavior is not stable over time, it may reflect a "state" phenomenon. Inconsistent risk-taking may be related to complex strategies of risk management based on several characteristics of the individual and the particular sexual encounter, and may involve both rational and irrational risk calculation (Meyer & Dean, 1995).

Although attributional style has not been directly linked to high-risk sex, the present study focused on whether a pessimistic attributional style would predict engagement in risky sexual behavior. A latent variable, internality/externality, was composed of two indicators (DSR and ASQ). While attributional style was found to be a stronger indicator of internality / externality, the combination of the two indicators nonetheless proved to be a statistically significant predictor of high-risk sex (p<.001 for both measures of high-risk sex). That pessimistic attributional style and external locus of control predict high-risk sexual behaviors is not unfounded. Peterson (1982) has suggested that perceived control is central to health and illness, and Peterson and Seligman (1987) propose many possible pathways by which attributional style may mediate behavior and illness. First, individuals with a pessimistic attributional style may become passive in the face of disease. Failure to seek or follow medical advice, such as utilizing HIV risk-reduction strategies, can be considered a helpless response that can invite or exacerbate illness (Seligman, 1975). Further, individuals with a pessimistic attributional style may neglect the basics of care (such as, for example, using condoms during sexual intercourse), because they see no connection between anything they might do and the onset of an illness (Becker, 1974).

Loneliness may also be a possible factor linking attributional style to behavior or illness (Anderson, Horowitz, & French, 1983). The individual who makes pessimistic explanations for bad events may be socially withdrawn. Since supportive contacts with others may buffer negative behavior and subsequent illness (Cobb, 1976), the path from attributional style to behavior and illness may lead through social withdrawal and loneliness.

Finally, depression may provide a link between attributional style, behavior, and illness. More depressed individuals, who may subsequently experience lowered self-esteem and self-efficacy, may not waver in the face of uncontrollability. The significant correlation between depression and pessimistic attributional style (p<.001) in the present study supports such a premise. Schleifer, Keller, Sirus, Davis, and Stein (1985) found that depressed individuals were at increased risk for disease. Further, Kelly, St. Lawrence, and Brasfield (1991) found that high-risk sexual behavior was significantly associated with the belief that HIV infection was determined by external factors, such as chance and luck. Kelly et al. (1990a) also found that high-risk takers were more likely to view health as being attributable to chance or luck, both characteristics of pessimistic attributional style. Continued research that addresses the collective impact of depression and attributional style on high-risk behaviors may provide greater clarity regarding these possible mediating factors.

Recommendations for Practice

Many psychosocial variables (e.g., attributional style, control factors, and substance abuse) are of importance in understanding the continued practice of HIV/-related high-risk sexual behavior. Historically, HIV prevention efforts have operated on the assumption that HIV/AIDS is the preeminent health problem facing at-risk populations, and have generally offered limited regard to the other health problems facing such communities. If it is indeed true that the additive effect of interrelated psychosocial health conditions increases vulnerability to HIV infection, it may be possible to enhance the effectiveness of HIV prevention efforts by working to support a broader health movement within vulnerable

communities. That is, by working in tandem with organizations addressing mental health and substance abuse problems within a community, it may be possible to increase the efficacy of HIV prevention efforts and related health promotion efforts.

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