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Modeling high risk sexual behavior in hiv-negative gay men

Abstract

Several predictors of high-risk sexual behavior in gay men (internalized homophobia, locus of control, multiple AIDS-related loss, depression, and substance use) were examined. Eighty-seven HIV-negative gay males (M=36.7 years old, SD=5.9) were recruited through advertisements in the greater San Francisco, CA Bay Area. Structural equation modeling(SEM)analysis revealed that, as predicted, internalized homophobia, multiple AIDS-related losses, and substance use emerged as significant predictors of high-risk sexual behavior. Subsidiary analyses further revealed that multiple AIDS-related losses predicted both internalized homophobia and substance use suggesting that multiple losses experienced by gay men over the course of the AIDS epidemic may lead to other maladaptive behaviors.

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Introduction

Since the beginning of the AIDS epidemic a total of 28,793 San Francisco residents have been diagnosed with AIDS, which comprises 18% of California AIDS cases and 3% of cases reported nationally. There have been 19,341 reported AIDS deaths in San Francisco as of December 31, 2010.[1] Gay and bisexual men continue to bear the greatest burden of HIV infection, accounting for an estimated 61% of new infections.[2] Recent increases in the incidence of high risk sexual behavior,[1] underscore an urgent need to identify the factors which, in combination, lead people to place themselves at risk for contracting HIV. Prior studies of high-risk sexual behavior have considered a number of factors; .including: internalized homophobia,[3,4] locus of control,[5,6] and substance use.[7,8] Others have examined the role of AIDS-related losses and bereavement,[9,10] and the link between multiple loss and psychological distress.[7,11]

Though informative, much of this research also has been characterized by two limitations. First, most studies have been limited to investigations of single predictors.[5,12–13] Consequently, the interactive effects of multiple factors in contributing to high risk sexual behavior (the most common form of AIDS transmission) have been sparsely examined. Second, much of the research in this area has been empirically derived, rather than theoretically or conceptually guided. Thus, the potentially mediating role of such factors as multiple AIDS-related loss and pessimistic attribution style, for example, has been overlooked. Integrating learned helpless theory,[2,14] examination of the interactive role of multiple factors in predicting high-risk sexual behavior among HIV-negative gay males was conducted. Two hypotheses were tested. First, it was predicted that external locus of control, internalized homophobia, and depression would emerge as significant predictors of high-risk sexual behavior. Second, a meditational effect was hypothesized to exist between length of residence in San Francisco (an epicenter in the AIDS epidemic), AIDS-related loss, and pessimistic attributional style. Specifically, it was hypothesized that length of residence in the San Francisco Bay area would predict both AIDS-related loss and pessimistic attributional style, each of which, in turn, would predict high risk sexual behavior. Finally, three covariates (social desirability, substance use, and AIDS risk knowledge) were included to control for their potentially competing influence.

Method

Sample

The sample consisted of 87 HIV-negative gay men (M=36.75years), residing in the San Francisco Bay Area. Table 1 shows the distribution of demographic characteristics in the sample. All of the participants reported that they had been tested for HIV: 45% had been tested 1-6months prior to the study, 22% had been tested 7-12months prior, and 33% more than 12months prior to the study. Seventy-three percent of the sample had been tested for HIV 1-5times in the past five years, 23% had been tested 6-10times, and 4% had been tested more than 10times.

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Table 1 Sample Demographic Characteristics

	% Respondents
Ethnic group	
Black	3
Hispanic	7
White	83
Other	7
Educational level	
High school diploma	2
Junior/business college	2
Some college	19
College degree	45
Graduate/professional degree	27
Other	5
Employment	
Not employed	6
Employed part-time	21
Employed full-time	70
Other	3
Annual income	
$ 5,000 - $25,000	32
$26,000 - $45,000	32
$46,000 - $65,000	20
$66,000 - $85,000	7
>$85,000	9

Table 2 Standardized Regression Weights for Indicators Predicting Latent Constructs

Construct	Indicators	Beta Weight	p
AIDS exposure	DEI	0.94	0.01
	Length of SF residence	-0.23	ns
Depression	BDI	-0.26	0.04
	POMS	1.08	0.005
Internality/Externality	ANS-IE	-0.1	ns
	ASQ	1.02	0.001
Internalized homophobia	IHP	0.42	0.05
	MAGI-MSV	0.77	0.01
Substance use	BMAST	-1.07	0.02
	MCMI-111	1.12	0.03

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Procedure: Participants were recruited through ads in SF Bay area gay newspapers which briefly described the study and included an 800number where participants could leave their name, address, and telephone number, in order to be sent a copy of the survey packet. Participants completed and returned surveys containing: (a) a demographic questionnaire; (b) the Attributional Style Questionnaire;[15] (c) the Multi-Axial Gay Inventory- Men's Short Version MAGI- MSV;[16] (d) the Beck Depression Inventory;[17] (e) the Brief Michigan Alcoholism Screening Test;[18] (f) substance use items from the Millon Clinical Multiaxial Inventory-III;[19] (g) the UCSF Center for AIDS Prevention Studies Sexual Behavior Questionnaire;[20] (h) the Adult Nowicki-Strickland Internal-External Control Scale;[21] (i) a modified version of the Death Experience Inventory;[22] G) the AIDS Risk Knowledge Questionnaire;[23] (k) the Profile of Mood States;[24] (1) the Index of Homophobia;[25] and (m) the Marlowe-Crowne Social Desirability Scale.[26]

Results

Preliminary Analyses

The AIDS Risk Knowledge (ARK) Questionnaire showed poor reliability (α=.47) which could not be improved through the selective deletion of problematic items. Examination of total ARK scores.

Revealed a likely ceiling effect: The highest possible score was 40, yet our sample mean was 35.9 (SD=2.16), with a range of 10 points. Therefore, ARK scores were excluded from further analysis. The remaining subscales demonstrated good reliability (α ranged between .71 and .93).

Modelling High Risk Behavior: Data were analyzed using Analysis of Moment Structures.[27,28] Examinations of the relationships between (a) depression, a latent variable with two indicators (BDI and POMS Depression-Dejection scores); (b) internalized homophobia, a latent variable with two indicators (IHP and MAGI-MSV scores); (c) internality/externality, a latent variable with two indicators (ANS-IE and ASQ scores); (d) AIDS exposure, a latent variable with two indicators (AIDS-related loss DEI score and length of residence in San Francisco in years); and (e) an observed, dependent variable (high-risk sexual behavior) were conducted. Social desirability (an indicator) and substance use, a latent variable with two indicators (BMAST scale and MCMI-III item scores) were included as covariates.

Model Estimation: Model estimation proceeded in three stages. First, the model was assessed and determined to be over identified with 51 degrees of freedom. Second, a test of the independence model was performed and easily rejected, (χ2 45, N= 87 =124.7, p< .001). Third, a Chi-square test of differences between the sample and estimated population model was significant (χ2 51, N= 87 =140.5, p<.001), indicating that population and sample covariance's differed.

Because the initial CFI was low (.05), regression weights for individual indicators were examined. As shown in Table 2, two indicators failed to reach significance (length of residence in San Francisco and locus of control). Therefore, both variables were removed and the model re-estimated with the remaining indicators.

As relative Chi-square values below 3 indicate good fitting models,[29,30] the Relative Chi -square obtained for the modified model (1.7) indicated that it fit the data reasonably well. Other indices confirmed that the modified model's goodness-of-fit had improved (i.e., GFI = .91; AGFI =.80; RMR =.07; CFI =.80). Finally, one hundred bootstrap replications[31] were performed. No significant differences emerged, indicating that the distribution of estimated parameter estimates was no wider than the expected estimates under assumptions of multivariate normality.

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Hypothesis 1: determining direct predictors of high

Risk sexual behavior: Next, multiple regression analysis was conducted, in which all indicators and latent variables were simultaneously entered as predictors. As shown in Figure 1, 20% of the variance in high risk sexual behavior was accounted for by the predictors (p<.01). Examination of the latent variables revealed that internalized homophobia (R=.26, p<.04), AIDS-related loss (R=.16, p<.04), and substance use (R=.30, p<.04) were significant predictors of high-risk sexual behavior. The remaining variables (depression, internality/externality, social desirability) were non-significant.

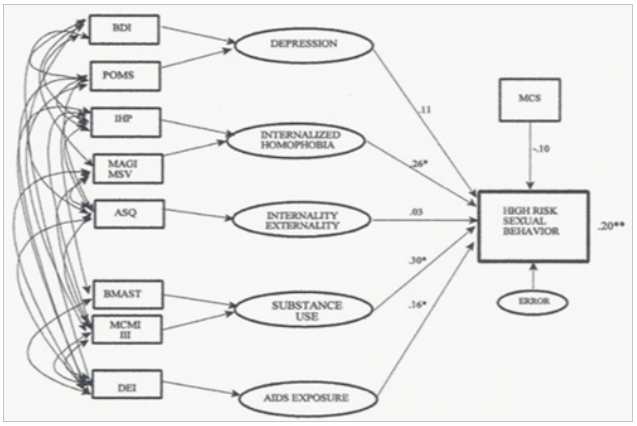

Figure 1 Modified Model. Modelling High Risk Sexual Behavior in HIV-Negative Gay Men 6.

Hypothesis 2: testing a mediational model of high risk sexual behavior: Finally, to determine whether a meditational path emerged from the significant latent variables (AIDS-related loss, internalized homophobia, and substance use) to the dependent variable, high-risk sexual behaviour, two steps were completed. First, AIDS-related loss was regressed on the two latent variables to determine meditational effects; then, the direct effects of internalized homophobia and substance use were examined for significance.

As shown in Figure 2, AIDS-related loss was significant in mediating a path both to internalized homophobia (β =.34, p= .03) and to substance use (β =.36, p=.03). Subsequently, internalized

homophobia predicted high-risk sexual behavior (β =.19, p=.04) and substance use predicted a trend in the same direction (β =.18, p=.06). Eight percent of the variance in high-risk sexual behavior (p=.01) was accounted for by this analysis.

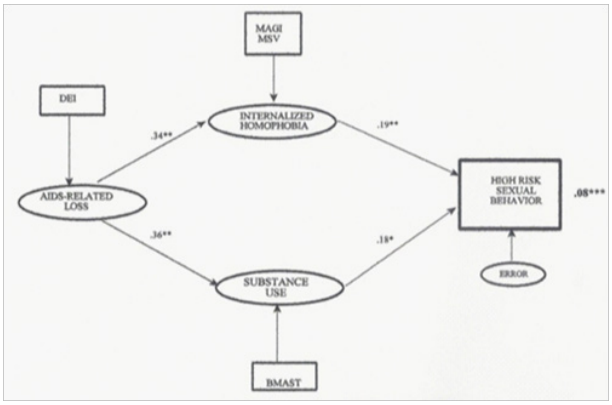

Figure 2 Mediational Model.

Conclusion

The present findings suggest that many psychosocial variables (e.g. internalized homophobia, multiple AIDS-related loss, and substance use) are of importance in understanding the practice of high-risk sexual behavior among HIV-negative gay men. As predicted, internalized homophobia, AIDS-related loss, and substance use emerged as significant predictors. By contrast, pessimistic attributional style, external locus of control, and depression were not significant. The application of the present findings for future research includes: utilizing a domain-specific Attributional Style Questionnaire (ASQ) in conjunction with the generalized ASQ for an investigation of state versus trait-like phenomena in the prediction of high-risk sexual activity, utilizing the three subscales of the ASQ (internality, stability, and globality) to test for their individual salience in predicting risky behavior, and conducting cross-validation studies with gay men from other urban epicenters.

The construct of internalized homophobia, while emerging as a significant predictor of engagement in high-risk sexual behavior, warrants further study. In particular, whether sexual risk-taking behavior could be reduced by enhancing gay self-acceptance requires closer examination of the definition of internalized homophobia. The MAGI-MSV proved reliable, yet future studies of internalized homophobia should employ a factor analysis to investigate the measures' underlying structure. Such an examination could lead to more informed clinical understanding and interventions. Internalized homophobia may be a product of self-loathing, societal response to AIDS, moral and religious acceptability, or some combination of factors.[32]

That AIDS-related loss was predictive of internalized homophobia and substance use suggests that the repeated, uncontrollable losses many gay men have experienced over the course of the AIDS epidemic may lead to the development of maladaptive attitudes and behaviors. Consistent with learned helpless theory,[2,14] these findings suggest that repeated exposure to AIDS related loss may engender a certain degree of passivity or fatalism, which, in turn, sets the stage for engagement in high risk sexual activity, or, at the very least, a decrease in proactive, risk avoidant behavior. It is important to note that, as these findings with the ARK scale suggest, such linkages occur.

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Although the present study utilized structural equation modeling to test hypotheses, a conventional regression analysis was employed to predict a single observed variable as a linear combination of four latent variables and two covariates. Future research could be meaningfully enhanced by the use of more exploratory path analyses. Such analyses could theoretically propose a sequential model of variables whose collective influence mediates a path of increasing variation in high-risk sexual behavior. For example, as previously stated, multiple AIDS-related losses may best be viewed as a setting condition which influences attributional style, which in turn influences other variables in the prediction of high-risk behavior. Indeed, the present study did find that certain variables were predictive of others, and yet a significant path connecting all variables did not emerge in subsidiary analyses. Future studies should incorporate other variables as predictors which might provide a missing link or links in the sequential change of psychosocial factors influencing engagement in risky behavior.

Further, the reduction in variance accounted for in testing the mediational hypothesis (from 20% to 8%) suggests that the obtained model may be most useful in predicting behavior at the extreme end of the sexual risk continuum (i.e., repeated, unprotected anal intercourse with multiple partners). Additional studies are needed to determine the (multiple) predictors of behavior which, though risky, does not fall at the far end of that continuum. Such understanding is necessary for clinicians and health providers to provide more focused interventions targeted towards harm-reduction and AIDS prevention.

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Conflicts of interest

Author declares there are no conflicts of interest.

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