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Effects of Disengagement Coping with HIV Risk on Unprotected Sex among HIV-Negative Gay Men in New York City

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Abstract

Objective—This study examined how disengagement coping with HIV risk mediated the association between internalized homophobia and unprotected anal intercourse (UAI) and how sexual encounters in public venues (public sex) and drug use moderated the association between disengagement coping and UAI among HIV-negative gay men. Disengagement coping included fatalistic beliefs about maintaining HIV-negative seronegative serostatus (fatalism), optimistic attitudes toward medical seriousness of HIV infection and reduced concern about HIV risk due to HAART (optimism), and negative affective states associated with sexual risk (anxiety).

Design—A survey was conducted among 285 HIV-negative gay men at an HIV prevention counseling program in New York City.

Main Outcome Measures—Sexual risk was defined as having had UAI with non-primary partners in the past six months.

Results—In addition to the positive association between internalized homophobia, disengagement coping, and UAI, fatalism mediated the association between internalized homophobia and UAI; and optimism mediated the association between anxiety and UAI. A significant moderation effect of public sex was found between fatalism and UAI.

Conclusions—The findings highlight the importance of understanding disengagement coping as it affects sexual risk practices among HIV-negative gay men in the continuing epidemic.

Keywords

fatalism; optimism; internalized homophobia; gay men; coping; sexual risk

Coping is the process of using psychological and behavioral strategies to reduce the potential harms from stressful events (Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986). HIV-negative gay men may develop disengagement coping mechanisms to deal with the stress of being at risk of HIV infection when they perceive the risk as too stressful to cope with and the behavioral regulation of condom use too restricted to sustain (Hoyt, Nemeroff, & Huebner, 2006; McKirnan, Ostrow, Hope, 1996; Williams, Elwood, & Bowen, 2000; for discussion of coping strategies see Carver, Scheier, & Weintraub, 1989). As opposed to using active coping strategies by seeking help and prevention resources, HIV-negative gay men disengaging from HIV risk prevention may exhibit fatalistic beliefs about maintaining seronegative serostatus (Hoyt et al., 2006; Nemeroff, Hoyt, Huebner, & Proescholdbell, 2008), optimistic attitudes

toward outcomes of sexual risk practices and the severity of HIV due to Highly Active Anti-Retroviral Therapies; HAART (Huebner, Rebchook, & Kegeles, 2004; Valdiserri, 2004), and unrealistic optimism regarding the “real” threats of infection (Gold, 2004, 2006).

Coping is a multidimensional process. Coping strategies are not only determined by the cognitive appraisal of stress but also by self-concept; lower self-esteem induces short-term life perspective, which may lead to disengagement (Folkman et al., 1986). Among gay men, internalized homophobia — negative attitudes toward one’s own homosexuality and a negative self-concept as a gay man — exerts complex psychological conflicts in engaging same-sex encounters, and internalized homophobia may impede avoidance of unprotected anal intercourse (UAI) (Meyer & Dean, 1998). Coping is not a static personal mechanism but dependent upon social contexts and physical environments (Livneh, Livneh, Maron, & Kaplan, 1996). HIV risk disengagement among gay men may be elicited more in public sex environments where sexual practices occur anonymously and/or spontaneously in “heat of the moment” and sexual risk is often regarded as “permissible” (Gold, 2000; Kippax et al., 2003; McKirnan et al., 1996).

As suggested by coping theory, the fact that coping styles are independent from the level of knowledge may in part explain the research findings that relapse to UAI has become more prevalent among HIV-negative gay men despite much effort to disseminate knowledge about HIV prevention and the severity of HIV (Wolitski, Valdiserri, Denning, & Levine, 2001). For the five consecutive years between 2001 and 2006, newly diagnosed HIV cases among men who have sex with men (MSM) have significantly increased, in particular among young men (CDC, 2008). Notably, the latest report on the surveillance of HIV incidence estimated that 56,300 new HIV infections occurred in the U.S. in 2006, compared to the previous annual incidence estimates of 40,000 since the early 1990s; MSM accounted for 53% of all new infections and 74% among infected men (for the increase in annual reported HIV cases among MSM over the past decade, see Hall et al., 2008). New York City (NYC) has been found to be one of the highest HIV saturation cities in the gay community. During the time of this study in NYC, HIV prevalence was 18% and incidence was 2.3% (95% CI: 0.28% - 4.2%) among MSM (CDC, 2005). According to the latest available surveillance, 102,404 cumulative HIV/AIDS cases and 3,787 new HIV diagnoses (i.e., 47.3/100,000 population) were reported in NYC in 2007: 73% of new diagnoses were men, and 40% of new diagnoses were attributed to MSM (NYC Department of Health and Mental Hygienic, 2008). The resurgence of UAI and increase in HIV incidence among gay men is a heightened health concern, and it requires further understanding of the roles of disengagement from HIV prevention in sexual risk taking.

Disengagement Coping Among HIV-Negative Gay Men

Disengagement refers to the coping response that is oriented away from stress, while engagement is directed to the stressful events and intended to influence or change the conditions of the stressors (Carver et al., 1989; Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001). Compared to accumulative knowledge of coping with HIV illness among HIV-positive gay men (Brown & Venable, 2008), much less emphasis has been placed on examining the potential outcome of sexual risk as stress and sexual risk (or safer sex) as a stressful event among HIV-negative gay men. Continued exposure to the stress of HIV may reduce the ability to respond effectively to sexual risk, resulting in an increase in disengagement from prevention. The psychological stress of long-term adherence to safer sex has been particularly salient among HIV-negative gay men living in a metropolitan area of high seroprevalence where their social networks contain HIV-positive gay men (Odets, 1995; Shidlo, 1997). In a subculture of HIV-positive gay men, condom use was reported as unnecessary in their sexual networks due to the use of serosorting as a harm reduction strategy; condom use has been excluded from the core sexual scripts among these gay men (Clatts,

Goldsamt, & Yi, 2005; Parsons et al., 2005). Perceiving higher stress related to being HIV infected, HIV-negative gay men may be more vulnerable to adopting disengagement, which often leads to positive reinterpretation of sexual risk practices by regulating emotional states resulting from stressful events (Kippax et al., 2003; Shidlo, Yi, & Dalit, 2005).

Several issues related to disengagement coping have been addressed in studies about HIV prevention. One of the most apparent phenomena associated with disengagement with HIV risk has been addressed as “HIV/AIDS complacency, defined as minimizing, discounting, and discrediting the threat of HIV/AIDS” (Valdiserri, 2004, p. 427). The advance of medical treatment of HIV/AIDS (i.e. Highly Active Anti-Retroviral Therapies; HAART) not only reduced AIDS-related mortality but also changed the meanings of the epidemic and illness by introducing a sense of optimism (Kalichman et al., 2007; Vanable et al., 2000). Receiving HAART among HIV-positive gay men was not associated with the prevalence of UAI; reduced concern of HIV risk, however, was positively associated with the prevalence of UAI among gay men regardless of HIV status (Crepaz, Hart, & Marks, 2004). Although optimism is understood as an antecedent of behavior, it is plausible that optimism may be explained by cognitive dissonance: HIV-negative gay men engaging in sexual risk behavior tend to see consistency between their risk behavior and attitudes by changing their belief about the risk (Huebner et al., 2004). In addition, optimism would “serve as a psychological coping mechanism to reduce [HIV-related] stress and anxiety” (Crepaz et al., 2004, p. 234).

Another construct of research interest in disengagement is fatigue and fatalism. First, two types of HIV fatigue have been studied: (1) fatigue with HIV prevention messages, which refers to the experience that “prevention messages, programs, outreach, or counseling have become tiresome” (Stockman et al., 2004, p. 432) and (2) safer sex fatigue — diminished motivation to practice safer sex (Ostrow et al., 2002, 2008; Stole et al., 2006). Second, the relationship between fatalism and sexual risk has been discussed in the framework of cognitive escapism (McKirnan et al., 1996; McKirnan, Vanable, Ostrow, & Hope, 2001; McKirnan, Houston, & Tolou-Shams, 2007; Nemeroff et al., 2008). When a prevention norm of condom use on every sexual occasion is perceived as a high level of behavioral commitment, such a perceived cognitive restraint may elicit heightened aversive responses to adherence to safer sex with intense anxiety. Even for gay men exercising restraint, exposure to drug use and highly sexually-charged environments as stimuli that reduce cognitive restraint may induce disengagement. In two studies, McKirnan and colleagues examined their model of “cognitive escapism” by testing whether cognitively escaping self-awareness of HIV risk (1) moderated the relationship between drug use and sexual risk (2001); and (2) mediated the effect of Internet use for sex on sexual risk (2007). The first study found that, among gay men using drugs on 50% or more of sexual occasions (“drugs + sex” group), those with strong escape expectancies reported significantly higher rates of UAI than those with less expectancies or who did not combine drugs with sex. The second study found that gay men, who were motivated to cognitively escape, sought sex through the Internet and tended to have risky sex. Both studies highlighted the importance of understanding psychological factors which may make gay men vulnerable to the risk of HIV infection.

Internalized Homophobia

As noted earlier, one’s self-concept is critical in developing coping strategies. Internalized homophobia has been long explored in its association with various outcomes of mental health (Meyer, 2005; Shidlo, 1994), passive coping strategies (Nicholson & Long, 1990), lack of coping resources for sexual health (Huebner, Davis, Nemeroff, & Aiken, 2002) and sexual risk (Preston, D’Augelli, Kassab, & Starks, 2007). In longitudinal studies, high internalized homophobia at baseline predicted higher levels of problems in mental health and intimacy problems, and sexual risk at follow-up (Hatzenbuehle, Nolen-Hoeksema, & Erickson, 2008;

Meyer & Dean, 1998). The findings of the association between internalized homophobia and UAI, however, have not been conclusive (Sandfort, 1995). The limitations on the findings may result from the following reasons. Theoretically, internalized homophobia has been mostly based on the model of gay identity development (Mohr & Fassinger, 2000). Although those two constructs — internalized homophobia and gay identity development — are related, they may have specific effects on sexual risk: Gay men who have a sense of integration with their gay identity may engage in sexual risk. Thus, the study of the relationship between internalized homophobia and sexual risk should be more context-specific according to research interest.

Current Study

The primary aim of the current study was to examine the effects of disengagement coping on the associations between internalized homophobia, drug use, and sexual encounters in public sex venues, including gay bathhouses, porn theatres, and sex parties, (public sex, hereafter) and UAI. With respect to the types of drug use, we assessed club drugs, including crystal amphetamine, MDMA (3,4-methylenedioxymethamphetamine; “ecstasy”), and ketamine, since previous studies have found these drugs to be significantly associated with UAI among gay men (Drumright, Patterson, & Strathdee, 2006). Figure 1 presents the conceptual framework to be examined in this study. The hypotheses tested were: (1) Internalized homophobia and disengagement coping styles would be positively associated with UAI; (2) Disengagement coping would mediate the association between internalized homophobia and UAI; (3) Club drug use and/or public sex would moderate the association between disengagement and UAI; and (4) Since anxiety associated with sexual risk practices may affect disengagement coping, we expect a mediation effect of anxiety on disengagement and UAI. In addition, we conducted a multiple logistic regression to determine the independent factors of UAI by entering all the study variables, and we expected disengagement coping, public sex, club drug use would be positively associated with UAI.

Methods

Procedure and Participants

This study involved 285 HIV-negative gay men at an HIV prevention counseling program in New York City between 2003 and 2004. The program has offered multi-session individual, couple, and group HIV risk reduction counseling for HIV-negative gay men since 1995. Information about the program was widely disseminated in the gay community, including via community organizations, gay magazines, gay websites, and through friends. As part of the intake procedure, prospective clients were interviewed by staff clinical psychologists. Men under 18 years old were referred to specialized organizations for gay youth. Clients who presented with significant psychological or substance abuse issues were referred for appropriate conjoint services. During the intake assessment, we asked the participants about the issues they would like to discuss during counseling sessions. Their presenting complaints included: difficulties in a same-sex relationship (78%), risky or unprotected sex (61%), self-esteem (58%), depression (46%), compulsive sex (44%), wanting to talk about being HIV-negative (41%), discussing HIV serostatus when having sex (40%), body image/aging (39%), sexual partnerships with HIV-negative men (31%), negative feeling toward being HIV-negative (30%), loss of friends to AIDS (29%), relationships with HIV-positive partners (27%), hopelessness (25%), using alcohol or drugs during sex (22%), coming out as gay (17%), suicidal thoughts (12%), and sexual abuse (9%). Prior to the intake procedure, clients were informed that the survey was only for the purpose of research and that participation was completely voluntary and did not affect counseling enrollment. None of the clients refused study participation. This study followed the Health Insurance Portability and Accountability Act (HIPAA) procedures established by the study site hospital, and its assessment was approved by IRB at Columbia University.

The participants ranged in age from 18 to 66 years old ($M = 35.6$, $SD = 8.7$). The sample was ethnically diverse: 59% White, 13% African-American, 19% Latino/Hispanic, 3% Asian or Pacific Islander, 1% Native American, and 5% biracial. The majority self-identified as gay (93%) or bisexual (7%). Overall, the men reported high educational attainment: 14% completed only high school, 5% currently attended college, 60% completed 1-4 years of college, and 21% completed some graduate studies. In terms of sexual orientation openness, 97% had come out to gay or bisexual friends, 82% to heterosexual friends, 79% to family, and 63% to co-workers. About one third (30%) reported currently being in a same-sex relationship, and 77% reported having sex with more than one man in the past six months.

Measures

Internalized homophobia was measured by the Multi-Axial Gay Attitudes Inventory-Men's Short Version (MAGAI), a 20-item self-report instrument using a 4-point Likert scale (Shidlo, 1994). The scale has shown adequate internal consistency and preliminary construct validity with the Rosenberg Self-Esteem Scale. The scores obtained in this sample suggest high internal consistency ($\alpha = .91$). The scale consisted of three subscales: (1) self-esteem relating to homosexuality (e.g., "Whenever I think a lot about being gay, I feel depressed."; $\alpha = .87$); (2) AIDS-related negative self-image (e.g., "Because of the fear of AIDS, I find myself wishing that I were heterosexual."; $\alpha = .86$); and (3) attitudes toward gender-expression, (e.g., "Some gay men are too effeminate."; $\alpha = .79$).

Disengagement coping with HIV risk—Since the mid 1990s, we have observed that some HIV-negative gay men at a prevention counseling program in the gay community of NYC have difficulty in coping with the psychological impact of the epidemic and in maintaining a seronegative status (Shidlo, 1997). This led to our interest in developing measures that assess maladaptive coping styles in this population. In order to develop scale items, we employed inductive and deductive approaches. We conducted a qualitative study among HIV-negative gay men at our program using qualitative sentence completion stem questionnaire about the meanings of being HIV-negative gay men and sexual relationships. Based on the themes identified from the qualitative data, clinical experience with clients, and the theoretical framework of coping, we developed a measure of Disengagement Coping with HIV Risk (DCHR); items were face-validated by peer-counselors. *Fatalism* assessed fatigue with safer sex and fatalistic beliefs about maintaining HIV-negative serostatus and consisted of six items, including "I sometimes wonder if it's worth all the trouble it takes to stay HIV negative." The scale had adequate internal consistency ($\alpha = .81$). *Optimism* assessed optimistic attitudes toward medical seriousness of HIV infection and reduced concern about HIV risk due to HAART ($\alpha = .86$). The scale consisted of seven items, including, "Since the discovery of new drugs to fight HIV, I'm less concerned about getting infected" and "Now that HIV is a manageable disease, I feel more free to have sex without condoms." The psychometric properties of these measures of disengagement coping are reported elsewhere (Yi, Shidlo, & Sandfort, under review), and the measure items are provided in the Appendix. As noted in the coping literature, when risk is perceived as uncontrollable, maladaptive coping with negative affective states such as anxiety and guilt are more prevalent (Austenfild & Stanton, 2004; Gerrard, Gibbons, & Bushman, 1996). In addition to fatalism and optimism, we were interested in the emotional aspects of coping, and developed four items of *Anxiety* assessing negative affective states associated with sexual risk behavior and HIV risk ($\alpha = .67$). The items, including "I've taken chances I regretted the next morning."

Use of club drugs and having sex in public sex venues in the past six months were assessed by asking (1) whether men had used crystal amphetamine, MDMA (3,4-methylenedioxymethamphetamine; "ecstasy"), or ketamine; and (2) whether they had engaged in sex in gay bathhouses, porn theatres, or sex parties. The outcome variable of UAI was defined

as having had sex without a condom with casual sex partners (i.e. sex partners who are not in a steady relationship, including anonymous or previously known men) in the past six months.

Statistical Analyses

We first conducted univariate analyses to test frequencies and measures of central tendency and variability of the study variables. The mean scores of fatalism showed in a positively skewed distribution. Since the measure of fatalism was intended to differentiate the subgroup of gay men with disengagement among normal-range individuals, it required relatively extreme items (Smith & McCarthy, 1995). The mean scores of measures and interaction terms were standardized using the centering method (Cohen, Cohen, West, & Aiken, 2003). Since less than 3% of responses were missing on each item, missing data were handled using the multiple imputation method, which generated five imputations for missing portions on the basis of the assumption that missing values are arbitrary (Schafer & Graham, 2002). Bivariate correlation analyses were conducted to examine the relationships between predictor variables. We gauged the magnitude of relationships using Cohen's (1988) effect size (d). The odds ratio was converted to an effect size using the formula, $d = \ln(\text{odds ratio}) / 1.81$ (Chinn, 2000).

We tested the effects of each subscale (fatalism, optimism, and anxiety) on internalized homophobia and UAI in multiple logistic regression models; significance values were corrected for predictor, mediator, and confounding variables. As suggested by Baron and Kenny (1986), for mediation to occur, the predictor must have a significant association with both the mediator and the outcome variable; in the full model, the mediator must also predict the outcome variable, and the size and significance of the association between the predictor and the outcome variable must be reduced. It is important to note that a path model unlikely yield a single dominant mediator since psychology deals with multiple causes (Baron & Kenny, 1986, p. 1176). Since the outcome variable was a dichotomous variable, we used MacKinnon and Dwyer's (1993) statistical solutions in conducting mediation analysis of a dichotomous outcome variable in logistic regression models, which are given by

$$\text{Model 1: } Y_o = \beta_1 + cX_p + \sum \beta_i X_i + \delta_1$$

$$\text{Model 2: } Y_o = \beta_2 + c'X_p + bX_M + \sum \beta_i X_i + \delta_2$$

$$\text{Model 3: } X_M = \beta_3 + aX_p + \sum \beta_i X_i + \delta_3$$

where Y_o is probability of being in one of the categories of the outcome variable; $\beta_1, 2$, and 3 are the intercepts in Model 1, 2, and 3 respectively; X_p is the predictor variable; X_M is the mediator; c is the effect of the predictor variable on the outcome variables; c' is the effect of the predictor adjusted for the effect of the mediator; b is the effect of X_M controlling for X_p ; a is the effect of X_p on X_M ; $\sum \beta_i X_i$ is the coefficients of confounding variables; and δ is the residual in the model. This difference in coefficients is theoretically exactly the same as the product of the effect of X_p on X_M times the effect of X_M on Y_o or ab ; thus it holds that $ab \approx c - c'$. If there is no mediation effect, ab equals to the difference in the predictor variable coefficients ($c - c'$). If c' is zero then this indicates a perfect mediation with a strong dominant mediator, and if not this indicates a partial mediation with the operation of multiple mediating factors. Sobel (1982) test was used to test the statistical significance of mediation effect. We performed Sobel test using a bootstrapped sampling distribution ($N = 1000$) provided by Preacher and Hayes (2004).

In order to test moderation effects, we tested potential interactions between disengagement coping (i.e. fatalism and optimism) and club drug use and public sex on UAI. A full model was tested with the predictors and the mediators in the same step and interaction variables in a subsequent step. In addition to reporting adjusted odds ratios (AOR) with 95% CI for AOR, we used the following statistics to assess the appropriateness, adequacy, and usefulness of the model: Wald statistics to test the statistical significance of individual coefficients, Hosmer-Lemeshow χ^2 to test the goodness of fit, and Nagelkerke R^2 to measure effect sizes (Bewick, Cheek, & Ball, 2005). All regression models presented in this report were controlled for age, ethnicity (4 categories), and education. SPSS 16.0 was used for statistical analysis.

Results

Descriptive statistics

Univariate analyses of study variables and correlation coefficients among the measures are shown in Table 1. In the past six months, 48% of the participants reported at least one occasion of UAI with casual sex partners; 38% had sex in public venues; and 12% used club drugs. Gay men who reported UAI, compared to the men without UAI, reported significantly higher levels of internalized homophobia, $t(283) = 2.47, d = 0.29$, fatalism, $t(283) = 2.81, d = 0.33$, optimism, $t(283) = 5.02, d = 0.60$, and anxiety $t(283) = 4.85, d = 0.58$ ($p < .05$ for all), and they also reported higher rates of public sex, $\chi^2(1, n=285) = 12.9, d = 0.44, p < .001$, and club drug use, $\chi^2(1, n = 285) = 7.0, d = 0.32, p < .01$. In zero-order bivariate correlations, internalized homophobia was positively correlated with fatalism ($r = .34, df = 285, d = 0.72$) and anxiety ($r = .20, d = 0.41$). Optimism was not significantly correlated with internalized homophobia. Fatalism was found to be positively correlated with anxiety ($r = .21, d = 0.43$) and negatively correlated with optimism ($r = -.25, d = 0.52$). Public sex was only significantly associated with anxiety ($p < .001, d = 0.44$), while club drug use was associated with internalized homophobia ($p < .05, d = 0.25$) and public sex ($p < .05, d = 0.28$).

Mediation analyses

All three scales of fatalism, optimism, and anxiety were examined as potential mediators between internalized homophobia and UAI controlling for age, ethnicity, and education. Table 2 and Figure 2 present the mediation effects of fatalism and optimism on UAI. There was an evidence for partial mediation of the effect of internalized homophobia on UAI via fatalism. Internalized homophobia was positively associated with fatalism, $\beta = .27, R^2 = .12, F(6, 278) = 4.36, p < .001, d = 1.70$, which subsequently was associated with increase in likelihood of UAI (AOR = 1.49, 95% CI: 1.01-1.65, $p < .05, d = 0.14$). The AOR of internalized homophobia predicting UAI was reduced from 2.09 ($p < .01, d = 0.41$) to 1.92 ($p < .05, d = 0.36$). The c' estimate of mediation .078 does not equal to $ab = .108$. Sobel test supported the finding of partial mediation demonstrating that Sobel test statistic: z score = 2.03, $p < .05$. The first row in Table 2 shows the total effect of internalized homophobia on UAI. The next row shows changes after entering the mediation of fatalism. Mediation was indicated by a significant decrease in the χ^2 value of the direct effect when the mediator was entered into the equation first. The total effect was Wald = 8.60 ($p = .03$) with $\chi^2 = 9.12$. When fatalism was entered, Wald reduced from 8.60 to 6.45 ($p = .12$) with $\chi^2 = 6.71$, accounting for 11% variance. Hosmer-Lemeshow test, $\chi^2 = 8.40, df = 8, p = .395$, suggested that the overall model fit is good.

We did not find the mediation effects of optimism or anxiety in the pathway of internalized homophobia and UAI. Optimism, however, was found to be a strong mediator of the association between anxiety and UAI. The effect of anxiety on UAI was significantly reduced by optimism. Anxiety was positively associated with optimism: $\beta = .17, R^2 = .10, F(6, 278) = 2.58, p < .05, d = 1.31$, which subsequently was associated with UAI (AOR = 3.28, 95% CI: 1.74-6.20, $p < .001, d = 0.66$). The AOR of anxiety predicting UAI was reduced from 1.52 ($p < .001, d =$

0.23) to 1.32 ($p < .05$, $d = 0.15$). The $c - c'$ estimate of mediation .130 does not equal to $ab = .186$. Sobel test supported the finding of partial mediation demonstrating that Sobel test statistic z score = 2.83, $p < .01$. When optimism was entered, Wald statistics reduced from 19.20 ($p < .001$) to 4.92 ($p = .27$), with a change of χ^2 from 21.00 to 5.12, accounting for 19% variance. Hosmer-Lemeshow test indicated the goodness of fit of the model: $\chi^2 = 12.49$, $df = 8$, $p = .131$. This result suggested that optimism might be used as a coping strategy to reduce anxiety associated with sexual risk.

Moderation analysis

The contextual risk factors of club drug use and public sex were examined as potential moderators between disengagement and UAI. All scale scores were centered, and regressions were controlled for age, ethnicity, and education. Of all four possible interactions (i.e., fatalism-public sex and -drug use, and optimism-public sex and -drug use), only the interaction of fatalism and public sex was significant: AOR = 1.35, 95% CI: 1.02-1.78, $p < .05$, $d = 0.17$ (Table 3). Figure 3 shows an interaction effect between fatalism and public sex on UAI. In order to draw the graph, we calculated the predicted probability of each individual case using the formula, $\pi = [\exp(\beta + \sum\chi\beta)] / [1 + \exp(\beta + \sum\chi\beta)]$, and performed the scatter plots with Y-axis reflecting the predicted probabilities and X-axis reflecting the scores of fatalism. The best-fit regressions lines were produced from the plots: Hosmer-Lemeshow $\chi^2 = 14.81$, $df = 8$, $p = .063$. The participants who reported higher fatalism and had public sex were more likely than those without public sex to report UAI. None of the interactions with club drug use were statistically significant. The data suggest that higher fatalism and optimism were associated with an increase in UAI, but the association did not vary by club drug use.

Multiple logistic regression of UAI

Lastly we conducted a multiple logistic regression to examine independent factors predicting UAI by entering all the variables in one model (Table 4) and found that the following variables are significantly associated with UAI: internalized homophobia (AOR = 6.40, 95% CI: 2.89-14.20, $d = 1.03$), fatalism (AOR = 1.43, 95% CI: 1.01-2.03, $d = 0.20$), optimism (AOR = 4.33, 95% CI: 1.94-9.64, $d = 0.82$), anxiety (AOR = 1.48; 95% CI: 1.07-2.03, $d = 0.22$) and public sex (AOR = 1.93; 95% CI: 1.27-2.94, $d = 0.36$). The percentage of variances accounting for UAI varied from 1.5% in demographic variables, 12.3% in internalized homophobia, and 35.3% in disengagement, to 41.5% in public sex and drug use. Hosmer-Lemeshow test, $\chi^2 = 11.3$, $df = 8$, $p = .182$, suggested the model fits well. Although club drug use was significantly associated with UAI in bivariate analysis, it did not remain in the multivariate model. No demographic characteristics were found to be significant.

Discussion

The current study demonstrated a complex relationship between fatalism, internalized homophobia, public sex and unprotected anal sex among HIV-negative gay men. In addition to supporting previous findings of the positive associations between internalized homophobia, fatalism, optimism, and UAI among gay men, this study expanded our current understanding of the relationships amongst those constructs and the effect of fatalism on public sex. Our study found the following mediation effect of fatalism and moderation effect of optimism on UAI. The mediation effect of fatalism on the association between internalized homophobia and UAI suggested that the HIV-negative gay men were more likely to use disengagement coping as their negative self-concept increased, and in turn, a higher level of fatalism predicted UAI. The findings of the relationship between anxiety and optimism suggested that the HIV-negative men who experienced high anxiety concerning sexual risk used optimism — “HIV is now manageable” — as a way of disengagement coping with the risk. A significant interaction between fatalism and public sex supported the hypothesis that the HIV-negative gay men’s

cognitive restraint favoring safer sex might be released by public sex; thus, fatalism has a much greater effect on UAI in such risk environments (McKirnan et al., 1996). Note only fatalism was shown a mediator effect in this study. Overall, compared to fatalism, optimism showed less of an effect in this study. The advance of HIV treatment might have impacted the perception of HIV risk among gay men.

Although previous studies have reported a significant association between club drug use and sexual risk among gay men, this study did not find club drug use neither as a moderator nor as an independent predictor of UAI, when other variables were entered in a multiple logistic regression. There was a caveat, however, with respect to the analysis of drug use in this current study. Club drug use was assessed as a global measure without consideration of the context of sexual events. It is plausible that some gay men used club drugs but did not engage in sex at the same time. This limitation in our assessment might explain the discrepancy between our non-significant findings, compared to other research which has found a strong relationship between drug use and sexual risk among MSM at the episode-level (Golfax et al., 2004; Mansergh et al., 2008). Ethnographic research on drug use within sexual settings would help us build up the systematic knowledge as to how meaning and practice of club drug use is embedded, and sex and drug is interacted, often scripted as “party (club drug use) and play (sex)” in a subculture of gay men (Green & Halkitis, 2006; Clatts, Welle, and Goldsamt, 2001).

Understanding the dynamic process of psychological and behavioral adaptation to sexual risk is important to developing and reshaping intervention protocols. The findings of this study highlighted the importance of exploring the issue of disengagement coping when HIV-negative gay men address the difficulty with sustaining safer sex. The challenge in psychological interventions addressing cognitive avoidance is that stressing the harms of sexual risk taking may lead to a higher level of anxiety and disengagement (Hoyt et al., 1996; Witte, Meyer, & Martell, 2001). For example, in response to counter fatigue with safer sex, prevention messages describing the negative consequences of HIV infection and the unpleasant side effects of HAART have been delivered to the gay community. Fear-inducing prevention strategies, however, may not be as effective as they were in previous decades, when HIV was perceived as a threat to the “survival” of the gay community with its higher level of mortality. In determining the optimal level of perceived threat as a focal point in interventions, the study findings suggest that internalized homophobia needs to be taken into consideration in cognitive-behavioral approach, especially among gay men who frequently seek casual sex partners in public venues.

It is important to acknowledge that sexual risk taking may not be “purely” accidental (or for some gay men, a series of purely accidental events) but the outcome of the disengagement coping process. Coping with HIV risk amid the epidemic, gay men’s risk estimation has become more subjective, moving away from public health norms of HIV prevention. They found “new” ways of avoiding HIV risk (e.g. negotiated safety, strategic positioning, and serosorting) rather than use a “traditional” method of condom use only (Kippax & Race, 2003). Although harm reduction strategies of “defragmenting” high-risk sexual networks (i.e. HIV seroconcordant unprotected sex) may help reduce the epidemic among gay men (Wohlfeiler & Potterat, 2005), those types of behavioral adaptations may increase a sense of segmentation in their gay identity development and sexual exploration among HIV-negative gay men. Until an effective biomedical prevention of HIV infection is developed, perhaps even after the discovery of vaccine, such disengagement coping strategies might continue. During psychological interventions, episodic sexual risk practices must be examined to understand the patterns of sexual risk practices and key factors, including physical settings, sexual partnerships, meanings of gay sex and HIV-negative gay identity, and social networks. The interventions also need to share emotional and affective states attached to sexual risk and how

those domains are related to coping strategies, either active engagement or passive disengagement. By doing so, the intervention can approach ambivalent attitudes toward sexual risk justifications and reduce dissonant beliefs among those HIV-negative gay men who no longer perceive HIV infection as a primary issue in their sexual activities.

Limitations

Because of the nature of this exploratory study, limitations of this study exist, although the study design has taken steps toward understanding how the relationship between internalized homophobia and disengagement influence sexual risk. First, the data were self-reported and cross-sectional, and therefore cannot indicate causality. With regard to study population, the current study was limited to participants in a mental health setting in NYC. The typical participants in this study had at least a college education and, most importantly, were self-identified gay men living in a metropolitan area of high seroprevalence. In addition, the participants generally had a high level of openness about their sexual orientation. This research did not feature a random sample of men who have sex with men who might not self-identify themselves as gay or involved in gay community services. The study analysis did not control for potentially important variables, including socioeconomic status, religion, gender roles, and experience of victimization based on same-sex orientation. Subsequent studies among gay men with diverse demographic backgrounds are needed to ensure generalizability of these findings. Since data analyses were conducted in the direction of associations that were inferred from the conceptual framework proposed in this study, the results should be interpreted with some caution. It may be plausible that sexual risk taking would induce disengagement coping styles: HIV-negative gay men who had UAI may attribute their behaviors as fatalism after the sexual risk occasion. With respect to measurement, this study did not directly explore cognitive restraint, which has been discussed as a predisposing factor of fatalism: HIV-negative gay men who perceived themselves as restricted by the regulation of condom use may develop fatalism. Sexual risk was assessed by a dichotomous variable (yes/no) of UAI; therefore, the degree of sexual risk was not examined in a linear model. Another missing measure is related to assessing the “desirability” or perceived pleasure of UAI. Since we did not ask about this, it is not clear to what extent gay men with disengagement coping strategies would perceive sexual risk taking positively. Lastly, since we did not assess engagement coping strategies in this study, we did not know the relationship between disengagement and engagement coping in the group of HIV-negative men disengaging from HIV risk; we should not assume that those men in the subgroup are only taking HIV risk with fatalism and optimism.

Conclusions

Given the importance of understanding disengagement responses to the dynamic and prolonged HIV epidemic among HIV-negative gay men, future research should develop integrative theoretical constructs and rigorous empirical research methods to examine the phenomena. Valid assessments are mostly needed in order to compare across diverse populations, including gay men, heterosexuals, and other at-risk groups. Importantly, coping is multi-faceted; engagement and disengagement coping strategies may be co-exhibited in a person. Future research needs to incorporate multi-dimensional coping strategies and comprehensively examine the coping mechanisms in sexual risk taking and sexual risk reduction. Assessment of sexual risk should be examined in detail in these contexts. In order to fully understand the pathways from cognitive risk appraisal to coping styles to sexual risk, the domain of feedback of previous sexual risk needs to be taken into consideration; interpretation of previous sexual experiences influences re-appraisal of risk. Longitudinal research examining changes of coping strategies would be helpful in refinement of interventions in HIV prevention.

As the epidemic continues, it is imperative to continue refining prevention programs. Discussion should be initiated about how the affected community will deliver the issues of disengagement, not only as personal but also as socio-cultural. Together with correct knowledge of HIV prevention and transmission, the prevention interventions must develop innovative programs to promote active community engagement to the risk globally. Successful HIV prevention can be accomplished through societal awareness of the impact of the epidemic and the needs for prevention, both personal and structural, of the target populations.

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Appendix

Disengagement Coping with HIV Risk (DCHR) Scale Items

Fatalism ($\alpha = .81$)

1. I sometimes wonder if it's worth all the trouble it takes to stay HIV-negative.
2. It seems like part of being gay/bisexual is also to be HIV-positive, so why aren't I?
3. I don't look forward to getting older because many of my friends will not be around because of AIDS.
4. I sometimes feel like giving up because everybody around me is getting HIV.
5. If my partner were going to get HIV, I don't want to be the one left alone.
6. No one really knows what's safe anymore. I'll just take my chances.

Optimism ($\alpha = .89$)

1. Since the discovery of new drugs to fight HIV, I'm less concerned about getting infected.
2. Now that HIV is manageable disease, I feel more free to have sex without condoms.
3. With all the talk of new HIV medicines, AIDS doesn't seem so scary anymore.
4. I'm less concerned about getting AIDS now that there are new effective medicines to treat it.
5. The new antiviral drugs are making it less scary to get AIDS.
6. I wouldn't be so upset if I got infected with HIV because there are powerful new drugs to treat it.

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Figure 1.
Conceptual model of internalized homophobia, disengagement coping, and sexual risk

Effect of internalized homophobia on UAI via fatalism

Effect of anxiety on UAI via optimism

Figure 2.

Path models for UAI represents the total effect (c) without the mediator, the direct effect (c'; the bolded values above arrow) via the mediator, and the indirect effect (ab) of the predictor on the outcome variable. * $p < .05$, ** $p < .01$. *** $p < .001$.

Figure 3.

Interaction between fatalism and sex in public venues on UAI. Regression lines were drawn from the scatter plots of the predicted probability of UAI (Y-axis) and fatalism scores (X-axis). For the model of public sex-yes, intercept = 0.66, $\beta = 0.14$, $R^2 = .72$, $p = .003$; for the model of public sex-no: intercept = 0.37, $\beta = 0.02$, $R^2 = .03$, $p = .74$.

Table 1

Descriptive Statistics and Correlations among Variables

	UAI		Correlations			
	t-test	1	2	3	4	M (SD)
1. Internalized homophobia	2.47 [*]	-				3.36 (0.61)
2. Fatalism	2.81 ^{**}	.34 ^{**}	-			2.37 (1.33)
3. Optimism	5.02 ^{***}	.08	-.25 ^{**}	-		2.47 (0.68)
4. Anxiety	4.85 ^{***}	.20 ^{**}	.21 ^{**}	.18 [*]	-	2.27 (1.41)
	χ^2					%
Public sex	12.9 ^{***}	0.69	0.77	-0.51	3.74 ^{***}	38.0%
Club drug use	7.0 ^{**}	2.10 [*]	0.51	2.34 [*]	1.13	11.6%

^aNote. t-test values between the scales and public sex and club drug use.

*
 $p < .05$

**
 $p < .01$.

 $p < .001$.

Table 2

Mediation Effect of Internalized Homophobia (IH) and Anxiety on UAI

	Wald	p value	ΔR^2	$\Delta \chi^2$
Total effect of IH on UAI	8.60	0.03	.09	9.12**
With fatalism, direct effect of IH on UAI	6.45	0.12	.11	6.71*
Total effect of anxiety on UAI	19.20	<.001	.14	21.00***
With optimism, direct effect of anxiety on UAI	4.92	0.03	.19	5.12*

Note. R^2 = Nagelkerke R^2 .*
 $p < .05$ **
 $p < .01$.***
 $p < .001$.

Table 3

Moderation Effect of Fatalism and Public Sex on UAI

	Wald	AOR (95% CI for OR)	p value
Fatalism	5.87	1.42 (1.07-1.89)	.015
Public sex	21.17	1.91 (1.45-2.52)	< .001
Fatalism *Public sex	4.32	1.34 (1.02-1.78)	.038

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

Table 4

Multiple Logistic Regression of UAI

	Wald	AOR (95% CI for OR)	p value	R ²
Demographic characteristics				.015
Age	2.04	0.97 (0.92-1.01)	.153	
Ethnicity				
White	-	-	-	-
Black	0.61	0.62 (0.19-2.07)	.435	
Hispanic	0.32	1.33 (0.49-3.59)	.571	
Other	1.20	2.05 (0.57-7.39)	.274	
Education				
Above college year	-	-	-	-
Completed high school	0.15	1.42 (0.24-8.28)	.696	
Internalized homophobia	20.85	6.40 (2.89-14.20)	.000	.123
Disengagement coping				.353
Fatalism	4.03	1.43 (1.01-2.03)	.045	
Optimism	12.83	4.33 (1.94-9.64)	.000	
Anxiety	5.66	1.48 (1.07-2.03)	.017	
Contextual risk factors				.415
Public sex	9.60	1.93 (1.27-2.94)	.002	
Club drug	0.07	1.09 (0.57-2.11)	.787	

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