

Sexual sensation seeking, reduced concern about HIV and sexual risk behaviour among gay men in primary relationships

I. CRAWFORD,¹ P. L. HAMMACK,² D. J. MCKIRNAN,³
D. OSTROW,⁴ B. D. ZAMBONI,⁵ B. ROBINSON & B. HOPE⁶

¹Loyola University Chicago, ²University of Chicago, ³University of Illinois at Chicago, ⁴Centegra Health System, Crystal Lake, Illinois, ⁵University of Minnesota Medical School & ⁶Howard Brown Health Center, Chicago, USA

Abstract *Gay and bisexual men who indicated they were currently in a primary relationship with another man (N = 230) completed measures of HIV treatment attitudes, sexual risk behaviour and sexual sensation seeking. Results indicate non-primary partner sexual activity is common in many gay relationships and men in non-exclusive relationships possessed greater levels of sexual sensation seeking and treatment-related reduced concern about the dangerousness of HIV than men in exclusive relationships. Results also suggest that individuals who were members of HIV-seroconcordant relationships were more likely to engage in unprotected sexual activity with their primary sexual partners than gay men who were members of HIV-discordant couples. A series of regression analyses revealed that reduced concern about HIV mediated the relationship between sexual sensation seeking and sexual risk behaviour. The next generation of HIV prevention interventions must address the attitudinal shifts that have occurred among some gay men regarding the seriousness of HIV and should be sensitive to the dynamics of gay relationships.*

Introduction

Although rates of HIV infection among gay men in the USA have declined substantially over the past two decades, infection rates remain high in this group, and may be increasing (CDC, 1999, 2000; Wolitski *et al.*, 2001). Antiretroviral treatments have transformed HIV into a manageable chronic illness for many patients (Lert, 2000), postponing the onset of AIDS and decreasing the number of AIDS-related deaths (Kelly *et al.*, 1998b). There is evidence that these changes in the treatment of HIV infection have altered the perception of sexual risk among gay men and other groups (e.g. Vanable *et al.*, 2000). The perception that HIV infection can be successfully treated has lessened some men's concern over infection, and consequently their intention to use condoms (Gagnon & Godin, 2000). Developing a more

Address for correspondence: Dr Isaiah Crawford, Department of Psychology, Loyola University Chicago, Lake Shore Campus, 6525 North Sheridan Road, Chicago, IL 60626-5385, USA. Tel: +1 773 5083505; Fax: +1 773 5083514; E-mail: icrawfo@luc.edu

precise understanding of how attitudinal shifts associated with reduced concern about HIV impacts the sexual behaviour of gay men at both the individual and dyadic level may facilitate the development of new HIV/AIDS prevention programmes.

Recent studies suggest that gay men who report being less concerned about becoming HIV-positive are more willing to risk infection during sex (Dilley *et al.*, 1997) and more frequently engage in unprotected anal intercourse (Kalichman *et al.*, 1998a; Ostrow *et al.*, 2000; Vanable *et al.*, 2000). Although both HIV-positive and HIV-negative men report reduced concern about HIV infection, this attitude shift seems most profound among infected men. Thus, the behavioural consequences of attitude changes vary within the larger population of gay and bisexual men (e.g. Kelly *et al.*, 1998a; Vanable *et al.*, 2000). This paper examines HIV attitudes and risks within another important sub-set of gay men, those in a primary relationship.

Descriptive studies of HIV risk among gay men typically employ general samples that combine men who are 'single' with those who are in steady or 'primary' relationships. Within these general samples, primary relationship status emerges as one of the strongest predictors of unprotected sex (Berger, 1990; Bosga *et al.*, 1995; Hoff *et al.*, 1996; Lye Chng & Geliga-Vargas, 2000; McLean *et al.*, 1994; Misovich *et al.*, 1997; Semple *et al.*, 2000; Wagner *et al.*, 1998). Despite this common finding, there has been little systematic research addressing HIV risks specifically among gay men in relationships. In fact, there have been few empirical attempts to understand the behaviour and psychosocial functioning of gay male couples generally. Psychological and behavioural differences between single gay men and those in primary relationships may have important implications for HIV prevention (see Hoff *et al.*, 1996).

Primary relationships among gay men have always existed but have elicited minimal scientific attention, possibly due to an implicit assumption that gay relationships are uncommon or less important to individual behaviour than are relationships among heterosexuals. In fact, in descriptive studies, many gay men describe themselves as being in a primary relationship (Vanable *et al.*, 2000; Wagner *et al.*, 1998). Further, gay relationship status presents a number of key issues in HIV and sexually transmitted disease (STD) prevention, including differences in primary and non-primary relationship sexual risk behaviour (e.g. Bosga *et al.*, 1995), HIV-seroconcordance versus discordance (e.g. Sacco & Rickman, 1996), the emotional dynamics of the relationship itself, and larger issues of sexual exclusivity (e.g. Hickson *et al.*, 1992). Of course, variables that affect sexual behaviour among 'single' men may also influence sexual behaviour of non-single men (e.g. the context and timing of sex, the availability of condoms, alcohol or drug use, or individual personality and attitude variables).

Gay primary relationships may have a complex relation to both perceived and actual sexual risk. Many gay men may approach relationships specifically to facilitate 'safe' unprotected sex; thus, sexually exclusive relationships among HIV-concordant men may account for a high proportion of unprotected sex in descriptive studies, and much of that behaviour may be objectively safe. As Genden (1997) and Goode (2001) discuss, sexual exclusivity characterizes many so-called 'barebacking' relationships (i.e. exclusive sexual relationships among HIV-positive men). Some mutually HIV-negative men have adopted similar strategies in their relationships that entail the development of a 'negotiated safety agreement' (i.e. both partners use condoms with non-primary sexual partners so that unprotected primary partner sexual activity remains 'safe'). Men who remain in long-term, sexually exclusive dyads, or who successfully develop a 'negotiated safe relationship', might thus practise what is traditionally identified as sexual risk behaviour but might accurately perceive themselves as not at risk (Hoff *et al.*, 1996).

In contrast to relationships that facilitate actual (if not apparent) safety, some primary relationships may present obstacles to HIV prevention (Misovich *et al.*, 1997). Some couples may view demands to practise safer sex as a threat to the trust and intimacy that is at the core of the relationship (see Misovich *et al.*, 1997). Alternatively, men may be willing to think about risks when meeting a new partner, but may view the relationship as one context where they can escape the burden of having to be aware of HIV risk (McKirnan *et al.*, 1996), which may lead the partners to abandon condoms and/or engage in other ‘cognitive escape’ behaviours such as alcohol or drug use. Finally, many gay men describe their relationships as non-exclusive (Hickson *et al.*, 1992), raising the prospect of infections being brought into the relationship. As a consequence, there are a number of ways a relationship may affect a gay man’s HIV risk status. Given the emerging importance of treatment-based shifts in gay men’s attitudes toward HIV, we decided to examine the role of HIV attitudes on sexual risk within the context of gay relationships.

We hypothesized that, consistent with the literature, men reporting the emerging risk attitude of ‘reduced concern over HIV’ would engage in more unprotected sex (Vanable *et al.*, 2000). We further hypothesized that the attitude–risk relation would vary by relationship status, a potentially important issue for prevention design. To fully explore relationship differences in attitudes and sexual risk we also examined a well-studied attitude variable: sexual sensation seeking. This refers to the tendency to prefer ‘exciting, optimal, and novel stimulation or arousal’ (Kalichman *et al.*, 1994). Sexual sensation seeking has been shown to be a strong predictor of alcohol and drug use, as well as the rate of unprotected sex among gay men (DiFranceisco *et al.*, 1996; Kalichman & Rompa, 1995; Kalichman *et al.*, 1994, 1998b; Lye Chng & Geliga-Vargas, 2000).

We also hypothesized that both sexual sensation seeking and reduced concern about HIV would be associated with primary and non-primary partner sexual risk behaviour. We further theorized that reduced concern about HIV would mediate the effect of sexual sensation seeking on actual behavioural risk. Despite a penchant for risk, men who are ‘sexual sensation seekers’ may feel the need to restrain their behaviour if they continue to be strongly concerned about HIV infection. However, reduced concern about HIV—whether driven by optimism over HIV treatments or other psychological variables—may ‘release’ such men from such behavioural restraints (see McKirnan *et al.*, 1996). As a consequence, men who are drawn to pursue novel sexual experiences may closely attend to information that HIV is ‘treatable’. This attention to HIV treatments may result in reduced concern about HIV and/or more sexual risk behaviour. If supported, this hypothesis would have significant implications for prevention campaigns targeted to counter or modify these attitudes.

We also hypothesized that these key variables would operate differentially depending on whether participants were members of sexually exclusive or non-exclusive relationships. It is our belief that these groups represent distinct populations of gay men who require divergent preventative interventions. Specifically, we theorized that reduced concern over HIV would significantly predict sexual risk behaviour only among men whose relationships were not sexually exclusive. Sexual exclusivity may serve as a ‘buffer’ for the effect of reduced concern about HIV; that is, gay men who establish rules within their relationships that prohibit sexual activity outside of the primary relationship presumably are less motivated to release themselves from sexual restraint. They should then be less affected by reduced concern about HIV, as they are not seeking a rationale to engage in risky sexual behaviour. Another objective of this paper was to explore the sexual risk dynamics of gay primary relationships and to test the hypothesis that sexual exclusivity is a key moderator of the effect of risky attitudes on unprotected sex.

Methods

Participants

A large number of self-identified gay and bisexual men ($N = 492$) were administered a brief, anonymous survey during the course of a two-day, gay-orientated street fair held in Chicago, Illinois in August 1999. Of the 492 respondents, 230 (47%) indicated they were currently in a primary sexual relationship. These 230 men comprised the sample for this study. Participants' mean age was 36.4 years ($SD = 8.64$); 77% identified themselves as European American, while 11%, 5% and 1% identified themselves as African American, Latino and Asian/Pacific Islander, respectively. Thirty-five per cent indicated they were involved in a sexually exclusive relationship, while 54% defined their relationships as sexually non-exclusive. Participants were well educated, with 93% reporting at least some college level course work or above. Median income was between \$31,000 and \$50,000. Approximately 16% ($n = 37$) of participants reported that they were HIV-positive.

Procedure

As described by Vanable *et al.* (2000), outreach workers randomly approached and described the study to potential respondents. They requested that respondents complete an anonymous survey of attitudes toward HIV/AIDS and combination therapies, as well as their current sexual practices. The intercept survey format did not allow for a formal sampling framework, hence a specific enrollment rate could not be calculated. However, we estimate that at least 50% of the individuals we approached accepted invitations to participate in the study. Respondents received \$5 for their participation in the study. Individuals who agreed to participate in the study completed the questionnaire at tables staffed by research assistants. Before participants were given compensation, research assistants briefly examined item responses and instructed respondents to complete any skipped sections of the questionnaire. As participants were recruited, they were told that the survey contained questions about sexual activity. Informed consent was implicit in participants' decision to complete the survey. The survey instrument and all procedures were approved by Institutional Review Boards of Loyola University Chicago and Howard Brown Health Center.

Measures

The seven-page survey consisted of items assessing demographics, attitudes toward HIV and sexual behaviour, sexual sensation seeking, HIV serostatus information and sexual behaviour.

Demographics. Participants were asked to provide data regarding their race/ethnicity, education, sexual orientation, annual income, age and relationship status. Sexual orientation was assessed as 'gay' (92% of participants), 'bisexual' (8%), 'straight' (0%) or 'other' (0%). Primary relationship/partner was defined as 'someone you are emotionally close to and have sex with'.

Sexual risk behaviour. To assess sexual risk behaviour, participants rated the frequency of five sex acts (Vanable *et al.*, 2000) with their steady or casual sexual partners in the past six months, using a six-point scale (0 = never to 6 = nearly every day). The scale included the following items: (1) 'had unprotected receptive anal sex (bottom)'; (2) 'had unprotected insertive sex (top)'; (3) 'had oral sex where you came in his mouth'; (4) 'had oral sex where he came in your mouth'; and (5) 'slipped from previous safer sex guidelines'. Responses to items

for each class of partner were averaged to yield two sexual risk behaviour scores: one for primary partner sexual activity (Cronbach's alpha = 0.76) and one for non-primary partner sexual activity (Cronbach's alpha = 0.92). Higher scores on this scale reflect engagement in more frequent high-risk sexual behaviour.

Treatment-related reduced concern. Reduced concern about HIV due to treatment advances was assessed via six questionnaire items, which participants rated on a five-point Likert-type scale (1 = do not agree at all to 5 = strongly agree; e.g. 'The new AIDS combination drugs make me less worried about having unprotected sex'). Responses to the six items were averaged to create a reduced concern scale score for each participant (Cronbach's alpha = 0.83). Higher scores indicated greater levels of reduced concern.

Sexual sensation seeking. Participants responded to three items relating to sexual sensation seeking (DiFranceisco *et al.*, 1996), also using a five-point Likert-type scale (1 = do not agree at all to 5 = strongly agree; e.g. 'I like new and exciting sexual experiences and sensations'). Responses were averaged to obtain a scale score for each participant, with higher scores indicating a greater desire for new and novel sexual experiences (Cronbach's alpha = 0.80).

Results

Descriptive and preliminary analyses

Two group-level variables were created for the analyses: one based on couple serostatus and one based on couple sexual exclusivity. Most participants were members of HIV-concordant (83%) and sexually non-exclusive (54%) couples. Of participants who were in a HIV-concordant relationship ($n = 191$), 93% were in a concordant HIV-negative couple, and 7% were in concordant HIV-positive relationships. Of participants in a HIV-discordant couple ($n = 39$), 59% were themselves HIV-positive with an HIV-negative partner, and 41% were HIV-negative with an HIV-positive partner. As expected, participants whose primary partner was seroconcordant reported significantly higher rates of unprotected sex with that partner than did participants whose primary partner was serodiscordant ($M = 1.34$ versus 0.67 , $F(1,228) = 10.75$, $p < 0.01$, $\eta^2 = 0.05$). We did not have sufficient power to test these effects by participant or partner serostatus. Among participants in ostensibly concordant HIV-negative relationships, 49% reported at least one 'other' partner in the previous six months, and the average time since last HIV testing was 16.6 months, with a mode of over 50 months. As a consequence, the accuracy of these seroconcordance reports may be questionable in some cases.

Forty-eight per cent of participants reported that their primary relationship was sexually exclusive. Among participants whose primary relationship was not sexually exclusive, fully two-thirds reported at least one other 'safety rule' (i.e. regarding the type of sex they have with outside partners). Among all men in a primary relationship, 55% reported at least one safety-orientated rule. Thus, it was not a strong norm for gay men in a primary relationship to be sexually exclusive with that partner, but it was common for relationships to have behavioural rules to facilitate sexual safety.

Participants whose partner was serodiscordant reported greater levels of treatment-related reduced HIV concern ($M = 1.81$, $SD = 0.88$) than did participants whose partner was seroconcordant ($M = 1.55$, $SD = 0.60$), $F(1,228) = 5.21$, $p < 0.05$, $\eta^2 = 0.02$. There were no significant group differences in sexual sensation seeking based on couple serostatus.

Compared to participants in a sexually exclusive relationship, participants in a sexually non-exclusive relationship reported significantly more sexual sensation seeking ($M = 3.41$ versus 2.81 , $F(1,201) = 14.02$, $p < 0.001$) and treatment-related reduced HIV concern ($M = 1.70$ versus 1.41 , $F(1,201) = 9.11$, $p < 0.01$). Despite differences in risk attitudes, men in exclusive versus non-exclusive relationships did not significantly differ in their overall sexual risk behaviour, either specifically with their primary partners or when non-primary partners are included for the men reporting 'non-exclusive' relationships.

Correlation analyses were performed to describe the relations between primary and non-primary sexual risk, sexual sensation seeking and reduced concern. These analyses used only men who reported sex with both a primary and a non-primary partner, $n = 138$, or about 45% of our sample of men with a primary partner. The results are presented in Table 1.

As may be expected, men with greater sexual risks in their primary relationships reported significantly greater risks with non-primary partners. Consistent with previous studies, both reduced HIV concern and sexual sensation seeking predicted sexual risk, again with both types of partner. Finally, in support of our hypothesis that sensation seeking may lead men to more strongly attend to or be optimistic about HIV treatment, participants who were higher in sexual sensation seeking also reported significantly greater levels of reduced concern about HIV (this latter correlation was similar when tested with the complete sample, $n = 307$, $r = 0.29$, $p < 0.000$).

Reduced concern about HIV as a mediator of the relationship between sexual sensation seeking and sexual risk behaviour

Two mediational models were used to test the hypothesis that treatment-related reduced HIV concern mediated the effect of sexual sensation seeking on behavioural risk; one using risk with the primary partner as the outcome (Table 2), and one using risk with non-primary partners as the outcome (Table 3). The first model used the complete sample, $n = 307$, while the second model used only participants who reported any non-primary partner(s), $n = 138$. The mediation hypotheses were tested using a series of multiple regression equations, as per Baron and Kenny (1986).

As presented in Table 2, sexual sensation seeking was a significant predictor of risk with the primary partner and reduced concern about HIV (the hypothesized mediator). Mediation is demonstrated by a reduction in the effect of a predictor once the hypothesized mediator is entered into the model (Holmbeck, 2002). Here the effect of sexual sensation seeking was significantly reduced after reduced concern was entered into the model, supporting the hypothesis that reduced concern mediates the effect of sensation seeking on sexual risk behaviour. We used procedures outlined by Holmbeck (2002) to calculate the coefficient and standard error of the indirect effect. The results showed the mediating effect of reduced

Table 1. Correlations among sexual risk behaviour, sexual sensation seeking and reduced concern about HIV ($n = 138$)

Variable	1	2	3	4
1. Sexual risk with non-primary partner(s)	–	32.28**	52.42**	37.52*
2. Sexual sensation seeking		–	39.29**	27.19*
3. Reduced concern about HIV			–	37.23*
4. Sexual risk with primary partner				–

* $p < 0.05$; ** $p < 0.001$.

Table 2. Summary of mediational analyses predicting sexual risk behaviour with participants' primary partner (n = 307)

Variable	B	SE B	β
Equation 1: Sexual sensation seeking \rightarrow risk behaviour			
Sexual sensation seeking	0.19**	0.07	0.19
Equation 2: Sexual sensation seeking \rightarrow reduced concern			
Sexual sensation seeking	0.16***	0.04	0.29
Equation 3: Sexual sensation seeking \rightarrow reduced concern \rightarrow risk behaviour			
Sexual sensation seeking	0.13	0.07	0.13
Reduced concern about HIV	0.35**	0.12	0.20

$R^2 = 0.03$ for equation 1; $R^2 = 0.08$ for equation 2; $R^2 = 0.07$ for equation 3.

** $p < 0.01$; *** $p < 0.001$.

Table 3. Summary of mediational analyses to predict extradyadic sexual risk behaviour (n = 138)

Variable	B	SE B	β
Equation 1: Sexual sensation seeking \rightarrow extradyadic risk behavior			
Sexual sensation seeking	0.23**	0.08	0.28
Equation 2: Sexual sensation seeking \rightarrow reduced concern			
Sexual sensation seeking	0.16***	0.04	0.29
Equation 3: Sexual sensation seeking \rightarrow reduced concern \rightarrow extradyadic risk behaviour			
Sexual sensation seeking	0.09	0.08	0.13
Reduced concern about HIV	0.40**	0.11	0.37

$R^2 = 0.08$ for equation 1; $R^2 = 0.08$ for equation 2; $R^2 = 0.19$ for equation 3.

** $p < 0.01$; *** $p < 0.001$.

concern to be statistically significant, $z = 2.47$, $p < 0.05$. The final model explained approximately 7% of the variance in primary partner sexual risk.

The second mediational model replicated the effects for primary partner risk behaviour among participants with non-primary partners (Table 3). Consistent with the pattern of findings for risk with primary partners, reduced concern significantly mediated the relationship between sexual sensation seeking and non-primary partner sexual risk, $z = 2.88$, $p < 0.05$. The final model explained approximately 19% of the variance in non-primary partner sexual risk.

Couple exclusivity status as a moderator of the relationship between reduced concern about HIV and sexual risk behaviour

Our final hypothesis was that the effect of reduced HIV concern on sexual risk might be limited to men in relationships that are not sexually exclusive. We expected men who are motivated to maintain sexually exclusive relationships to be less affected by developments in HIV treatments or shifts in community attitudes toward risk than compared with men in non-exclusive relationships. We used multiple regression analyses to test the moderating effect of exclusivity status on the relation between reduced HIV concern and sexual risk with the primary partner.

The continuous variables were standardized to a mean of zero to reduce the effect of multicollinearity and to enhance interpretability (see Aiken & West, 1991). The interaction term was calculated by multiplying reduced concern and the hypothesized moderator,

exclusivity status. We used hierarchical multiple regression to test the interaction: the main effects of the predictor and moderator (reduced concern about HIV and relationship status) were entered first, followed by the interaction term (see Baron & Kenny, 1986). The overall model accounted for 10% of the variance in sexual risk, $F(3,199) = 7.43$, $p < 0.001$. The interaction term added significantly to the prediction ($R^2 \Delta = 0.04$, $p < 0.01$), indicating a significant moderator effect. The simple slope of the regression line was significant only for the sexually non-exclusive group ($B = 0.64$, $p < 0.001$, Fig. 1) (see Aiken & West, 1991; Holmbeck, 2002). In more descriptive terms, the correlation between reduced concern and sexual risk behaviour among participants in an exclusive relationship was 0.07, $n = 91$ (NS); whereas among men in non-exclusive relationships, the correlation was 0.37, $n = 115$, $p < 0.000$. Among men in non-exclusive relationships, the reduced concern about HIV–sexual risk behaviour correlation was similar for ‘other’ partners, $r = 0.49$, $n = 72$, $p < 0.000$. The effect of reduced concern about HIV infection on sexual risk varied considerably depending upon participants’ relationship structure.

Discussion

We found that primary relationships are common among gay men; almost half of this general community sample reported being in a relationship during the previous six months. However, similar to results reported in previous studies (Lye Chng & Geliga-Vargas, 2000; Wagner *et al.*, 1998), a high proportion of men in a primary relationship also reported non-primary sexual partners. Men in non-exclusive relationships reported higher levels of the two key risk attitudes we investigated in this study: sexual sensation seeking and treatment-related reduced concern about HIV. However, neither being in a non-exclusive relationship nor the presence of ‘outside’ sex partners were significant predictors of actual risk behaviour. At least in this general community sample, the exclusivity of primary relationships did not have a direct path to unprotected sex.

Relationship exclusivity did have a moderating effect on the relation between reduced HIV concern and risk; reduced HIV concern only predicted risk within ‘non-exclusive’ relationships. The lack of a main effect of relationship structure, combined with this more complex moderating effect, suggests that incorporating relationship structure into HIV prevention targeting gay men should be more complex than simply cautioning that some relationships are ‘risky’. Rather, relationship qualities may impact more subtle psychological vulnerabilities for risk and, as a consequence, may require more nuanced HIV prevention and education materials.

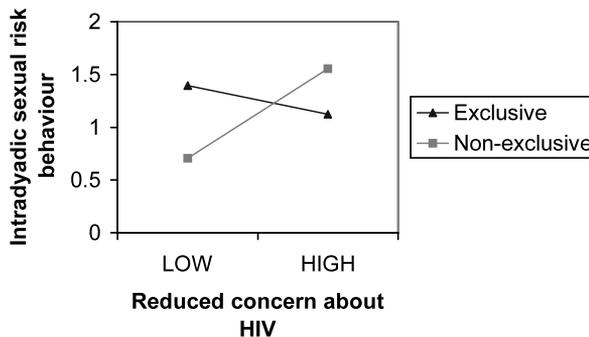


FIG. 1. Interaction of sexual exclusivity status by reduced concern about HIV on sexual risk with primary partners.

We replicated the basic finding that HIV-concordant dyads engage in more unprotected sex than do HIV-discordant couples. Since the great majority of these couples were concordant HIV-negative, unprotected sex may be objectively 'safe' for many of them. However, about half of concordant HIV-negative relationships were not sexually exclusive and a large percentage of the men in these relationships had not been HIV tested for some time. Thus, for many men, the perceived safety of an HIV-concordant relationship may be illusory and represents a critically important prevention issue.

Consistent with our primary hypothesis, both sexual sensation seeking attitudes and reduced concern about HIV stemming from advances in HIV treatment were associated with sexual risk among both primary and non-primary partners. This finding replicates the increasingly important discovery that the very success of HIV treatments has had reactive effects on gay men's sexual risk by lowering their concern about HIV infection altogether. In this sample we found the effect of reduced concern to be more general than in other studies, including our own previous community samples (Venable *et al.*, 2000), where the effect of reduced concern was limited to HIV-positive men. Here, the effect of lessened HIV concern was limited to men in a non-exclusive relationship, constituting about half of the men who reported primary relationships.

Considering these results and other reports together, it is clear that reduced concern is a major factor in recent increases in unsafe sex, but shows complex relations with other features of gay relationships and HIV status. The CDC has clearly recognized the importance of this variable in their strategic plan through 2005 (CDC, 2001), both in combating these attitude shifts and in encouraging prevention among HIV-positive men. Our data suggest that meaningful prevention programming will require sensitivity to those features of gay culture and sexuality that control the effects of these attitudes.

Beyond operating in specific sub-populations, reduced concern over HIV—and consequent risk—may be activated by other risk attitudes. Men with a strong sexual sensation seeking perspective may be particularly prone to concluding that HIV treatments have made HIV infection less serious, partially because their existing attitudes will make such information more cognitively salient to them, and in part as a simple rationalization of their risk disposition. It is not likely that optimism over HIV treatments will remain very high in the general population of gay men. Increasing data showing high rates of 'drug failures' and long-term side effects (e.g. diabetes and serious lipid abnormalities) make it increasingly difficult to view HIV as a wholly manageable chronic disease (Pequenat & Stover, 1999). However, our study and other recent data suggest that some men may be particularly prone to maintaining such 'HIV optimism' and will continue to engage in high-risk sexual behaviour despite evidence that HIV infection remains very serious. Those who are vulnerable to adopting or maintaining high risk attitudes—be they 'sensation seekers', men in non-exclusive relationships or HIV-positive 'barebackers'—are the appropriate focus of intensified prevention efforts. Such efforts must directly confront newly emerging attitudes and assumptions that lead to—or rationalize—risk.

As we hypothesized, we found two distinct sub-populations among gay men in primary relationships: men in sexually exclusive relationships and men in sexually non-exclusive relationships. About half of participants in a primary relationship had other partners and/or reported that their relationship was not sexually exclusive, although most men reported some form of a 'relationship sexual safety rule'. Gay relationship patterns differ considerably from heterosexual norms. Explicit non-exclusivity is a recognized relationship structure and our data suggest this aspect of some gay relationships may cause some men to become vulnerable to high-risk attitudes. However, non-exclusivity is also typically combined with other rules or

guidelines for sexual activity with non-primary partners and is not a simple predictor of risk with the primary partner.

Clearly, gay relationships are an important target for prevention programming: they are common, relate to high-risk attitudes and are complex both in their structure and their effects on actual sexual risk. The finding that most men in relationships have at least one explicit relationship-based guideline for safety indicates that such men would be receptive to preventive interventions focusing on relationship structure or norms. We strongly propose that prevention designs begin incorporating approaches specifically targeted to men in relationships.

We replicated the finding that treatment-based reduced concern about HIV is common and relates to sexual risk. We extended this literature by showing that reduced concern mediated the relationship between sexual sensation seeking and sexual risk behaviour; this finding helps clarify why gay men may differ in reduced HIV concern and how this attitude set actually leads to risk. Our results, although based on cross-sectional data, suggest that the need for exciting and uninhibited sexual activity among high sensation seekers may actually foster reduced concern about HIV, which in turn allows men to feel comfortable engaging in sexual risk behaviour.

These data have several important limitations. All participants were self-identified as gay or bisexual and were 'out' enough about their sexual orientation to attend—and complete a survey at—a gay-orientated street fair. While this does represent a large proportion of the population of men who have sex with men, it is an important boundary on the generalization of these results. In particular, ethnic minority men who have sex with men tend to less strongly identify as 'gay', thus generalizations across racial or ethnic lines must be very limited. Further, men not only self-selected into the single venue we sampled, but within that venue self-selected into our survey sample. These multiple self-selection biases are unfortunately the norm for this type of research, since random or probability samples are impractical and present their own biases. These practical difficulties make it important that studies such as ours be replicated using alternate sampling methods in different geographic locations. In that light, our data replicate other findings, and the demographics of our sample closely resemble those of the only probability sample done in the Chicago area, the Gay Urban Men's Study (see Blair, 1999). Another methodological limitation is that all data come from a single source, with a single cross-sectional method. As a consequence, common method variance may account for some of the effects we observed in these data. Nonetheless, these findings provide potentially important insights into the dynamics of treatment-related reduced concern about HIV, sexual sensation seeking and the nature of gay male relationships.

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