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Sexual Risk Behaviors by Relationship Type and Trauma History Among HIV-Positive Men Who Have Sex with Men

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Abstract

The association of trauma exposure and coping style to sexual risk behavior has yet to be fully examined in the context of primary and casual sexual partnerships. The current study assessed a high risk sexual behavior—unprotected anal intercourse (UAI)—in a high risk population of HIV-positive men who have sex with men (MSM) with a history of trauma. Using audio computer-assisted self-interview technology, 132 HIV-positive MSM completed measures of trauma exposure, trauma symptoms, coping strategies, and sexual risk behavior. Hierarchical logistic regression analyses indicated that completing more years of education and having experienced sexual abuse were positively associated with UAI with casual partners. Additionally, use of active coping was negatively associated with UAI with casual partners and the final model significantly predicted variance in UAI with casual partners. However, no variables were significantly associated with UAI with primary partners, suggesting that sexual risk behavior with primary partners may be associated with factors not commonly assessed in risk prediction or prevention research. We discuss the results in the context of developing new or modifying existing interventions to address rates of sexual risk in the relationships of HIV-positive MSM.

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Keywords

HIV; Sexual risk taking; Trauma; Coping; Sexual partners; Men who have sex with men

Introduction

Men who have sex with men (MSM) have been disproportionately affected by the HIV/AIDS epidemic (CDC, 2010). In recent years, decreasing concern about HIV and AIDS as an epidemic has been accompanied by growing rates of sexual risk behavior among both HIV-negative and HIV-positive MSM (Dilley, Woods, & McFarland, 1997; Hall et al., 2008; Osmond, Pollack, Paul, & Catania, 2007; Valdiserri, 2004). Sexual risk behavior, defined in this study as unprotected anal intercourse (UAI), is particularly common in the context of same-sex romantic relationships (Crawford et al., 2006). In fact, same-sex male romantic partners are the source of infection in 68% of newly diagnosed cases of HIV in the United States (Sullivan, Salazar, Buchbinder, & Sanchez, 2009). Rates of UAI with primary romantic partners are also particularly high among MSM living with HIV (Poppen, Reisen, Zea, Bianchi, & Echeverry, 2005; Semple, Patterson, & Grant, 2003). It is important to note that while romantic relationships provide one context in which sexual risk can occur, the trust and intimacy shared between two partners of any sex and sexuality provide significant mental and physical health benefits (e.g., Kiecolt-Glaser & Newton, 2001) and that research and interventions targeting these relationships must acknowledge and preserve these benefits in order to avoid stigmatizing sexual relationships. At the same time, it is imperative that researchers identify the situations and factors that contribute to sexual risk behavior in casual and romantic partnerships, so that prevention efforts can incorporate a dyadic perspective. The current study aimed to further explicate the association between relationship type (primary versus casual) and risk behavior among HIV-positive MSM who have been exposed to trauma, examining trauma history, trauma symptoms, and coping strategies as correlates of sexual risk.

Relationship Type and Sexual Risk

Relationship type has been broadly found to be an important moderator of sexual risk behavior in MSM. A primary partner, for the purpose of the current study, was defined as a partner with whom one has both a romantic and sexual relationship, including a boyfriend, lover or spouse. Casual partners, by contrast, were defined as individuals with whom one has a sexual but not a romantic relationship, including new, anonymous, and one-time sexual partners. Both HIV seropositive (Poppen et al., 2005) and seronegative (Crawford et al., 2006) MSM have been found to have a much higher frequency of UAI with primary partners than with casual partners. Furthermore, UAI makes up a greater proportion of sexual behaviors with primary partners than with non-primary partners (Crawford et al., 2006). HIV-positive men are more likely to engage in unprotected sex with primary partners of HIV-negative or unknown serostatus than with casual partners of HIV-negative or unknown serostatus, thus increasing the chance of HIV transmission to these primary partners (Semple et al., 2003). The same pattern holds true for heterosexual couples: in heterosexual relationships, condom use is lower with primary partners than casual partners (Macaluso, Demand, Artz, & Hook, 2000). Many studies that have specifically focused on

sex within a same-sex male couple partnership have noted that MSM make use of strategies to reduce their risk with primary romantic partners. These strategies include serosorting (Osmond et al., 2007), wherein MSM engage in UAI only with partners of concordant HIV serostatus; strategic positioning (Parsons et al., 2005), wherein HIV-positive MSM take a receptive role during UAI with HIV-negative partners to reduce HIV infection risk; and negotiated safety (Kippax, Noble, Prestage, Crawford, & Campbell, 1997), wherein same-sex romantic partners will agree to practice UAI only in the context of their primary relationship or with seroconcordant partners.

Despite high rates of sexual risk behavior with primary partners, most HIV prevention studies have only examined variables predicting sexual risk with casual partners, with some studies explicitly excluding sexual risk in the context of primary partnerships as an outcome measure (e.g., Paul, Catania, Pollack, & Stall, 2001). In addition, it appears that few variables commonly measured in HIV prevention research are predictive of sexual risk in the context of primary relationships. Vanable et al. (2004) found that substance use was predictive of unprotected sex with casual but not primary partners, and Catania et al. (2008) found that while child abuse severity influenced sexual risk with casual partners, it had no impact on sexual risk with primary partners. Notably, Catania et al. did not include measures of trauma symptoms. Thus, it remains unclear how men's trauma histories affect sexual risk behavior with male primary partners.

Trauma as a Predictor of Sexual Risk

The mechanisms that link risk behavior and trauma are of particular importance for HIV-positive MSM, both because risk reduction is a goal of many interventions with HIV-positive populations and because traumatic experiences are common among people living with HIV. Studies estimate that over 70% of individuals with HIV will experience two or more traumatic events in their lifetimes (Leserman et al., 2005) and reported rates of violent trauma are higher in populations living with HIV than in the general population (Zierler et al., 2000). HIV-positive populations also are diagnosed with PTSD at higher rates than the general population (Gore-Felton, Butler, & Koopman, 2001; Gore-Felton & Koopman, 2002), likely as a result of exposure to high rates of traumatic experiences. There is evidence suggesting that HIV-positive adults with trauma histories report greater impulsivity and, consequently, higher rates of sexual risk behavior (Gore-Felton & Koopman, 2002).

Among traumatic experiences, sexual abuse and sexual assault appear to be uniquely predictive of negative outcomes, both in the context of sexual risk and of coping strategies. HIV-positive individuals are more likely than the general population to be exposed to the unique stresses of sexual abuse and assault (Kalichman, Sikkema, DiFonzo, Luke, & Austin, 2002; Liebschutz, Geier, Horton, Chuang, & Samet, 2000). Studies have demonstrated a link between childhood sexual abuse (CSA), higher endorsed sexual risk behavior, and poor psychosocial outcomes, including more psychological distress, more HIV-related shame, more substance abuse, and less adaptive coping strategies (Arreola, Nieland, & Diaz, 2009; Schraufnagel, Davis, George, & Norris, 2010; Sikkema, Hansen, Meade, Kochman, & Fox, 2009). Moreover, HIV-negative MSM who reported non-consensual sexual experiences in adolescence and adulthood were more likely to engage in UAI with casual partners

than those who did not report nonconsensual sexual experiences (Strathdee et al., 1998). Similarly, Paul et al. (2001) found that CSA experiences among men significantly predicted sexual risk with male casual partners. As stated previously, however, research that has examined sexual risk and partner type tends to exclude primary relationships. This is problematic due to the high rates of unprotected sex reported among primary partners (e.g., Catania et al., 2008) and the risk of infection or co-infection from a primary partner (Sullivan et al., 2009).

Coping Style and Trauma

While a number of theories have been advanced to explain increased rates of risk behavior in those who have experienced trauma, one possibility is that exposure to the uncontrollable stress of a life-threatening event promotes the use of avoidance-based coping strategies (for a review, see Ben-Zur & Zeidner, 2009). Utilization of avoidance-based coping, which includes strategies designed to deny the reality of or disengage from a stressful situation, may to some extent be adaptive in the context of trauma, given the inability of victims to actively control their traumatic experience (e.g., child abuse, sexual assault). Several studies have found a positive association between MSM who used avoidant coping styles and a decision to engage in risky sexual behaviors with casual partners (Kelly, Bimbi, Izienicki, & Parsons, 2009; Martin, Pryce, & Leeper, 2005; Yi, Sandfort, & Shidlo, 2010). This likely occurs because the same cognitive and emotional strategies that mitigate the sense of danger inherent in a life-threatening situation also impair estimation of risk in sexual situations (Ben-Zur & Zeidner, 2009).

MSM who use active behavioral coping strategies, such as problem solving and planning, are less likely to put themselves and others at risk for contracting HIV (Robins, Dew, Kingsley, & Becker, 1997). It may be that access to active coping strategies in the aftermath of trauma may serve to increase threat perception and decrease rates of risk behavior. Further research is needed to parse specific factors that may impact this association, including research examining the type of relationship in which sexual risk behavior is enacted (Martin et al., 2005; Sikkema et al., 2008).

The Current Study

In the face of declining public interest and increasing risk among populations hit hardest by the disease, HIV prevention efforts are facing a new and challenging era (Coates, Richter, & Caceres, 2008). It is critical that researchers identify factors that are uniquely predictive of HIV transmission risk, so as to inform the development of new interventions. It is particularly important that HIV prevention efforts incorporate a dyadic perspective, given high rates of sexual risk behavior in the context of primary relationships and the relative lack of research attention devoted to this vector of HIV transmission. Consequently, the current study specifically examined predictors of sexual risk in primary and casual same-sex male relationships, incorporating measures of trauma exposure, trauma symptoms, coping style, and sexual risk behavior with different partner types. The current study comprised two hypotheses:

H1 We hypothesize that MSM who had been exposed to sexual abuse and reported use of avoidant coping strategies would self-report higher rates of UAI with casual partners.

H2 Given the lack of research specifically focusing on sexual risk behavior in the context of primary relationships, we hypothesized that MSM who reported more trauma symptoms and used avoidant coping strategies would self-report higher rates of UAI with primary partners. This hypothesis was based on previous research highlighting rates of sexual risk behavior in general (e.g., Catania et al., 2008).

Method

Participants

Participants consisted of 132 seropositive MSM living in the San Francisco Bay Area. Participants were recruited as part of a larger study (Project RISE) examining a group intervention for individuals with HIV and symptoms of trauma. Criteria for inclusion in the study were: (1) age 18 or older, (2) documentation of an HIV diagnosis, (3) self-report of recent sexual activity with a male partner (i.e., an oral or anal sexual encounter within the past 3 months), (4) evidence, as assessed by self-report, of psychological and behavioral functioning that would permit participation in the intervention groups, and (5) report of experiencing at least one hallmark symptom of PTSD (avoidance, re-experiencing or hyperarousal). This study had a cross-sectional design and examined data from baseline questionnaires collected before participants were randomized to intervention groups. Participants were paid \$25 for attending the baseline assessment.

The mean age of the participants was 44.7 years (range, 23–67). Over one quarter (28.0%) reported having obtained a high school diploma or the equivalent, while another quarter (25.6%) reported having obtained a college degree. Overall, 38.6% of study participants identified as Caucasian ($N=51$), 27.3% as African American ($N=36$), 24.2% as Latino/Hispanic ($N=32$), and 9.8% as another racial category (e.g., mixed race; $N=13$). More than two-thirds (71.4%, $N=93$) reported an income of less than \$20,000 per year, while 83.5% ($N=111$) reported being unemployed. While 18.9% ($N=25$) of the sample reported having only primary sexual partner(s), 43.2% ($N=57$) reported having only casual sexual partners, and 37.8% ($N=50$) reported having both primary and casual partners.

Approval was obtained from Stanford University's institutional review board to conduct the current study and all participants provided informed consent regarding collection, maintenance, and use of data they provided.

Measures

Self-report questionnaires were administered via audio computer-assisted self-interview (ACASI) technology. Items were presented to all participants in the same order, including a demographic form (as per the above characteristics).

Exposure to Trauma and Exposure to Sexual Trauma—We assessed prevalence of traumatic experiences using the Trauma History Questionnaire (THQ) (Green, 1996), which asks participants to endorse which of 24 different types of trauma they had experienced.

For the current study, we examined both exposure to trauma generally and exposure to sexual trauma specifically. We first summed the total number of types of traumatic events that participants had experienced, excluding sexual trauma. This Exposure to Trauma scale, which ranged from 0 to 21 types of traumatic events experienced, demonstrated strong reliability in the current study ($\alpha = .83$). We then dichotomized participants based on whether or not they reported having experienced nonconsensual sexual contact or sexual abuse in childhood, adolescence or adulthood.

Trauma Symptoms—Trauma symptoms were assessed with the Impact of Events Scale-Revised (IES-R) (Weiss & Marmar, 1995), a psychometrically reliable and valid measure that asks participants to rate their distress related to specific symptoms of PTSD on a 0 (none) to 4 (extremely) point scale. Previous studies have shown that the IES-R can be used as a screening instrument; for this purpose, a clinical cutoff score of 33 appears to provide the best balance of specificity and sensitivity in identifying those who would be diagnosable with PTSD (Creamer, Bell, & Failla, 2003). The IES-R total score demonstrated strong reliability in the current study ($\alpha = .94$).

Active and Avoidance Coping—Coping style was assessed with the Brief COPE (Carver, 1997), which asks participants to rate how often they used different coping strategies in managing their stress over the last 3 months on a 1 (not at all) to 4 (a lot) point scale. For the current study, we summed items from the Active and Planning subscales to form an Active Coping scale (e.g., “I have been taking action to improve the situation”) and summed items from the Denial and Behavioral Disengagement subscales to form an Avoidance Coping scale (e.g., “I have been giving up trying to deal with it”). These scales were theoretically derived and empirically supported; principal components factor analysis revealed that the two scales had eigenvalues >2 and explained 60% of the variance in the target coping items. Total scores for both scales ranged from 4 to 16 and both scales displayed adequate reliability in the current study (Active Coping $\alpha = .75$; Avoidance Coping $\alpha = .79$).

Sexual Risk Behavior with Primary and Casual Partners—Sexual risk behavior was assessed via a Sexual Risk Behavior Assessment Schedule (SERBAS) that has been used in previous studies of sexual risk and injection drug risk behavior (Weinhardt et al., 2004). This measure asks participants to report on sexual behavior over the last 3 months in general and over the last five partners specifically. A participant was categorized as a man who has sex with men if he endorsed having had sex with a male partner over the past 3 months and provided specific detail on sexual activity with at least one male partner. To define their relationship with each of their last five partners, participants labeled the partner either as a “primary partner that you have sex with on an ongoing basis, like a boyfriend, lover, or spouse,” or as a “casual,” “new,” or “one-time” partner. Partners in the three latter categories were examined together as “casual” partners. To define sexual risk, or UAI, participants’ report of the number of times they used a condom during anal sex with each of their last five male partners was subtracted from the total number of times they reported engaging in anal sex with each of their last five partners. Due to skew in the data, with a large number of participants reporting no episodes of UAI, we calculated sexual risk with

primary partners as a dichotomous variable representing endorsement of at least one episode of UAI with at least one primary male partner over the past 3 months. Similarly, sexual risk with casual partners was defined as endorsement of at least one episode of UAI with at least one casual male partner.

Data Analysis

We used point biserial correlations and hierarchical logistic regression analyses to examine the relationships among trauma exposure, coping strategies, and sexual risk behavior with different types of partners. We constructed two hierarchical logistic regression equations, the first examining sexual risk with primary partners and the second examining sexual risk with casual partners. We controlled for demographic characteristics of age, race, and education in the first block of each regression analysis. Age and education were treated as continuous variables and race was dichotomized to represent White/Caucasian and non-White/Caucasian participants, again based on the techniques used in previous research (e.g., Sikkema et al., 2009). We then simultaneously entered variables representing non-sexual and sexual trauma exposure in the second block, followed by PTSD symptomatology in the third block. Finally, we simultaneously entered avoidance and active coping strategies in the fourth block, to test whether coping style predicted additional variance in sexual risk behavior above and beyond trauma exposure and symptoms. All statistical analyses were performed using SPSS 17.0 (SPSS Inc., Chicago, IL).

Results

Frequency of Trauma and Sexual Risk

Men in the current sample reported extensive trauma histories. All participants had experienced at least one type of traumatic event in their lifetimes, as per the inclusion criteria, and the mean reported number of types of non-sexual trauma experienced was 7.05. A total of 48.5% ($N=64$) of the sample reported that they had experienced sexual abuse at some point in their lives. In terms of trauma symptoms, the mean score on the IES was 36.1 while the median was 37, both of which exceeded the recommended clinical cutoff of 33 and indicated that the average participant in this sample would meet diagnostic criteria for PTSD. In total, 57.6% ($N=76$) of the sample reported IES scores exceeding the recommended clinical cutoff for diagnosing PTSD.

Men in the current sample also reported relatively frequent engagement in sexual risk behavior with their last five male partners in the past 3 months. While 53% ($N=70$) of participants stated that they had used a condom during every anal sex act with their last five male partners, the other 47% ($N=62$) of the sample reported engaging in between 1 and 52 instances of UAI with their last five male partners in the past 3 months, with a mean of 4.25 instances. However, the rates of engaging in UAI differed between partner types. With primary partners, participants had engaged in 0 to 52 instances of UAI, with a mean of 3.15 instances. With casual partners, participants had engaged in 0 to 24 instances of UAI, with a mean of 1.10 instances. The mean for UAI with primary partners was significantly higher than the mean for UAI with casual partners, $t(131) = -3.11, p < .01$.

Examining other metrics of sexual risk, individuals with only primary partners reported a mean of 1.47 sexual partners in the past 3 months, while individuals with only casual partners reported a mean of 8.30 partners and those with both primary and casual partners reported a mean of 5.85 partners. After adjusting for unequal variance, the difference in number of partners was significant between those with only primary partners and the other two groups, $t(48.93) = -2.75, p < .01$. The difference in number of partners was non-significant between those with only casual and those with both primary and casual partners. Those with only primary relationships reported a mean of .16 partners of unknown HIV serostatus in the past 3 months, while individuals with only casual partners reported a mean of 2.94 partners of unknown HIV serostatus and those with both primary and casual partners reported a mean of 1.88 partners of unknown HIV serostatus. After adjusting for unequal variance, the difference in number of partners of unknown HIV serostatus was significant between those with only primary partners and the other two groups, $t(56.87) = -2.49, p < .05$. The difference in number of partners of unknown HIV serostatus was non-significant between those with only casual and those with both primary and casual partners. No significant differences emerged among the three groups in number of HIV+ or HIV- partners. Furthermore, the three relationship groups did not differ in terms of degree of overall non-sexual trauma exposure, exposure to sexual assault or abuse, number of trauma symptoms or reported use of coping strategies.

Association of Coping Strategies and Trauma Exposure with Sexual Risk

We calculated point biserial correlations between measures of trauma exposure, PTSD symptoms, active and avoidance coping, and sexual risk behavior with primary and casual partners. In examining sexual risk behavior with primary partners, we included 132 participants, 25 of whom reported only primary partners and 50 of whom reported both primary and casual partners. No variables included were significantly associated with UAI with primary partners. In examining sexual risk behavior with casual partners, we included 132 participants, 57 of whom reported having only casual partners and 50 of whom reported both primary and casual partners. Exposure to sexual abuse or assault was positively associated with endorsement of UAI with casual partners. Higher report of avoidance coping strategies was also positively associated with endorsement of UAI with casual partners, while higher report of active coping strategies was negatively associated with endorsement of UAI with casual partners. See Table 1 for Pearson correlations between predictor variables and sexual risk behavior by partner type.

Multivariate Modeling of Sexual Risk Behavior

We first modeled sexual risk with primary partners. No variables included in the multivariate regression model predicted sexual risk behavior with primary sexual partners (OR = .89–1.46, 95% confidence intervals from .61 to 3.46, all $ps > .05$) and the total model did not predict a significant amount of variance in sexual risk behavior with primary partners, $R^2 = .10, \chi^2 = 9.80, p > .05$.

We then modeled sexual risk with casual partners. Among demographic variables, education was associated with sexual risk behavior with casual partners (OR=1.02, $p < .05$), with more educated men endorsing more instances of UAI with casual partners. Overall exposure

to non-sexual trauma predicted fewer self-reported instances of sexual risk behavior with casual partners (OR=.87, $p<.05$); however, sexual abuse in childhood, adolescence or adulthood was associated with more instances of UAI with casual partners (OR=5.77, $p<.01$). Symptoms of trauma did not predict variance in sexual risk behavior with casual partners. Engagement in active coping predicted unique variance in sexual risk behavior with casual partners above and beyond the contributions of exposure to trauma and demographic variables (OR=.71, $p<.05$), with those endorsing an active coping style likely to engage in less UAI with casual partners. When coping strategies were entered into the model, education (OR=1.02, $p>.05$) and non-sexual trauma (OR=.92, $p>.05$) became non-significant as predictors. The final model predicted a significant amount of variance in sexual risk behavior with casual partners, $R^2=.25$, $\chi^2=20.82$, $p<.001$. See Table 2 for the results of the hierarchical regression model.

Discussion

The current study was among the first to examine predictors of sexual risk behavior among MSM living with HIV, taking into account the context of different relationship types. Previous research has highlighted associations between sexual risk behavior with casual partners and sexual abuse (Sikkema et al., 2009), as well as a lack of adaptive coping (Robins et al., 1997). However, previous HIV prevention research has not focused on correlates of sexual risk behavior with primary partners.

In the current study, even variables that have been infrequently examined in previous sexual risk research, such as report of trauma symptoms and coping style, did not significantly predict sexual risk behavior in the context of primary relationships. Thus, we could not confirm our second hypothesis. Sexual risk in the context of primary relationships is unique and may not result from traditional predictors of sexual risk. In this sample, for example, exposure to trauma, symptoms of trauma, and coping strategies were all non-significant in a model predicting UAI with primary partners. Furthermore, the model as a whole did not predict a significant portion of the variance in this type of sexual risk. Coupled with the finding that MSM in this sample were significantly more likely to report sexual risk behavior with primary partners than casual partners, this result highlights the need to examine unprotected sex in the context of primary same-sex male relationships, both to delineate a set of related predictors and to establish how risky this sexual behavior actually is in terms of HIV transmission.

In the current study, sexual risk behavior in the context of casual relationships, though less commonly reported than sexual risk with primary partners, was significantly associated with a number of factors related to trauma and coping. Education, exposure to sexual assault or abuse, and lack of active coping strategies all predicted some amount of variance in UAI with casual partners, though education was no longer a significant predictor in the final model. Overall, the final model predicted 25% of the variance in UAI with casual partners. A total of 57 men in the current sample reported having only casual sexual relationships, while 50 reported both casual and a primary relationship and 25 reported having only a primary sexual relationship. It may be that HIV-positive MSM with trauma histories have more difficulty building and maintain intimate relationships with a primary partner and

are, therefore, more likely to seek out casual sexual relationships, though report of trauma symptoms did not differ between those of different relationship statuses and this study did not measure constructs specifically related to partner choice or relationship formation. Future research is needed to examine the associations among partner choice, trauma history, relationship satisfaction, and risk behaviors.

While it might seem unusual that education would be related to more, rather than less, sexual risk, higher educational attainment has been linked to more sexual partners in samples as diverse as men and women in rural Uganda (Smith et al., 1999), truck drivers in India (Dude et al., 2009), and men and women living in Nashville, Tennessee in the U.S. (Metro Public Health Department, 2001). Given that, by and large, the sample in the current study reported relatively high educational attainment, low income, and high rates of unemployment, this finding may be unique to this sample of HIV-positive MSM reporting a history of trauma. Future studies should examine the relationship between education and sexual risk in broader samples of MSM, using more detailed measures of socioeconomic status, access to sexual partners, and sexual attitudes.

Previous studies have indicated that sexual assault and abuse is more common among HIV-positive populations than the population at large (e.g., Kalichman et al., 2002) and that sexual abuse is linked to higher rates of sexual risk behavior (Arreola et al., 2009). In the current study, we found that MSM living with HIV were likely to report a history of sexual assault or abuse, with nearly half of the sample (48.5%) endorsing a history of forced sexual contact at some point during their lives. Furthermore, UAI with casual partners was associated with exposure to sexual abuse and assault, replicating previous findings. However, report of trauma symptoms was not a significant predictor of sexual risk. These findings highlight the importance of assessing trauma history when intervening with sexual risk behavior in HIV-positive populations, particularly for individuals whose primary source of sexual contact is casual or one-time sexual partners. However, given the non-significant relationship between trauma symptoms and sexual risk, future research should clarify the mechanism through which sexual assault and abuse increase the likelihood of sexual risk behavior.

Active coping predicted unique variance in sexual risk behavior with casual partners, above and beyond trauma exposure and trauma symptoms. Individuals who endorsed an active coping strategy were less likely to endorse UAI with casual partners. It may be that utilizing adaptive coping responses following exposure to sexual assault and abuse reduces the likelihood of risky sexual behavior, as individuals may rely on behavioral and problem-focused strategies to regulate negative emotions arising in the aftermath of the traumatic experience rather than regulating their emotions through sex or other risk behaviors. Interventions designed to prevent HIV transmission risk, therefore, should include education about and practice with active coping strategies, while future research into sexual risk behavior should parse the exact contribution of coping to the process leading from sexual abuse and assault to sexual risk behavior. Though active coping was significantly related to sexual risk, its overall contribution to the prediction of variance in sexual risk was relatively small. Thus, additional studies are needed to further assess mechanisms by which trauma leads to sexual risk behavior; such studies might examine the mechanistic role of changes in

information processing, emotion regulation or cortisol levels following trauma (Ben-Zur & Zeidner, 2009). Future studies should also examine coping strategy as a specific moderator of the impact of sexual assault on sexual risk behavior.

The fundamental question posed by this research still remains unanswered: how are we to understand and predict sexual risk behavior among HIV-positive MSM in the context of primary sexual relationships? Before addressing this question, research must first answer the question: how risky is “sexual risk behavior,” even UAI, in the context of primary relationships among HIV-positive MSM? For HIV-positive MSM, unprotected sex in the context of primary relationships, or any sexual relationship, carries a risk of HIV re-infection, possibly with a drug resistant strain of the virus, as well as potential infection with other sexually transmitted pathogens, including herpes, hepatitis, and bacterial infections that may increase risk of cancer and health complications. It also carries a risk of HIV transmission when the sexual partner is HIV-negative or of unknown serostatus. Thus, future research examining risk in the context of primary relationships among HIV-positive MSM should attend specifically to serodiscordant relationships. While some factors related to sexual risk in serodiscordant, same-sex male relationships have been outlined (e.g., Remien, Wagner, Dolezal, & Carballo-Diéguez, 2001), it is critical that further research into this population be conducted, so as to inform future interventions. These studies should collect data from both members of a couple, so as to observe how both individual and dyadic factors influence risk.

Results and conclusions of the current study should be interpreted in light of several limitations. This study relied on self-report measures of sexual risk behavior and factors related to trauma and coping. Therefore, the data may reflect underreporting of sexual risk behavior as a consequence of social desirability bias. To attempt to reduce this bias and increase accuracy, we used an ACASI format in which questions and response options were pre-recorded and read aloud to participants, thus minimizing interaction with a human interviewer. However, some bias in reporting likely still exists. We also gathered information on sexual risk behavior from only one member of a sexual partnership; future studies collecting data from both partners would add to the richness and interpretability of analyses of sexual risk in primary partnerships specifically. In addition, this study was cross-sectional in nature and should not be interpreted as indicating causal or temporal relationships between any of the factors studied. Our questionnaire assessed for serostatus of participants’ partners in a molar fashion and so did not allow for detailed examination of serosorting practices. Finally, the current sample was unique, as it consisted of an ethnically diverse group of low-income MSM with histories of trauma recruited from the Bay Area of California. Though the diversity of the sample was a point of strength, results of the current study may not generalize to other populations. Further research is needed to establish the associations among sexual risk, relationship type, trauma, and coping style in HIV-negative MSM, heterosexual men, women, and other demographic groups not represented in the current study.

Despite the study limitations, the findings have implications for secondary HIV prevention interventions. As HIV prevention efforts prepare to face a new and challenging era, it is critical that both research and clinical approaches examine new and under-studied factors

related to HIV transmission risk, such as relationship type. The current study highlighted the prevalence of sexual risk behavior among HIV-positive MSM in primary relationships, and also emphasized the inadequacy of current models of risk to predict sexual risk in these relationships. As mentioned previously, the current study also found that sexual risk behavior with casual partners, while less prevalent than sexual risk with primary partners, also occurs among HIV-positive MSM and was associated with sexual assault and abuse and with active coping strategies. HIV prevention efforts must thus walk a fine line: attending to sexual risk with casual partners by bolstering coping strategies and assessing trauma history, while at the same time attempting to identify predictors of sexual risk with primary partners. In accomplishing the latter goal, such efforts must also establish how much risk is incurred by engaging in unprotected sex with a primary partner. This may be particularly important in the context of serodiscordant relationships. By attending to relationship type while intervening to reduce sexual risk behavior, HIV prevention efforts will incorporate complex relational behavior that is likely to bolster efficacy of prevention programs, thereby reducing new infection incident rates among populations who carry the burden of the epidemic.

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Point biserial correlations between trauma exposure, coping strategies, and sexual risk behavior (UAI) with primary and casual partners ($N = 132$)

Table 1

	<i>M</i>	Range	SD	Correlation with UAI with primary partners	Correlation with UAI with casual partners
Trauma exposure	7.05	0–21	4.29	–.01	–.07
Sexual abuse	–	–	–	.01	.21*
Trauma symptoms	36.10	0–81	18.73	–.06	.04
Avoidance coping	2.33	4–16	2.81	–.07	.14
Active coping	8.34	4–16	2.81	–.07	–.20*

* $p < .05$

Table 2
 Hierarchical regression analysis of trauma exposure and coping strategies predicting sexual risk with casual partners, controlling for demographic variables ($N=132$)

Variable	OR, Step 1	(95% CI)	OR, Step 2	(95% CI)	OR, Step 3	(95% CI)	OR, Step 4	(95% CI)
Step 1: $R^2 = .08^*$								
Age	1.00	(.94–1.06)	1.03	(.97–1.10)	1.03	(.96–1.09)	1.01	(.95–1.08)
White/non-white	1.00	(.38–2.63)	.69	(.24–1.98)	.69	(.24–1.99)	.75	(.25–2.27)
Years of education	1.02*	(1.00–1.05)	1.02*	(1.00–1.04)	1.02*	(1.00–1.04)	1.02	(1.00–1.04)
Step 2: $R^2 = .11^{**}$								
Trauma exposure			.87*	(.76–.99)	.86*	(.75–.99)	.92	(.79–1.06)
Sexual abuse			5.77**	(1.66–18.66)	5.34**	(1.57–18.67)	5.63**	(1.58–20.01)
Step 3: $R^2 < .01$								
Trauma symptoms					1.01	(.98–1.03)	1.00	(.97–1.03)
Step 4: $R^2 = .06^{**}$								
Avoidance coping							1.01	(.83–1.24)
Active coping							.71*	(.51–1.00)

Final $R^2 = .25$,

$\chi^2 = 20.82$,

* $p < .05$,

** $p < .01$