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Predictors of day-level sexual risk for young gay and bisexual men

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Abstract

As HIV infection rates remain high among young gay and bisexual men, investigations into determinants of sexual risk are paramount. This study examined independent and interactive effects of substance use, mental health, perceived benefits of unprotected sex, and type of sex partner on odds of not using condoms. Analyses included 188 high-risk substance using HIV-negative and unknown status young gay and bisexual men (ages 18–29). Substance use and endorsing favorable attitudes towards unprotected sex strongly predicted sexual risk. Mental health moderated the relationship between partner type (main versus casual) and condom use such that increased anxiety and depression were associated with increased odds of using condoms with main partners and not using condoms with casual partners. Understanding how these determinants of HIV risk converge to predict unprotected anal sex can identify essential risk relationships for prevention, obtain effects sizes of greater magnitude and prolonged sustainability, and build robust couples-based interventions.

Keywords

sexual risk; substance use; mental health; attitudes towards condoms; male couples; gay and bisexual men

Introduction

HIV prevention that accounts for independent determinants of sexual risk and their interactive effects continues to take priority, especially for researchers and service providers focused on gay and bisexual men. Although the incidence of HIV has leveled since the early 1990s for several groups (e.g., injection drug users, heterosexuals), HIV transmission via male-to-male sexual contact has been rising in recent years, with a 14% increase from 2006–2009 (1). Specifically, in 2009, 61% of all new HIV infections in the US were among men who have sex with men (MSM), with 73% of new infections among 13–24 year-old males being attributed to male-to-male sexual transmission (2). These findings suggest an imperative need for public health professionals and researchers to attend to the prevention needs of young gay and bisexual men (YGBM).

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YGBM aged 18–29 are often referred to as ‘emerging adults’ in the literature, and this period has been identified as a unique developmental stage, yielding specific characteristics that need to be considered in understanding risk patterns for the purposes of better informed risk reduction strategies. Specifically, emerging adulthood is a period during which young people have attained adult status legally and physically, but may not yet have assumed the roles and responsibilities of full adulthood (3–5). Attitudes and behaviors surrounding sexual risk and substance use are still being crystallized, with a highly normative co-occurrence of these behaviors (6). Furthermore, youth may engage in sex before they have enough motivation or skills to protect themselves (7), while the number of partners and lack of condom use peak during emerging adulthood (8). A recent comprehensive review of the state of research on YGBM and HIV found that, despite their vulnerability to infection and increased risk, there is a dearth of interventions designed to address their specific needs that are informed by the most relevant social, epidemiological and behavioral aspects of their lives (9). Therefore, the focus of this paper is on emerging adult YGBM, given the importance of drawing new intervention development guidelines that are specific to their needs.

Sexual risk is exacerbated by substance use during sexual encounters, and YGBM have higher prevalence of substance use compared to the general population (10, 11). Attitudes towards condom use, particularly perceptions of the benefits of having sex without a condom, have been associated with sexual risk-taking among YGBM (12, 13). Additionally, mental health has been proven to be an important predictor of increased vulnerability to HIV infection among MSM (14–17), as anxiety and depression (independently and together) can affect not just risk behavior, but also one’s perceived benefits of unprotected sex. This study examines these precursors to sexual risk behavior together, with the goal of transitioning from viewing them in isolation to understanding their synergistic impact on condom use.

High rates of polydrug use have been documented among MSM, including YGBM (10, 16, 18–23). Previous research has found that drugs such as cocaine, methamphetamine, ecstasy, ketamine and gamma hydroxybutyrate (GHB) – sometimes referred to as “club drugs” (24–26) – are commonly used among YGBM, often in tandem with sexual activity (27–29). Examining sexual behavior in the context of substance use bears continued importance because of the strong and positive association between the use of drugs and high risk sex in YGBM. Drug use, particularly stimulant use, has been linked to unprotected anal sex (22, 30–34), HIV seroconversion (35–37), sexually transmitted infections (38–40), and multiple sex partners (33, 41).

As mentioned previously, attitudes towards and reasons behind condom use are also essential for HIV prevention purposes, as these ultimately influence subsequent condom use (13, 42–44). Not only do attitudes towards condoms have direct effects on sexual risk behaviors, they have recently been shown to moderate the relationship between methamphetamine use and risky sex among HIV-positive MSM (44). Some have found that perceived benefits, or the positive consequences, of unprotected sex, are more predictive of behavioral intentions and condom non-use than are perceived costs (12, 13, 45). Holding positive attitudes towards unprotected sex has been associated with increased acts of unprotected anal sex, number of sexual partners, and having serodiscordant sexual partners (42, 46). Recently, it has also been suggested that the desire for sexual intimacy and pleasure among gay and bisexual men may be at the root of these positive attitudes towards unprotected sex (47, 48).

The role of mental health in the sexual risk behavior of YGBM has been investigated to a great extent, most importantly because YGBM are at higher risk for and report increased levels of depression and anxiety compared to the general population (15, 49, 50). Reports of

elevated anxiety and depression among sexual minority men have been framed as consequences of stigmatization and homophobia (15, 51, 52). Some studies have found that higher levels of depression and anxiety are associated with increased sexual risk behavior and substance use in YGBM. Recent studies have found that anxiety is associated with unprotected anal sex (53–55), and higher numbers of sexual partners and substance use (56) among YGBM. Earlier studies found anxiety to have an inverse relationship with sexual risk for gay men in general, as it may inhibit one from engaging in unprotected sexual intercourse due to fear of contracting HIV (57, 58). Similarly, one meta-analysis examining the relationship between depression and sexual risk found this relationship to be positive in some studies, while lacking in statistical significance in others (59). This meta-analysis, however, encompassed various groups, and did not exclusively examine YGBM. Regardless, mental health among MSM of any age has been identified as an integral element to target for HIV prevention, because intervention efforts have been shown to be less successful in reducing sexual risk for those reporting high levels of depression (15). Therefore, it is important to monitor not only concomitant drug use and sexual risk patterns, but also their co-occurrence within the context of indicators of poor mental health.

The intersection of substance use, mental health, and attitudes towards unprotected sex gains significance in the context of HIV prevention. A long trajectory of preventive approaches has been established, predominantly targeting individual behavior rather than dyadic behavior occurring within relationships (60, 61). To date, HIV risk prevention and intervention efforts, particularly among YBGM have focused on behavioral patterns with casual sex partners (9), often because of the lack of sufficient information about HIV status and difficulties surrounding status disclosure and condom negotiation during episodic sexual encounters. Little prevention work has focused on YGBM in relationships, despite the finding that more than half of men engage in unprotected sex with their male main partners within the first three months of the relationship (62). However, attention to the partner context shifted dramatically when Sullivan and his colleagues (63) reported that 68% of incident HIV cases among MSM were attributed to main partners, whereas only 32% were attributed to casual partners. Although Davidovich and his colleagues in the Netherlands first reported on the increased risk of HIV transmission in the context of main partner relationships among gay men (64) a decade ago, it is only recently that researchers in the United States have really focused on the nature of same-sex relationships and HIV risk (65–68). Variability in condom use within and outside main partnerships needs further elucidation, alongside factors that may influence decisions to avert or assume risk with these types of sex partners.

The current paper examines the degree to which substance use, mental health (anxiety and depression) and attitudes towards unprotected sex predict unprotected anal sex acts with main and casual partners in a group of YGBM. We hypothesized that substance use, increased anxiety and depression, and perceived benefits of unprotected sex are likely to be associated with lack of condom use, alone and under the influence of drugs and alcohol, and that different patterns of risk would be observed when sex occurred with main versus casual partners. Both individual and interaction effects among these risk variables are of interest in this paper, as these factors are likely to impact behavior and cognition synergistically. Although some existing HIV prevention intervention models have yielded significant risk reductions, their effect sizes are modest and not sustainable over long periods of time (15). Continuing to identify essential risk relationships to be targeted would further fine-tune current prevention approaches to obtain effects sizes of higher magnitude and prolonged sustainability.

Methods

Participants

This article presents baseline data collected from YGBM recruited in the New York City (NYC) metropolitan area for the Young Men's Health Project, a study focused on illicit drug use and sexual risk behavior (55, 69, 70). Participants were recruited through a multi-method approach implemented in diverse geographic areas of NYC using techniques previously effective in the recruitment and enrollment of ethnically and racially diverse, substance-using MSM (34, 71). Both active and passive recruitment strategies were used. For active recruitment, recruiters screened potential participants for eligibility using Palm Pilots in a variety of venues catering to gay and bisexual men - including bars, sex venues, streets in predominately gay neighborhoods, and LGBT community events. For passive recruitment, tear-off flyers and project recruitment cards were distributed to potential participants or left on premises. These cards included a project phone number to be called for eligibility screening. These recruitment approaches were supplemented with internet-based efforts (recruitment via chat rooms and banner advertisements), friendship referrals, and print advertising in gay and non-gay publications. Study visits took place at a research center in NYC. Upon the completion of baseline assessment, participants were offered the option to enroll in a randomized controlled trial of a behavioral intervention. Participants were compensated \$40 for a 2-hour visit. All procedures were approved by the Institutional Review Board of the investigators' institution.

Between September 2007– 2010, the study conducted 1,951 eligibility screenings, of which 602 men were preliminarily eligible. Eligible participants were: male; at least 18 years of age; reported a negative or unknown HIV status; had used drugs – including cocaine, methamphetamine, GHB, ecstasy, Ketamine, or poppers – on at least 5 of the past 90 days; and had at least 1 incident of unsafe anal sex with a high risk partner (HIV+ or unknown status main partner or casual partners of any HIV status) in the past 90 days. A total of 351 eligible men presented for a baseline assessment, of which 36 men were dropped from the study for various reasons (e.g., participant-initiated withdrawal, having reported a false HIV negative/unknown status, incarceration, etc), resulting in a total sample of 315 men. As our interest is to document patterns of HIV risk associations within emerging adults, the current analyses drew on a subsample of the Young Men's Health Project by specifically including only YGBM between the ages of 18 and 29 ($n = 206$). The final analytic sample for this paper ($N = 188$) was limited to YGBM who reported anal sex during the 30-day assessment period and did not have an HIV-positive main partner. The sample was limited to sexually active participants in order to examine determinants of protected versus unprotected sex days, so participants not reporting any sexual events in the past 30 days ($n = 11$) were excluded. Participants with HIV-positive partners ($n = 7$) were excluded, because the dynamics of condom use among serodiscordant main partners differ significantly and there was an insufficient number of serodiscordant couples in the sample to allow for moderation analyses. At the day-level, 16 days (0.003 percent of the 5640 days analyzed) in which participants reported sex with both a 'main' and 'casual' partner were excluded from these analyses so that day-level data could be clearly classified by partner type.

Measures

Participants completed baseline assessments via audio computer-assisted self-interview (ACASI) software and an interviewer-administered interview. Data on participants' sexual activity and drug use 30 days prior to baseline assessment were collected using a Timeline Follow Back (TLFB) calendar interview (72). For each of the past 30 days, participants were asked if they engaged in anal sex, if a condom was used during the act, their relationship to each sex partner (main/casual), the HIV status (negative/positive/unknown) of each partner,

and if the sexual episode occurred under the influence of drugs and/or alcohol. Participants were also asked if they had engaged in heavy drinking or used cocaine, ketamine, ecstasy, crystal methamphetamine, GHB and/or poppers on each day regardless of any sexual activity on that day. Various important personal events (i.e., vacations, birthdays, paycheck days, parties) were reviewed retrospectively to prompt recall of daily sex and drug use, such that data were recorded on a personalized calendar.

The TLFB has previously demonstrated good test-retest reliability, convergent validity, and agreement with collateral reports for drug abuse (73), and for sexual behavior (74, 75), and has been previously utilized with substance-using MSM (34, 76, 77). Interviewers received extensive training in the administration of the TLFB, and demonstrated skills (as evidenced by ongoing review of audiotapes of the TLFB interviews and supervision) in the development of rapport with participants and remaining non-judgmental and sex-positive in order to facilitate honest self-reports and to respect the values and behaviors of all participants.

Type of Sex Day

A ‘main partner sex day’ was defined as a day when a participant had anal sex with a person with whom they had been in a committed relationship for at least 90 days, and who was either HIV-negative or had an ‘unknown’ HIV status. A ‘casual partner sex day’ occurred when a participant had anal sex with a person who was not defined as a ‘main partner.’

Odds of Not Using a Condom

Assignment of the relative risk of a participant’s day-level sexual activity during the 30-day TLFB measurement period was determined based on self-reported condom use during each episode of anal sex on a given day. If a participant did not use condoms with any partner on a given day, that day was categorized as a ‘no condom sex day,’ while always using a condom for every sex occurrence on a given day was categorized as a ‘condom sex day.’

Drug Use

Participant daily use of drugs was also recorded on the 30-day TLFB. Day-level use of individual drugs was used to create a composite variable that indicated if a participant used *any* of five drugs on any given day during the 30-day TLFB period: cocaine, ecstasy, methamphetamine, GHB and ketamine.

Mental Health Measures

Mental health status was assessed using the anxiety and depression subscales of the Brief Symptom Inventory (BSI, 12 items) (78); each scale consists of six items, with scores ranging from 0 to 23. Higher scores indicate more severe mental health issues. For the current study, the Cronbach’s alpha values for the anxiety and depression subscales were .84 and .86, respectively. Given that the independent effects of the two depression and anxiety subscales evidenced similar statistically significant relationships with our outcome, we decided to present data for the total BSI scale (anxiety and depression individual scores combined into a total score, $\alpha=.85$). This predictor was normed on its relative sample mean for analysis (Z-scores).

Attitudes toward Condom Use

Attitudes towards unprotected sex were measured by the Decisional Balance for Condom Use (DB) scale (79), adapted from Prochaska et al (1994) (80). Given the aims of the study, and previous research which has shown sexual risk among MSM is more driven by cognitive perceptions of the benefits of not using condoms (42, 79), analyses included only

the DB "Pros of Unsafe Sex" scale (DB-Pros) with items pertaining to favorable attitudes towards unprotected sex, and not those indicative of one's negative evaluations of unprotected sex. To measure their favorable attitudes towards unprotected sex, participants were asked to rate the importance of 10 statements, such as "Unprotected sex is more spontaneous" or "Using condoms helps me or my partner maintain an erection." Individual items were associated with the sensual pleasure derived from not using a condom, the opportunity for increased spontaneity in sexual behavior when not using a condom, and issues surrounding increased connection and trust with a sexual partner when having unprotected sex. Response options ranged from 0 – "Not at all" to 4 – "Extremely." Scores ranged from 0 to 40, where higher scores indicate the endorsement of more favorable attitudes towards unprotected sex. Inter-item reliability for the scales was high in this sample ($\alpha = .87$). As with the BSI, the DB-Pros scale was normed on its relative sample mean for analysis (Z-scores).

Statistical Analysis

The associations between substance use, mental health, attitudes toward condom use and the relative risk of not using a condom on a day when a participant had anal sex were modeled using General Estimating Procedures (GEE). GEE is used to control for intra-subject correlated responses across time which reduces bias in estimation of standard error increasing the accuracy of effect size estimation. We assumed that the working correlation matrix among our repeated measures was exchangeable given that our sample had a complete TLFB set for all cases, the effective 30-day data collection period began on a random day, and measurement of baseline mental health, perceived benefits of unprotected sex and the 30-day episodic type of anal sex and substance use occurred prior to implementation of any behavioral intervention.

The following steps were taken to estimate condom use using GEE procedures. Initial descriptive procedures were conducted to examine the demographic characteristics of the sample. Next, bivariate analyses examined the relationships between each predictor and outcome, including demographics. We conducted first order analyses looking at individual effects of predictors on outcomes, after which we regressed the outcome on each predictor individually. Significant relationships from first order analyses were then built into partial models, controlling for drug use. Lastly, interaction and partial GEE models were built using hierarchical techniques based on the significance of the parameters in the partial models. Analyses were conducted using SPSS version 17.0.

Results

Sample characteristics

Table 1 presents demographic characteristics of the sample. The mean age was 26.5 (SD = 2.5; range 18–29). The participants' racial and ethnic distribution was diverse, with 33% being Latino, 35% White, 20% Black and 12% of Other/Mixed background. The majority of the sample earned \$30,000 or below annually (65%) and held at least some college education (80%). The majority of participants self-identified as being gay (90%), while less than one quarter (18%) reported having a main partner. The latter group reported being in a relationship for a mean of 27.8 months (SD = 29.0, range 3–108).

Sex and Substance Use

In the 30 days prior to the baseline assessment, participants had a median of five anal sex days (mean = 6.0; SD = 4.5) ranging from one day ($n = 18$; 19.6%), to 26 days (data not shown). Only 24 participants (12.8%) always used a condom on a sex day, while 37 participants (19.8%) never used a condom (data not shown). The majority of participants

engaged in both high risk (no condom used with at least one partner) (87.2%) and low risk (condom used) (83.5%) anal sex (See Table 2). Most participants who reported sex with a main partner ($n = 34$) never used a condom on a sex day in which they had sex with their main partner (82.4%). Participants used substances a median of four days (Mean = 5.9 days; SD = 6.5) in the past 30 days. Any drug use ranged from none (17.0%) to one participant using drugs every day (data not shown). Participants most frequently used cocaine (70.2%), followed by ecstasy (31.9%), methamphetamine (19.7%), GHB (12.2%) and ketamine (10.6%).

Condom Use and Drugs

GEE first order analyses showed that the use of *any individual drug* increased the odds of not using a condom on a sex day (See Table 3). Relative to other drug use, Ketamine was a predictor of not using a condom on a sex day (OR = 4.36; $p = .052$), followed by methamphetamine (OR = 2.40; $p = .025$). Given that each drug contributed to the odds of not using a condom, we collapsed the daily use of individual substances into an 'any drug use' independent variable for further GEE analyses. This decision was supported via first order analysis as shown in Table 3; using any drug was highly and significantly associated with not using a condom on a sex day (OR = 2.15; $p < .001$).

Condom Use, Main Partner Sex Days, BSI and Benefits of Unprotected Sex

In the first order GEE analysis, the association between having a main partner sex day and the odds of not using a condom was only of borderline significance (OR = 2.62; $p = .08$) (Table 3). Similarly, sample normed BSI depression (OR = 1.04; $p = .096$) and anxiety (OR = 1.05; $p = .065$) scores were also only borderline significantly associated with the lack of condom use on a sex day. The BSI measures of depression and anxiety were highly correlated ($r = .724$; $p < .001$), creating substantive interpretation issues associated with multicollinearity if both variables were to be included in a single model. To address this issue, depression and anxiety were combined into a single indicator of mental health (total BSI) for model presentation. First order analysis of the BSI composite variable showed that, although not significantly associated with the odds of not using a condom, it retained sufficient predictive power (OR = 1.03; $p = .064$) for further analyses in the multivariate modeling process.

In contrast, the perceived benefits of unprotected sex subscale, the DB-Pros subscale of the DB scale, was significantly associated with not using a condom on a sex day; each unit increase in the perceived benefit scores increased the odds of not using a condom on a sex day by eight percent (OR = 1.08; $p < .001$) (Table 3). Given the significance of this first order effect, the sample normed perceived benefits score was retained for further GEE model building.

Multivariate GEE Models with Interactions

Table 4 shows the results from two partial interaction GEE models (M1 and M2) and the full parsimonious model (M3) predicting not using a condom on a sex day. Drug use had a constant and significant effect in all three models whereby participants who used drugs were more than twice as likely not to use a condom on a day when they had sex than were participants who did not use drugs, holding all other predictors constant within each of the models. Having a main partner sex day also had an acute effect on the odds of not using a condom in all three models, although its effect varied by the inclusion of other predictors.

Model 1 in Table 4 shows that the BSI total score becomes a significant predictor of not using a condom on a sex day (OR = 1.36; $p = .033$) when its (highly significant) interaction with the main partner sex day variable (OR = 0.15; $p < .001$) is also included in the GEE

model. Figure 1 illustrates the effects of including the *BSI total*/by *main partner sex day interaction* term in a model that also holds drug use constant. For those who had sex with their main partner on a given day, the odds of not using a condom decreased, as general depression/anxiety increased. For a casual partner sex day, the odds of not using a condom increased as depression/anxiety increased. Drug use maintained an independent effect on the odds of not using a condom (OR = 2.17; $p < .001$), regardless of main versus casual partner sex day status (OR = 4.25; $p = .012$).

Model 2 in Table 4 shows that the perceived benefits of unprotected sex score does not significantly interact with having a main partner sex day (OR = 2.01; $p = .169$), but maintains a constant independent effect on the odds of not using a condom (OR = 1.93; $p < .001$), when holding both main partner sex day (OR = 7.33; $p = .025$) and drug use (OR = 2.24; $p = .002$) constant in the model. Figure 2 illustrates the absence of statistical significance of the interaction term in this model, as indicated by the uniformly positive direction of the slopes across relative levels of the perceived benefit scores.

Model 3 in Table 4 is the fully parsimonious model. Again, both drug use (OR = 2.08; $p < .001$) and having a main partner sex day (OR = 5.36; $p < .001$) maintained their independent effect in this model, indicating a greater likelihood of not using a condom on a sex day when a participant used drugs or had a main partner sex day. The perceived benefit scores also retained their predictive power (OR = 1.92; $p < .001$), indicating that those who were fundamentally adverse to using a condom because it interfered with their pleasure or trust between any type of partner and their sexual experience, were also less likely to use a condom. However, while the BSI total was no longer a significant (OR = 1.16; $p = .148$) predictor of condom use when perceived benefit scores were held constant, its interaction with having a main partner sex day remained a powerful predictor (OR = 0.15; $p < .001$) of not using a condom on a sex day and therefore was retained in the model (which was not the case for the interaction between the perceived benefit score and having a main partner sex day). The interpretation of the effect of this interaction remains the same as in the partial model discussed above.

Discussion

Confirming existing evidence (22, 30–34), our analyses found that substance use strongly and significantly predicted high risk sex (odds of not using a condom). Further, the use of drugs increased the odds of not using condoms during anal sex at any level of participants' depression, anxiety or type of sex partner, therefore substance use should continue to be a target for prevention programs for YGBM. Similarly, our finding that perceived benefits of unprotected sex, such as the cognitive belief that not using condoms increases pleasure and intimacy and is an indicator of trust between sex partners, was predictive of unprotected sex, above and beyond substance use, supports earlier research (47, 48, 66, 81, 82). Lastly, neither mental health nor type of partner interacted with endorsements of benefits of unprotected sex, as the latter maintained its robust ability to predict odds of not using condoms when adjusting for all the other aspects of interest in this study.

Interestingly, although neither mental health nor having sex with a main partner independently predicted condom use on a sex day, when considered together, reports of increased anxiety and depression were predictive of condom use with main partners. The cross-sectional nature of the analyses prevents us from identifying the causal order of these effects. However, our results could be interpreted in the context of previous findings examining predictors of unprotected sex within main partnerships (66), which found that relationship satisfaction and trust are associated with unprotected sex with main partners. Perhaps, participants in our study who reported acute anxiety and depression also reported

more frequent condom use with main partners possibly due to a less comforting, trusting or satisfactory main partnership. Poorer mental health may catalyze self-preservation behaviors, which could be translated into using condoms with main partners who may not be trusted or able to provide a secure satisfactory relationship. Although a strong body of research (not focused on main partnerships) has supported the positive association between elevated levels of anxiety and depression and unprotected sex (15, 16, 55), other studies have shown that poorer mental health may be a protective factor against sexual risk (57, 58). Depressed or anxious affective states may be associated with increased concerns around physical health, which may extend to enhanced worries around the safety of sex. In such cases, the use of condoms with main partners may represent a way for the couple to simultaneously experience physical/sexual closeness, while also reducing the concerns and anxieties of the depressed or anxious partner related to the safety of sexual contact. These findings, therefore, suggest the need for continued research of the intersections of mental health and sexual behavior among male couples, in order to draw clearer implications for the development of dyadic risk reduction interventions.

We found opposite trends when examining condom use with casual partners in conjunction with mental health. Specifically, those with higher levels of anxiety and depression had increased odds of not using condoms. Indeed, our findings support existing evidence of the positive association between risky sex and poorer mental health (53, 54, 56), including reports on instances of unprotected sex with casual partners and HIV-positive main partners (55). Our data provide further support for theories of minority stress (51) and syndemics (16, 17), where sexual minority men experience a conglomerate of adverse factors, which synergistically compound to create increased odds of engagement in risk and general negative health outcomes. Further, the association between lower depression and anxiety reports and condom use with casual partners may be explained by the fact that good mental health allows one to tend to personal health goals and success of existing HIV prevention interventions. These findings suggest the need to preserve good mental health as an effective moderator of keeping sexual risk in casual encounters at bay.

Our analyses present several limitations. The cross-sectional nature of the analyses does not lend itself to establishing the direction of effects, or a temporal sequence of events, as mentioned previously. For example, is pre-existing poor mental health a determinant of sexual risk or was engaging in sexual risk a catalyst for increases in depression and anxiety? Longitudinal analyses, which will be feasible given the multiple time points of data collection for the larger Young Men's Health Project, have the potential to clarify the direction of the relationship between mental health and sexual risk. Further, our findings reflect patterns of association reported by GBM in an urban environment, which in itself is likely to affect substance use, mental health and relationship characteristics (reflected in sexual behavior) in ways that other settings may not. Generalizations to other types of samples should be done with caution, especially in applying these findings to inform prevention efforts. Additionally, the sample's mean age was 26.5, which indicates that findings may be more applicable for those closer to age 29 than 18, who are also in a different stage of professional and social development than their younger counterparts. Lastly, as explained in our methods section, we had to exclude certain participants (those reporting having HIV+ partners) and sexual activity days (when sex occurred with both 'main' and 'casual' partners), therefore our findings need to be interpreted with these considerations in mind.

These findings strongly suggest that examination of contexts surrounding main partner relationship characteristics, satisfaction, types of sexual agreements and possible violations of those would elucidate what determines those with poorer mental health to use condoms and those with no evidence of anxiety or depression not to use condoms when having sex

with their main partners. It is not surprising that the rate of condom use was higher during sex with casual partners, which is likely to be a result of the established tradition of HIV prevention interventions successfully targeting sex with casual partners (76, 83). However, as the majority of new HIV incident cases for partnered men has been attributed to their main partners (63), we may consider expanding the definition of “sexual risk” to main partnerships, and carefully considering relationship agreements, degree of monogamy versus non-monogamy, and other factors that are salient to HIV risk transmission (e.g., agreement violations, condom negotiation, power relations) (66, 84).

Variability in condom use within and outside main partnerships among YGBM needs further examination, alongside factors that may influence decisions around substance and condom use with main versus casual partners. While the current data do not lend themselves to such investigations, recent evidence has begun to elucidate relationship aspects that are associated with concurrence of unprotected sex with main and casual partners. For example, having a sexual agreement, as well as partner commitment to that agreement were indicators of engaging in protected sex with causal (secondary) partners while practicing unprotected sex with main partners (66). Gay couples-based interventions to prevent HIV transmission, but also to maintain healthy relationships, are currently under development, and emergent research of principal components that need to be incorporated is essential. Findings like those by Golub and her colleagues (47), in particular, indicate that the desire for intimacy, more so than the desire for pleasure, is a strong predictor of unprotected sex with casual partners. The pivotal role played by the desire for intimacy in engaging in unprotected sex with casual partners, advocates for its inclusion in interventions and further testing of the moderating role that could be attributed to it. These elements inform not only developing couples’ therapeutic models, but also perhaps a novel counseling approach that engages single men or men in relationships whose partners are not interested in participation. Discussions of the roles played by intimacy (47), having concordant understandings of and maintaining sexual relationship agreements (85) and having recently tested for HIV (66) could be essential issues to raise in a counseling context, where gay men could learn how to negotiate these aspects with their main and casual partners. Furthermore, as Motivational Interviewing has proven to be an efficacious approach to behavioral change and increasing motivation towards it (34, 86–89), its techniques could feasibly be taught to gay men to use in their communication with their sexual and romantic partners to discuss relationship agreements, testing and the desire of intimacy and trust, in relation to unprotected sex within and/or outside main partnerships.

As dyadic prevention gains momentum, in order to identify points of intervention, much remains to be elucidated about partner dynamics framing the conditions under which risk is likely to occur. Further, mental health emerges, once more, as an essential aspect to be addressed by prevention given that more acute depression and anxiety scores are associated, as previous research also attests, with increased odds of not using condoms during sex with casual partners. Prevention packages that adopt a concomitant outlook on dyads and those who may not currently be in relationships would provide additional safety nets by tending to sex with both main and casual partners. The lower occurrences of condomless sex with casual partners found in these analyses potentially provide a positive evaluation of the success of interventions targeting casual sex. These should still remain on our intervention agendas, as dyadic prevention begins to have a stronger presence. Lastly, although previous research established the factors examined in this paper as individual antecedents to risk behavior, understanding their synergistic impact on the odds of not using condoms is important for more targeted prevention.

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References

- Centers for Disease Control and Prevention. HIV surveillance in men who have sex with men (MSM). Atlanta, GC: Center for Disease Control and Prevention; 2011. Available from: <http://www.cdc.gov/hiv/topics/surveillance/resources/slides/msm/index.htm>
- Centers for Disease Control and Prevention. HIV surveillance in adolescents and young adults. Atlanta, GC: Center for Disease Control and Prevention; 2011. Available from: <http://www.cdc.gov/hiv/topics/surveillance/resources/slides/adolescents/>
- Arnett J. Emerging adulthood: A theory of development from the late teens through the twenties. *Am Psychol*. 2000; 55(5):469–480. [PubMed: 10842426]
- Cooke R, Clark D. Is there an association between alcohol consumption and sexually transmitted diseases? A systematic review. *Sex Transm Dis*. 2005; 32(3):156–164. [PubMed: 15729152]
- Stoner S, George W, Peters L, Norris J. Liquid courage: alcohol fosters risky sexual decision-making in individuals with sexual fears. *AIDS Behav*. 2007; 11(2):227–237. [PubMed: 16802196]
- Wells BE, Kelly BC, Golub SA, Grov C, Parsons JT. Patterns of alcohol consumption and sexual behavior among young adults in nightclubs. *Am J Drug Alcohol Abuse*. 2010; 36(1):39–45. [PubMed: 20141395]
- Schuster C, O'Malley P, Bachman J, Johnston L, Schulenberg J. Adolescent marijuana use and adult occupational attainment: A longitudinal study from age 18 to 28. *Subst Use Misuse*. 2001; 36(8):997–1014. [PubMed: 11504156]
- Fergus S, Zimmerman M, Caldwell C. Growth trajectories of sexual risk behavior in adolescence and young adulthood. *Am J Public Health*. 2007; 97(6):1096. [PubMed: 17463379]
- Mustanski BS, Newcomb ME, Du Bois SN, Garcia SC, Grov C. HIV in Young Men Who Have Sex with Men: A Review of Epidemiology, Risk and Protective Factors, and Interventions. *J Sex Res*. 2011; 48(2):218–253. [PubMed: 21409715]
- Corliss HL, Rosario M, Wypij D, Wylie SA, Frazier AL, Austin SB. Sexual orientation and drug use in a longitudinal cohort study of U.S. adolescents. *Addict Behav*. 2010; 35(5):517–521. [PubMed: 20061091]
- Grov C, Bimbi DS, Nanín JE, Parsons JT. Race, ethnicity, gender, and generational factors associated with the coming-out process among gay, lesbian, and bisexual individuals. *J Sex Res*. 2006; 43(2):115–121. [PubMed: 16817058]
- Parsons J, Siegel A, Cousins J. Late adolescent risk-taking: effects of perceived benefits and perceived risks on behavioral intentions and behavioral change. *J Adolesc*. 1997; 20(4):381–392. [PubMed: 9268413]
- Parsons J, Halkitis P, Bimbi D, Borkowski T. Perceptions of the benefits and costs associated with condom use and unprotected sex among late adolescent college students. *J Adolesc*. 2000; 23(4):377–391. [PubMed: 10936012]
- Mustanski B, Garofalo R, Herrick A, Donenberg G. Psychosocial health problems increase risk for HIV among urban young men who have sex with men: Preliminary evidence of a syndemic in need of attention. *Ann Behav Med*. 2007; 34(1):37–45. [PubMed: 17688395]
- Safren SA, Reisner SL, Herrick A, Mimiaga MJ, Stall RD. Mental health and HIV risk in men who have sex with men. *JAIDS*. 2010; 55:S74. [PubMed: 21406991]
- Stall R, Mills TC, Williamson J, Hart T, Greenwood G, Paul J, et al. Association of co-occurring psychosocial health problems and increased vulnerability to HIV/AIDS among urban men who have sex with men. *Am J Public Health*. 2003; 93(6):939. [PubMed: 12773359]

17. Parsons JT, Grov C, Golub SA. Sexual Compulsivity, Co-Occurring Psychosocial Health Problems, and HIV Risk Among Gay and Bisexual Men: Further Evidence of a Syndemic. *Am J Public Health*. 2012; 102(1):156–162. [PubMed: 22095358]
18. Nanín JE, Parsons JT. Club drug use and risky sex among gay and bisexual men in New York City. *J Gay & Lesbian Psychotherapy*. 2006; 10(3):111–122.
19. Patterson TL, Semple SJ, Zians JK, Strathdee SA. Methamphetamine-using HIV-positive men who have sex with men: correlates of polydrug use. *J Urban Health*. 2005; 82:120–126.
20. Fernandez MI, Perrino T, Bowen GS, Hernandez N, Cardenas SA, Marsh D, et al. Club drug use, sexual behavior, and HIV risk among community and internet samples of Hispanic MSM: implications for clinicians. *J Soc Work Pract and Addict*. 2005; 5(4):81–100.
21. Halkitis P, Moeller R, Siconolfi D, Jerome R, Rogers M, Schillinger J. Methamphetamine and poly-substance use among gym-attending men who have sex with men in New York City. *Ann Behav Med*. 2008; 35(1):41–48. [PubMed: 18347903]
22. Lim SH, Ostrow D, Stall R, Chmiel J, Herrick A, Shoptaw S, et al. Changes in stimulant drug use over time in the MACS: Evidence for resilience against stimulant drug use among men who have sex with men. *AIDS Behav*. 2010:1–8. [PubMed: 18843530]
23. Thiede H, Valleroy LA, MacKellar DA, Celentano DD, Ford WL, Hagan H, et al. Regional patterns and correlates of substance use among young men who have sex with men in 7 US urban areas. *Am J Public Health*. 2003; 93(11):1915. [PubMed: 14600066]
24. Kelly B, Parsons J, Wells B. Prevalence and predictors of club drug use among club-going young adults in New York city. *J Urban Health*. 2006; 83(5):884–895. [PubMed: 16937088]
25. Parsons J, Halkitis P, Bimbi D. Club drug use among young adults frequenting dance clubs and other social venues in New York City. *J Child Adoles Subst*. 2006; 15(3):1–14.
26. Romanelli F, Smith KM, Pomeroy C. Use of club drugs by HIV-seropositive and HIV-seronegative gay and bisexual men. *Topics in HIV medicine: a publication of the International AIDS Society, USA*. 2003; 11(1):25.
27. Parsons JT, Kutnick AH, Halkitis PN, Punzalan JC, Carbonari JP. Sexual risk behaviors and substance use among alcohol abusing HIV-positive men who have sex with men. *J Psychoactive Drugs*. 2005; 37(1):27. [PubMed: 15916249]
28. Purcell D, Moss S, Remien R, Woods W, Parsons J. Illicit substance use, sexual risk, and HIV-positive gay and bisexual men: differences by serostatus of casual partners. *AIDS*. 2005; 19:S37. [PubMed: 15838193]
29. Purcell DW, Parsons JT, Halkitis PN, Mizuno Y, Woods WJ. Substance use and sexual transmission risk behavior of HIV-positive men who have sex with men. *J Subst Abuse*. 2001; 13(1–2):185–200. [PubMed: 11547619]
30. Mimiaga MJ, Reisner SL, Fontaine YM, Bland SE, Driscoll MA, Isenberg D, et al. Walking the line: Stimulant use during sex and HIV risk behavior among Black urban MSM. *Drug Alcohol Depend*. 2010; 110(1–2):30–37. [PubMed: 20334986]
31. Celentano DD, Valleroy LA, Sifakis F, MacKellar DA, Hylton J, Thiede H, et al. Associations between substance use and sexual risk among very young men who have sex with men. *Sex Transm Dis*. 2006 Apr; 33(4):265–271. [PubMed: 16434886]
32. Grov C, Parsons J, Bimbi D. In the shadows of a prevention campaign: Sexual risk behavior in the absence of crystal methamphetamine. *AIDS Educ Prev*. 2008; 20(1):42–55. [PubMed: 18312066]
33. Koblin B, Chesney M, Husnik M, Bozeman S, Celum C, Buchbinder S, et al. High-risk behaviors among men who have sex with men in 6 US cities: baseline data from the EXPLORE Study. *Am J Public Health*. 2003; 93(6):926. [PubMed: 12773357]
34. Morgenstern J, Bux D Jr, Parsons J, Hagman B, Wainberg M, Irwin T. Randomized trial to reduce club drug use and HIV risk behaviors among men who have sex with men. *J Cons Clin Psychol*. 2009; 77(4):645–656.
35. Koblin BA, Husnik MJ, Colfax G, Huang Y, Madison M, Mayer K, et al. Risk factors for HIV infection among men who have sex with men. *AIDS*. 2006 Mar 21; 20(5):731–739. [PubMed: 16514304]

36. Buchacz K, McFarland W, Kellogg T, Loeb L, Holmberg S, Dilley J, et al. Amphetamine use is associated with increased HIV incidence among men who have sex with men in San Francisco. *AIDS*. 2005; 19(13):1423. [PubMed: 16103774]
37. Plankey M, Ostrow D, Stall R, Cox C, Li X, Peck J, et al. The relationship between methamphetamine and popper use and risk of HIV seroconversion in the multicenter AIDS cohort study. *JAIDS*. 2007; 45(1):85. [PubMed: 17325605]
38. Diamond C, Thiede H, Perdue T, MacKELLAR D, Valleroy LA, Corey L. Seroepidemiology of human herpesvirus 8 among young men who have sex with men. *Sex Transm Dis*. 2001; 28(3): 176. [PubMed: 11289201]
39. Hirshfield S, Remien RH, Walavalkar I, Chiasson MA. Crystal methamphetamine use predicts incident STD infection among men who have sex with men recruited online: a nested case-control study. *J Med Internet Research*. 2004; 6(4)
40. Wong W, Chaw JK, Kent CK, Klausner JD. Risk factors for early syphilis among gay and bisexual men seen in an STD clinic: San Francisco, 2002–2003. *Sex Trans Dis*. 2005; 32(7):458.
41. Centers for Disease Control and Prevention. [cited 2010 February 2] NHBS: HIV Risk and Testing Behaviors Among Young MSM. 2009. Available from: <http://www.cdc.gov/hiv/topics/msm/ymsm.htm>
42. Bauermeister JA, Carballo-Diéguez A, Ventuneac A, Dolezal C. Assessing motivations to engage in intentional condomless anal intercourse in HIV-risk contexts (“bareback sex”) among men who have sex with men. *AIDS Ed Prev*. 2009; 21(2):156.
43. Benotsch EG, Kalichman S, Cage M. Men who have met sex partners via the Internet: Prevalence, predictors, and implications for HIV prevention. *Arch Sex Behav*. 2002; 31(2):177–183. [PubMed: 11974643]
44. Nakamura N, Mausbach BT, Ulibarri MD, Semple SJ, Patterson TL. Methamphetamine Use, Attitudes About Condoms, and Sexual Risk Behavior Among HIV-Positive Men Who Have Sex with Men. *Arch Sex Behav*. :1–6.
45. Moore S, Gullone E. Predicting adolescent risk behavior using a personalized cost-benefit analysis. *J Youth Adolescence*. 1996; 25(3):343–359.
46. Halkitis P, Parsons J, Wilton L. Barebacking among gay and bisexual men in New York City: explanations for the emergence of intentional unsafe behavior. *Arch Sex Behav*. 2003; 32(4):351–357. [PubMed: 12856896]
47. Golub SA, Starks TJ, Payton G, Parsons JT. The critical role of intimacy in the sexual risk behaviors of gay and bisexual men. *AIDS Behav*. 2011 Jun 1.:1–7. [Epub ahead of print]. [PubMed: 20683650]
48. Blais M. Vulnerability to HIV among regular male partners and the social coding of intimacy in modern societies. *Cult Health Sex*. 2006;31–44. [PubMed: 16500823]
49. Cochran SD, Sullivan JG, Mays VM. Prevalence of mental disorders, psychological distress, and mental health services use among lesbian, gay, bisexual adults in the United States. *J Consult Clin Psycho*. 2003; 71(1):53–61.
50. Balsam KF, Huang B, Fieland KC, Simoni JM, Walters KL. Culture, trauma, and wellness: a comparison of heterosexual and lesbian, gay, bisexual, and two-spirit native americans. *Cultur Divers Ethnic Minor Psychol*. 2004; 10(3):287. [PubMed: 15311980]
51. Meyer IH. Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: Conceptual issues and research evidence. *Psychol Bull*. 2003; 129(5):674. [PubMed: 12956539]
52. Safren SA, Heimberg RG. Depression, hopelessness, suicidality, and related factors in sexual minority and heterosexual adolescents. *J Consult Clin Psychol*. 1999; 67(6):859. [PubMed: 10596508]
53. Hart TA, Heimberg RG. Social anxiety as a risk factor for unprotected intercourse among gay and bisexual male youth. *AIDS Behav*. 2005; 9(4):505–512. [PubMed: 16205961]
54. Yi H, Sandfort TGM, Shidlo A. Effects of disengagement coping with HIV risk on unprotected sex among HIV-negative gay men in New York City. *Health Psychol*. 2010; 29(2):205–214. [PubMed: 20230094]

55. Lelutiu-Weinberger C, Pachankis JE, Walker JJ, Bamonte A, Golub SA, Parsons JT. Age cohort differences in the effects of gay-related stigma, anxiety and identification with the gay community on risky sex and substance use. *AIDS Behav.* 2011 Oct 30. [Epub ahead of print].
56. Rosario M, Schrimshaw EW, Hunter J. A model of sexual risk behaviors among young gay and bisexual men: Longitudinal associations of mental health, substance abuse, sexual abuse, and the coming-out process. *AIDS Educ Prev.* 2006; 18(5):444–460. [PubMed: 17067255]
57. Bancroft J, Janssen E, Strong D, Carnes L, Vukadinovic Z, Long JS. Sexual Risk-Taking in Gay Men: The Relevance of Sexual Arousability, Mood, and Sensation Seeking. *Arch Sex Behav.* 2003; 32(6):555–572. [PubMed: 14574099]
58. Schönnesson LN, Dolezal C. HIV-related risk factors among Swedish gay men. *Scandinavian J Sex.* 1998; 1(1):51–62.
59. Crepaz N, Marks G. Towards an understanding of sexual risk behavior in people living with HIV: a review of social, psychological, and medical findings. *AIDS.* 2002; 16(2):135. [PubMed: 11807297]
60. Misovich SJ, Fisher JD, Fisher WA. Close relationships and elevated HIV risk behavior: Evidence and possible underlying psychological processes. *Review Gen Psychol.* 1997; 1(1):72.
61. Karney BR, Hops H, Redding CA, Reis HT, Rothman AJ, Simpson JA. A framework for incorporating dyads in models of HIV-prevention. *AIDS Behav.* 2010:1–15. [PubMed: 18843530]
62. Davidovich U, Wit JBF, Stroebe W. Behavioral and cognitive barriers to safer sex between men in steady relationships: implications for prevention strategies. *AIDS Ed Prev.* 2004; 16(4):304–314.
63. Sullivan PS, Salazar L, Buchbinder S, Sanchez TH. Estimating the proportion of HIV transmissions from main sex partners among men who have sex with men in five US cities. *AIDS.* 2009; 23(9):1153. [PubMed: 19417579]
64. Davidovich U, de Wit J, Albrecht N, Geskus R, Stroebe W, Coutinho R. Increase in the share of steady partners as a source of HIV infection: a 17-year study of seroconversion among gay men. *AIDS.* 2001; 15(10):1303. [PubMed: 11426076]
65. Mustanski B, Newcomb ME, Clerkin EM. Relationship characteristics and sexual risk-taking in young men who have sex with men. *Health Psychol.* 2011; 30(5):597–605. [PubMed: 21604883]
66. Mitchell JW, Harvey SM, Champeau D, Seal DW. Relationship Factors Associated with HIV Risk Among a Sample of Gay Male Couples. *AIDS Behav.* 2011 May 26.:1–8. [Epub ahead of print]. [PubMed: 20683650]
67. Parsons JT, Starks TJ, Du Bois SN, Grov C, Golub SA. Alternatives to Monogamy among Gay Male Couples in a Community Survey: Implications for Mental Health. *Arch Sex Behav.* In Press.
68. Hoff CC, Beougher SC, Chakravarty D, Darbes LA, Neilands TB. Relationship characteristics and motivations behind agreements among gay male couples: differences by agreement type and couple serostatus. *AIDS Care.* 2010; 22(7):827–835. [PubMed: 20635246]
69. Golub SA, Kowalczyk W, Weinberger CL, Parsons JT. Preexposure prophylaxis and predicted condom use among high-risk men who have sex with men. *JAIDS.* 2010; 54(5):548. [PubMed: 20512046]
70. Wells BE, Golub SA, Parsons JT. An Integrated Theoretical Approach to Substance Use and Risky Sexual Behavior Among Men Who Have Sex with Men. *AIDS Behav.* 2010; 15(3):509–520. [PubMed: 20677019]
71. Grov C, Bux D Jr, Parsons J, Morgenstern J. Recruiting Hard-to-Reach Drug-Using Men Who Have Sex With Men into an Intervention Study: Lessons Learned and Implications for Applied Research. *Subst Use Misuse.* 2009; 44(13):1855–1871. [PubMed: 20001284]
72. Sobell, M.; Sobell, L. Problem drinkers: Guided self-change treatment. New York, NY: Guilford Press; 1993.
73. Fals-Stewart W, O'Farrell T, Freitas T, McFarlin S, Rutigliano P. The timeline followback reports of psychoactive substance use by drug-abusing patients: psychometric properties. *J Consult Clin Psychol.* 2000; 68(1):134–144. [PubMed: 10710848]
74. Weinhardt L, Carey M, Maisto S, Carey K, Cohen M, Wickramasinghe S. Reliability of the timeline follow-back sexual behavior interview. *Ann Behav Med.* 1998; 20(1):25–30. [PubMed: 9755348]

75. Carey M, Carey K, Maisto S, Gordon C, Weinhardt L. Assessing sexual risk behaviour with the Timeline Followback (TLFB) approach: continued development and psychometric evaluation with psychiatric outpatients. *Int J STD AIDS*. 2001; 12(6):365. [PubMed: 11368817]
76. Velasquez MM, von Sternberg K, Johnson DH, Green C, Carbonari JP, Parsons JT. Reducing sexual risk behaviors and alcohol use among HIV-positive men who have sex with men: a randomized clinical trial. *J Consult Clin Psychol*. 2009 Aug; 77(4):657–667. [PubMed: 19634959]
77. Irwin TW, Morgenstern J, Parsons JT, Wainberg M, Labouvie E. Alcohol and sexual HIV risk behavior among problem drinking men who have sex with men: An event level analysis of timeline followback data. *AIDS Behav*. 2006 May; 10(3):299–307. [PubMed: 16482407]
78. Derogatis LR, Melisaratos N. The Brief Symptom Inventory: an introductory report. *Psychol Med*. 1983 Aug; 13(3):595–605. [PubMed: 6622612]
79. Parsons JT, Halkitis PN, Borkowski T, Bimbi D. Perceptions of the benefits and costs associated with condom use and unprotected sex among late adolescent college students. *J Adolesc*. 2000; 23:377–391. [PubMed: 10936012]
80. Prochaska JO, Velicer WF, Rossi JS, Goldstein MG, Marcus BH, Rakowski W, et al. Stages of Change and Decisional Balance for 12 Problem Behaviors. *Health Psychol*. 1994; 13:39–46. [PubMed: 8168470]
81. Appleby PR, Miller LC, Rothspan S. The paradox of trust for male couples: When risking is a part of loving. *Pers Relat*. 1999; 6(1):81–93.
82. McNeal JL. The association of idealization and intimacy factors with condom use in gay male couples. *J Clin Psychol Med Settings*. 1997; 4(4):437–451. [PubMed: 12348422]
83. Mausbach BT, Semple SJ, Strathdee SA, Zians J, Patterson TL. Efficacy of a behavioral intervention for increasing safer sex behaviors in HIV-positive MSM methamphetamine users: results from the EDGE study. *Drug Alcohol Depend*. 2007; 87(2–3):249–257. [PubMed: 17182196]
84. Parsons JT, Starks TJ, Dubois S, Grov C, Golub SA. Challenging the privileged status of heterosexual partnership benefits and monogamous arrangements in gay and bisexual male couples: Findings from a community survey. *Arch Sex Behav*. In Press.
85. Mitchell JW, Harvey SM, Champeau D, Moskowitz DA, Seal DW. Relationship Factors Associated with Gay Male Couples' Concordance on Aspects of Their Sexual Agreements: Establishment, Type, and Adherence. *AIDS Behav*. 2011:1–10. [PubMed: 20683650]
86. Morgenstern J, Irwin T, Wainberg M, Parsons J, Muench F, Bux D, et al. A randomized controlled trial of goal choice interventions for alcohol use disorders among men who have sex with men. *J Consult Clinical Psychol*. 2007; 75(1):72. [PubMed: 17295566]
87. Naar-King S, Lam P, Wang B, Wright K, Parsons J, Frey M. Brief Report: Maintenance of Effects of Motivational Enhancement Therapy to Improve Risk Behaviors and HIV-related Health in a Randomized Controlled Trial of Youth Living with HIV. *J Pediatr Psychol*. 2008; 33(4):441. [PubMed: 17905800]
88. Naar-King S, Outlaw A, Green-Jones M, Wright K, Parsons JT. Motivational interviewing by peer outreach workers: a pilot randomized clinical trial to retain adolescents and young adults in HIV care. *AIDS Care*. 2009 Jul; 21(7):868–873. [PubMed: 20024744]
89. Outlaw AY, Naar-King S, Parsons JT, Green-Jones M, Janisse H, Secord E. Using Motivational Interviewing In HIV Field Outreach With Young African American Men Who Have Sex With Men: A Randomized Clinical Trial. *Am J Public Health*. 2010; 100(S1):46–51.

Figure 1.
Log Odds of Not Using a Condom and Brief Symptom Inventory Interaction (Model 1)

Figure 2.
Log Odds of Not Using a Condom and Benefits of Unprotected Sex (Model 2)

Table 1

Sample demographics of young drug-using gay and bisexual men in New York City (N= 188).

	<i>n</i>	<i>%</i>
<i>Race/Ethnicity</i>		
Black	38	20.2
Latino	62	32.9
White	66	35.1
Other/Mixed	22	11.8
<i>Education</i>		
Less than College	37	19.7
Some College	76	40.4
College Graduate	64	34.0
Post Graduate Participation	11	5.9
<i>Employment</i>		
Full-time	64	34.0
Part-time	49	26.0
Student	21	11.2
Unemployed	54	28.8
<i>Income</i>		
<30K	123	65.4
>30K	65	34.6
<i>Parental Social/Economic Class</i>		
Working Class or Poor	68	36.2
Middle Class and Above	120	63.8
<i>Sexual Orientation</i>		
Gay	170	90.4
Bisexual	18	9.6
<i>Partnered</i>		
Yes	34	18.1
No	154	81.9
<i>Live with Partner (for partnered men)</i>		
Yes	13	38.2
No	21	61.8

Table 2

Sexual risk and substance use among young drug-using gay and bisexual men in New York City.

	<i>N</i>	<i>%</i>	<i>Mean</i>	<i>S.D.</i>
<i>Full Sample (N = 188)</i>				
Any Sex Day	188	100.0	6.0	4.5
No condom sex day	164	87.2	3.0	3.8
Condom sex day	157	83.5	3.4	3.7
<i>Non-Partnered Participants (n = 154)</i>				
Any Sex Day	154	100.0	5.4	4.2
No condom sex day	136	88.3	3.1	4.0
Condom sex day	123	79.9	2.7	3.0
<i>Partnered Participants (n = 34)</i>				
Any Sex Day *	34	100.0	8.5	5.0
No condom sex day	28	87.4	2.5	3.1
Condom sex day	34	100.0	6.4	4.9
<i>Full sample substance use (N = 188)</i>				
Any drug	156	83.0	5.9	6.5
Cocaine	132	70.2	4.4	5.7
Ecstasy	60	31.9	1.2	3.0
Methamphetamine	37	19.7	1.0	3.5
GHB **	23	12.2	0.6	2.1
Ketamine	20	10.6	0.3	1.6

* For Partnered Participants, Any Sex Day, No Condom Sex day and Condom Sex Day includes sex with both Main and Casual Partners.

** GHB = gamma hydroxybutyrate

Table 3

First order odds of not using a condom on a sex day by drug use, BSI Total/Depression/Anxiety scores and Benefits of Unprotected Sex scores.

	<i>OR</i>	<i>C.I.</i>	<i>P</i>
Main partner sex day	2.62	0.89/7.73	.080
Any drug	2.15	1.43/3.23	.000
Cocaine	2.22	1.39/3.56	.001
Ecstasy	1.43	0.76/2.67	.267
Methamphetamine	2.40	1.11/5.16	.025
GHB *	2.33	1.02/5.35	.046
Ketamine	4.36	0.99/19.20	.052
BSI ** Total Score	1.03	1.00/1.05	.064
Depression	1.04	0.99/1.09	.096
Anxiety	1.05	1.00/1.11	.065
Benefits of Unprotected Sex	1.08	1.05/1.11	.000

* GHB = gamma hydroxybutyrate

** BSI = Brief Symptom Inventory Scale

Table 4

Models for odds of not using a condom on a sex day among young drug-using gay and bisexual men in New York City.

	<i><u>OR</u></i>	<i><u>C.I.</u></i>	<i><u>p</u></i>
<i>M1: Partial Model using BSI Total Score</i>			
Intercept	0.99	0.74/1.32	.959
Any drug	2.17	1.47/3.20	.000
Main partner sex day	4.25	1.38/13.04	.012
BSI Total Score	1.36	1.11/1.66	.033
BSI*Main partner sex	0.15	0.06/0.38	.000
<i>M2: Partial Model using Benefits of Unprotected Sex</i>			
Intercept	0.97	0.74/1.28	.853
Any drug	2.24	1.57/3.20	.002
Main partner sex day	7.33	1.90/28.28	.025
Benefits of unprotected sex	1.93	1.52/2.45	.000
Benefits * Main partner sex	2.01	0.50/8.05	.169
<i>M3: Final Parsimonious Model</i>			
Intercept	0.98	0.74/1.30	.982
Any drug	2.08	1.45/2.98	.000
Main partner sex day	5.36	1.98/14.50	.001
BSI Total Score	1.16	0.95/1.43	.148
Benefits of unprotected sex	1.92	1.52/2.45	.000
BSI * Main partner sex day	0.15	0.06/0.40	.000

BSI= Brief Symptom Inventory Scale