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Sexual Partner Typologies among Single Young Men who Have Sex with Men

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Abstract

Using data from a sample of single YMSM (N=1,359; ages 18-24; 65% White; 93% gay), we examined whether the number of unprotected anal intercourse (UAI) partners with differed across relationship typologies (e.g., friends with benefits, hookups, romantic interests). We then examined how safer sex self-efficacy, decisional balance to forego condoms, ideal relationship attributes (i.e., intimacy, passion and commitment), and limerence were associated with UAI. Different partner types were associated with greater UAI partners; single partner types were associated with fewer UAI partners, irrespective of how they were categorized. UAI partners was associated with decisional balance (OR=1.89; $p<.001$), passion ideation (OR=1.38; $p<.001$), and difficulty negotiating safer sex with romantic partners (OR=1.16; $p<.001$). Odds of UAI partners decreased with higher scores of commitment ideation (OR=.91; $p<.05$) and difficulty negotiating safer sex with casual partners (OR=.96; $p<.05$). We discuss the importance of acknowledging how different sexual partnerships, alongside its motivational correlates, influence UAI risk in order to inform HIV-prevention interventions.

Keywords

love; limerence; ideation; gay; self-efficacy

INTRODUCTION

The alarming resurgence of new HIV/AIDS cases among young men who have sex with men (YMSM) has highlighted the importance of re-examining prevention modalities and behavior change strategies [1,2]. The disproportionate incidence of new cases among YMSM coincides with a series of developmental milestones as adolescents transition into young adulthood [3,4], including the pursuit of relationships through dating behaviors, whether they be for sexual and/or romantic purposes. Compared to heterosexual counterparts, however, YMSM may not readily receive support and advice from family, peer and school systems on how to date and seek out same-sex partners [5,6]. Furthermore, YMSM do not receive instruction on how to have anal sex as part of their sex education

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[7,8] nor guidance on how to negotiate condom use with their partners [9]. This is particularly problematic as YMSM's participation in dating behaviors during this period coincides with their mean age of initiating anal sex [4,10,11], and may create unique vulnerabilities for unprotected anal intercourse (UAI) as they engage in partner-seeking behaviors. Consequently, it is vital that we understand how relationship explorations influence YMSM's HIV/AIDS risk behaviors if we are to design effective HIV/AIDS prevention interventions for this population.

HIV/AIDS researchers often describe HIV risk by the number of partners with whom MSM have UAI over a given period of time [12]. This outcome, while useful to identify "high-risk" populations, limits our ability to understand the nature of YMSM's sexual partnerships. Increasingly, researchers have noted that relationship dynamics are crucial to preventing new HIV infections among MSM [13–15], with epidemiologic data suggesting that sexual networks that employ serial monogamy as a partner-selection strategy may reduce the spread of HIV, as compared to concurrent sexual networks [12]. While this network approach is useful, the sexual network composition must also account for the nature of the relationships between individuals within the sexual network. Sullivan and colleagues [16], for example, have noted that most new infections among MSM may be attributable to having unprotected sex with a *main* partner. The definition of what constitutes a *main* partner, however, may not be so clearly defined among MSM who self-identify as single, yet are sexually active. Researchers have documented that adolescents and young adults in the United States sort their sexual partners into diverse relationship typologies (e.g., friends with benefits, hookups, and/or romantic interests) as part of their dating behaviors [17–19], with each typology engendering distinct sexual and emotional considerations [19,20]. At present, however, few researchers have examined the prevalence of these typologies among single YMSM, nor examined whether UAI is differentially distributed across these relationship typologies. Therefore, we sought to examine how single YMSM categorize their sexual partners with whom they had UAI, both receptive and insertive, and whether these different partner categories were associated with different amounts of sexual risk behavior. These data are vital if we are to develop prevention interventions that acknowledge the different sexual and relational experiences of YMSM.

Above and beyond documenting the types of partnerships reported by single YMSM who engage in UAI, interventionists seeking to build programs for single YMSM will require strategies to identify and address the sexual and emotional motivations ascribed onto these different partner types [9,21]. From a Social Cognitive Theory perspective [22], the decision to engage in UAI is dependent on YMSM's efficacy expectations regarding the negotiation of safer sex with different partners (i.e., self-efficacy), and the outcome expectations resulting from not using a condom use during a sexual encounter (i.e., decisional balance). For example, researchers have indicated that MSM may report greater UAI if they do not feel confident negotiating safer sex strategies with casual and/or romantic partners [23], and if they perceive that foregoing condoms can create an emotional connection with a sexual partner [24,25]. YMSM's perceptions of their relationship with a given partner may be particularly noteworthy to consider in these findings, as decision-making researchers have noted that affective motivations may be processed more rapidly and may result in decision-

making that is affectively motivated rather than analytically motivated [26]. Furthermore, individuals with conflicting affective and cognitive motivations tend to report less correspondence between their intentions and behavior [27–29]. Given the limited research documenting whether single YMSM’s efficacy and outcome expectations regarding UAI vary depending on how different sexual partners are perceived (e.g., hookups, friends with benefits, romantic interests), we propose to examine whether YMSM’s safer sex self-efficacy and decisional balance to forego condoms differs based on the relationship attributions that YMSM assign to their sexual partners.

It is equally important to recognize that non-sexual relationship motivations may also influence YMSM’s sexual decision-making. Consistent with the Triangular Theory of Love [30], three inter-related constructs (i.e., intimacy, commitment and passion) are posited to inform the characteristics that individuals pursue in their relationships. Intimacy represents the emotional component of relationships and is characterized by feelings of closeness, emotional support, and connectedness; this manifests behaviorally as interpersonal trust, communication, and social support. Passion refers to the motivational aspect of a relationship and is characterized by physical arousal, manifested through touching and sexual consummation. Commitment embodies the cognitive aspect of love and is characterized by decisions to be in, and maintain or dissolve, a relationship. Behaviorally, commitment manifests as exclusivity, whether emotional or sexual, and active participation in the relationship during times of stress. Individuals’ investment in each subcomponent may inform what kinds of relationships are pursued and/or initially formed (e.g., casual encounters are low-investment relationships and are usually characterized as having low scores on all three subcomponents; romantic interests, on the other hand, tend to be characterized by having high scores on passion, intimacy and commitment) [18]. These components may be measured as “ideal characteristics” while individuals identify as single, and have been associated with single YMSM’s sexual behaviors. For example, Bauermeister [31] found that single YMSM indicating greater romantic ideation reported fewer number of partners with whom they had unprotected sex in the prior two months. A similar association between relationship ideation and UAI has been documented among older MSM [32]. These findings are particularly meaningful as they suggest that encouraging YMSM to develop relationship expectations may serve as a protective factor and therefore be useful in implementing HIV/AIDS prevention strategies. It remains unclear, however, whether romantic ideation is associated with fewer UAI partners irrespective of the partner type, or if its protective association is attributable to self-selection into certain partner typologies (e.g., only have UAI with romantic interests) than others (e.g., UAI with hookups and/or friends with benefits). Therefore, as a contribution to this area, we examine whether YMSM’s relationship ideation is associated with different kinds of sexual partnerships.

Relationship explorations may also increase sexual risk-taking behaviors through affective dysregulation. Beyond the protective association attributable to relationship ideation, researchers have also acknowledged that overzealous ideation (limerence) [33], although normative in this developmental stage, may increase sexual risk [34,35]. In a study with single YMSM, Bauermeister and colleagues [35] found that single YMSM who expressed stronger desires to find a romantic partner were more likely to report a greater number of partners and occasions in which they had UAI in the prior 2 months. These findings suggest

that some youth may be eager to find a relationship, yet increase their HIV/STI risks in the process. Taken together, these findings suggest that single YMSM's relationship desires may be protective in some circumstances (e.g., romantic ideation), and risky in others (e.g., limerence). To date, romantic ideation and limerence have not been examined concurrently in a sample of single YMSM, nor have they been examined as correlates of different sexual partner typologies. Therefore, in this study, we focus on relationship desires as precursors that may inform *single* YMSM's likelihood to engage in UAI with sexual partners identified as friends with benefits, casual partners, and/or romantic interests.

Study Goals and Objectives

The overall goal of our study was to document the different types of sexual partnerships reported by single YMSM in the United States, and to understand their implications for HIV prevention. We propose three objectives in our analyses. First, we assess the prevalence of different relationship typologies among single YMSM. We then examine whether YMSM's safer sex self-efficacy, decisional balance to forego condoms, relationship ideation (intimacy, passion and commitment), and limerence are associated with the mean number of unprotected anal intercourse (UAI) partners in the prior two months. Finally, we examine whether YMSM's safer sex self-efficacy, decisional balance to forego condoms, relationship ideation (intimacy, passion and commitment), and limerence are associated with different UAI partner types (e.g., romantic interests, casual encounters, friends with benefits).

Methods

Sample

Data for this paper come from a cross-sectional observational study examining single YMSM's partner-seeking experiences online between July 2012 and January 2013. To be eligible for participation, recruits had to self-identify as male, report having same-sex attractions, be between the ages of 18 and 24, report being single, and be a resident of the United States (including Puerto Rico). Participants were primarily recruited through advertisements on two popular social networking sites and participant referrals. Social network advertisements were viewable only to men who fit our age range and who lived in the United States. Promotional materials displayed a synopsis of eligibility criteria, a mention of a \$10 VISA e-card incentive, and the survey's website.

A total of 3,140 entries were recorded over the 7 months of data collection. We excluded 942 entries because they were ineligible to participate once they completed the screener. We then used best practices [36] to identify duplicates and falsified entries by manually examining participants' online presence, email and IP addresses, operating system and browser information, irregular answer patterns, and time taken to complete survey. We disqualified 366 entries because they were identified as duplicate/fraudulent entries, leaving us with a total of 1,963 valid entries. Of these, 325 participants consented but did not commence the survey (i.e., missing all data; 16.6%); resulting in an analytic sample of $N = 1,638$ eligible YMSM. One hundred and ninety-three of these eligible and consented participants did not complete all sections of the survey (i.e., missing data in some sections of the survey; 10.5%). For the purposes of this analysis, we report on the subsample that had

full data on our study variables ($N = 1,359$; 82.9% of our sample). We provide a brief description of the sample's characteristics in Table 1.

Procedures

We developed our web survey using best practices [37], including various iterations of pilot testing prior to data collection. Study data were protected with a 128-bit SSL encryption and kept within a University of Michigan firewalled server. Upon entering the study site, participants were asked to enter a valid and private email address to serve as their username. This allowed participants to save their answers and, if unable to complete the questionnaire in one sitting, continue it at a later time. Upon completing an eligibility screener, eligible youth were presented with a detailed consent form that explained the purpose of the study and their rights as participants, and were asked to acknowledge that they had read and understood each section of the consent form. Consented participants answered a 30-45 minute online questionnaire that covered assessments regarding their socio-demographic characteristics, Internet use, ideal relationship and partner characteristics, sexual behaviors, and psychological well-being. We acquired a Certificate of Confidentiality from the National Institutes of Health to protect study data. The University of Michigan Institutional Review Board approved all study procedures.

Measures

Sexual Behavior—Participants were asked to report their sexual behavior with men during the previous two months using the Sexual Practices Assessment Schedule (SPAS; [21,38,39]). Questions were posed both in formal language and vernacular (in italics) to increase comprehension. For this study, we included questions regarding the total number of male partners in the past two months and the number of male partners with whom participants engaged in unprotected receptive anal intercourse (URAI) and unprotected insertive anal intercourse (UIAI), respectively.

After participants reported their number of male partners with whom they had URAI and/or UIAI in the past two months, they were asked to categorize each of these partners as friends with benefits, a hookup or one-night stand, or a romantic interest. The web survey was programmed to ensure that the number across relationship categories totaled the number of URAI and UIAI partners reported. For both the URAI and UIAI outcomes, we then cross-tabulated the three relationship types across participants and created a 7-point categorical variable of partner types (Romantic Interests Only, One-Night Stand Only, Friends with Benefits Only, Friends with Benefits and Romantic Interests, Friends with Benefits and One-Night Stands, Romantic Interests and One-Night Stands, and All Three Partner Kinds). For multivariate analyses, we collapsed these groups subsequently into the three-level categories (0=None; 1=Some; 2=All) for each relationship type.

Ideal Relationship Characteristics—We used the Triadic Love Scale (TLS) to measure YMSM's ideal romantic relationships [40,41]. Participants rated the importance of a series of listed qualities in their *ideal romantic relationship* with another man (1 = *Not at all important*, 7 = *Extremely important*). Three subscales were derived from the TLS: Intimacy (e.g., "To feel close to your partner"; 9 items, Cronbach's $\alpha=.93$), Commitment (e.g., "To

feel a sense of responsibility towards your relationship”; 5 items, Cronbach’s $\alpha=.80$), and Passion (e.g., “To explore your sexuality with your partner”; 6 items, Cronbach’s $\alpha=.89$). To minimize order effects [42], we programmed the survey to randomize question order within each domain. We computed a mean score for each subscale, where higher scores indicate greater ideation on that component. We also created a relationship ideation total score from the three subscales (Cronbach’s $\alpha=.82$).

Limerence—Participants rated 8 statements [35] using a 5-point scale ranging from 1 = *Strongly Disagree* to 5 = *Strongly Agree*. The scale includes statements such as “I confuse sex with love”, “My desire to find a boyfriend has interfered with my ability to get into a meaningful relationship”, and “I pursue partners even though they have told me that they are not interested”. We then computed a mean composite score, where higher scores indicate greater limerence (Cronbach’s $\alpha = .84$).

Decisional Balance to Use Condoms—We used the Decisional Balance scale for Pleasure and Emotional Connection [25,31] to examine participants’ decisional balance to use or forego condoms with partners. Participants were asked to answer 4 items twice. Each statement first referred to sex without condoms, followed by an identical statement asking about sex with condoms. Items included “Sex [with/without] condoms is very intimate to me” and “Sex [with/without] condoms makes me feel close to my partner”. Participants rated each statement using a 5-point scale ranging from 1 = *Strongly Disagree* to 4 = *Strongly Agree*. Respondents’ score was computed by summing the net difference between condomless sex and condom use scores across the statements. Greater positive scores reflect greater benefits/gains associated with unprotected sex (Cronbach’s $\alpha = .82$).

Safer Sex Self-Efficacy—We adapted Fisher’s et al. self-efficacy scale [43] for use with YMSM [23] to ascertain their confidence to: discuss safer sex with partners, refuse to have unprotected sexual intercourse, nonverbally communicate to a partner a desire for safer sex, tell a partner through a joke one’s desire for safer sex, refuse sex if a partner refuses to use a condom, ask a partner his HIV status, and ask a partner when he was last tested for HIV. Participants responded to these items using a 6-point scale (1 = Very confident, 6 = Not confident at all). Questions were asked separately for romantic and casual sex partners. Cronbach’s alphas for the self-efficacy for safer sex scales were $\alpha = .93$ for romantic partners and $\alpha = .89$ for casual partners. Higher scores in each scale indicate less confidence to negotiate condoms.

HIV Status and other Sexually Transmitted Infections (STI)—Participants were asked whether they had been tested for HIV, if they had received their test result, and whether they were HIV positive (no actual HIV test was performed). Based on their answers, we created dummy variables to indicate whether participants reported being HIV negative, not knowing their HIV status, or HIV positive. HIV negative participants served as the referent group. Participants were also asked whether they had been diagnosed with a STI by a health professional. Participants without a diagnosed STI served as the referent group (0=No, 1=Yes).

Demographic characteristics—Respondents reported their age (in years). Respondents were asked to report if they considered themselves of Latino or Hispanic ethnicity, followed by these racial categories: African American or Black, Asian or Pacific Islander, White or European American, Native American, and Other. Most Latinos identified as White/European American (n=170; 60.1%) and/or as Other (n=84; 29.7%), making it difficult to have sufficient cases to represent other Latino racial subgroups (e.g., Black Latino (n=25; 8.8%; Asian Latino (n=16; 5.7%); and/or Native American Latino (n=17; 6.0%) in our multivariate analyses. We also combined the Native American and Other race categories given the limited number of observations, and created dummy variables for each race/ethnicity group. White non-Latino participants served as the referent group in our analyses. We also asked participants to report their sexual identity as gay/homosexual, bisexual, straight/heterosexual, same gender loving, MSM, or Other. Given that the majority of participants self-identified as gay, we created a dichotomous variable for sexual identity. Non-gay participants served as the referent group in an attempt to distinguish YMSM who self-identify as gay from others who adopt other identities (e.g., queer, bisexual, straight).

Data Analytic Strategy

Prior to conducting our multivariate analyses, we compared the total sample's characteristics to the sub-sample excluded due to missing data. We then conducted descriptive statistics for our sample, using bivariate analyses to compare participants who engaged in UAI to those who did not (see Table 1). We also examined the bivariate associations between continuous variables in a correlation matrix (see Table 2).

To test our first objective, we used a generalized linear model with a Poisson distribution to test whether YMSM's number of UAI partners was associated with the psychosocial correlates of interest (e.g., ideal relationship characteristics, decisional balance to forego condoms, limerence, and self-efficacy), after adjusting for age, gay identity, race/ethnicity, HIV status and prior STI history.

To test our second objective, we computed a relationship typology that identified participants based on the types of partners reported in the prior two months (e.g., a single type of partner, two types of partners, or all three types of partners). We then used generalized linear regression models with a negative binomial distribution to examine whether different partnership typologies were associated with YMSM's mean number of URAI and UIAI partners, respectively. This negative binomial model acknowledged the count nature of our data, and allowed us to compare the odds of reporting a greater number of URAI and UIAI partners across partner categories, as well as comparing whether different typologies had similar (i.e., 95% confidence intervals overlap between typologies) or different (i.e., 95% confidence intervals between typologies do not overlap) risk profiles. We adjusted for race/ethnicity, age, gay identity, HIV status, and prior STI history in this model. YMSM in the category that reported having had all three types of partners served as the referent group.

Finally, we examined whether the psychosocial correlates could help discriminate across the different partner types using multinomial regressions. Given the clustered findings that emerged from the negative binomial regressions and concerns of limited sample size within

specific partnership categories, we collapsed the groups subsequently into three-level outcome categories (0=None; 1=Some; 2=All) for each relationship type. To avoid increasing Type I errors and reducing our statistical power, we used the total relationship ideation score in this analysis rather than entering each relationship ideation construct (i.e., passion, commitment, intimacy) separately.

Results

Attrition Analyses

Attrition analyses suggest that participants with missing data were more likely to report not identifying as gay ($\chi^2(N=1638; df=1)=6.49; p<.05$), report being HIV-negative ($\chi^2(N=1638; df=1)=9.06 p<.01$) and not have had a prior STI diagnosis ($\chi^2(N=1637; df=1)=9.54; p<.01$). YMSM with missing data were also more likely to report being sexually inactive ($\chi^2(N=1638; df=1)=146.80; p<.001$), and indicate greater difficulty negotiating safer sex with casual ($M=2.80, SD=1.34$ vs $M=2.38, SD=1.20; t(1423)=-2.77, p<.01$) and romantic interests ($M=2.55; SD=1.13$ vs $M=2.09, SD=1.50; t(1393)=-2.17, p<.05$), respectively. We observed no differences across age, decisional balance, romantic ideation, or limerence.

Sample Description

YMSM had an average age of 20.89 ($SD=1.89$). Across racial/ethnic categories, the sample was predominantly White, followed by Latinos, African Americans, Asian/Pacific Islanders, and Other race/ethnicity participants. Most of the sample identified as gay. Three quarters of the sample reported being sexually active in the prior 2 months. Half of the sample engaged in receptive anal intercourse, with 30% of the sample reporting at least one event of URAI. The majority of the sample reported being HIV negative, with the remainder identifying as never having tested for HIV (HIV status unknown; 17.1%) or HIV positive (1.4%).

As shown in Table 1, participants who reported recent UAI were more likely to be older, self-report as being HIV negative, and to have had a prior STI. Participants who did not know their HIV status were less likely to report recent UAI. Compared to those who did not report UAI, YMSM who engaged in UAI reported greater decisional balance to forego condoms to create an emotional connection with a partner, and reported lower self-efficacy to negotiate safer sex with casual and romantic interests, respectively. We noted no differences across race/ethnicity, sexual identity, romantic ideation or limerence.

UAI partners

We used a generalized linear regression with a Poisson distribution ($X^2(df=16; N=1,352) = 2,501.64; p < .001$) to estimate the odds of having multiple UAI partners in the prior two months across YMSM's psychosocial correlates (e.g., ideal relationship characteristics, decisional balance to forego condoms, limerence, and self-efficacy), after adjusting for age, gay identity, race/ethnicity, HIV status and prior STI history (see Table 3). The odds of reporting more UAI partners in the prior two months were higher among YMSM reporting greater decisional balance to forego condoms ($OR=1.89$ [95% CI: 1.82, 1.97]; $p<.001$), who had greater difficulty negotiating safer sex with romantic interests ($OR=1.16$ [95% CI: 1.12, 1.21]; $p<.001$), and who reported higher passion ideation ($OR=1.38$ [95% CI: 1.28, 1.49];

$p < .001$). Having fewer UAI partners was associated with greater commitment ideation (OR=.91 [95% CI: .85, .98]; $p < .05$) and greater difficulty negotiating safer sex with casual partners (OR=.96 [95% CI: .92, .99]; $p < .05$). We found no association between UAI partners and limerence.

URAI partners

Differences by partner typologies—YMSM who engaged in URAI ($n=414$) reported different partner type configurations, with different mean number of partners across subgroup types: Romantic Interests Only [N=118; M=1.18($SD=.88$); 95% CI (1.32-1.64)]; Hookups Only [N=64; M=1.58($SD=1.18$); 95% CI (1.28-1.87)], Friends with Benefits [N=76; M=1.33($SD=.77$); 95% CI (1.15-1.51)], Hookup and Friends with Benefits [N=22; M=3.68($SD=2.38$); 95% CI (2.63-4.74)], Hookup and Romantic Interests [N=24; M=4.92($SD=9.74$); 95% CI (.80-9.03)], Friends with Benefits and Romantic Interests [N=53; M=2.85($SD=1.17$); 95% CI (2.53-3.17)] and all three partner types [N=57; M=13.58($SD=27.16$); 95% CI (6.37-20.79)].

Given the count nature of the number of URAI partners outcome, we ran a negative binomial regression ($X^2(df=15; N=414)=1,548.42; p < .001$) to estimate mean differences in number of URAI partners in prior two months across YMSM's partner typologies, after adjusting for age, gay identity, race/ethnicity, HIV status and prior STI history. Compared to YMSM who reported having partners of all categories, YMSM reported fewer URAI partners if they reported only having sex with friends with benefits (OR=.10 [95% CI: .08, .13]; $p < .001$), hookups (OR=.12 [95% CI: .10, .15]; $p < .001$), or romantic interests (OR=.12 [95% CI: .10, .14]; $p < .001$). Compared to YMSM with all three partner types, YMSM reported fewer URAI partners if they had sex with both friends with benefits and romantic interests (OR=.23 [95% CI: .19, .27]; $p < .001$), hookups and romantic interests (OR=.45 [95% CI: .36, .55]; $p < .001$), and hookups and friends with benefits (OR=.31 [95% CI: .25, .40]; $p < .001$). Post-hoc analyses indicated that YMSM who reported only one kind of partner were less likely to report multiple partners than counterparts who reported at least two kinds of partners. Compared to White counterparts, racial/ethnic minorities reported fewer URAI partners (see Table 4). Gay-identified participants reported a greater number of URAI partners than non-gay identified counterparts (OR=1.59 [95% CI: 1.25, 2.03]; $p < .001$). YMSM who reported a prior STI diagnosis indicated a greater number of URAI partners (OR=1.57 [95% CI: 1.40, 1.75]; $p < .001$). We found no association between URAI partners and age or HIV status.

Relationship desires and URAI partner types—In order to examine whether the relationship desire variables were associated with different sexual partner types, we collapsed our observed typologies into a 3-level categorical outcome due to small number of observations within some of the partner typologies. Consequently, we ran three partner-type specific nominal regressions: None of URAI partners are of a specific type (the referent group), Some of URAI partners reported are of the specified type, or All of the URAI partners are of a specified type.

Romantic Interests ($X^2(df=28)=59.95; p < .001$): Relative to respondents who reported that none of their URAI partners were romantic interests, YMSM reporting greater relationship ideation were more likely to identify all of their partners as romantic interests (OR= 1.94 [95% CI: 1.25, 3.00]; $p < .001$), after controlling for age, race/ethnicity, gay identity, HIV status, self-efficacy, limerence, and prior STI history. Compared to Whites, Latinos (OR= 2.39 [95% CI: 1.20, 4.75]; $p < .05$) and Asian Pacific Islanders (OR= 8.31 [95% CI: .98, 70.50]; $p = .05$) were more likely to report that all of their URAI partners were romantic interests. No other covariates were associated with identifying all partners as romantic interests.

YMSM who reported greater decisional balance to forego condoms to establish an emotional connection were more likely to report that some of their URAI partners were romantic interests (OR= 1.30 [95% CI: 1.02, 1.65]; $p < .05$), after controlling for age, race/ethnicity, gay identity, HIV status, relationship ideation, limerence, self-efficacy, and prior STI history.

Hookups ($X^2(df=28)=62.46; p < .001$): Compared to those who reported that none of their URAI partners were hookups, YMSM who reported greater relationship ideation were less likely to report that some (OR=.68 [95% CI: .47, .97]; $p < .05$) or all (OR= .62 [95% CI: .42, .92]; $p < .05$) were hookup partners, after controlling for age, race/ethnicity, gay identity, limerence, HIV status, self-efficacy, and prior STI history.

Compared to YMSM who did not identify their URAI partners as hookups, participants with higher limerence (OR=1.45 [95% CI: 1.08, 1.94]; $p < .05$) and decisional balance scores (OR=1.42 [95% CI: 1.11, 1.83]; $p < .01$) were more likely to indicate that some of their partners were hookups, after controlling for age, race/ethnicity, gay identity, HIV status, relationship ideation, self-efficacy, and prior STI history.

Friends with benefits ($X^2(df=28)=53.58; p < .01$): YMSM who reported higher decisional balance scores were more likely to indicate that some of their partners were friends with benefits (OR=1.34 [95% CI: 1.06, 1.69]; $p < .05$). We found no association between partner type and the relationship ideation or limerence constructs, after controlling for other covariates. None of the proposed predictors increased the likelihood of reporting that all participants were friends with benefits, as compared to YMSM who did not identify their URAI partners as friends with benefits.

UIAI partners

Differences by partner typologies—YMSM who engaged in UIAI ($n=345$) reported different partner type configurations, with different mean number of partners across subgroup types: Romantic Interests Only [$N=104$; $M=1.47(SD=1.05)$; 95% CI (1.27-1.68)]; Hookups Only [$N=59$; $M=1.51(SD=1.36)$; 95% CI (1.15-1.86)], Friends with Benefits [$N=81$; $M=1.19(SD=.56)$; 95% CI (1.07-1.32)], Hookup and Friends with Benefits [$N=20$; $M=4.60(SD=6.24)$; 95% CI (1.68-7.52)], Hookup and Romantic Interests [$N=21$; $M=3.09(SD=1.45)$; 95% CI (2.43-3.75)], Friends with Benefits and Romantic Interests [$N=33$; $M=3.27(SD=2.28)$; 95% CI (2.46-4.08)] and all three partner types [$N=27$; $M=13.33(SD=18.15)$; 95% CI (6.15-20.51)].

We then ran a negative binomial regression ($X^2(df=15; N=345)=885.77; p < .001$) to estimate mean differences in number of UIAI partners in prior two months across YMSM's partner typologies, after adjusting for age, gay identity, race/ethnicity, HIV status and prior STI history. Compared to YMSM who reported having partners of all categories, YMSM reported fewer UIAI partners if they reported only having sex with friends with benefits (OR=.10 [95% CI: .08, .12]; $p < .001$), hookups (OR=.13 [95% CI: .10, .16]; $p < .001$), or romantic interests (OR=.12 [95% CI: .10, .15]; $p < .001$). Compared to YMSM with all three partner types, YMSM reported fewer UIAI partners if they had sex with both friends with benefits and romantic interests (OR=.26 [95% CI: .21, .32]; $p < .001$), hookups and romantic interests (OR=.25 [95% CI: .19, .32]; $p < .001$), and hookups and friends with benefits (OR=.34 [95% CI: .27, .43]; $p < .001$). Post-hoc analyses indicated that YMSM who reported only one kind of partner were less likely to report multiple partners than counterparts who reported at least two kinds of partners. YMSM reported a greater number of UIAI partners if they were older (OR=1.11 [95% CI: 1.07, 1.15]; $p < .001$), identified as African American (OR=1.36 [95% CI: 1.12, 1.63]; $p < .001$), and reported a prior STI diagnoses (OR=1.24 [95% CI: 1.08, 1.43]; $p < .001$). We found no association between UIAI partners and gay identity or HIV status.

Relationship desires and UIAI partner types—Similar to the URAI analyses, we collapsed our observed typologies into a 3-level categorical outcome: None of UIAI partners are of a specific type (the referent group), Some of UIAI partners reported are of the specified type, or All of the UIAI partners are of a specified type.

Romantic Interests ($X^2(df=28)=48.83; p < .05$): Relative to respondents who reported that none of their UIAI partners were romantic interests, YMSM who reported greater decisional balance to forego condoms to establish an emotional connection were more likely to report that some of their UIAI partners were romantic interests (OR=1.46 [95% CI: 1.08, 1.98]; $p < .05$), after controlling for age, race/ethnicity, gay identity, HIV status, relationship ideation, limerence, self-efficacy, and prior STI history. None of the proposed predictors increased the likelihood of reporting that all UIAI participants were romantic interests.

Hookups ($X^2(df=28)=45.94; p < .05$): Relative to respondents who reported that none of their UIAI partners were hookups, YMSM who reported greater decisional balance to forego condoms to establish an emotional connection were more likely to report that some of their UIAI partners were hookups (OR=1.35 [95% CI: 1.00, 1.84]; $p = .05$), after controlling for age, race/ethnicity, gay identity, HIV status, relationship ideation, limerence, self-efficacy, and prior STI history. None of the proposed predictors increased the likelihood of reporting that some or all UIAI participants were hook-up partners, after controlling for age, race/ethnicity, gay identity, HIV status, self-efficacy, and prior STI history.

Friends with benefits ($X^2(df=28)=44.54; p < .05$): Relative to respondents who reported that none of their UIAI partners were friend with benefits, YMSM who reported greater decisional balance to forego condoms to establish an emotional connection were more likely to report that some of their UIAI partners were friends with benefits (OR=1.42 [95% CI: 1.05, 1.92]; $p < .05$), after controlling for age, race/ethnicity, gay identity, HIV status,

relationship ideation, limerence, self-efficacy, and prior STI history. None of the proposed predictors increased the likelihood of reporting that all UIAI participants were friends with benefits.

Discussion

The sole reliance on quantity of partners may be insufficient to promote innovative strategies to reduce YMSM's exposure to HIV and other sexually transmitted infections [12]. Beyond quantity, we sought to qualify YMSM's sexual exchanges by examining what types of partnerships (i.e., romantic interests, friends with benefits, hookups) they attributed to recent partners with whom they had UAI. Interestingly, when we examined the mean number of UAI partners across relationship typologies, we found that YMSM's mean number of partners increased based on how many types of partners were reported, rather than on the type of partner. In other words, the odds of reporting a greater number of UAI partners were increased among YMSM who reported multiple partner types (e.g., romantic interest and hookups), in comparison to YMSM who reported having sex with a single type of partner, irrespective of whether they classified these partners as solely romantic interests, hookups, or friends with benefits. From a sexual network perspective, these findings underscore the importance of considering the characteristics of YMSM's sexual partners, the diversity of partner types in YMSM's sexual networks, and the motivations associated with different types of partners.

YMSM's likelihood of reporting multiple UAI partners in the prior two months was associated with both sexual and non-sexual motivations. Consistent with Social Cognitive Theory, we found support for our hypothesis that YMSM would be more likely to report UAI if they had sexual motivations for doing so (i.e., ascribed positive outcome expectations to foregoing condoms). YMSM who reported greater decisional balance scores (i.e., endorsement of the belief that foregoing condoms aids in creating an emotional connection with a partner) were more likely to report having had UAI with a greater number of partners over the past two months. In subsequent analyses, we found that decisional balance was also associated with different relationship typologies, with YMSM who exhibited greater decisional balance to forego condoms being more likely to have different types of partners. We found no association between decisional balance and UAI among YMSM who reported only one type of partner. Although these findings coincide with prior research suggesting that MSM may forego condoms as a sign of intimacy and trust with their sexual partners [25,44], our data extend the current understanding of the role that decisional balance plays in URAI and UIAI, respectively, by suggesting that YMSM who are more willing to forego condoms in an effort to make an emotional connection may also be less discriminating in choosing partners with whom to have UAI. At present, however, it remains unclear whether YMSM scoring higher in decisional balance perceive that foregoing condoms will help them transform the nature of the sexual relationship (e.g., a hookup may become a romantic interest) and/or if the association noted for decisional balance is confounded by other variables (e.g., perceived loneliness, sensation seeking). Future research examining these hypotheses is warranted.

The relationship between the number of UAI partners and safer sex self-efficacy also varied by partner type. YMSM reporting greater difficulty negotiating safer sex with casual partners were less likely to report UAI partners. One possible interpretation for this finding could be that YMSM who feel less confident in their ability to negotiate safer sex with casual partners are less likely to engage in anal intercourse (after all, only about half of our sample reported engaging in UAI). Conversely, YMSM indicating greater difficulty to negotiate safer sex with romantic partners were more likely to report a greater number of UAI partners. One potential interpretation for this finding is that YMSM who envision partners as potential romantic interests may feel more pressured to engage in UAI and therefore report greater difficulty negotiating safer sex with these partners. Although these findings could be interpreted to suggest that YMSM who report different partner types may have difficulty enacting partner-specific safer sex strategies [23], we found no evidence to suggest differences in YMSM's safer sex self-efficacy across partner typologies. Future research examining how YMSM's confidence in their ability to negotiate their safety varies by partner type is warranted.

In addition to motivations centered on sex, we also examined non-sexual motives to pursue partnerships. Using the sub-components of the relationship ideation scale, as proposed by the Triangular Theory of Love, we posited that YMSM's desire to find a partner may influence their pursuit of partners and, in turn, influence their sexual decision-making. Consistent with prior findings, YMSM who reported desiring more commitment in their ideal relationship were less likely to have a greater number of UAI partners. These findings are particularly meaningful, as they suggest that providing YMSM with opportunities to develop relationship expectations may serve as a viable method of HIV prevention. After adjusting for desired intimacy and commitment, however, we also found that the number of UAI partners was greater among YMSM who reported desiring more passion in their ideal relationship. The positive association between passion and number of UAI partners underscores the importance of considering how arousal is associated with risk behavior. Nevertheless, given how the passion subscale is defined and measured [40,41], this construct may have conceptual overlap with sexual sensation seeking [45,46] and may require further empirical exploration in future research. When relationship ideation was treated as a unified construct, YMSM who exhibited greater relationship ideation were more likely to report that all of their URAI sexual partners were romantic interests, and less likely to sort some or all of their URAI partners into the hookup category. Curiously, we found no association between relationship ideation and UIAI partner types – suggesting that the proposed relationship between relationship ideation and UAI risk behavior may vary by sexual role (i.e., receptive vs. insertive)[47,48]. It is plausible that YMSM reporting greater relationship ideation (i.e., intimacy, passion, and commitment) are identifying URAI partners as prospective romantic suitors. Though sorting all partners into a single partner category (e.g., romantic interests) was indicative of having had the least number of URAI partners, it is important to note that these sexual encounters occurred outside of a monogamous, seroconcordant relationship and/or in an open relationship with sexual agreements in place, thereby increasing the potential for HIV/STI infection with these partners. Future research, both qualitative and quantitative, that examines how YMSM place romantic attributions on

their sexual partners and their rationale for engaging in URAI with these partners prior to the initiation of a romantic relationship (i.e., no longer identifying as single) is needed.

Overzealous relationship ideation (i.e., limerence) has been associated with greater number of UAI partners in prior literature [35]. Our data builds on these prior findings by suggesting that types of partnerships contextualize the relationship between limerence and UAI risk. When we examined the role of limerence on YMSM's partner types, we found that limerence increased the likelihood that some (but not all) URAI partners were hookups. Given that limerence may increase the value placed on meeting a partner, it is plausible that our finding is capturing YMSM's willingness to engage in URAI with casual encounters as well as with romantic interests and/or friends with benefits, irrespective of YMSM's own safer sex intentions. The lack of an association between limerence and partner types within the romantic interests and friends with benefits models, respectively, further supports this perspective. In the absence of longitudinal data, however, this interpretation remains an untested hypothesis. Future research in this area may be warranted.

While our study provides important insights into the sexual partnerships of single YMSM, several limitations must be noted. First, the majority of our sample identified as gay or bisexual, such that our findings may not be generalizable to YMSM who do not claim these identities. Second, although our study includes a national sample of YMSM, it does not necessarily reflect a representative sample of YMSM in the United States and therefore may not be generalizable. Third, our survey focused on single YMSM. As a result, it is possible that the constructs under study (self-efficacy, decisional balance, romantic ideation and obsession) may operate differently among YMSM in relationships, particularly those with sexual agreements, in serodiscordant relationships, and/or in open relationships. Fourth, self-report and social desirability bias may have influenced how participants answered survey questions. Fifth, our study relies on YMSM's relationship type as perceived, after having had URAI and/or UIAI with partners. It is possible that YMSM are recalling their partners and assigning new meanings to them based on the outcome of their interactions with said partners. Finally, the cross-sectional nature of our study limits our ability to test some of the causal or prospective hypotheses that have emerged from our study. Future longitudinal studies examining the development of single YMSM's sexual partnerships would be useful in this regard.

These limitations notwithstanding, our study builds on our current understanding of the literature by acknowledging that single YMSM's HIV/STI risks – as measured by number of UAI partners - may vary depending on their relationship typology. Furthermore, our study tests several constructs associated with single YMSM's relationship expectations concurrently, and acknowledges that YMSM engaging in UAI may be motivated by diverse relationship expectations. This is particularly relevant for prevention interventions geared towards single YMSM. Beyond cognitive exercises to help YMSM explore and strengthen risk reduction attitudes, norms and values, our findings suggest that programs may benefit from providing YMSM with affective regulation skills in order to strengthen their ability to engage in risk reduction behaviors across different types of relationships by self-regulating feelings (e.g., passion, limerence), and reinforce sex positive motivations (e.g., commitment) as they pursue new partnerships. Consequently, HIV/AIDS interventions must address

YMSM's relationship expectations and partner-seeking behaviors in order to help YMSM learn when to employ different condom negotiation skills and safer sex strategies as they interact with different types of partners, regardless of whether said partner turns out to be "Mr. Right" or "Mr. Right Now".

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Table 1

Demographic Characteristics of Study Sample (N = 1,359)

	M(SD)/N(%)	Non-UAI Subsample (N=825)	UAI Subsample (N=534)	t/ χ^2
Age	20.82 (1.94)	20.73 (1.93)	20.96 (1.94)	-2.13*
Race/Ethnicity				
White	878 (64.6%)	529 (64.1%)	349 (65.4%)	.22
Black	129 (9.5%)	81 (9.8%)	48 (9.0%)	.26
Latino	236 (17.4%)	135 (16.4%)	101 (18.9%)	1.50
Asian/Pacific Islander	55 (4.0%)	38 (4.6%)	17 (3.2%)	1.69
Other Race/Ethnicity	61 (4.5%)	42 (5.1%)	19 (3.6%)	1.78
Sexual Identity				
Gay	1,264 (93.0%)	767 (93.0%)	497 (93.1%)	.01
Sexual Behavior (prior 2 mo.)				
Sexually Active	1000 (73.6%)	466 (56.5%)	534 (100%)	315.79***
RAI	705 (52.0%)	247 (30.0%)	458 (86.1%)	407.13***
URAI	414 (30.6%)	---	414 (100%)	---
IAI	575 (42.3%)	191 (23.2%)	384 (71.9%)	315.74***
UIAI	345 (25.4%)	---	345 (64.6%)	---
Self-reported HIV status				
HIV-negative	1,108 (81.5%)	640 (77.6%)	468 (87.6%)	21.81***
HIV-unknown	232 (17.1%)	176 (21.3%)	56 (10.5%)	26.94***
HIV-positive	19 (1.4%)	9 (1.1%)	10 (1.9%)	1.44
Prior STI	232 (17.1%)	93 (11.3%)	140 (26.2%)	50.97***
Romantic Ideation				
Intimacy	6.52 (.74)	6.52 (.74)	6.53 (.75)	-.24
Passion	6.17 (.83)	6.15 (.83)	6.19 (.83)	-.95
Commitment	6.38 (.85)	6.37 (.83)	6.39 (.87)	-.50
Decisional Balance	.07 (1.11)	-.20 (1.08)	.47 (1.02)	-11.48***
Limerence	2.91 (.89)	2.90 (.88)	2.92 (.91)	-.45
Safer Sex Self-Efficacy				
With Casual Partners	2.38 (1.20)	2.28 (1.12)	2.52 (1.29)	-3.47***
With Romantic Interests	2.09 (1.25)	1.99 (1.13)	2.25 (1.40)	-3.48***

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

Table 2

Correlation matrix across study variables among young men who have sex with men (N=1,359).

	1	2	3	4	5	6	7
1 Age	1						
2 Decisional Balance	.06*	1					
3 Intimacy	-.02	.02	1				
4 Passion	.02	.02	.52***	1			
5 Commitment	-.04	.05	.68***	.62***	1		
6 Limerence	-.09***	.01	.08**	.17***	.12***	1	
7 SE Casual	-.07**	.18***	-.11***	-.11***	-.11***	.20***	1
8 SE Romantic	-.06*	.12***	-.13***	-.11***	-.11***	.14***	.63***

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

Table 3

Generalized Linear Model with Binomial Distribution of the Number of Unprotected Anal Intercourse Partners for Young Men (N=1,352).

	Odds Ratio	95% CI		Wald X ²
		Lower	Upper	
Intercept	.08	.04	.16	50.83***
Age	1.06	1.04	1.09	31.50***
Race/Ethnicity ^a				
Black	1.13	.98	1.30	2.99
Latino	.89	.80	.99	4.13*
Asian/Pacific Islander	.78	.61	.99	4.04*
Other Race/Ethnicity	.43	.33	.54	45.76***
Sexual Identity ^b				
Gay	.83	.70	.98	5.09*
Self-reported HIV status ^c				
HIV-unknown	.53	.44	.62	55.10***
HIV-positive	.45	.32	.65	18.66***
Prior STI ^d	2.96	2.72	3.22	639.40***
Romantic Ideation				
Intimacy	.98	.91	1.05	.41
Passion	1.38	1.28	1.49	74.57***
Commitment	.91	.85	.98	5.99*
Decisional Balance	1.89	1.82	1.97	1019.77***
Limerence	.99	.94	1.03	.26
Safer Sex Self-Efficacy				
With Casual Partners	.96	.92	.99	4.68*
With Romantic Interests	1.16	1.12	1.21	68.77***

Notes.

CI = Confidence Interval

* $p < .05$;

** $p < .01$;

*** $p < .001$

^a Non-Latino Whites serve as referent group;

^b Non-gay identified YMSM serve as referent group;

^c HIV-negative participants serve as referent group;

^d Participants who did not report a prior STI serve as referent group.

Table 4

Generalized Linear Model with Binomial Distribution of the Number of Unprotected Anal Intercourse Partners across Partner Types, after adjusting for age, race/ethnicity, HIV status, and past STI history.

	Number of URAI Partners (N=414)				Number of UIAI Partners (N=345)			
	Odds Ratio	95% CI		Wald X ²	Odds Ratio.	95% CI		Wald X ²
		Lower	Upper			Lower	Upper	
Intercept	9.59	5.13	17.90	50.27***	1.18	.52	2.67	.16
Partner Type ^a								
Friend with Benefits Only (N=76)	.10	.08	.13	444.48***	.10	.08	.12	398.49***
Hookups Only (N=64)	.12	.10	.15	367.10***	.13	.10	.16	291.48***
Romantic Interests Only (N=118)	.12	.10	.14	618.86***	.12	.10	.15	452.31***
FB+RI (N=53)	.23	.19	.27	265.13***	.26	.21	.32	150.03***
HU+RI (N=24)	.45	.36	.55	61.61***	.25	.19	.32	102.32***
HU+FB (N=22)	.31	.25	.40	92.61***	.34	.27	.43	81.43***
Age	.99	.97	1.02	.20	1.11	1.07	1.15	31.18***
Race/Ethnicity ^b								
African American/Black	.53	.43	.66	32.27***	1.36	1.12	1.63	10.12***
Asian Pacific Islander	.76	.58	.99	4.14*	.66	.36	1.21	1.81
Latino	.65	.56	.75	34.03***	.84	.71	1.00	3.71
Other Race/Ethnicity	.64	.46	.88	7.35**	.96	.65	1.43	.36
Gay identified ^c	1.59	1.25	2.03	13.90***	1.06	.85	1.32	.25
HIV Status ^d								
HIV Status Unknown	.74	.58	.93	6.38*	.91	.71	1.18	.47
HIV Positive	.85	.55	1.32	.52	.63	.32	1.24	1.77
Prior STI ^e	1.57	1.40	1.75	61.99***	1.24	1.08	1.43	8.81**

Notes. Analyses were conducted among YMSM who reported being sexually active and engaging in receptive and/or insertive anal intercourse, respectively.

CI = Confidence Interval.

* $p < .05$;

** $p < .01$;

*** $p < .001$

^a All three partner types serves as referent group;

^b Non-Latino Whites serve as referent group;

^c Non-gay identified YMSM serve as referent group;

^d HIV-negative participants serve as referent group;

^eParticipants who did not report a prior STI serve as referent group.

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