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Sexual Negotiation and HIV Serodisclosure among Men who Have Sex with Men with Their Online and Offline Partners

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ABSTRACT *The aim of this study was to examine online profile and in-person communication patterns and their associations with unprotected anal intercourse (UAI) in online and offline partnerships between men who have sex with men (MSM) who have never tested for HIV ("Never Tested"), had been tested at least once for HIV ("Tested"), and had tested positive for HIV. Between September and November 2005, 2,716 MSM participated in a one-time online survey. Although 75% and 72% of the Tested and Never Tested groups disclosed a HIV-negative status in all of their online profiles, 17% of HIV-positive participants did so. Exchanging HIV status information was highest among the Tested group, while HIV-positive men were most likely to negotiate UAI. Serodisclosure was not an independent predictor of UAI, although making an explicit agreement to engage in UAI was. Sexual communication and risk-taking patterns differed by testing status. Explicit agreements to avoid UAI were associated with reduced sexual risk-taking. Misrepresentation of HIV status is an identified challenge for HIV prevention.*

KEYWORDS *HIV risk, Men who have sex with men, Serodisclosure, Condom negotiation, Internet*

INTRODUCTION

There has been a resurgence of HIV/AIDS infections among men who have sex with men (MSM) in the United States and other Western industrialized countries.[1,2] Many MSM attribute the increasing acceptance and practice of unprotected anal intercourse (UAI) within the gay community to ineffective safer sex campaigns, advances in treatment, and fatigue regarding the AIDS epidemic.[3] Likewise, HIV transmission dynamics have changed in response to the rapid emergence of technology in mediating sexual liaisons.[4–7] A recent meta-analysis found that at least 40% of MSM used the Internet to seek sex partners and that going online for this purpose was associated with increased risk for UAI, particularly among HIV-positive MSM (HIV + MSM).[8] Although studies show that MSM who use the Internet to seek sex partners are at increased risk for UAI compared to those that do not,[9,10] much remains to be known of how condom negotiation and serostatus disclosure occurs in Internet-mediated sexual partnerships and what relationship these have with subsequent sexual risk.

The popularity of using the Internet to locate sexual partners is credited to the medium's accessibility, affordability, anonymity, and acceptability.[11–13] Namely, it

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provides access to a large pool of potential sex partners, allows users to search for others who share an interest in specific sexual acts or experiences (e.g., men seeking to engage in UAI or "barebacking"), is efficient, and provides a level of anonymity that typically cannot be achieved in face-to-face settings.[3,14] These features are thought to facilitate open discussions of preferred sexual practices and HIV status through active communication between potential sex partners, occurring during online chats (i.e., synchronous electronic discussions) or over e-mail, or through passive communication via online profiles (i.e., user-created descriptions of themselves and their likes/dislikes that can be browsed by other users) found on most sex-seeking websites. Active and passive online communication tools can work in conjunction; online profiles may serve as a first-line filter for locating partners of a particular HIV status ("seroserting") and, once located, the potential sex partner can be engaged in a chat room discussion to determine the extent to which he is willing to fulfill a particular sexual experience.

There is a large literature of how condom negotiation and serostatus disclosure occurs in face-to-face sexual exchanges[15–24]; however, in comparison, relatively little is known of how such communication unfolds online. A study of Internet-using Latino MSM found higher rates of communicating several times before having sex, talking about the kinds of sexual things they like to do when having sex, talking about safer sex, talking about condoms, and revealing HIV status online than in-person.[25] In that study, 17% of HIV-negative respondents reported discussing safer sex online but not when they met in-person, while only 3% talked about safer sex in-person and not online beforehand. The exception was among HIV-positive men's reports of talking about condoms, for which there was no significant difference between online (12.5%) and in-person (4.2%) discussions. A positive association was found between communicating about safer sex and condom use online and actual condom use. Eighty and eighty-six percent of HIV-negative men who talked about using condoms with their most recent Internet sex partner before having sex reported condom use during receptive and insertive anal intercourse, respectively, compared to 36% and 59% of HIV-negative men who did not hold such discussions beforehand. Small cell sizes precluded analyses for HIV-positive men, although observed differences generally mirrored the results found for the HIV-negative men.

The findings from the study by Carballo-Dieguez and his colleagues are limited in three respects. First, they did not consider passive communication strategies of sexual negotiation and serostatus disclosure, such as communication that may take place through online profiles. Second, their results cannot elucidate the degree to which sexual communication may differ between partners met online and offline, since the analyses were restricted to the most recent sex partner met online. Third, the associations between sexual negotiation, serodisclosure, and risk behaviors were explored with bivariate models, which fail to examine multiple sexual communication factors concurrently. Sexual communication is complex, with the potential for multiple—perhaps contradictory—messages to be conveyed, as well as for some communication (e.g., agreeing to use condoms) to preempt the need for other discussions (e.g., serostatus disclosure). Several studies show that HIV-positive MSM who consistently do not disclose their HIV status report less sexual risk behavior than those who inconstantly disclose their status to their partners,[20,23] which may reflect a strategy among consistent nondisclosers to use condoms and avoid the discussion of HIV status altogether.

We sought to address these gaps in this study by examining condom negotiation and serostatus disclosure: (1) in MSM's online profiles; (2) by participant HIV testing status and venue in which sex partners were met (online v. offline); and (3) their

association with UAI using multivariate models. Given the unique features of the Internet (e.g., accessibility and anonymity) and prior research,[25] we anticipated high rates of serostatus disclosure in Internet profiles, as well as higher reports of condom negotiation and serostatus disclosure with sex partners met on the Internet compared to partners met offline. This study is noteworthy because the sample represents an ethnically and racially diverse group of MSM who use the Internet to seek sex.

METHODS

Eligibility and Recruitment

To be eligible for the study, participants must have self-reported being male, 18 years of age or older, residing in the US, and sex with a man in the past 3 months. Ethnicity and race eligibility criteria were adjusted during screening to over-sample African American, Hispanic/Latino, Asian, and "other" participants of Color (i.e., Native American and bi- and multiracial), with the goal of recruiting up to 750 from each group. As racial and ethnic categories filled during the screening process, they were closed out, and efforts were placed on recruiting the remaining men of Color.

Participants were recruited during 3 months in 2005 with banner advertisements placed on a highly subscribed gay website in the U.S. (M. Latham, PlanetOut Inc.® senior client services manager, personal communication, December 5, 2002). Banner advertisements were randomly placed throughout the website (i.e., not just in chat rooms) to reduce potential selection bias. Ten dollars was first offered for survey completion, with remuneration later raised to $20.00 to accelerate recruitment. Participants could choose from four remuneration options that accommodated their level of comfort regarding confidentiality: personal check mailed to their home, Pay Pal electronic transfer, donation to an AIDS charity, or decline payment.

Procedures

Participants clicking on a study banner advertisement were taken to a secure study website where they viewed a welcome page with an overview of procedures and information about the study and staff. A brief screener questionnaire was used to determine eligibility. Eligible respondents were invited to give informed consent in accordance with procedures approved by the University of Minnesota Institutional Review Board and to create a username and password for reentry to the survey website. Ineligible persons were sent to another webpage that thanked them for their interest.

Participants were required to answer all questions, if only with the refusal option. Questions about online and offline partners were block randomized to control for order effects. Participants who started the survey, but did not finish within 24 h, were sent an automated reminder. The number of persons who completed the screening process was 15,425, of which 7,547 were screened as eligible for the study and 6,076 provided consent. Of the 4,859 individuals who started the survey, 3,035 (63%) completed all of the measures, of which 2,716 (56%) were deemed unique and valid participants. Chi-square comparisons between the persons who did not complete the survey and those who did revealed that the two groups did not differ by ethnicity/race, income, or size of the city in which they lived. Slightly more of the persons who completed the survey were under the age of 25 (42%) than those who did not complete the survey (36%), $\chi^2(4) = 15.82$, $p = .003$. The mean online survey completion time was 45 min.

Measures

The items analyzed in this study are a subset of the total possible 170 questions regarding Internet use and sexual attitudes and behaviors. The survey was adapted from a prior study of Internet use by Latino MSM.[26] Using algorithms with skip and branch patterns, participants were presented variable numbers of items based on individual responses. Survey sections also were randomized to minimize order effects.

In addition to demographic factors shown in Table 1, participants used a drop-down menu of years to report when they had their most recent HIV test, with a choice of "I have never been tested" for participants who have never been tested for HIV. Next, participants were asked to indicate whether or not they had ever been diagnosed with HIV, with the following response choices: (1) "Yes, more than 12 months ago", (2) "Yes, I was diagnosed in the last 12 months", and (3) "No, never".

TABLE 1 Sample demographic characteristics

	Total		Never tested	Tested	HIV-positive	
	(n = 2,716)		(n = 469)	(n = 2,110)	(n = 119)	
Demographic	N	%[a]	%[b]	%[b]	%[b]	χ^2
Age						
18–24	979	36	29	69	2	214.06***
25–29	690	25	14	83	3	
30–39	724	27	9	85	6	
40–49	249	9	9	79	12	
50+	71	3	6	84	10	
Race/ethnicity						
Asian	512	19	22	76	2	24.20**
Black	445	16	16	77	7	
Latino	683	25	16	78	6	
White	728	27	18	78	4	
Other[c]	348	13	15	82	3	
Residency						
Rural	130	5	21	75	4	14.19
Small town	378	14	22	75	3	
Medium city	690	25	18	77	5	
Suburb	655	24	17	78	5	
Downtown	831	31	14	82	4	
Other	26	1	23	73	4	
Income						
$0–10,000	560	21	27	69	4	84.60***
$10,001–$25,000	648	25	22	74	4	
$25, 001–$45,000	729	28	14	81	5	
$45,001+	677	26	9	86	5	

*$p < 0.05$
**$p < 0.01$
***$p < 0.001$
[a]Column percentages
[b]Row percentages
[c]Represents bi-/multiracial, Native American, or other less common races/ethnicities (e.g., Arab-American)

Passive communication is conceptualized as communicating about HIV status and preferred sexual activity in one's online profile, which other men in the same online environment can view. Therefore, passive communication, for the purposes of this study, is only relevant to online partners. Participants were asked to self-report the total number of online profiles they currently have (at the time they completed the survey), as well as in how many of them they said they were HIV-negative and HIV-positive, and prefer to combine drugs and sex ("Party-and-Play"), have UAI ("Bareback"), and have safer sex.

Active communication is conceived as what participants actually talked about with their sex partners and, therefore, are relevant to partners met both online and offline. Participants were asked to indicate with a "yes" or "no" response if they "communicated on the Internet several times before [they] met" for their most recent Internet partner and if they "talked several times before meeting for sex" for their most recent non-Internet partner. In addition, yes/no response options were provided to assess whether participants talked about the following sexual topics with their most recent online and offline partner, separately, before sex:

- We discussed what kinds of sexual things we like to do when having sex with men
- I found out his HIV status;
- I revealed my HIV status;
- We decided to avoid anal sex (no fucking);
- We decided to use condoms (fuck using rubbers);
- We decided to have unprotected anal sex (fuck without condoms).

Regarding their sexual behavior, participants reported with a yes/no response option whether they had receptive anal sex ("He entered you") and insertive anal sex ("You entered him") with their most recent online and offline partner, separately. For men who stated they had receptive anal sex and/or insertive anal sex, they were asked whether a condom was used during either sexual act.

Analyses

Data were analyzed using the statistical package STATA, version 9.2. Respondents were categorized into three testing groups based on their responses to the last time they were tested for HIV and whether they had ever been diagnosed with HIV. The *Never Tested* group reported that they had never been tested for HIV or received an HIV-positive diagnosis. The *Tested* group reported being tested in their lifetime and had never received an HIV-positive diagnosis. The *HIV-positive* group reported that they had been tested in their lifetime and had received an HIV-positive diagnosis.

Age and income were originally continuous numeric values and recoded into categories shown in Table 1. Frequencies and percentages were used to summarize sample sociodemographics, communication practices before meeting for sex, and sexual behavior with their most recent online and offline partner. Chi-square analyses and sign tests were used to examine group differences in sociodemographic, AI, UAI, passive sexual communication in online profile, and active sexual communication factors. A series of six multiple logistic regression analyses were used to determine the significance and direction of the association between the active sexual communication factors described above and UAI with the most recent online and offline partner within HIV testing status group and adjusted for age and race/ethnicity. Statistical significance was set at $\alpha = .05$.

RESULTS

Sociodemographics

Age, race/ethnicity, residency, and income for the total sample and by testing and HIV status are shown in Table 1. Compared to participants who have never been tested, HIV-positive men were older, more likely to be black or Latino, and reported higher incomes. Participants in the Never Tested group were more likely to be young (36% between 18 and 24 years) and lower income (one third earned no more than $10,000 per year).

HIV Risk Behavior with Online and Offline Partners by HIV Testing Status

Just over half of the total sample reported anal intercourse (AI) with their most recent online (55%) and offline (53%) partner (Table 2). UAI occurred 14% (online partner) and 15% (offline partner) of the time. A higher percentage of HIV + MSM reported having AI, UAI, and insertive and receptive UAI with their most recent online partner compared to men in the Never Tested and Tested groups. Similarly, a greater proportion of HIV + MSM reported UAI and insertive and receptive UAI with their most recent offline partner than those in the other two groups.

Passive Communication via Online Profiles

Sixteen percent of men reported having no online profiles at the time they completed the survey; nearly a quarter (24%) had only one online profile, and 20% of participants had four or more profiles (M = 2.5; SD = 3.8, Mdn = 2; Table 3). A significant difference in the number of online profiles was found by HIV testing group, $F(2, 2689) = 5.21$, $p < .01$. HIV-positive men reported a significantly greater number of online profiles (M = 3.4, SD = 3.0, Mdn = 3) than men who had never been tested for

TABLE 2 Percentage of participants within group who reported sexual act with most recent male sexual partner

	Total	Never tested (A)	Tested (B)	HIV-positive (C)		Pairwise comparisons
	column %	column %	column %	column %	χ^2	
Online partner						
Anal intercourse	55	45	56	71	30.06 ***	C>B>A
UAI (receptive or insertive)	14	14	13	33	31.70 ***	C>A,B
Insertive UAI	9	7	8	17	11.69 **	C>A,B
Receptive UAI	9	9	8	22	25.36 ***	C>A,B
Offline partner						
Anal intercourse	53	44	55	57	10.53 **	B,C>A
UAI (receptive or insertive)	15	13	14	24	8.14*	C>A,B
Insertive UAI	10	7	10	16	6.94*	C>A,B
Receptive UAI	9	8	9	15	5.87n.s.	C>A,B

*$p < 0.05$
**$p < 0.01$
***$p < 0.001$

TABLE 3 Percentage of respondents reporting they are HIV-negative, HIV-positive, party and play, bareback, and have safer sex in all, some, or none of their online profiles

	Never Tested	Tested	HIV-Positive	
	(*n* = 380) %	(*n* = 1,757) %	(*n* = 113) %	χ^2
Profile says:				
HIV-negative				
None	14.2	8.0	75.2	445.52 ***
Some	13.4	16.7	8.0	
All	72.4	75.3	16.8	
HIV-positive				
None	99.0	99.0	50.4	754.94 ***
Some	0.5	0.5	23.0	
All	0.5	0.5	26.6	
Safer sex				
None	29.5	21.3	46.9	52.63 ***
Some	14.7	20.8	20.4	
All	55.8	57.9	32.7	
Party and play				
None	95.5	93.1	87.5	13.38 **
Some	1.6	4.1	5.4	
All	2.9	2.8	7.1	
Bareback				
None	90.8	85.8	60.2	73.79 ***
Some	4.5	8.5	28.3	
All	4.7	5.6	11.5	

*$p < 0.05$
**$p < 0.01$
***$p < 0.001$

HIV (M = 2.1; SD = 2.9, Mdn = 2; $p < .01$), but were not significantly different than men in the Tested group (M = 2.5; SD = 4.1; Mdn = 2).

The percentage of participants' online profiles that state their HIV status and preferred sexual practices (i.e., safer sex, party and play, and have bareback sex) none, some (1–99%), and all of the time by HIV testing status are shown in Table 3. Approximately three quarters of the Never Tested and Tested group stated they were HIV-negative and 27% of HIV + MSM stated they were HIV-positive in all their profiles. By contrast, 25% of HIV + MSM reported at least one profile describing their HIV status as HIV-negative, and 1% of never tested and HIV-negative men reported their status as HIV positive. A greater proportion of men in the Never Tested (55.8%) and Tested (57.9%) group stated that they prefer safer sex in all of their online profiles than men in the HIV-positive group (32.7%); while a higher proportion of HIV-positive men reported in all of their online profiles that they prefer to party and play (7.1%) and bareback (11.5%) than men in the other groups.

Active Communication with Online and Offline Sex Partners

The percentage of participants by HIV testing status who talked several times before having sex, discussed what they like to do sexually, shared their HIV status before having sex, and decided to avoid anal sex, use condoms and have UAI with their most

recent online and offline partner are shown in Table 4. For those in the Never Tested and Tested groups, more participants communicated several times, discussed what they like to do sexually, and serodisclosed with their online partners than their offline partners. The degree of serodisclosure with online and offline partners did

TABLE 4 Percentage of participants self-reported communication of HIV-related topics before meeting for sex with most recent online and offline partner by HIV testing status

	Total sample	Never tested (*A*)	Tested (*B*)	HIV-positive (*C*)		
	%	%	%	%	χ^2	Pairwise comparisons
Online partner						
n	2,483	399	1,959	112		
Communicated several times	68[a]	69[a]	68[a]	54[a]	9.59 **	*A*, *B* > *C*
Discussed sexual things we like to do	85[b]	80[b]	85[b]	90[b]	8.29*	*B*, *C* > *A*
His HIV status	65[c]	55[c]	68[c]	48	37.71 ***	*B* > *A*, *C*
My HIV status	64[d]	53[d]	67[d]	49	40.41 ***	*B* > *A*, *C*
Decided to avoid anal	38	45	38	21[c]	22.06 ***	*A* > *B* > *C*
Decided to use condoms	54	45	57[e]	42	25.46 ***	*B* > *A*, *C*
Decided to have UAI	14	11	13	33	35.30 ***	*C* > *A*, *B*
Offline partner						
n	2,089	283	1,690	104		
Communicated several times	50[a]	56[a]	50[a]	36[a]	13.00 **	*A* > *B* > *C*
Discussed sexual things we like to do	55[b]	51[b]	56[b]	64[b]	6.18*	*C* > *A*; *B* = *A*, *C*
His HIV status	50[c]	34[c]	53[c]	41	36.37 ***	*B* > *A*, *C*
My HIV status	50[d]	35[d]	53[d]	44	31.29 ***	*B* > *A*; *C* = *A*, *B*
Decided to avoid anal	36	38	36	31[c]	1.70	n.s
Decided to use condoms	52	46	54[e]	41	11.48 **	*B* > *A*, *C*
Decided to have UAI	16	14	16	27	10.65 **	*C* > *A*, *B*

Pairs of identical superscripts indicate a significant difference between the proportion of participants reporting the communication type within testing group using a sign test, $p < 0.05$ for participants who reported a most recent online *and* offline sexual partner.

*$p < 0.05$

**$p < 0.01$

***$p < 0.001$

Total sample: all $p < .001$

Never tested: all $p < .001$

Tested: a–d = $p < .001$; e = $p < .05$

HIV-positive: a = $p < .01$; b = $p < .001$; c = $p < .01$

not differ for HIV-positive group members. With the exception of more HIV-positive participants agreeing to avoid anal sex with their offline partner (31%) than online partner (21%), there were no differences in avoiding anal intercourse, using condoms, or agreeing to have UAI for the total sample and within groups. (Table 4)

Differences in communication patterns between HIV testing groups were found. The highest percentage of participants who communicated several times before having sex and negotiated avoidance of anal sex was among men who have never been tested. In contrast, the Tested group had the highest percentage who exchanged serostatus information and agreed to use condoms. The HIV-positive group, by comparison, was the least likely to communicate several times, avoid anal sex, or use condoms, and the most likely to agree to unprotected anal sex. A higher percentage of HIV-positive men exchanged HIV status information with their offline partners than the group of men who had never been tested, while the reverse was found for online partners.

Multiple Regression Models of Communication Patterns before Sex and UAI

HIV disclosure was dichotomized as one factor (0 = No disclosure by either partner; 1 = Serodisclosure by at least one partner) given the high correlation (>0.90) between the participants revealing their HIV status and learning of the HIV status of their online and offline sexual partners. Communicating several times before meeting was not included in the following models as it does not represent a specific communication message unlike serodisclosure or communicating a preference for specific sexual experiences (e.g., UAI; Table 5).

Discussing what they liked to do during sex generally did not lower or heighten risk for UAI. In all but one model (Tested with online partners), HIV disclosure was *not* associated with lower risk for UAI after adjusting for other communication factors. Specific agreements to avoid anal intercourse or to use condoms were associated with lower odds of having UAI, while making explicit agreements to have UAI before sex was strongly associated with greater odds of UAI regardless whether the sex partner was met online or offline. The models correctly predicted between 88% (within the HIV-positive group with their online partners) and 94% (within Never Tested and Tested groups with their online partners) of responses. Fitting robust standard errors[27] to the prior models yielded comparable results and did not alter the conclusions.

DISCUSSION

The overall aim of this study was to examine condom negotiation and serostatus disclosure with partners who met online and offline and its association with UAI. Three distinct communication and HIV-risk patterns were identified for participants who had never been tested for HIV ("Never Tested" group), previously tested HIV negative and had never been diagnosed HIV-positive ("Tested" group), or had tested HIV-positive.

Sexual communication via online profiles was similar for men in the Never Tested and Tested groups; however, differences emerged when participants directly communicated with their sex partners. Specifically, most men in both groups report being HIV-negative in all of their online profiles (with virtually none stating that they are HIV-positive in any) and relatively few men stated a preference for high-risk sexual activity (i.e., barebacking and/or party-and-play). By contrast, when directly communicating with their sexual partners, fewer men who have never been tested

exchanged HIV status information and made explicit agreements to use condoms during anal sex than those in the Tested group, although fewer of the Tested group negotiated the avoidance of anal sex. These communication differences may account for the finding that while fewer men in the Never Tested group reported anal intercourse with their sex partners than men who had been tested, when anal sex did occur, a higher percentage of the Never Tested group engaged in UAI.

Estimates of persons infected with the virus without knowing are thought to be roughly 25% of all HIV-infected individuals.[28] At least some men in the untested group may remain HIV-negative by avoiding anal sex; however, a serious challenge for HIV prevention targeting untested MSM is that they appear either to assume that they are HIV-negative or present themselves as such to avoid social exclusion (e.g., potential sex partners assuming they are HIV-positive if they do not state their HIV status), and a sizeable minority engage in unprotected intercourse. Tailored online campaigns encouraging HIV testing (e.g., "know your status" campaign) may be an effective way to engage some MSM who have yet to be tested, but should be cautious to refrain from fear-inducing messages that perpetuate avoidance of HIV testing and have ultimately been found ineffective.[29]

The Tested group was by far the largest group comprising 78% of participants in the study. HIV-negative disclosure and reporting a preference for safer sex in online profiles were high, matched by high rates of HIV status disclosure and preference against UAI during direct communications with sex partners. HIV prevention targeting this group should include targeted messages that reinforce high disclosure and low risk behavior as normative and the additional challenge of addressing regular HIV testing. Tailored online and offline mass marketing campaigns demonstrating HIV-negative men checking profiles and negotiating safer sex may reinforce norms for this group.

HIV + MSM had a distinctly different communication pattern from both the Never Tested and Tested groups. Although one quarter of HIV + MSM accurately reported their HIV status on all of their online profiles, half did not report being HIV-positive in any, and one quarter reported being HIV-negative in some or all of their online profiles. Nondisclosure or misrepresentation of an HIV-positive status may be a consequence of HIV stigma, and fear that disclosing one's HIV-positive status will result in less men being interested in having sex with them. A high percentage of men seeking high-risk sexual activity (i.e., UAI and party-and-play) was found among the HIV-positive group. It is possible that such communication is targeted toward other HIV + MSM with whom the health risks associated with UAI may be reduced[30]; however, such practices may nonetheless result in HIV cross-infection and, during sex with uninfected persons, poses a high risk for new infections. Research is needed to understand motivations for falsely communicating HIV status to potential sex partners online, how HIV-positive MSM in this sample differs from other HIV + MSM, and what are effective strategies for engaging or reengaging such men in HIV prevention (e.g., addressing the health and sexual risk concerns of the drug-using HIV + MSM).

As anticipated, the results of this study support those of prior studies[25] that the Internet increases the likelihood of general discussions of preferred sexual practices and HIV serostatus disclosure compared to meeting partners in offline venues, especially among HIV-negative or unknown MSM. A relatively consistent pattern for the association between sexual communication and activity emerged. Between 24% and 47% of MSM in all three groups reported UAI during anal intercourse with their last sexual partner. Directly communicating a desire for using condoms during anal

TABLE 5 Adjusted association between UAI, HIV disclosure, and communication of HIV-related topics before sex with online and offline partners

		Never tested			Tested			HIV-positive		
		OR	95% CI (LL, UL)		OR	95% CI (LL, UL)		OR	95% CI (LL, UL)	
Online partner										
n		384			1,909			86		
Age (ref: 18–24 years)	25–29	2.50	0.87	7.03	1.48	0.88	2.51	0.31	0.02	5.28
	30–39	0.82	0.25	2.68	0.88	0.52	1.50	0.21	0.02	2.14
	40–49	1.58	0.20	12.42	0.82	0.29	2.27	0.63	0.10	4.13
	50+	–[a]	–	–	0.44	0.13	1.45	0.79	0.05	12.90
Race	Asian	1.08	0.31	3.74	0.63	0.32	1.23	1.55	0.11	21.14
(ref: White)	Black	1.33	0.28	6.22	0.80	0.43	1.50	2.17	0.27	17.23
	Latino	0.44	0.09	2.14	0.98	0.55	1.75	0.19	0.02	1.75
	Other	1.28	0.38	4.33	1.07	0.52	2.21	0.70	0.11	4.34
Discussed sexual things we like to do		2.92	0.77	11.02	1.55	0.88	2.73	0.41	0.02	7.45
HIV disclosure		0.39	0.13	1.14	0.51 **	0.32	0.80	2.15	0.29	16.01
Decided to avoid anal		0.14 **	0.03	0.57	0.04 ***	0.02	0.08	–[b]	–	–
Decided to use condoms		0.14 **	0.04	0.46	0.07 ***	0.04	0.12	0.02 ***	0.00	0.09
Decided to have UAI		97.14 ***	27.92	337.97	31.30 ***	19.33	50.68	50.50 **	4.19	608.98

Offline partner										
n		274			1,658			103		
Age (ref: 18–24 years)	25–29	0.66	0.17	2.58	1.41	0.80	2.50	0.65	0.04	10.21
	30–39	1.60	0.42	6.07	1.03	0.58	1.82	0.31	0.07	1.28
	40–49	1.99	0.10	39.36	1.10	0.45	2.70	0.50	0.10	2.39
	50+	–[a]	–	–	2.03	0.56	7.31	–[a]	–	–
Race (ref: White)	Asian	1.53	0.36	6.53	0.78	0.40	1.50	1.31	0.03	62.26
	Black	3.64	0.71	18.66	0.90	0.44	1.82	2.92	0.23	36.46
	Latino	2.86	0.65	12.60	1.31	0.71	2.41	4.97	0.48	51.45
	Other	6.84*	1.28	36.59	1.10	0.55	2.20	12.31*	1.19	126.73
Discussed sexual things we like to do		1.68	0.41	6.84	1.43	0.88	2.33	1.50	0.19	12.09
HIV disclosure		1.88	0.55	6.39	1.05	0.65	1.68	0.54	0.07	3.87
Decided to avoid anal		0.05**	0.01	0.48	0.12***	0.07	0.23	0.13*	0.02	0.85
Decided to use condoms		0.12**	0.02	0.55	0.12***	0.07	0.20	0.08*	0.01	0.69
Decided to have UAI		32.65***	9.74	109.52	49.67***	31.26	78.90	35.89***	7.76	165.90

*$p<0.05$
**$p<0.01$
***$p<0.001$
[a]All members within testing group and age category reported no unprotected anal intercourse
[b]5/76 agreed not to have anal sex, all of whom did not have UAI

intercourse was associated with reduced risk for UAI with both online and offline partners, whereas agreeing to have UAI before sex was very strongly associated with its subsequent occurrence. In the context of direct agreements to use or not use condoms, HIV status disclosure was not associated with lower risk of UAI. The exception was that among men who had been tested for HIV at least once in their lifetime, HIV status disclosure reduced the odds of UAI with their most recent online partner. HIV-negative MSM who have been tested may believe that that risks for acquiring HIV are higher with partners met online, and therefore, HIV disclosure may be one of a number of strategies they use to mitigate the risk. These results support intervention strategies that teach MSM to make explicit agreements about condom use for anal intercourse with sex partners rather than rely on partner reports of HIV status, which may be invalid or unreliable.

Study Limitations

Limitations of this study include the cross-sectional design that precludes analysis of temporal ordering of the independent variables and outcomes. The findings should not be generalized to MSM who were excluded because they abstain from sex or do not use the Internet. The sample was taken from the largest sex site for men in the US; generalizability to men in other websites is unknown. Although the ultimate effects of missing data on study conclusions is unknown, we note that a greater percentage of men who completed the survey were under the age of 25 than those who did not; otherwise, the groups were similar in terms of ethnicity/race, income, and size or residency. The actual or perceived HIV status of sex partners was not asked in the survey, and therefore, the findings do not speak specifically to HIV transmission risk or possible serosorting. Although we asked participants to report their HIV status in their *current* online profiles, inconsistencies in reporting HIV status among the HIV-positive group may result from the possibility that they reported their status in online profiles that predate their HIV diagnosis. Finally, although precautions were taken to detect and eliminate deception,[31] the study relied on self-reported data. Research has shown that computer-assisted data collection is comparable to and less susceptible to social desirability bias of stigmatized behavior than face-to-face interviews,[32–34] and online self-reports of health information are valid.[35]

Implications

The unique communication features of the Internet, particularly the anonymity it affords users and the ability to locate sex partners seeking similar sexual experiences, has the potential to dramatically alter condom negotiation and HIV status disclosure. More open communication of sexual preferences and serostatus online provides opportunities to instruct users to provide safety messages in their online profiles (e.g., "Always play safe") and to initiate sexual discussions prior to the face-to-face encounter. Communication of preferred sexual practices before having sex may represent individual intentions to follow through with such practices. In this respect, the communication factors examined in the current study may reflect the contribution of safer sex intentions in safer sex behaviors, as is presented in the Theory of Planned Behavior.[36] Increasing communication regarding safer sex and increasing perceived behavioral control over sexual activities through skills training may be an effective risk reduction strategy.[37]

Although there are a number of motivations for disclosing HIV status to potential sex partners (e.g., empowering each participant to make informed health-related decisions about their sexual practices), it is problematic to use partner serostatus

disclosure either through passive or active means to guide condom use decisions given the possibility for misrepresentation of HIV status or partners being unaware of their actual status. Direct, explicit agreements with sexual partners to use condoms during anal intercourse should be promoted as a risk reduction strategy.

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