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Associations between partner-venue specific personal responsibility beliefs and transmission risk behavior by HIV-positive men who have sex with men (MSM)

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Abstract

Personal responsibility beliefs of HIV-positive individuals to protect sex partners are an important determinant of engagement in transmission risk behavior. However, the degree to which such beliefs vary across different partners is unknown. HIV-positive men who have sex with men in the United States (N = 248) completing an online survey rated their personal responsibility beliefs for partners met in up to four different ways: a) in a bar; b) through the internet; c) in a public sex environment (PSE); or d) through friends or family. About a third of respondents reported variation in responsibility ratings. For those reporting two or more partner-meeting venues in the prior three months (n = 98), means among the venues were compared in pairwise fashion, with the strongest beliefs accruing to partners met through friends or family and the least with partners met in PSEs. These results provide further evidence that identifying ways to increase personal responsibility beliefs is an important goal, as well as is the application of Bandura's theory of moral agency to HIV transmission risk behavior.

Keywords

Personal responsibility; altruism; partner specificity; MSM; transmission risk

Introduction

Serodiscordant unprotected sexual intercourse involving a partner who is aware of his or her serostatus and does not disclose it may have practical and moral implications given the potential for HIV transmission. A recent review of the literature showed that holding a high standard of personal responsibility to not transmit the virus to others is associated with reduced sexual risk behavior (1), suggesting that interventions to heighten personal responsibility beliefs among persons with low beliefs may be important. Although the associations between personal responsibility beliefs, disclosure, and risk behavior are complex (2), greater understanding of situational variations in personal responsibility beliefs would benefit the design of such interventions (3). To date, no studies have explored whether personal responsibility beliefs among persons living with HIV vary by context in which sex partners are met (e.g., online vs. offline). The overall aim of this study is to fill

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that gap in the literature by examining the degree to which personal responsibility beliefs vary by where and how sex partners are met among a sample of men who have sex with men (MSM) living with HIV.

Studies of HIV serostatus disclosure (which may be a proxy for underlying personal responsibility beliefs) provide insight into whether personal responsibility beliefs may vary by context. A study by Carballo-Dieguez and his colleagues found that 17% of HIV-positive MSM revealed their serostatus to partners met online but not to offline partners (4). However, a more recent study (5) showed that equivalent proportions of men disclosed their HIV status to partners met online and offline (49% vs 44%). How consistently persons living with HIV disclose their serostatus across sexual contexts may be associated with actual risk behavior. In a study of HIV status disclosure among HIV-positive MSM (6), the highest levels of sexual risk behavior were reported by men whose disclosure behaviors were inconsistent compared to men who consistently disclosed or did not disclose their HIV status. The authors interpreted this finding to indicate that entering into a situation without a clearly-established guideline for behavior were likely to become flustered and impulsive in the moment. It thus seemed possible that inconsistency in responsibility beliefs might be associated similarly with higher levels of transmission risk behavior.

Based on the results of studies of serostatus disclosure, the current study has two aims. First, we sought to examine whether responsibility beliefs varied by situation in which sex partners were met. The second aim was to determine whether the consistency of responsibility beliefs was significantly associated with transmission risk behavior. The sample was comprised of HIV-positive MSM recruited to complete an online survey, in which they rated their personal responsibility beliefs regarding sex partners met in four different contexts: in a bar, through the Internet, at a public sex environment (PSE), or through friends or family.

Methods

Recruitment and Enrollment

Data used for the purpose of the current study were collected from a larger (i.e., "parent") study of the associations between state laws affecting gay, lesbian, bisexual, and transgender (GLBT) residents, alcohol use, and availability of the Internet. Recruitment for the parent study was guided *a priori* by the degree to which legal and HIV experts believed that the state laws were generally favorable or unfavorable to GLBT residents, and matched on population size and the number of alcohol establishments catering to the GLBT community. The focus of the current paper (i.e., responsibility beliefs and their variation across the venue in which partner was met) is unrelated to the matching criteria (city size, GLBT-related laws, the number of alcohol establishment) and therefore there is no reason to believe that the selection criteria would bias the responsibility belief estimates reported in the analyses of this paper.

Participants were recruited in a 3.5 month period in 2008 from online banner advertisements placed on two websites popular among gay and bisexual men to meet sexual partners. Banner ads stated, "Participate in University Research on Sex and Alcohol and Earn $30", included the university and study logo, and a picture of a man. To be eligible for the study, participants must have self-identified as male, 18 years of age or older, and residing in the US or one of its territories. Having ever had sex with a man was an additional eligibility requirement. Of the men who clicked on the banner ad (n=3370), 56% (n=1874) met eligibility requirements and enrolled in the survey, and 92% (n=1725) of the men completed the survey. The present analyses were conducted on 248 men who reported that they were HIV-seropositive.

Procedures

We used procedures consistent with best practices for online survey methodology (7). Participants who clicked on the study banner advertisement were taken to the secure study website. Prospective participants viewed a welcome page with an overview of procedures and information about the study and staff. After answering eligibility questions, eligible respondents were guided through the consent process in accordance with procedures approved by the University of Minnesota Institutional Review Board. An e-mail was sent to participants with a link to the survey for re-entry if he chose to end before completion. Participants who started the survey without finishing were sent reminder messages. The mean completion time was approximately 70 minutes. Automated and manual de-duplication and validation protocols were applied to ensure that each case represented a unique respondent. Specifically, respondent data were examined to identify identical or similar IP addresses, referring URLs, e-mail addresses, last names, and mailing addresses. Flagged cases were examined by two research staff and a decision was made regarding whether the cases were duplicate, following which the first case was retained in the dataset and the second case was deleted. Ineligible persons were taken to another webpage that thanked them for their interest.

Measures

The questions used for the purpose of this study were taken from a larger online survey of online and offline sexual attitudes and behaviors, substance use, and laws relevant to the GLBT community. Using algorithms, participants were asked a variable number of questions depending on their responses. Participants responded to each relevant question with either their answer or by clicking a "refuse to answer" option.

Demographic factors included age (open-ended format), HIV-status (with response options including "No, I have never been diagnosed with HIV", "Yes, I was diagnosed in the past 12 months", and "Yes, I was diagnosed more than 12 months ago," ethnicity (Latino v. non-Latino) and race (check box for American Indian, Asian American, Black, Pacific Islander, White, or an open-ended text box for "other" race), and educational attainment. Participants self-reported their sexual identity (gay, bisexual, heterosexual, or a different sexual identity), as well as their comfort with their sexual orientation (Likert scale from 1=Very Comfortable to 5=Very Uncomfortable).

Responsibility to protect sexual partners from HIV and other STIs was assessed by asking participants to rate the degree to which they agreed with the statement, "I feel responsible for protecting my [online sexual partners; sexual partners I meet in gay bars/clubs; sexual partners I meet in bathhouses, adult book stores and public parks; sexual partners I meet through friends, family and other social connections] from HIV and/or other sexually transmitted infections" (1=Strongly agree to 7=Strongly disagree). These questions were answered for every situation in which actual sex partners had been met during the preceding three months; thus, responsibility scores were obtained for partners met through one to four venue types. They were reverse-coded so that higher scores indicate stronger beliefs about personal responsibility. This type of single-item question has been used extensively in the past, and has shown good validity in that it is consistently associated with transmission risk behavior (1). It should be noted that, although we only used responsibility data regarding venues that the men reported they had actually met partners through, their judgments are general ones and do not rely on memory.

Participants were asked separately about their sexual behaviors with partners met online, at a bar, and locations other than online or a bar. For each venue, participants were asked to report the number of male sexual partners they had in the past 3 months, the number with

whom they engaged in anal intercourse (AI), as well as the number with whom they had unprotected anal intercourse (UAI). Next, men were asked the HIV status of their UAI male partners (HIV-positive, HIV-negative, or HIV-unknown).

Analyses

Statistical analyses were performed using STATA 9.2. Age, ethnicity and race, education, sexual orientation, and comfort with sexual orientation were recoded as shown in Table 1. Responses to each of the four responsibility items were reverse coded such that higher scores indicated greater responsibility for protecting partners from HIV and other STIs. Responsibility consistency could be calculated only for participants who provided responsibility scores for 2 or more situation-partners (n=98/248). To examine consistency of responsibility across partner types, a new variable ("Responsibility Consistency Group") was created that indicated whether responsibility scores across all situation-partners were consistently extremely high (i.e., 7s across two or more partner types), consistently lower (i.e., the same score across all partner types, but not 7s), or inconsistent (i.e., scores varied across partners for those with 2 or more situation-partners). Participants were grouped in this way since responsibility scores were highly skewed toward 7, ranging from 35% of men reporting a personal responsibility score of 7 for PSE sex partners to 60% of men who rated a personal responsibility score of 7 for partners met through friends and family. Therefore, a cutpoint between 6 and 7 to form higher and lower responsibility categories was used. The total number of UAI partners was calculated by summing the total number of partners participants met online, at a bar, and locations other than online or a bar. The total number of serodiscordant UAI (SDUAI) male partnerships was calculated as the total number of UAI partners that participants reported were HIV-negative or had an unknown HIV status.

Group differences were examined with Fisher's exact or Wilcoxon sign-rank test where appropriate. To assess whether responsibility consistency was associated with sexual risk-taking, it and demographic factors significantly associated with UAI in bivariate analyses were entered into two negative binomial regression analyses with UAI partners and SDUAI partners in the last 3 months as the outcome variables. Logistic regression was not used in the current analysis since the outcomes were not binary (e.g., 0=no SDUAI and 1= SDUAI). A negative binomial regression analysis was used since the outcome (like nearly all sexual behavior data) is not normally distributed and is generally right skewed. In such cases, rather than transforming the outcome, a negative binomial regression is used." Statistical significance was set at $p<.05$.

Results

Sociodemographics

As can be seen in Table 1, participants tended to be older, with the largest group between 41 and 70. This may reflect the online recruitment methods, or the fact that becoming infected and learning one's HIV status tends to occur later in life. The sample was predominantly white (78%), with at least a high school education, self-identified as gay, and comfortable with their sexual orientation. About two-thirds were in a long-term relationship. Among participants who provided 2 or more responsibility scores, only one demographic variable distinguished among men based on the consistency and level of responsibility beliefs: Latino men were more likely to hold consistently lower responsibility beliefs.

Personal Responsibility Beliefs by Where Sex Partner was Met

Of the 247 participants who reported an Internet partner, the mean responsibility score was 5.79 (not shown in table). This was slightly lower than the mean responsibility score for all participants who reported bar partners (n=68; M=5.88) and meeting partners through friends

or family (n=57; M=6.07), but slightly higher than the average responsibility score for all participants who reported public sex environment partners (n = 57; M=5.33). Because participants could report a mean responsibility score for more than one partner (and therefore the means reported above do not represent mutually exclusive categories), we categorized men into mutually exclusive categories based on their pattern of sex partners (see Table 2). Most men (60.48%) reported only meeting men online, and the mean responsibility score for their online partners was 5.84. The next most frequent pattern of venues in which sex partners were met was online and at the bar (16.53%). For men, who reported meeting partners online and at the bar only, the mean responsibility score for online partners was 5.93 and for bar partners was 5.88. Only one participants met partners at public sex environments and through friends and family, however 11.69 percent of men met partners online, at public sex environments and through friends and family, with mean responsibility scores ranging from 5.00 for PSEs to 5.90 for friends and family. Finally, 10.89% of men reported meeting partners in all 4 venues, with the highest mean responsibility score for friends and family (M=6.33) and the lowest responsibility score for partners met at PSEs (M=5.63). Although examining patterns of responsibility scores within combinations of venues in which sex partners were met appears to suggest that mean responsibility ratings vary across partners, this cannot be statistically determined.

To statistically test whether responsibility scores vary across venue in which partners are met, we compared responsibility scores for pairs of venues reported by respondents (Table 3). Ninety-eight participants gave responsibility scores for two or more venues (as was noted above that 150 men only reported Internet partners). Pairs for which responsibility scores differed significantly were internet versus PSE (higher responsibility for internet); internet versus friend/family (higher responsibility for friend/family); bar versus friend/family (higher scores for friend/family); and PSE versus friend/family (higher scores for friend/family).

Consistency of Personal Responsibility Beliefs and Association with Transmission Risk Behavior

Relationships between consistency of responsibility beliefs and high transmission risk behaviors for participants reporting 2 or more responsibility scores are given in Table 4 (n = 98). Significant group differences were found both for UAI and SDUAI partners. In both cases, men with consistently extremely high responsibility beliefs (i.e., 7s across all partner types) had significantly fewer UAI and SDUAI partners than participants whose scores were consistently lower or inconsistent.

Table 5 shows the estimated effect of responsibility belief consistency on UAI and SDUAI, adjusted for sociodemographic factors that were significantly associated with the outcome in the bivariate analyses (not shown, however these were long-term relationship, race/ethnicity, and comfort with sexual orientation). Compared to men who reported inconsistent responsibility beliefs across partner types, those who reported consistently high responsibility beliefs were significantly likely to have fewer SDUAI partners in the past 3 months, IRR=0.26, 95% CI (0.11, 0.60).

Discussion

The data presented here show that personal responsibility beliefs for protecting sex partners from HIV is not a static, dispositional variable, but may vary depending on the circumstances surrounding meeting the partner. This indicates that personal responsibility is not a monolithic internalized self-standard for many men. In general, men saw themselves as having the least responsibility for protecting partners met in public sex environments, and the most for those met through friends or family. Interestingly, about half (n = 16/29) of men

who were inconsistent in their responsibility beliefs displayed the same pattern: they felt more responsible for partners met through friends and family than through any of the other meeting venues. One could speculate that in the case of partners met through friends or family, perceptions of responsibility may be based on concerns about social reprisal should the men engage in irresponsible behavior and the partner reveal this to the friend or family member. It may also be the case that friends of friends or family are seen as being more similar to the self and thus more protected with respect to disengagement of moral mechanisms (8, 9).

As has been shown in prior studies (1), responsibility beliefs were associated with transmission risk behavior in the expected direction: men who felt more responsible for protecting partners engaged in less risky behavior. Unlike the findings of Parsons and colleagues (2005) regarding serostatus disclosure, men with inconsistent responsibility beliefs did not show the riskiest behavior, but rather displayed risk levels similar to those consistently low in personal responsibility. The fact that many men vary in how strongly responsible they feel for protecting partners met in different ways suggests that they may be using different mechanisms for moral disengagement (8, 9) depending on how the partner was met. For example, partners who frequent public sex environments may be depersonalized and seen as being responsible for their own behavior and outcomes. Similarly, partners met on the internet may be screened for HIV status, and those met in PSEs may be assumed to already be HIV-positive (10). Both of these procedures are ways of minimizing potentially injurious consequences (8).

The results of the current study should be interpreted with caution. First, the number of men who reported responsibility beliefs for partners met in two or more venues (n=98) was relatively small, and therefore may not be representative of the larger population of Internet-using MSM or MSM overall. Second, men were recruited from the Internet and may not be representative of MSM who do not use the Internet. Third, although there is no obvious reason to believe that the selection criteria for choosing men from the 16 cities in the parent grant would affect the responsibility belief or risk behavior estimates, we cannot be certain. Therefore, the results of this study should be replicated with larger samples and more geographically diverse MSM.

Keeping these limitations in mind, variation reported by men in levels of responsibility for protecting partners met in different ways suggests that interventions to reduce transmission risk behavior may need to address responsibility beliefs for different partner types. For example, if different mechanisms for moral disengagement are used for different partner types, these should all be addressed if an intervention for HIV-positives is to be maximally efficacious. In general, interventions that increase levels of personal responsibility for protecting sex partners from their HIV infection may be a promising avenue for future research. In an earlier review (1), we outlined several speculative methods for changing responsibility beliefs; the interested reader is referred to this paper for possible intervention strategies.

Personal responsibility is one of the strongest and most consistent predictors of transmission risk behavior. The HIV prevention field is increasingly turning its attention to prevention for positives and combination (biomedical and behavioral) prevention. Personal responsibility for protecting others is therefore deserving of attention, both in research and in the development of interventions for HIV-positive individuals.

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Table 1

Participant background variables for all participants (n=248) and by responsibility consistency group (men reporting 2 or more venues, N = 98).

	All participants (*n*=248)	**Consistently Lower (1–6) (*n*=31)**	**Inconsistent Responsibility Score (*n*=29)**	**Consistently Extremely High (7) (*n*=38)**	**Fisher's Exact (FE) Significance Value**
	Col %	**n (Row %)**	**n (Row %)**	**n (Row %)**	
Age (years)					FE=0.49
18–20	2	0 (0)	1 (100)	0 (0)	
21–30	18	3 (16)	7 (37)	9 (47)	
31–40	28	7 (28)	8 (32)	10 (40)	
41–70	52	19 (37)	13 (25)	19 (37)	
Ethnicity/Race					FE=0.01
White	78	21 (30)	24 (34)	26 (37)	
Latino	15	10 (53)	1 (5)	8 (42)	
Other Races	7	0 (0)	4 (50)	4 (50)	
Education					FE=0.20
H.S. or less	14	3 (19)	5 (31)	8 (50)	
Technical/Some College	40	11 (27)	11 (27)	19 (46)	
College Degree	33	14 (45)	11 (35)	6 (19)	
Grad Degree	13	3 (30)	2 (20)	5 (50)	

	Total (*n*=248)	**Consistently Lower (1–6) (*n*=31)**	**Inconsistent Responsibility Score (*n*=29)**	**Consistently Extremely High (7) (*n*=38)**	**Fisher's Exact (FE) Significance Value**
	Col %	**Row %**	**Row %**	**Row %**	
Sexual Identity					FE=1.00
Gay	94	29 (31)	28 (30)	36 (39)	
Other (e.g., Bisexual)	6	2 (40)	1 (20)	2 (40)	
Comfort with Sexual Orientation					FE=0.21
Very	77	25 (32)	21 (27)	31 (40)	
Comfortable	16	6 (43)	5 (36)	3 (21)	
Less than comfortable	7	0 (0)	3 (43)	4 (57)	
Long-term Relationship					FE=0.76
No	66	23 (34)	19 (28)	25 (37)	
Yes	34	8 (26)	10 (32)	13 (42)	

Table 2

Mean responsibility ratings (range from 1 indicating lower responsibility to 7 indicating higher responsibility) by venue in which sex partner was met (in one or more venues) in the past three months.

Within Venue Combinations		**Internet**	**Bar**	**PSE**	**F/F**
Venue(s)	**n (%)**	***Mean***	***Mean***	***Mean***	***Mean***
Int	150 (60.48)	5.84	--	--	--
Int + Bar	41 (16.53)	5.93	5.88	--	--
PSE + F/F	1 (0.40)	--	--	7.00	4.00
Int + PSE + F/F	29 (11.69)	5.38	--	5.00	5.90
Int + Bar + PSE + F/F	27 (10.89)	5.78	5.89	5.63	6.33

Notes: -- Mean not available; Int = Interent; PSE = Public Sex Environment (e.g., Park, Bathhouse); F/F = Through friends or family

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Table 3

Comparison of pairs of mean responsibility scores (note: higher scores indicate greater responsibility) for men reporting more than one venue type for meeting partner, *n=98*.

Venue 1	Venue 2	n	Mean Venue 1	Mean Venue 2
Internet	Bar	68	5.87	5.88
Internet	PSE	56	5.57	5.30*
Internet	F/F	56	5.57	6.11***
Bar	PSE	27	5.89	5.63
Bar	F/F	27	5.89	6.33*
PSE	F/F	27	5.33	6.07***

* p<.05,

** p<.01,

*** p<.001

PSE = Public Sex Environment (e.g., Park, Bathhouse)

F/F = Through friends or family

Table 4

Mean unprotected anal intercourse (UAI) and serodiscordant UAI (SDUAI) partners in the past 3 months by responsibility consistency group for men reporting more than one venue type for meeting partner, *n*=98.

	Consistently Lower (1–6) (*n*=31)	**Inconsistent Responsibility Score (*n*=29)**	**Consistently Extremely High (7) (*n*=38)**
Mean UAI (SD[a])	10.13[c] (13.79)	8.48[b] (9.35)	6.21[b,c] (10.46)
Mean SDUAI (SD)	6.16[e] (9.03)	5.79[d] (8.03)	1.63[d,e] (4.00)

Note: superscript letter pairs b–e indicate significant group differences.

[a] Standard Deviation

[b] Z=2.26, p<.05

[c] Z=2.00, p<.05

[d] Z=2.92, p<.01

[e] Z=2.75, p<.01

Table 5

Estimated effect of responsibility to protect sexual partners from HIV/STIs on unprotected anal intercourse (UAI) and Serodiscordant UAI (SDUAI) among Internet-using men who have sex with men in the past 3 months (*n*=98), adjusted for long-term relationship status, race/ethnicity, and comfort with sexual orientation (CSO).

		UAI Partners			SDUAI Partners		
		IRR[a]	95% CI (LL, UL)		IRR	95% CI (LL, UL)	
Responsibility (Ref: Inconsistent)	Consistently Lower (1–6)	1.20	0.55	2.62	0.98	0.42	2.29
	Consistently Extremely High (7)	0.69	0.34	1.39	0.26**	0.11	0.60
In Long-term relationship		0.71	0.39	1.29	0.71	0.34	1.51
Race/Ethnicity (Ref: White)	Latino	0.70	0.32	1.50	n/a	n/a	n/a
	Other Races	0.69	0.24	1.97	n/a	n/a	n/a
CSO (ref: Very Comfortable)	Comfortable	0.95	0.43	2.12	n/a	n/a	n/a
	< Comfortable	0.99	0.35	2.83	n/a	n/a	n/a

* p<.05;

** p<.01;

*** p<.001

Notes:

[a] Incidence rate ratio; n/a = not included in model since not significant in bivariate analysis