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## Beliefs that Condoms Reduce Sexual Pleasure—Gender Differences in Correlates Among Heterosexual HIV-Positive Injection Drug Users (IDUs)

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**ABSTRACT** *Studies consistently find that negative condom beliefs or attitudes are significantly associated with less condom use in various populations, including HIV-positive injection drug users (IDUs). As part of efforts to reduce sexual risk among HIV-positive IDUs, one of the goals of HIV interventions should be the promotion of positive condom beliefs. In this paper we sought to identify the correlates of negative condom beliefs and examined whether such correlates varied by gender, using a subsample (those with an opposite-sex main partner; n=348) of baseline data collected as part of a randomized controlled study of HIV-positive IDUs. In multivariate analyses, we found more significant correlates for women than for men. With men, perception that their sex partner is not supportive of condom use (negative partner norm) was the only significant correlate (Beta=-0.30;  $p<0.01$ ;  $R^2=0.18$ ). Among women, negative partner norm (Beta=-0.18;  $p<0.05$ ); having less knowledge about HIV, STD, and hepatitis (Beta=-0.16;  $p<0.05$ ); lower self-efficacy for using a condom (Beta=-0.40;  $p<0.01$ ); and more episodes of partner violence (Beta=0.15;  $p<0.05$ ) were significantly associated with negative condom beliefs ( $R^2=0.36$ ). These findings suggest important gender-specific factors to consider in interventions that seek to promote positive condom beliefs among HIV-positive IDUs.*

**KEYWORDS** *Condom beliefs, Correlates, Gender differences, Partner norm.*

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### INTRODUCTION

Injection drug users (IDUs) represent about one-third of persons living with AIDS in the USA.<sup>1</sup> Recent CDC initiatives have emphasized the need to work with HIV-infected populations in an effort to prevent the spread of HIV.<sup>2-4</sup> HIV-positive IDUs are one of the groups that particularly need such attention. Early in the epidemic, injection risk behaviors were the primary source of HIV infection among IDUs; more recent studies have documented a strong association between unprotected sex and HIV seroconversion among IDUs.<sup>5,6</sup> Studies also have found that some HIV-positive IDUs continue to

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engage in risky sexual behaviors that could transmit HIV to uninfected persons.<sup>7–11</sup> It is imperative that prevention efforts with HIV-positive IDUs focus not only on reducing their injection risk behaviors but also on reducing their sexual risk behaviors.

Studies have consistently found that negative beliefs or attitudes about condoms are significantly associated with less frequent condom use in various populations.<sup>12–22</sup> This pattern has been confirmed in analyses of HIV-positive IDU men<sup>11</sup> and women.<sup>10</sup> Reducing negative condom beliefs or attitudes among people at risk of acquiring or transmitting HIV may be an important step toward reducing sexual risk, and identifying significant correlates of such beliefs or attitudes would inform us about what can be done to better promote condom use among those who need to use them. However, factors associated with negative condom beliefs or attitudes particularly among HIV-positive populations, including HIV-positive IDUs, have not been investigated greatly.

In this exploratory study, we sought to identify correlates of negative condom beliefs, specifically, beliefs that condoms would reduce sexual pleasure among a subsample of HIV-positive IDUs. We examined three categories of potential correlates, namely, individual characteristics, partner characteristics, and social characteristics. Individual characteristics included sociodemographic factors (age, race, education, and income); depression; knowledge about HIV, STD, and hepatitis; self-efficacy (one's perceived ability) for using a condom; self-efficacy for disclosing HIV status to a sex partner; and HIV status disclosure. Partner characteristics included partner norm supporting condom use, physical violence inflicted by partner, and partner's HIV serostatus. For social characteristics, we examined social norms supporting condom use.

Some of the constructs such as knowledge, self-efficacy, and norms were drawn from major theories of behavioral change (e.g., the information-motivation-behavior skills model;<sup>23</sup> the theory of reasoned action<sup>24</sup>) that have been shown to predict HIV risk reduction. Other variables (HIV status disclosure and partner's serostatus) were considered because of their relevance to sex lives of HIV-positive IDUs.<sup>25,26</sup> Depression might also be a relevant correlate, as depressed persons could be expected to perceive things (including condoms) in a negative manner. Drawing on the studies that point to the significant role of intimate partner violence in shaping HIV risk among women,<sup>27–29</sup> we also examined intimate partner violence as a potentially gender-relevant correlate.

Because condoms are worn by men, and thus, because men may be the ones to actually experience physical discomfort such as erection problems and loss of sensation,<sup>30–33</sup> men may have more negative condom beliefs than women and differential correlates of negative condom beliefs could be found between men and women. To explore gender differences, the majority of analyses were conducted separately by gender.

## **METHODS**

### **Study Participants**

We report baseline data from a convenience sample of HIV-positive IDUs who participated in the Intervention for Seropositive Injectors—Research and Evaluation (INSPIRE), a randomized controlled trial of an HIV prevention intervention designed for HIV-positive IDUs. The study was conducted in four cities in the United States (Baltimore, Miami, New York, and San Francisco) from 2001 through 2005. Participants were recruited using active (e.g., street outreach) and passive strategies (e.g., posters and leaflets, word of mouth) in a variety of HIV care

and community venues including AIDS service organizations, medical clinics, and methadone clinics, as well as street-based settings. Individuals were screened for eligibility and were eligible for the study if they were at least 18 years old, confirmed to be HIV-positive by testing of oral specimen, reported injection drug use in the past 12 months, and reported having sex with an opposite-sex partner in the past 3 months.

At baseline, participants were administered an audio computer-assisted self interview to answer questions regarding sexual and drug using behaviors, utilization of health care, and adherence to HIV medications. Participants also provided an oral fluid sample for confirmatory HIV-antibody testing (OraSure, OraSure Technologies, Bethlehem, PA, USA) and a blood specimen for CD4 count and viral load. HIV confirmation testing was performed at local laboratories, and immunoassays at the CDC laboratories. Participants were reimbursed \$30 for their time and effort for the baseline appointment. More detailed description of INSPIRE and its methodology has been reported elsewhere.<sup>34</sup> Study protocols were approved by institutional review boards of CDC and collaborating study sites.

### **Study Sample**

For the present paper, we used a subsample of 348 participants (179 men and 169 women). Of the total sample of 1,161 participants enrolled into the study, 7% (80/1,161) said they had not had sex in the past 3 months at the time of baseline (although they had had sex sometime in the 3 months prior to screening), 45% (517/1,161) reported having one sex partner, and 48% (552/1,161) reported having more than one sex partner in the past 3 months. We restricted our study sample to participants who reported having one sex partner so that partner-specific correlates (see “Measures” section below) did not have to be averaged or summed across different sex partners, and thus, more precise measurements of the correlates could be used. Some of the measures of correlates were assessed only from participants who reported having heterosexual relationships or those with main sex partners. Because of these restrictions, we used a subsample of participants who reported having one opposite-sex main or “steady” partner in the past 3 months. This subsample included more participants from the Baltimore site (36%) and fewer participants from the Miami site (16%) than the total sample (27% from Baltimore and 26% from Miami); however, other demographic characteristics and the average condom beliefs scores remained similar to the total sample. Preliminary analyses with this subsample found a significant association between negative condom beliefs and unprotected sex in both gender groups ( $p < 0.001$ ).

### **Measures**

Measures used in this study, when appropriate, were tested for their psychometric properties by factor and reliability analyses.

#### *Dependent Variable*

*Negative Condom Beliefs* Beliefs that condoms would reduce sexual pleasure were assessed by a four-item scale adapted from the “hedonistic outcome expectancy” scale developed for a study on HIV-positive men who have sex with men.<sup>35</sup> The items included “condoms ruin the mood,” “sex doesn’t feel as good when you use a condom,” “sex with condoms doesn’t feel natural,” and “using condoms breaks up the rhythm of sex.” Responses were scored from “strongly disagree” (=1) to

“strongly agree” (=5) and the mean score was computed. A higher score indicated more negative beliefs. (Cronbach’s  $\alpha=0.85$  for males and  $0.94$  for females).

#### *Potential Correlates—Individual Characteristics*

*Sociodemographic Characteristics* Sociodemographic variables examined include age (in years), biological sex, race/ethnicity (non-Hispanic white, non-Hispanic black, Hispanic, or other), city of residence (Baltimore, Miami, New York, or San Francisco), education (high school or more vs. less than high school), and income (\$10,000 or more per year vs. less than 10,000 per year).

*Knowledge About HIV, STD, and Hepatitis* Participants’ knowledge about HIV, STD, and hepatitis were tested using 18 true–false questions. Participants scored 1 for correctly answering each question, and percentage of correct answers was computed for each participant. Thus, a higher percentage indicated greater correct knowledge. Examples of questions included “Using latex condom is highly effective in reducing the risk of transmitting HIV” and “You can still transmit HIV even when your viral load is undetectable.”

*Self-efficacy for Using a Condom for Vaginal Sex* This construct was measured in reference to the specific main sex partner that a participant identified. The construct was assessed using a nine-item scale that asked about participants’ self-perceived ability to use condoms with the main partner during various situations. Examples of situations included “When you want to have vaginal sex with [Name of Partner], you can use a condom even if [Name of Partner] does not want to” and “even if you both really want to feel close.” Responses were scored from 1 (absolutely sure I cannot) to 5 (absolutely sure I can), and the mean score was computed. A higher score indicated higher self-efficacy ( $\alpha=0.93$  for males,  $0.95$  for females).

*Self-efficacy for Disclosing HIV Status to a Sex Partner* This construct was assessed using a six-item scale that asked about participants’ confidence to disclose their HIV status to a sex partner in various situations. Unlike the self-efficacy for using a condom scale mentioned above, this scale did not have any particular sex partner as a reference. Examples of items included “I can tell a new sex partner my HIV status before having sex even if I am really attracted to them” and “I can tell...even if they might know some of my friends.” Responses were scored from 1 (absolutely sure I cannot) to 5 (absolutely sure I can), and the mean score was computed. A higher score indicated higher self-efficacy ( $\alpha=0.94$  for males and females).

*Disclosure of HIV Sero-status to the Partner* Participants were asked whether they had disclosed their HIV status to the specific main partner that they identified. Response options were “yes,” “no,” and “unsure.” We further created a dichotomous variable indicating “yes” (=1) and “no or unsure” (=0).

*Depressive Symptoms* Depressive symptoms were measured by the seven-item depression subscale of the Brief Symptom Inventory.<sup>36</sup> Examples of questions included “In the past week, how much have you been bothered by thoughts of ending your life,” or “feeling lonely.” Responses were scored from 1 (not at all) to 5 (extremely), and the mean score was computed. A higher scale score indicated more depressive symptoms. ( $\alpha=0.88$  for males and females).

### *Potential Correlates—Partner Characteristics*

*Partner Norm Supporting Condom Use for Vaginal Sex* Like self-efficacy for using a condom for vaginal sex, the partner norm construct was measured in reference to the specific main partner that a participant identified. The construct was assessed using two questions: (1) whether participant perceived that the main partner thought that a condom should be used for vaginal sex (normative belief) and (2) whether the participant felt it was important to comply with that expectation (motivation to comply).<sup>24</sup> This construct could also be referred to as “perceived normative pressure.”<sup>37</sup> Responses to the “normative belief” item ranged from  $-2$  (strongly disagree) to  $+2$  (strongly agree). Responses to the “motivation to comply” item ranged from 1 (strongly disagree) to 5 (strongly agree). The normative belief score was multiplied by the motivation score to create the final score ranging from  $-10$  to  $+10$ , with a higher score indicating stronger partner norm supporting condom use.<sup>38</sup>

*Physical Violence from the Partner* Again, this construct was measured in reference to a specific main partner and was assessed using an adapted version of the Conflict Tactics Scale.<sup>39</sup> The scale included eight items. Questions asked whether, in the prior 12 months, the main partner had “threatened to hit you or throw something at you;” “slapped you;” “kicked, bit, or hit you with a fist;” “choked or strangled you;” “physically forced you to have sex;” “beaten you up;” “threatened you with a knife or gun;” and “used a knife or gun on you” with response options “yes” ( $=1$ ) and “no” ( $=0$ ). The number of “yes” responses was summed across items for a total score ( $\alpha=0.75$  for males and  $0.77$  for females).

*Partner’s HIV Serostatus* Participants were asked whether the main partner that they identified was perceived by them to be HIV positive, HIV negative, or of unknown serostatus. We created a dichotomous variable indicating “HIV-positive” ( $=1$ ) and “HIV-negative or of unknown serostatus” ( $=0$ ).

### *Potential Correlates—Social Characteristics*

*Social Norms Supporting Condom Use for Vaginal Sex* This construct was measured in a similar manner as the partner norm variable. Instead of using sex partner as a reference person, this construct used “most people who are important to me” as the reference group. Again, a higher score indicates stronger social norm supporting condom use.

## **Analytic Strategy**

All of these analyses were conducted separately by gender. First, we compared the descriptive statistics for major variables. Then, bivariate analyses (Pearson correlation and analysis of variance) were conducted to examine the associations between the outcome measure and each of the potential correlates. Lastly, all the bivariate correlates that were associated with the outcome ( $p<0.1$ ) were included in multivariate models (linear regression) predicting negative condom beliefs. Preliminary analysis indicated that distribution of residuals was approximately normal. This, together with examination of plots of the residuals against the predicted values and the independent variables, suggested that linear regression would be an appropriate statistical method for the multivariate analyses.<sup>40</sup>

**TABLE 1** Sample characteristics of HIV-positive IDUs who reported having one main partner

Variables	All (n=348)	Male (n=179)	Female (n=169)
	n (%)	n (%)	n (%)
Categorical variables			
Individual characteristics			
Race/ethnicity*			
White	41 (11.9)	16 (9.1)	25 (14.8)
African American	223 (64.6)	110 (62.5)	113 (66.9)
Hispanic	55 (15.9)	34 (19.3)	21 (12.4)
Other	26 (7.6)	16 (9.1)	10 (5.9)
City			
Baltimore	126 (36.2)	64 (35.8)	62 (36.7)
Miami	55 (15.8)	26 (14.5)	29 (17.2)
New York	98 (28.2)	58 (32.4)	40 (23.7)
San Francisco	69 (19.8)	31 (17.3)	38 (22.4)
Education**			
Less than high school	144 (41.4)	63 (35.2)	81 (47.9)
High school or more	204 (58.6)	116 (64.8)	88 (52.1)
Income			
Less than \$10,000/year	292 (86.4)	147 (84.5)	145 (88.4)
\$10,000/year or more	46 (13.6)	27 (15.5)	19 (11.6)
Disclosed HIV status to this partner			
Yes	335 (96.3)	173 (96.6)	162 (95.9)
No	13 (3.7)	6 (3.4)	7 (4.1)
Partner characteristics			
Partner's sero-status			
HIV-positive	184 (53.0)	99 (55.9)	85 (50.3)
HIV-negative/unknown	163 (47.0)	79 (44.1)	84 (49.7)
Continuous variables			
	Mean (SD)	Mean (SD)	Mean (SD)
	Range	Range	Range
Individual characteristics			
Negative condom beliefs*	2.87 (1.10) 1–5	2.97 (0.98) 1–5	2.75 (1.20) 1–5
Mean age***	42.23 (6.58) 23–56	43.43 (6.09) 26–56	40.96 (6.85) 23–56
Knowledge about HIV, STD, and hepatitis (proportion correct on 18-item index)	0.80 (0.12) 0.33–1.00	0.80 (0.12) 0.33–1.00	0.79 (0.12) 0.33–1.00
Self-efficacy for using a condom	3.85 (1.03) 1–5	3.94 (0.96) 1–5	3.76 (1.10) 1–5
Self-efficacy for disclosing HIV status to a sex partner*	3.77 (0.98) 1–5	3.86 (0.92) 1–5	3.68 (1.05) 1–5
Depressive symptoms***	1.91 (0.83) 1–4.86	1.76 (0.73) 1–4.57	2.07 (0.90) 1–4.86
Partner characteristics			
Partner norm supporting condom use***	3.29 (5.16) –10.00–10.00	4.44 (4.73) –8.00–10.00	2.07 (5.32) –10.00–10.00

TABLE 1 *Continued*

Variables	All ( <i>n</i> =348)	Male ( <i>n</i> =179)	Female ( <i>n</i> =169)
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)
Physical violence inflicted by this main partner*	0.84 (1.42) 0–8.00	0.97 (1.48) 0–8.00	0.70 (1.35) 0–6.00
Social characteristics			
Social norm supporting condom use**	4.29 (4.15) –10.00–10.00	4.85 (4.01) –10.00–10.00	3.70 (4.22) –10.00–10.00

\* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

## RESULTS

### Sample Characteristics—Differences Between Men and Women

Characteristics of the 348 participants in the study sample are summarized in Table 1. There were a few significant differences ( $p < 0.05$ ) between the gender groups (Table 1). A higher percentage of women than men reported having less than high school education. Women were also younger, reported greater depressive symptoms, and reported weaker partner norm supporting condom use and social norm supporting condom use than men.

With respect to condom beliefs, there was a marginally significant gender difference ( $p < 0.1$ ), where male participants reported more negative beliefs about condoms than female participants. When closely looking at the frequency distributions of condom belief scores, 47% of male participants and 35% of female participants scored higher than 3, showing negative condom beliefs. We further compared scores of male and female participants for each of the items in the condom beliefs scale (results not shown in the table) and found that males rated condoms more unfavorably with respect to the items “sex doesn’t feel as good when you use a condom” (3.18 for men vs. 2.82 for women,  $p < 0.01$ ) and “sex with condom doesn’t feel natural” (3.26 for men vs. 2.90 for women,  $p < 0.01$ ). No significant gender differences were observed with respect to the items “condom ruins the mood” and “using condoms breaks up the rhythm of sex.”

### Bivariate Associations with Negative Condom Beliefs

*Male Analysis* Bivariate analysis with the male sample found the following correlates of negative condom beliefs ( $p < 0.1$ ). Among individual characteristics, negative condom beliefs were associated with lower self-efficacy for using a condom with this partner ( $r = -0.33$ ;  $p < 0.01$ ), lower self-efficacy for disclosing HIV status to a sex partner ( $r = -0.16$ ;  $p < 0.05$ ), and greater depressive symptoms ( $r = 0.13$ ;  $p < 0.1$ ). Among partner characteristics, partner norm not supporting condom use ( $r = -0.39$ ;  $p < 0.01$ ) and the partner’s serostatus being HIV-positive as opposed to HIV-negative or of unknown status (3.13 vs. 2.78;  $p < 0.05$ ) were associated with negative condom beliefs. Social norm not supporting condom use was also associated with negative condom beliefs ( $r = -0.21$ ;  $p < 0.01$ ).

*Female Analysis* In the female sample, bivariate correlates of negative condom beliefs include individual characteristics, such as less knowledge about HIV, STD, and hepatitis ( $r = -0.14$ ;  $p < 0.1$ ); lower self-efficacy for using a condom with this partner

**TABLE 2** Final multiple regression model predicting negative condom beliefs among HIV-positive IDU men with one main partner ( $n=172$ )

	<i>B</i>	SE <i>B</i>	Beta	<i>p</i> value
Individual characteristics				
Self-efficacy for using a condom	-0.103	0.092	-0.100	NS
Self-efficacy for disclosing HIV status to a sex partner	-0.100	0.079	-0.091	NS
Depressive symptoms	0.137	0.095	0.103	NS
Partner characteristics				
Partner norm supporting condom use	-0.061	0.020	-0.296	$p<0.01$
Partner is HIV-positive	0.176	0.144	0.090	NS
Social characteristics				
Social norm supporting condom use	0.004	0.021	0.018	NS
$R^2=0.18$				

( $r=-0.53$ ;  $p<0.01$ ); greater depressive symptoms ( $r=0.13$ ;  $p<0.1$ ); partner characteristics, such as partner norm not supporting condom use ( $r=-0.42$ ;  $p<0.01$ ); and greater physical violence from this partner ( $r=0.23$ ;  $p<0.01$ ). Social norm not supporting condom use was also associated with negative condom beliefs ( $r=-0.25$ ;  $p<0.01$ ).

### Multivariate Analysis

Tables 2 and 3 show the results of multivariate analyses for men and women, respectively. Table 2 indicates that, among correlates found to be associated with condom beliefs in bivariate analysis, only perceived partner norm remained as a significant multivariate correlate among men. The model for men explained 18% of the variance in the outcome. Table 3 indicates that, among women, significant multivariate correlates were individual characteristics, such as self-efficacy for using a condom with this partner and knowledge about HIV, STD, and hepatitis, and partner characteristics, such as partner norm and physical violence from the partner. The model for women explained 36% of the variance in the outcome.

**TABLE 3** Final multiple regression model predicting negative condom beliefs among HIV-positive IDU women with one main partner ( $n=166$ )

	<i>B</i>	SE <i>B</i>	Beta	<i>p</i> value
Individual characteristics				
Knowledge about HIV, STD, and hepatitis	-1.524	0.631	-0.157	$p<0.05$
Self-efficacy for using a condom	-0.433	0.080	-0.400	$p<0.01$
Depressive symptoms	0.040	0.089	0.030	NS
Partner characteristics				
Partner norm supporting condom use	-0.041	0.018	-0.181	$p<0.05$
Physical violence from this partner	0.120	0.060	0.137	$p<0.05$
Social characteristics				
Social norm supporting condom use	-0.019	0.020	-0.068	NS
$R^2=0.36$				

## DISCUSSION

We sought to identify the correlates of condom beliefs and examined whether such correlates varied by gender among a subsample of HIV-positive IDUs who reported having an opposite-sex main partner. This paper is unique for its focus on HIV-positive IDUs and gender differences in correlates of condom beliefs and is a rare analysis for including HIV-positive heterosexual men; past studies of HIV-positive men were primarily focused on men who have sex with men.<sup>13</sup> It is crucial to examine beliefs and behaviors of HIV-positive heterosexual men, as HIV is more readily transmitted from men to women.<sup>41</sup> We found partner norm, i.e., what the sex partner thought about condom use and how the participant valued such views, to be a significant correlate of condom beliefs for both men and women. In other words, regardless of gender, the stronger the normative pressure to use a condom perceived from a sex partner, the more positive a person's beliefs about condoms. It is noteworthy that social norm (i.e., normative pressure from most people who are important to participants) was not a significant multivariate correlate in both male and female models. Additional analyses suggest that this finding was probably due to overlap between partner and "most people who are important" as significance of the latter variable disappeared after partner norm was entered into the models (results not shown).

In multivariate analysis, we found more significant correlates of condom beliefs among women than among men. Women's beliefs about condoms were also associated with individual characteristics such as HIV (STD and hepatitis) knowledge and self-efficacy to use a condom, as well as partner characteristics such as partner violence. That is, the more knowledge and self-efficacy a woman had and the less that violence was inflicted by her sex partner, the more positive her condom beliefs were. Knowledge and self-efficacy are some of the major constructs drawn from theories of behavioral change used in HIV risk reduction interventions. In fact, many behavioral interventions do address these factors by providing information about HIV/STD transmission and prevention and/or providing skills-building exercises to enhance communication skills (how to effectively convince their partners to use condoms in various situations) or to teach participants how to put on a condom using an anatomical model.<sup>42,43</sup> Thus, these interventions are already likely to positively affect condom beliefs among women.

On the other hand, addressing partner-related characteristics such as violence within the relationship can be a challenge for HIV prevention interventions. Our finding does indicate that partner violence is clearly an important problem to tackle among our sample of HIV-positive IDU women. In fact, given that HIV preventions based on cognitive behavioral models of behavior change largely assume participants have free agency to enact changes, new approaches may be needed to more adequately address the larger context in which risk behaviors occur, particularly among marginalized, drug-using women.<sup>25</sup> For example, Pronyk and his colleagues<sup>44</sup> found in a study conducted in South Africa that a structural intervention that combined a poverty-focused microfinance initiative with a curriculum of gender and HIV education reduced the levels of intimate-partner violence reported among the women receiving the intervention. Such a model is worth exploring in the US context as well. Our finding that partner norm was a significant correlate of condom beliefs in both men and women suggests that HIV prevention approaches need to be expanded to address relationship dynamics.

It is noteworthy that men tended to have more negative condom beliefs. Specifically, men rated condoms significantly more negatively for items such as “sex doesn’t feel as good when you use a condom” and “sex with a condom doesn’t feel natural.” Also, only 18% of the variance in the male model was explained by psychosocial factors. For men, it may be that experience of physical discomfort with condoms is the salient problem largely shaping their belief about condoms. To further investigate this issue, we need to consider additional factors such as participants’ previous unfavorable experiences (e.g., loss of erection or sensation) with condoms. These results suggest that more research is needed to fully understand what shapes the condom beliefs of men.

However, we found one significant correlate, namely, partner norm in the men’s model, and this result suggests that it may be possible to address men’s negative condom beliefs by working together with them and their partners. The question then is to come up with a strategy so that men would perceive strong normative pressure to use a condom from their partners. One potential strategy would be couples-based interventions where men and women each practice to develop norms supporting condom use. Another strategy would be to provide women with skills to clearly communicate their positive beliefs about condoms and also to apply appropriate pressure on their partners to use condoms. Partner violence may need to be factored into the discussion, particularly for women, as that might affect how they would comfortably apply such pressure.

This study has the following limitations: First, the data are cross-sectional, thus we are unable to establish causal relationships from this analysis. For example, we found a significant association between self-efficacy and condom beliefs among women, which suggests a possibility that skill-building interventions might promote better condom beliefs. However, it is plausible that having positive condom beliefs promote the sense of self-efficacy (e.g., I don’t believe condoms will interfere with sexual pleasure and thus I can negotiate with my partner about condom use even if he is not willing to), rather than self-efficacy promoting better condom beliefs. Experimental data are needed to determine the causal sequence and, thus, to better inform interventions about important components.

The second limitation is that we only examined data from participants who reported having an opposite-sex main partner. This sample restriction was due to the design of the data collection instrument in which some of the key measures were partner-specific and collected in reference to only certain types of partners (e.g., opposite-sex, main partners). While the sample restriction allowed us to use precise measures that were collected for specific sex partners, it raises the possibility that our findings may not be replicated in a broader sample of HIV-positive IDUs. To further address this question, we conducted additional analyses by expanding the study sample to also include participants with multiple opposite-sex partners ( $n=527$ ). Analyses with this expanded sample produced similar results in that (1) partner norm was a significant multivariate correlate for both men and women; (2) for women, self-efficacy and knowledge were also significant correlates; and (3) the male model had only one significant correlate (partner norm) and the model did not explain much of the variance in the outcome (results not shown). However, reproducibility of the results in samples including men who have sex with men or those without any main partners is still unknown. Future studies should design a data collection instrument that can fully address the associations between condom beliefs and potential correlates in a variety of partnership situations. In addition, it

should be noted that because we used a convenience sample, the results are not generalizable to the general population of HIV-positive IDUs.

Finally, the data were collected as part of a randomized trial of a behavioral intervention; thus, our survey instrument did not ask all the questions needed for this paper, including participants' previous experience with condoms, either favorable or unfavorable, or even beliefs or attitudes about condoms worn by women (female condoms). This limitation may have been particularly germane to the analysis among men, as the correlates available for analysis had very little predictive power among men.

With these caveats, we have generated a list of correlates of beliefs that condoms reduce sexual pleasure. Addressing negative condom beliefs may be an important step toward HIV sexual risk reduction in many populations including HIV-positive IDUs, the target population of this study. Our findings suggest a number of important gender-specific factors to be considered in interventions for HIV-positive IDUs, particularly those with opposite-sex main partners. These findings may be used to inform the development of interventions that might better promote positive condom beliefs among HIV-positive IDUs.

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## REFERENCES

1. Centers for Disease Control and Prevention. *HIV/AIDS Surveillance Report, 2004, vol. 16*. Department of Health and Human Services, Centers for Disease Control and Prevention; 2005. <http://www.cdc.gov/hiv/hopics/surveillance/resources/reports/index.htm>.
2. Centers for Disease Control and Prevention. Advancing HIV prevention: New strategies for a changing epidemic—United States, 2003. *MMWR Morb Mortal Wkly Rep.* 2003;52:329–332.
3. Centers for Disease Control and Prevention. Incorporating HIV prevention into the medical care of persons living with HIV. Recommendations of CDC, the Health Resources and Services Administration, the National Institutes of Health, and the HIV Medicine Association of the Infectious Diseases Society of America. *MMWR Recomm Rep.* 2003;52:1–24.
4. Janssen RS, Valdiserri RO. HIV prevention in the United States: increasing emphasis on working with those living with HIV. *J Acquir Immune Defic Syndr.* 2004;37(Suppl 2):S119–S121.
5. Kral AH, Bluthenthal RN, Lorvick J, Gee L, Bacchetti P, Edlin BR. Sexual transmission of HIV-1 among injection drug users in San Francisco, USA: risk-factor analysis. *Lancet.* 2001;357:1397–1401.
6. Strathdee SA, Sherman SG. The role of sexual transmission of HIV infection among injection and non-injection drug users. *J Urban Health.* 2003;80:iii7–iii14.
7. Avants SK, Warburton LA, Hawkins KA, Margolin A. Continuation of high-risk behavior by HIV-positive drug users: Treatment implications. *J Subst Abuse Treat.* 2000;19:15–22.
8. Kwiatkowski CF, Booth R. HIV-seropositive drug users and unprotected sex. *AIDS Behav.* 1998;2:151–160.
9. Metsch LR, McCoy CB, Lai S, Miles C. Continuing risk behaviors among HIV-seropositive chronic drug users in Miami, Florida. *AIDS Behav.* 1998;2:161–169.
10. Lakta MH, Metsch LR, Mizuno Y, et al. Unprotected sex among HIV-positive injection drug using women and their serodiscordant male partners: Role of personal and partner influences. *J Acquir Immune Defic Syndr.* 2006;42:222–228.
11. Purcell DW, Mizuno Y, Metsch LR, et al. Unprotected sexual behavior among heterosexual HIV-positive injection drug using men: associations by partner type and partner serostatus. *J Urban Health.* 2006;83:656–668.
12. Boone TL, Lefkowitz ES. Safer sex and the health belief model; considering the contributions of peer norms and socialization factors. *J Psychol Hum Sex.* 2004;16:51–68.
13. Crepaz N, Marks G. Towards an understanding of sexual risk behavior in people living with HIV: a review of social, psychological, and medical findings. *AIDS.* 2000;16:135–149.
14. DiClemente RJ. Psychological determinants of condom use among adolescents. In: DiClemente RJ, ed. *Adolescents and AIDS: A Generation in Jeopardy*. Newbury Park, CA: Sage; 1992:34–51.
15. Fernandez-Esquer ME, Krepcho MA, Freeman AC, Magee E, McAlister AL, Ross MW. Predictors of condom use among African American males at high risk for HIV. *J Appl Soc Psychol.* 1997;27:58–74.
16. Ford K, Wirawan DN, Muliawan P. Social influence, AIDS/STD knowledge, and condom use among male clients of female sex workers in Bali. *AIDS Educ Prev.* 2002;14:496–504.
17. Hinkle YA, Johnson EH, Gilbert D, Jackson L, Lollis CM. African-American women who always use condoms: attitudes, knowledge about AIDS, and sexual behavior. *J Am Med Womens Assoc.* 1992;47:230–237.
18. O’Leary A, Maibach E, Ambrose TK, Jemmott JB, Celentano DD. Social cognitive predictors of sexual risk behavior change among STD clinic patients. *AIDS Behav.* 2000;4:309–316.
19. Reitman D, St. Lawrence JS, Jefferson KW, Alleyne E, Brasfield TL, Shirley A. Predictors of African American adolescents’ condom use and HIV risk behavior. *AIDS Educ Prev.* 1996;8:499–515.

20. Sacco WP, Levine B, Reed DJ, Thompson K. Attitudes about condom use as an AIDS-relevant behavior: their factor structure and relation to condom use. *Psychol Assess.* 1991;3:265–272.
21. Sonenstein FL, Ku L, Pleck JH. Why young men don't use condoms: factors related to the consistency of utilization. In: Besharov DJ, Steward FH, Gardiner KN, Parker M, eds. *Why Some Men Don't Use Condoms: Male Attitudes About Condoms and Other Contraceptives.* Menlo Park, CA: Henry J. Kaiser Family Foundation; 1997:1–26.
22. St. Lawrence JS, Reitman D, Jefferson KW, Alleyne E, Brasfield TL, Shirley A. Factor structure and validation of an adolescent version of the Condom Attitudes Scale: an instrument for measuring adolescents' attitudes toward condoms. *Psychol Assess.* 1994;6:352–359.
23. Fisher JD, Fisher WA. Changing AIDS-risk behavior. *Psychol Bull.* 1992;111:455–474.
24. Ajzen I, Fishbein M. *Understanding Attitudes and Predicting Social Behavior.* Englewood Cliffs, NJ: Prentice Hall; 1980.
25. Knight KR, Purcell D, Dawson-Rose C, Halkitis PN, Gomez CA, & the Seropositive Urban Injectors Study Team. Sexual risk taking among HIV-positive injection drug users: contexts, characteristics, and implications for prevention. *AIDS Educ Prev.* 2005;17(Suppl A):76–88.
26. Parsons JT, Missildine MA, Van Ora J, Purcell DW, Gomez CA, and the Seropositive Urban Injectors Study Team. HIV status disclosure to sexual partners among HIV-positive injection drug users. *AIDS Patient Care STDS.* 2004;18:457–469.
27. Gielen AC, McDonnell KA, O'Campo PJ. Intimate partner violence, HIV status, and sexual risk reduction. *AIDS Behav.* 2002;6:107–116.
28. Wu E, El-Bassel N, Witte SS, Gilbert L, Chang M. Intimate partner violence and HIV risk among urban minority women in primary health care settings. *AIDS Behav.* 2003;7:291–301.
29. Saul J, Moore J, Murphy ST, Miller LC. Relationship violence and women's reactions to male- and female-controlled HIV prevention methods. *AIDS Behav.* 2004;8:207–214.
30. Basuki E, Wolffers I, Deville W, et al. Reasons for not using condoms among female sex workers in Indonesia. *AIDS Educ Prev.* 2002;14:102–116.
31. Crosby RA, Graham CA, Yarber WL, Sanders SA. If the condom fits, wear it: a qualitative study of young African-American men. *Sex Transm Infect.* 2004;80:306–309.
32. Crosby RA, Sanders SA, Yarber WL, Graham CA. Condom-use errors and problems: a neglected aspect of studies assessing condom effectiveness. *Am J Prev Med.* 2003;24:367–370.
33. Thomsen S, Stalker M, Toroitich-Ruto C. Fifty ways to leave your rubber: how men in Mombasa rationalize unsafe sex. *Sex Transm Infect.* 2004;80:430–434.
34. Purcell DW, Metsch LR, Latka M, et al. Interventions for seropositive injectors—research and evaluation: an integrated behavioral intervention with HIV-positive injection drug users to address medical care, adherence, and risk reduction. *J Acquir Immune Defic Syndr.* 2004;37(Suppl 2):S110–S118.
35. O'Leary A, Hoff CC, Purcell DW, et al. What happened in the SUMIT trial? Mediation and behavior change. *AIDS.* 2005;19(Suppl 1):S111–S121.
36. Derogatis LR, Spencer PM. *The Brief Symptom Inventory (BSI): Administration, scoring, and procedure manual—1.* Baltimore, MD: Wiley; 1982.
37. Mizuno Y, Kennedy M, Seals B, Myllyluoma J. Predictors of teens' attitudes toward condoms: gender difference in the effects of norms. *J Appl Soc Psychol.* 2000;30:1381–1395.
38. Corby NH, Jamner MS, Wolitski RJ. Using the theory of planned behavior to predict intention to use condoms among male and female injection drug users. *J Appl Soc Psychol.* 1996;26:52–75.
39. Straus MA. Measuring intrafamily conflict and violence: the conflict tactics scales. *J Marriage Fam.* 1979;41:75–88.
40. Neter J, Wasserman W, Kutner M. *Applied Linear Regression Models, 2nd edn.* Burr Ridge, IL: Irwin; 1989.

41. Padian NS, Shiboski SC, Glass SO, Vittinghoff E. Heterosexual transmission of human immunodeficiency virus (HIV) in northern California: results from a ten-year study. *Am J Epidemiol.* 1997;146:350–357.
42. Kalichman SC, Carey MP, Johnson BT. Prevention of sexually transmitted HIV infection: a meta-analytic review of the behavioral outcome literature. *Ann Behav Med.* 1996;18:6–15.
43. Semaan S, Kay L, Strouse D, et al. A profile of U.S.-based trials of behavioral and social interventions for HIV risk reduction. *J Acquir Immune Defic Syndr.* 2002;30:S30–S50.
44. Pronyk PP, Hargreaves JR, Kim JC, et al. Effect of a structural intervention for the prevention of intimate-partner violence and HIV in rural South Africa: a cluster randomized trial. *Lancet.* 2006;368:1973–1983.