Behavior and Health Beliefs as Predictors of HIV Testing among Women: A Prospective Study of Observed HIV Testing

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Abbreviations: HIV=human immunodeficiency virus; AIDS=acquired immune deficiency syndrome; CDC=Centers for Disease Control and Prevention; ACASI=audio computer-assisted self-interview; TRA=theory of reasoned action; HBM=Health Belief Model; STI=sexually

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transmitted infection; STD=Sexually Transmitted Disease; AOR=adjusted odds ratio; CI= confidence interval

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ABSTRACT

Much of the research examining predictors of HIV testing has used cross-sectional methodologies, necessarily relying on retrospective self-report to assess HIV testing history. Findings from these studies may be subject to recall bias and to difficulties determining the direction of associations. In this prospective study, we administered surveys to women in community clinics to identify predictors of subsequent observed oral HIV test acceptance, thus overcoming these limitations. Eighty-three percent accepted HIV testing. In the adjusted multivariable model, being born in the U.S. (AOR: 1.51; 95%C.I.=1.01-2.25), perceived benefits of testing (AOR: 2.17; 95%C.I.=1.78-2.63), worries about being infected with HIV (AOR: 1.69; 95%C.I.=1.47-1.95), having had more than 15 lifetime sexual partners (AOR: 1.96; 95%C.I.=1.26-3.05), and having had one or more casual sexual partners in the previous three months (AOR: 2.47; 95%C.I.=1.42-4.31) predicted acceptance of testing. Perceived obstacles to testing predicted non-acceptance (AOR: 0.82; 95%C.I.=0.71-0.94). Those who had never been tested for HIV (AOR: 4.46; 95%CI=3.14-6.34) and those tested two to five years previously (AOR: 2.74; 95%CI=1.77-4.24) had greater odds of test acceptance than those who had been tested within the last year. The findings from this prospective study with observed testing as the outcome, confirm some of the results from retrospective, self-report studies. Participants made largely rational decisions about testing, reflecting assessments of their risk and their history of HIV testing. Health beliefs are potentially modifiable through behavioral intervention, and such interventions might result in greater acceptance of testing.

Behavior and Health Beliefs as Predictors of HIV Testing among Women:

A Prospective Study of Observed HIV Testing

INTRODUCTION

Many of the research studies that have examined behavioral and health belief correlates of HIV testing have used cross-sectional designs, necessarily relying on retrospective report (including self-report) of HIV testing history (Evangeli, Pady, & Wroe, 2016). These studies, while valuable, are subject to several potential problems, including recall bias and difficulties determining the direction of causality with correlational associations. In this study, we overcome these limitations by using a longitudinal prospective design with information gathered on behaviors, health beliefs, and other relevant factors prior to measuring the outcome, observed rapid oral HIV testing.

Despite increases in HIV testing over time, it is estimated that 13% persons infected with HIV are still unaware of their HIV status (Centers for Disease Control and Prevention [CDC], July 2016; Trepka et al., 2014). Early detection of HIV infection through testing is important to ensure early engagement in treatment and to prevent transmission to non-infected individuals. HIV testing is also important for uninfected persons at behavioral risk for acquisition, as it provides an opportunity to connect them with HIV prevention interventions, such as behavioral risk-reduction counseling and oral pre-exposure prophylaxis (PrEP). Therefore, routine implementation of HIV testing should be regarded as the linchpin for both treatment and prevention. In fact, the CDC has recommended routine HIV screening for patients aged 13-64 years in clinical settings in the U.S. since 2006 (CDC, 2006).

According to the CDC, nearly 20% of the estimated 44,073 new U.S. HIV patients diagnosed in 2014 were women (CDC, 2014). Several studies support the idea that women's risk of presenting with advanced immunosuppression can be increased because of delayed diagnosis and treatment of HIV (CDC, 2005; Eng & Butler, 1997). Early diagnosis, followed by effective linkage to care, therefore, are keys to decreasing the risk of progression to AIDS, reducing the risk of HIV transmission, and increasing longevity and quality of life among HIV-infected persons (Rosenberg et al., 2000). In addition, individuals who become aware that they are HIV positive tend to reduce their risk behaviors (Bond, Lauby, & Batson, 2005). Thus, widespread implementation of HIV testing is a crucial public health priority.

A recent global systematic review of psychological predictors of HIV testing found that relatively few studies used a prospective design, limiting the possibility of making causal inferences (Evangeli, Pady, & Wroe, 2016). Further, some of this research relied on self-report, rather than objective evidence of testing. Of the seven studies that used objective measures of testing (Andrinopoulos, Kerrigan, Figueroa, Reese, & Ellen, 2010; Ford et al., 2009; Johnston et al., 2010; McNaghten, Herold, Dube, & St Louis, 2007; Mirkuzie, Sisay, Moland, & Astrom, 2011; Ratcliff et al., 2012; Thierman et al., 2006), two were U.S.-based (Ford et al., 2009; Ratcliff et al., 2012), and only one of these examined rapid, point-of-care testing (Ratcliff et al., 2012).

The purpose of this study was to look prospectively at behavioral, health belief, and sociodemographic predictors of rapid oral HIV test acceptance among a sample of women attending urban, primary care community clinics. This study was part of a larger intervention research effort that examined the effect of different messaging conditions on acceptance of HIV testing (Kasting et al., 2014). The present report is distinct from the intervention paper, in that its focus is examination of multiple predictors of HIV test acceptance, controlling for messaging condition, analyses not undertaken in the intervention paper.

METHODS

Participants

Potential participants were women, at least 18 years of age, able to comprehend English or Spanish, HIV-negative (via self-report), non-pregnant, and seeking care at one of seven urban community outpatient health clinics located in Indianapolis, IN, USA. Recruitment occurred from August 2008 to January 2011. Socio-demographic characteristics of patients varied across the seven different clinic sites. For the purpose of our study, we oversampled ethnic minorities so that we could assess potential differences in HIV test acceptance across different races/ethnicities.

Questions were presented to the participants via audio computer-assisted self-interview (ACASI), so high levels of literacy were not required. Participants only had to be able to recognize individual numbers and letters to indicate their responses. Each participant completed the ACASI in a private room. Pregnant women (by self-report) were excluded because HIV testing is routinely recommended and provided to all women who are pregnant. This was a prospective, longitudinal study, in that all survey items were completed before the subsequent offer of rapid HIV testing. For the randomized messaging trial reported on previously (Kasting et al., 2014), participants were randomized to different messaging conditions within the ACASI. Further details on the methodology can be found in Kasting et al. (2014).

The study was approved by the Indiana University Institutional Review Board and all participants provided written informed consent. Although potential participants were recruited from clinic waiting rooms, all consent and study procedures took place in a private area. Individuals who met the inclusion criteria and agreed to participate were instructed in the use of the ACASI by research staff.

Measures

Socio-demographic Factors

Socio-demographic factors measured included age, education status, employment status, relationship status, income, and whether they were born in the U.S. Respondents indicated if they were of Hispanic ethnicity. With respect to race, there were seven categories, but many of the categories (e.g., Asian, American Indian or Alaskan Native, Native Hawaiian or other Pacific Islander) represented few participants. Therefore, for the purposes of analysis, we grouped all participants into three race/ethnicity categories: Hispanic, non-Hispanic Black, and non-Hispanic White and other.

Health Beliefs

Four health belief scales were developed based on the Health Belief Model (HBM) and the Theory of Reasoned Action (TRA), theories commonly applied to studies of HIV testing (Booth, Norman, Harris, & Goyder, 2015; Boudewyns & Paquin, 2011; Nöthling & Kagee, 2013; Schnall, Rojas, & Travers, 2015). Perceived benefits were measured by five items (coefficient alpha=0.81). An example of a perceived benefits item is, “Getting tested for HIV/AIDS would be a good way to protect my health”. Perceived barriers/obstacles to HIV testing were measured by two items (coefficient alpha=0.53). Although this coefficient alpha is low, it is not unreasonable for a two item scale, as coefficient alpha is highly sensitive to scale length (Streiner, 2003). An example of a perceived barriers item is, “HIV/AIDS testing presents a lot of obstacles for me”. Normative beliefs about HIV testing were measured with eight items (coefficient alpha=0.80). An example of a normative beliefs item is, “Most of the people I know think that getting tested for HIV/AIDS is a good thing to do for your health”. Worries about testing positive for HIV were measured by two items (coefficient alpha=0.63). An example of perceived worries item is, “I am worried that I may be currently infected with HIV/AIDS”. These health beliefs scales were

derived from prior research on attitudes about testing and vaccination related to HIV and sexually transmitted infections (STI) (Ravert & Zimet, 2009; G. D. Zimet, Liau, & Fortenberry, 1997; G. D. Zimet, Perkins, Winston, & Kee, 2008; G. D. Zimet et al., 2004). Responses to all health belief items were measured on a 5-point Likert-type response scale ranging from 1= 'strongly disagree' to 5= 'strongly agree'.

HIV Testing History, Sexual Behaviors and Drug Use

Participants indicated the number of years since their last HIV test (0= 'not previously tested'; 1= '0-1 year ago'; 2= '2-5 years ago'; 3= '>5 years ago'). Participants reported their number of lifetime sexual partners (1= '0 to 3 partners' to 4='> 15 partners') and lifetime history of sexually transmitted disease (STD) diagnoses (0= 'no STDs', 1= '1 or more STDs'). We asked participants to report sexual behaviors in the last three months, including frequency of sexual intercourse (0='no partners or no activity' and 1='one or more times'), oral sex (0='no', 1='yes'), condom non-use (0='no partners'; 1='100% condom use'; 2='at least one time of non-condom use'), and casual sex encounters (0='no lifetime partners'; 1='no casual sex'; 2='at least 1 casual sex encounter'). We also assessed lifetime injection drug use history (0='no self-use and no partner use'; 1='no self-use, but partner use'; 2='self-use'). Questions were adapted from prior health behavior research (Grover & Miller, 2014; Rothman, Kelly, Weinstein, & O'Leary, 1999; Temesgen, 1999; Veinot, Caldwell, Loveluck, Arnold, & Bauermeister, 2016; Yamanis et al., 2017). Table 1 presents the categories for all predictors included in the analyses.

Outcome Measure

HIV test acceptance was the outcome of interest. After completing the ACASI, women were asked if they wanted to be tested with a free oral fluid rapid HIV test (Oraquick® Test by OraSure Technologies, Inc., Bethlehem, PA). HIV Test acceptance was measured as a binary variable (yes/no). The oral fluid test may result in a relatively high proportion of false positive

results in a low prevalence population. For this reason, anyone who tested positive on the rapid test had their results confirmed with Western blot.

Analyses

Univariate and multivariable logistic regression were used for data analysis. As described in a previous research report (Kasting et al., 2014), participants were randomly assigned to four messaging conditions: 1. Information only control group; 2. A one-sided message, which simply promotes the advantages of HIV testing (i.e., it includes only one side of an argument, in this case, promotion of the benefits of testing); 3. A two-sided message, which acknowledges a superficial objection to testing (i.e., a 20 minute wait for results), but is followed by a promotion of the advantages of testing (i.e., like the following message, it includes two sides of an argument); and 4. Two-sided message, which acknowledges a serious objection (i.e., fear of testing positive for HIV) followed by a promotion of the advantages of testing. We found that the one-sided message resulted in significantly lower rates of test acceptance. Therefore, in addition to the sociodemographic, health belief, and behavioral predictors, we also included intervention condition as a potential confounding variable. The association of each predictor with test acceptance was evaluated by univariate logistic regression, using the full sample of 2031 participants. For the forward, step-wise adjusted multivariable model, the criterion for entry was set at $P<0.05$. The goodness-of-fit of the final model was evaluated with the Hosmer and Lemeshow goodness-of-fit test (Hosmer, Lemeshow, & Sturdivant, 2013).

RESULTS

A total of 2031 women participated in the study. Participants ranged in age from 18-89 (mean = 44.1), with 20% identifying as Hispanic, 43% as non-Hispanic Black, and 37% as non-Hispanic White or other (see Table 1 for complete descriptive data on the sample). Eighty-three percent of participants accepted HIV testing, with two having a positive result on the rapid test. Western blot confirmation indicated that only one was a true positive result.

Results of the univariate logistic regression analyses indicated that, compared with those who refused HIV testing, test acceptors were more likely to be non-Hispanic, born in the U.S, and to have never been previously tested or tested greater than one year ago. With respect to health beliefs, test acceptors had higher scores on the perceived benefits, perceived norms, and perceived worry scales and had lower scores on the perceived obstacles scale. Risk behaviors/factors associated with significantly higher rates of HIV test acceptance were more lifetime sexual partners, recent engagement in oral sex, recent experiences with casual sex, a history of one or more STD diagnoses, and involvement with injection drug use. With respect to the intervention from the previous analyses (Kasting et al., 2014), women in the 1-sided message group had significantly lower rates of testing than those in the control group. The complete results from the univariate analyses are reported in Table 1.

Variables significant at the univariate level were considered eligible for entry into an adjusted forward step-wise multi-variable logistic regression analysis (See Table 2). In the final adjusted model seven sets of variables were identified as significant predictors of HIV testing. Women born in the U.S. had a greater odds of accepting testing compared to those not born in the U.S. (AOR=1.43; 95%CI=1.01-2.25). Higher scores on the perceived benefits (AOR=2.17; 95%CI=1.26-3.05) and the perceived worry (AOR=1.69; 95%CI=1.47-1.95) scales, and lower scores on the perceived obstacles (AOR=0.82; 95%CI=0.71-0.94) scale were associated with higher rates of testing. In terms of previous HIV testing history, those with no previous testing (AOR=4.46; 95%CI=3.14-6.34), prior testing 2-5 years ago (AOR=2.74; 95%CI=1.77-4.24), and prior testing more than 5 years ago (AOR=3.04; 95%CI=2.00-4.62) had a greater odds of testing compared to those who had been tested in the previous year. Women with more than 15 lifetime sexual partners (AOR=1.96; 95%CI=1.26-3.05) and those reporting casual sexual encounters in the previous three months (AOR=2.47; 95%CI=1.42-4.31) also had a greater odds of accepting

testing for HIV. The Hosmer and Lemeshow goodness-of-fit test resulted in a non-significant chi-square of 7.83, indicated that the data fit the model.

DISCUSSION

The results of this study provide information on determinants of women's decision-making about HIV testing. The focus on women, the prospective design, and the use of observed HIV testing as the outcome make this research unique. We found an overall high acceptance rate (83%) of HIV testing in a very low HIV-prevalence population. Only one true HIV-positive person was identified, out of nearly 1,700 tested. Not surprisingly, women who had not been tested previously or had been tested two or more years ago were more likely to accept testing than those who had been tested in the last year, suggesting a rational assessment of the need for HIV testing.

Health beliefs and risk behaviors were significant predictors of testing. In the adjusted model, perceived obstacles to testing and benefits of testing both predicted test acceptance, a set of findings that is largely consistent with prior research (Evangeli et al., 2016). Worry about currently being infected with HIV also predicted test acceptance. This finding has inconsistent support in the literature, with one previous study reporting a positive association (Andrinopoulos et al., 2010) and two reporting no significant association between worry about infection and HIV testing (Huang et al., 2012; Johnston et al., 2010). Health beliefs may be amenable to influence through education and health messaging. Therefore, provision of materials that emphasize the benefits of HIV testing and minimize perceived obstacles (e.g., stigma related to HIV testing) may move persons from hesitancy to acceptance of HIV testing.

With respect to HIV risk behaviors, it is clear from our results that women who engaged in riskier behaviors were more likely to agree to HIV testing, suggesting a realistic assessment of their

potential risk for infection. This finding is consistent with prior research on determinants of testing for HIV and other STIs (Benotsch, Kalichman, & Weinhardt, 2004; Brown, O'Grady, Farrell, Flechner, & Nurco, 2001; Wang, Li, Stanton, & McGuire, 2010; Zimet et al., 2005). In particular, women with more than 15 lifetime sexual partners and those with a recent casual sexual encounter were more likely to accept HIV testing.

Women who were born outside of the U.S., who were largely of Hispanic background in our sample, had a lower rate of acceptance of HIV test (78%) than those who were born in the U.S. (84%). This finding is consistent with previous reports indicating that Latino persons are more likely to enter HIV care at a later point in their illness than their non-Latino counterparts, potentially reflecting delays in testing (Dennis, Napravnik, Seña, & Eron, 2011; Poon, Dang, Davila, Hartman, & Giordano, 2013; Trepka et al., 2014). Several other research studies also point to the association of foreign birth with delayed HIV testing and diagnosis (Crawford, Caldwell, Bush, Browning, & Thornton, 2012; Levy et al., 2007; Tang, Levy, & Hernandez, 2011; Wohl, Tejero, & Frye, 2009). Proposed explanations for this phenomenon include cultural stigma related to HIV, language barriers, and insufficient knowledge about HIV (Trepka et al., 2014). It is also the case that many low income populations face significant barriers to health care, which can prevent them from accessing HIV testing and other important health services.

Data from this study suggest that several predictors of HIV test acceptance could be amenable to public health and clinical intervention. Public health programs in the future should concentrate on decreasing perceived and real obstacles to testing. Fewer obstacles and greater availability of testing can lead to increased rates of diagnosis of persons with unrecognized HIV infection, enabling them to connect to care. Enhanced, community-based access may be particularly important for reaching immigrant populations, who may experience increased stigma related to HIV testing. This kind of approach also has the advantage of reducing or eliminating the

otherwise significant barriers to accessing health care. Easy access to HIV testing also provides the opportunity to connect HIV uninfected persons at risk for infection with preventive services, such as oral pre-exposure prophylaxis. For example, religious congregations have successfully sponsored HIV testing events (Derose et al., 2011), often as part of larger health fairs.

This study has several limitations, which should be considered. Data for this study were collected from 2008 to 2011 and it is possible that attitudes about HIV testing have changed since that time. The research only included women from one U.S. city with a very low overall prevalence of HIV. The results that we found, therefore, may not be applicable to men, to women from other geographic locations, or to individuals residing in high HIV prevalence areas. At the same time, our pattern of results is similar to those reported in retrospective studies across varying populations. One additional note, the results of this study do not alter in any way the findings from the previously reported randomized messaging study (Kasting et al. 2014). Given that respondents were randomized to the different messages, this ensured that their characteristics were equally distributed across conditions. Despite the stated limitations, the results of this study, which used a prospective design and included an observed outcome (as opposed to self-report), provides useful information that will help to guide the development of future HIV testing programs and research.

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Table 1. Sample description and univariate associations with HIV test acceptance. [a]

Characteristic	*Mean (SD) or n (%)*	*Accepted (SD) or n (%)*	*Not Accepted (SD) or n (%)*	*P-Value*
Race/ Ethnicity (N=2016)				
Hispanic or Latino	397 (19.7%)	306 (77.1%)	91 (22.9%)	
not Latino but African American or Black	880 (43.7%)	741 (84.2%)	139 (15.8%)	<.01
not Latino but other groups not African American or Black	739 (36.7%)	626 (84.7%)	113 (15.3%)	<.01
Age (N=2031)	44.12 (13.2)	44.22 (12.9)	43.40 (14.33)	NS
Education status (N=2010)				
Non- High School	565 (28.1%)	474 (83.9%)	91 (16.1%)	
Some High School	651 (32.4%)	546 (83.9%)	105 (16.1%)	NS
Post - High School	794 (39.5%)	649 (81.7%)	145 (18.3%)	NS
Employment Status (N=2013)				
No	1238 (61.5%)	1033 (83.4%)	205 (16.6%)	
Yes	775 (38.5%)	639 (82.5%)	136 (17.5%)	NS
Income (N=1945)				
< $10,000	899 (46.2%)	764 (85%)	135 (15%)	
$10,000 - $29,999	827 (42.5%)	683 (82.6%)	144 (17.4%)	NS
≥$30,000	219 (11.3%)	181 (82.6%)	38 (17.4%)	NS
USBORN (N=2014)				
not born in U.S.	388 (19.3%)	305 (78.6%)	83 (21.4%)	
born in U.S.	1626 (80.7%)	1366 (84.0%)	260 (16.0%)	<.05
Years since Last HIV Test (N=1985)				
0-1 Years Ago	451 (22.7%)	332 (73.6%)	119 (26.4%)	
Not Previously Tested	896 (45.1%)	776 (85.5%)	130 (14.5%)	<.01
2-5 Years Ago	289 (14.6%)	246 (85.1%)	43 (14.9%)	<.01
>5 Years Ago	349 (17.6%)	302 (86.5%)	47 (13.5%)	<.01
Mean Obstacle Scale (N=2012)	4.4 (2.1)	4.3 (2.1)	4.7 (2.1)	<.01
Mean Benefits Scale (N=2012)	22.2 (3.2)	22.6 (2.9)	20.7 (4.0)	<.01
Mean Norm Scale (N=2011)	24.9 (3.7)	25.1 (3.5)	23.5 (4.1)	<.01
Mean Worry Scale (N=2014)	5.0 (2.3)	5.1 (2.3)	4.2 (2.2)	<.01

Table 1. Sample description and univariate associations with HIV test acceptance. [a] (continued 2)

Characteristic	*Mean (SD) or n (%)*	*Accepted (SD) or n (%)*	*Not Accepted (SD) or n (%)*	*P-Value*
Relationship Status (N=2011)				
Not in a relationship	840 (41.8%)	694 (41.5%)	146 (17.4%)	
Married and living with husband	424 (21.1%)	343 (80.9%)	81 (19.1%)	NS
Married and not living with husband	116 (5.8%)	100 (86.2%)	16 (13.8%)	NS
Not married and living with a partner	369 (18.3%)	306 (82.9%)	63 (17.1%)	NS
Not married and not living with a partner	262 (13.0%)	228 (87.0%)	34 (13.0%)	NS
Partner numbers during Lifetime (N=1971)				
0-3 Partners	538 (27.3%)	418 (77.7%)	120 (22.3%)	
4-7 Partners	536 (27.2%)	455 (84.9%)	81 (15.1%)	<.01
8-15 Partners	456 (23.1%)	383 (84.0%)	73 (16.0%)	<.05
More than 15 Partners	441 (22.4%)	393 (89.1%)	48 (10.9%)	<.01
Sexual Activity during Recent 3 Months (N=1945)				
0	759 (39.0%)	625 (82.3%)	134 (17.7%)	
1 and more	1186 (61.0%)	1004 (84.7%)	182 (15.3%)	NS
No Condom Used during Recent 3 Months (N=1908)				
No Partners Last 3MO	399 (20.9%)	332 (83.2%)	67 (16.8%)	
Partners - 100% Condom Use	774 (40.6%)	636 (82.2%)	138 (17.8%)	NS
≥1 instance of non-condom use	735 (38.5%)	632 (86.0%)	103 (14.0%)	NS
Oral Sexual Activity during Recent 3 Months (N=1911)				
No	1116 (58.4%)	925 (82.9%)	191 (17.1%)	
Yes	795 (41.6%)	686 (86.3%)	109 (13.7%)	NS
Casual Sexual Behaviors during Recent 3 Months (N=1960)				
0	1409 (71.9%)	1186 (84.2%)	223 (15.8%)	
≥1 Times	269 (13.7%)	237 (88.1%)	32 (11.9%)	NS
No Lifetime Partners	282 (14.4%)	217 (77.0%)	65 (23.0%)	<.01

Table 1. Sample description and univariate associations with HIV test acceptance. [a] (continued 3)

Characteristic	*Mean (SD) or n (%)*	*Accepted (SD) or n (%)*	*Not Accepted (SD) or n (%)*	*P-Value*
Ever Had STD Before (N=2005)				
Not Have STD Before	1022 (51.0%)	818 (80.0%)	204 (20.0%)	
At Least Have One STD Before	983 (49.0%)	847 (86.2%)	136 (13.8%)	<.01
Injection Drug Use Index (N=2008)				
No Use, No Partner Use	1542 (76.8%)	1250 (81.1%)	292 (18.9%)	
No Use, Partner or Unknown Partner Use	393 (19.6%)	353 (89.8%)	40 (10.2%)	<.01
IV Drug Use	73 (3.6%)	66 (90.4%)	7 (9.6%)	<.05
Messaging Condition				
Information Only	518 (25.7%)	443 (85.5%)	75 (14.5%)	
1-Sided Message	499 (24.8%)	401 (80.4%)	98 (19.6%)	<.01
2-Sided Superficial Message	504 (25.0%)	411 (81.5%)	93 (18.5%)	NS
2-Sided Serious Message	495 (24.6%)	418 (84.4%)	77 (15.6%)	NS

[a] Differences in N represent missing cases.

Table 2. Predictors of acceptance of HIV testing (N=2031). [a]

	Univariate Logistic Regression		*Multivariable Logistic Regression*	
Predictors	*OR*	*95% CI*	*OR*	*95% CI*
Race/ Ethnicity (N=2016)				
Hispanic or Latino [b]	1			
not Latino but African American or Black	1.58[d]	1.18-2.13		
not Latino but other groups not African American or Black	1.65[d]	1.21-2.24		
USBORN (N=2014)				
Not Born in US [b]	1			
Born in US	1.43[c]	1.08-1.88	1.51[c]	1.01-2.25
Years since Last HIV Test (N=1985)				
0-1 Years Ago [b]	1			
Not Previously Tested	2.11[d]	1.60-2.79	4.46[d]	3.14-6.34
2-5 Years Ago	2.05[c]	1.39-3.01	2.74[d]	1.77-4.24
>5 Years Ago	2.30[d]	1.59-3.34	3.04[d]	2.00-4.62
Mean Obstacle Scale (N=2012)	0.86[d]	0.77-0.95	0.82[d]	0.71-0.94
Mean Benefits Scale (N=2012)	2.15[d]	1.82-2.54	2.17[d]	1.78-2.63
Mean Norm Scale (N =2011)	1.90[d]	1.58-2.28		
Mean Worry Scale (N=2014)	1.42[d]	1.28 -1.59	1.69[d]	1.47-1.95
Partner Numbers during Lifetime (N=1971)				
0-3 Partners [b]	1			
4-7 Partners	1.61[d]	1.18-2.20	1.27	0.87-1.85
8-15 Partners	1.50[d]	1.09-2.08	1.17	0.79-1.73
More than 15 Partners	2.35[d]	1.64-3.37	1.96[d]	1.26-3.05
Oral Sexual Activity during Recent 3 Months (N=1911)				
No [b]	1			
Yes	1.3[c]	1.01-1.68		
Casual Sexual Behaviors for Recent 3 Months (N=1960)				
No Lifetime Partners [b]	1			
No Casual Sexual Partners (3 mos)	1.59[d]	1.17-2.18	1.76[d]	1.18-2.61
≥1 Casual Sexual Partner (3 mos)	2.22[d]	1.40-3.52	2.47[d]	1.42-4.31
Ever Had STD Before (N=2005)				
Not Have STD before [b]	1			
At Least Have One STD Before	1.45[c]	1.12-1.88		

Table 2. Predictors of acceptance of HIV testing (N=2031). [a] (continued 2)

	Univariate Logistic Regression		*Multivariable Logistic Regression*	
Predictors	*OR*	*95% CI*	*OR*	*95% CI*
Injection Drug Use Index (N=2008)				
No Use, No Partner Use [b]	1			
No Use, Partner or Unknown Partner Use	2.06[d]	1.45-2.93		
Injection Drug Use	2.20[d]	1.00-4.85		
Messaging Condition				
Information Only [b]	1			
1-Sided Message	0.69[d]	0.50-0.96		
2-Sided Superficial Message	0.75	0.54-1.04		
2-Sided Serious Message	0.92	0.65-1.30		

[a] Differences in N represent missing cases.
[b] Reference category
[c] $P < 0.05$
[d] $P < 0.01$