Published in final edited form as:

J Sex Res. 2010 September ; 47(5): 471–478. doi:10.1080/00224490903132069.

The Relationship Between Condom-Related Protective Behavioral Strategies and Condom Use Among College Students: Global- and Event-Level Evaluations

Melissa A. Lewis,

Department of Psychiatry and Behavioral Sciences, University of Washington

Debra L. Kaysen,

Department of Psychiatry and Behavioral Sciences, University of Washington

Michiko Rees, and

Department of Psychiatry and Behavioral Sciences, University of Washington

Briana A. Woods

Department of Psychology, University of Washington

Abstract

This study evaluated the relationship between condom-related protective behavioral strategies (PBS; including those that require active behavior and mental planning) and condom use at both global and event levels. College students ($N = 623$; 57.8% female) completed self-report measures of condom-related PBS, as well as drinking and sexual behavior. Logistic regression findings indicated that students who reported greater use of condom-related PBS were more likely to discuss their and their partner's HIV status, sexually transmitted infection (STI) history (other than HIV), and protection against STIs (such as HIV and other STIs) the first time they had sex with their most recent vaginal sexual partner. Logistic regression findings also indicated that more frequent use of condom-related PBS was associated with being more likely to use a condom during the most recent vaginal sexual experience. Zero-inflated negative binomial regression results showed that condom-related PBS predicted condom non-users and that condom-related PBS were associated with increased use of condoms during sexual behavior in the previous three months. These results extend prior research by demonstrating that both active and mental planning condom-related PBS are associated with condom use at both the global and event levels, which suggests that condom-related PBS may be useful to incorporate in interventions targeting risky sexual behavior among young adults.

Individuals who engage in risky sexual behavior (typically defined as multiple partners, casual partners, unprotected sexual activity, or coinciding risky behavior such as heavy alcohol consumption) are at risk for negative consequences such as sexually transmitted infections (STIs; Weinstock, Berman, & Cates, 2004), HIV (Centers for Disease Control [CDC], 2008;

Copyright © The Society for the Scientific Study of Sexuality

Correspondence should be addressed to Melissa A. Lewis, Department of Psychiatry and Behavioral Sciences, University of Washington, 1100 NE 45th Street, Suite 300, Box 354944, Seattle, WA 98195. lewisma@u.washington.edu.

Publisher's Disclaimer: Full terms and conditions of use: <http://www.informaworld.com/terms-and-conditions-of-access.pdf>

This article may be used for research, teaching and private study purposes. Any substantial or systematic reproduction, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

Office of National AIDS Policy, 2000), and unwanted pregnancies (Henshaw, 1998). U.S. incidence rates for STIs are especially high in adolescents and young adults, with approximately 48% of all new STIs occurring among 15- to 24-year-olds (Weinstock et al., 2004). In 2006, the number of HIV and AIDS cases that occurred among persons aged 15 to 24 years accounted for approximately 14% of all HIV and AIDS cases diagnosed during that year (CDC, 2008). Findings from a recent national survey indicate that among sexually active college students, 3.3% of women and 1.1% of men reported having genital warts–human papillomavirus, 1.2% of women and 0.6% of men reported having genital herpes, and 0.2% of women and 0.4% of men reported having HIV in the past academic year (American College Health Association [ACHA], 2008). In addition, research has estimated that in the United States there are more than three million unintended pregnancies each year (Henshaw, 1998). Among sexually active college students, 2.3% of female students reported having become unintentionally pregnant, and 2.5% of male students reported having gotten someone pregnant unintentionally within the previous academic year (ACHA, 2008).

Among individuals who choose to be sexually active, condom use is the only reliable method of STI and HIV prevention. Regardless, rates of condom use among young adults, including college students, are low. For instance, research has shown that 4.5%, 27.9%, and 52.8% of sexually active students used condoms during their most recent oral, anal, and vaginal intercourse experiences, respectively (ACHA, 2008). Thus, it is critical to identify factors related to decreased sexual risk behavior among college students.

Prior research has found that using condom-related protective behavioral strategies (PBS) more frequently is associated with greater condom use during alcohol-related sexual behavior among college students at the global level (Lewis, Logan, & Neighbors, 2009). This research extends previous findings by evaluating the relationship between condom-related PBS and condom use at both global and event levels (i.e., the most recent vaginal sexual experience).

Condom-Related PBS

One area of interest in increasing condom use among young adults is PBS. PBS are behaviors that individuals can engage in prior to unprotected intercourse to limit high-risk sexual behavior and potential consequences. Many of the risk factors associated with lower rates of condom use are either unchangeable, such as gender or age, or are more resistant to change, such as attitudes or beliefs (Sheeran, Abraham, & Orbell, 1999). Given that PBS are active strategies that can be used in the moment, they are important to examine as predictors of safer sex behaviors because they may be more amenable to intervention. In general, intentions to change behaviors are associated with actual behavioral change (Sheeran, 2002). Perceptions of control over the identified health risk behavior have been found to moderate the relationship between intention to change and behavioral changes, whereupon individuals who have higher perceptions of behavioral control demonstrate more behavioral change in the presence of intentions to make those changes (Webb & Sheeran, 2006). Thus, increasing PBS has the potential to increase intentions to change and perceived behavioral control.

Based on a large meta-analysis of psychosocial predictors of condom use, preparatory behaviors (e.g., carrying a condom or having a condom available) were associated with medium to large effect sizes in the prediction of condom use (Sheeran et al., 1999). Similarly, in that same article, prior discussion or agreements regarding condom use were also strongly associated with actual condom use. Indeed, these three preparatory behaviors were among the strongest predictors of actual condom use out of the various psychosocial factors that were tested. Preparatory behaviors were found to fully mediate the relationship between intentions to use condoms and actual condom use in both high school and college students (Bryan, Fisher, & Fisher, 2002). This is also consistent with findings regarding condom use in Dutch

adolescents, where the relationship between intention and condom use was fully mediated by preparatory behaviors, although this relationship was only seen with steady, as opposed to casual, sexual partners (van Empelen & Kok, 2008). In both of these studies, intentions to use condoms by themselves did not appear to affect condom use, unless the intentions were associated with preparatory behaviors like buying or carrying condoms. Thus, studies that focus entirely on intentions may be missing important aspects of the process of moving from intentions to actual behavioral change.

One difficulty with this area of research is that studies to date have predominantly examined a limited range of strategies. These studies have focused solely on three aspects of this construct: discussing or negotiating condom use, buying condoms, or having condoms available. However, it seems highly likely that other PBS are also associated with increased condom use. One study examined an expanded range of PBS (i.e., those that required active behavior and mental planning) and found that more frequent use of PBS was associated with increased condom use during alcohol-related sexual activity (Lewis et al., 2009). This is particularly important given that alcohol has been associated, in some studies, with decreased likelihood to use condoms among college students (e.g., Kiene, Barta, Tennen, & Armeli, 2009). Thus, PBS appears to predict condom use and may provide critical information for how to help individuals move from intentions to behavior change.

This Study

Understanding the planning and preparatory behavior that leads to safer sexual behavior could inform the development and evaluation of preventative interventions aimed to reduce risky sexual behavior among college students. Examining these behaviors at the event level may provide critical additional information regarding whether global PBS translate to condom use at the event level. Thus, the purpose of this research was to extend previous findings by examining the relationship between condom-related PBS and condom use at both global and event levels. In addition, this study aimed to extend findings by examining the relationship between condom-related PBS and sexual discussions regarding STIs at the event level.

Hypotheses

We expected condom-related PBS to be associated with condom use during sexual behavior in the past three months (global level). In addition, it was expected that students who reported greater use of condom-related PBS would be more likely to have sexual discussions related to HIV, STI history, and protection against HIV and STIs the first time they had sex with their most recent vaginal sexual partner (event level). Finally, we expected that more frequent use of condom-related PBS would be associated with being more likely to use a condom during the most recent vaginal sexual experience (event level). It was expected that these relationships will be present even when controlling for relevant covariates such as sex, relationship status, frequency of sexual behavior, and alcohol consumption.

Method

Participants and Procedures

Names and contact information for a random sample ($N = 2,000$) of undergraduates were obtained from the university registrar's office. Students who were between the ages of 18 and 30 at the start of the study were eligible to participate. Students were mailed and e-mailed invitations to participate in a 40-min, Web-based survey assessing drinking and sexual behavior, condom-related PBS, and other psychosocial constructs. Interested students read an online information statement that provided all the components of informed consent, and those who chose to participate were directed to the main study survey. A total of 1,002 students

(56.9% female; 43.1% male) agreed to participate; and, of those, 958 (95.6%) completed the survey. Participants received \$20 for survey completion. All procedures were reviewed and approved by the university's institutional review board. In addition, a Federal Certificate of Confidentiality was obtained for this research.

The mean age of the sample was 20.61 ($SD = 2.07$). Demographics of the participants were 60.0% White or Caucasian, 26.1% Asian, 8.7% multiracial, and 5.2% "other." A small proportion of the sample identified as Hispanic (4.9%). There was no significant difference in ethnic composition based on whether students decided to participate, $\chi^2(2, N = 1,901) = 3.20$, $p = ns$. In regards to gender, our sample included 57.1% women and 42.9% men, whereas the invited sample was 50.3% women and 49.7% men. Women were more likely to participate than men, $\chi^2(1, N = 2,000) = 37.53$, $p < .001$. The majority of students reported being heterosexual (94.6%) and not currently in a relationship (64.0%). Participants ($n = 623$; 57.8% female and 42.2% male) in the final analyses included only those students who reported ever having had vaginal sexual intercourse.

Measures

Condom-related PBS (global level)—Participants were assessed with the Condom-Related Protective Behavioral Strategies Scale (Lewis et al., 2009). Students reported how often they used six condom-related strategies, with response options ranging from 0 = (*never*) (0%) to 4 (*always*) (100%). Example items included "Buy condoms," "Told a partner I wanted to use a condom," and "Have a mental plan to use a condom." Internal consistency for this sample was .87. Final scores were the mean of the six items.

Sexual behavior and condom use (global level)—Participants were asked, "How many times have you had sexual intercourse with ANY partner during the past 3 months?" Responses ranged from 0 (*none*) to 15 (*15 or more times*). Participants also indicated how many of those occasions a condom was used and the number of times they consumed alcohol before or during sexual intercourse.

Alcohol consumption (global level)—Typical drinks per week was assessed with a modified version of the Daily Drinking Questionnaire (Collins, Parks, & Marlatt, 1985). Participants were asked, "Consider a typical week during the last month. How much alcohol, on average (measured in number of drinks), do you drink on each day of a typical week?" A response table with each day of the week was presented, and the participants filled in how much they typically drank on each day of the week. Scores were computed by summing the number of drinks the participants reported drinking on each day of the typical week.

Sexual behavior, condom use, and alcohol consumption (event level)—Items measuring event-level sexual behavior were adapted from Cooper, Peirce, and Huselid (1994), Temple and Leigh (1992), and Goldstein, Barnett, Pedlow, and Murphy (2007). Participants were asked about the most recent time they had vaginal sex. If this sexual experience was not the first sexual experience with that partner, they were asked about the first sexual experience with that partner. For their vaginal sexual experience, they were asked about their relationship with their partner on a scale ranging from 1 (*someone who is a casual sexual partner*) to 4 (*someone I'm in a serious monogamous relationship with [includes being engaged or married]*). Casual sexual partner was defined as "a sexual partner you do not have a committed relationship with, or someone you just met." Participants were asked if a condom was used and if they had discussed their sexual history and their partner's sexual history, STI and HIV status, and protection against STIs. Responses ranged from 0 (*no*) to 1 (*yes*). Finally, participants were asked how many alcoholic drinks they had consumed and how many drinks

they thought their partner had consumed. Responses ranged from 0 (*0 drinks*) to 25 (*25 or more drinks*).

Results

Global-Level Findings

Of importance, a relevant portion (33.5%) of sexually active students reported not using a condom at all during sexual behavior in the previous three months. Means and standard deviations for global-level sexual behavior frequency, drinks per week, and condom-related PBS are presented in Table 1. A mean of 2.03 for condom-related PBS corresponds with the “sometimes (50%)” response option.

Preliminary analyses revealed non-normality of condom use (i.e., positively skewed; skewness = .83, kurtosis = -.81). Thus, hypothesis testing for global-level data were conducted using a zero-inflated negative binomial (ZINB) regression model (Cameron & Trivedi, 1998). The ZINB model has two components: (a) a logistic component to predict the likelihood of an always-zero score, or those who never used a condom in the past three months; and (b) a negative binomial component to predict the number of times a condom is used among predicted condom users. To summarize, this model predicts both those who chose to use a condom and how many times the predicted condom users used a condom. ZINB models have two sets of predictors: One set predicts zero values (condom non-users), and one set predicts counts among condom users. Sex, whether or not students were in a relationship, typical drinking behavior, sexual behavior frequency, and condom-related PBS were included as predictors in both components of the model. Sex, relationship status, typical drinking behavior, and sexual behavior frequency were included as covariates. Sex and relationship status were dummy coded (men = 1, women = 0; 1 = relationship, 0 = no relationship). Typical drinks per week, sexual behavior frequency, and condom-related PBS were mean centered to facilitate interpretation of parameter estimates (Cohen, Cohen, West, & Aiken, 2003)

The likelihood ratio for the full ZINB model was $\chi^2(10, N = 521) = 581.44, p < .001$; and the maximum likelihood was $R^2 = .67$, which indicates that the overall model was significant. Findings indicated strong support for the ZINB model over other possible count models. The Vuong test for non-nested models supported the use of a zero-inflated model over a standard negative binomial model ($z = 9.02, p < .001$). The likelihood ratio (LR) test of overdispersion was significant— $LR = \chi^2(1, N = 521) = 18.81, p < .001$ —which indicates that a zero-inflated Poisson model would be inappropriate.

As expected, findings presented in Table 2 indicated that condom-related PBS predicted zero scores (condom non-users). Students who used PBS more frequently were less likely to be condom non-users. Moreover, results demonstrated that more frequent use of condom-related PBS was positively associated with condom use frequency among predicted condom users.

Event-Level Findings

The majority of students reported being in a serious monogamous relationship with their most recent vaginal sexual partner (49.4%), followed by someone they are seriously dating but not in a monogamous relationship (19.2%), someone who is a casual sexual partner (17.9%), and someone they are casually dating (13.4%). About one half of the sample reported engaging in sexual discussions the first time they had sex with their most recent vaginal sexual partner: HIV status (51.3%), STI history (54.4%), and protection against HIV and STIs (59.2%). Finally, 51.5% of students reported using a condom during their most recent vaginal sexual experience. Means and standard deviations for event-level number of drinks and perceived number of drinks consumed by recent vaginal sexual partner are presented in Table 1.

Logistic regression analysis was used to evaluate the likelihood of having discussions with most recent sexual partner related to HIV status, STI history, and protection against HIV/STIs prior to vaginal sexual intercourse. Logistic regression was also used to determine the likelihood of condom use during the most recent vaginal sexual experience. These behaviors were evaluated as a function of sex, relationship with sexual partner, sexual behavior frequency, number of drinks, perceived number of drinks consumed by partner, and condom-related PBS. Sex, relationship status, frequency of sexual behavior, number of drinks, and perceived partner drinking were included as covariates. Sex was dummy coded (men = 1, women = 0). Relationship with sexual partner, sexual behavior frequency, number of drinks, perceived number of drinks consumed by partner, and condom-related PBS were mean-centered to facilitate interpretation of parameter estimates (Cohen et al., 2003).

When evaluating sexual discussions related to HIV status, STI history, and protection against HIV and STIs, all three models with all main effects were statistically reliable compared to a constant-only model, which indicates that the predictors reliably distinguished between students who had these discussions the first time they had sex with their most recent sexual partner and those who did not. Classification was good for all three models. The overall percentage classified correctly was 65.7%, 65.0%, and 65.0% for HIV status, STI history, and protection against HIV and STIs, respectively. Results presented in Tables 3 through 5 indicated that sex, relationship with sexual partner, sexual behavior frequency, number of drinks, perceived number of drinks consumed by partner, and condom-related PBS provided a good fit for the likelihood of having sexual discussions. As expected, when taking relevant covariates into account, students who reported greater use of condom-related PBS were more likely to have sexual discussions with their most recent sexual partner.

When evaluating condom use, the model with all main effects was statistically reliable compared to a constant-only model— $\chi^2(6, N = 605) = 221.16, p < .001$ —which indicates that the predictors reliably distinguished between students who used a condom during their most recent vaginal sexual experience and those who did not. Classification was good, with 74.6% classified correctly. Results presented in Table 6 indicated that the model provided good fit for the likelihood of using a condom with most recent vaginal sexual partner (Nagelkerke $R^2 = .397$). As expected, individuals who used condom-related PBS were more likely to use a condom during their most recent vaginal sexual behavior. Each unit increase in the condom-related PBS score was associated with a threefold increase (odds ratio = 3.11) in the likelihood of using a condom during the most recent vaginal sexual experience.

Discussion

This research examined the relationship between condom-related PBS and condom use at both global and event levels. Specifically, results demonstrated that students who reported more frequent use of condom-related PBS were more likely to use a condom during sexual behavior in the previous three months and during their most recent vaginal sexual experience. This research extends the previous work of Lewis et al. (2009) by demonstrating that condom-related PBS are important factors that are associated with condom use for alcohol-related sexual behavior but also for sexual behavior, in general. Furthermore, findings showed that condom-related PBS was not only associated with condom use but also more generally with sexual discussions regarding STIs. Specifically, findings indicated that students who used condom-related PBS more frequently were more likely to discuss their and their partner's HIV status, STI history (other than HIV), and protection against STIs (HIV and other STIs) the first time they had sex with their most recent vaginal sexual partner.

These findings extend prior research evaluating condom-related PBS. A meta-analytic review by Sheeran et al. (1999) found that carrying a condom, having a condom available, and

discussing condom use with a sexual partner were all associated with condom use among heterosexuals. Furthermore, Bryan et al. (2002) found that active behavior strategies (i.e., buying condoms, carrying condoms, and discussing condoms) mediated the relationship between condom use intentions and condom use among heterosexual adolescents and college students. Findings from Lewis et al. (2009) and from this study extend this research by examining additional, distinct PBS that better sample preparatory behaviors: having a mental plan to use a condom, having a mental plan to talk about condom use with a sexual partner prior to sex, and telling a sexual partner they wanted to use a condom. Preparatory behavior not only includes regulating behavior but formulating plans on how to engage in that behavior, which indicates likelihood to implement a behavior (Bagozzi, 1992).

Having a mental plan to use a condom is distinct from buying condoms or carrying a condom, as it involves formulating how or when one would use a condom during a sexual encounter. For example, one could plan on having the condom be a part of foreplay and, thus, be available for use. Similarly, having a mental plan to talk about condom use with a sexual partner prior to sex differs from having intentions to discuss, and actually talking about condom use, with a sexual partner prior to sex. Having a mental plan to talk about condom use can be perceived as a step beyond having an intention to talk about condom use. For example, one might intend to discuss condom use and then formulate how to talk to one's sexual partner. Creating a mental plan might entail envisioning how the conversation would play out with one's sexual partner. In addition, a person might formulate potential responses to any objections they believe their partner might have regarding using a condom. Finally, directly telling a sexual partner that one wants to use a condom involves a clear request. However, having a conversation about condom use may only include past history of condom use. Thus, this study extends previous research by demonstrating that formulating plans related to condom use, in addition to other preparatory behaviors, are associated with condom use at global and event levels.

Implications for Preventative Interventions

This study has clear implications for preventative interventions, as it suggests that planning and preparing to use a condom are associated with condom use. Condom-related PBS would help to facilitate condom use by not only providing tools for how one could prepare to use a condom but also how one could mentally plan to use a condom. Thus, one question is whether interventions changing condom-related PBS would translate into safer sexual behavior among college students. Future research is warranted to evaluate if condom-related PBS would be effective either as an independent intervention or as part of a multi-component intervention.

In addition to the implications for including condom-related PBS as a component of preventative interventions, this study has implications for existing preventative interventions and how their efficacy is evaluated. As found in Bryan et al. (2002), results showed that condom-related PBS and condom use behavior are strongly associated. However, it is important to note that they are distinct behaviors. Specifically, condom-related PBS are more tertiary behaviors that ideally result in the target behavior (i.e., increased condom use). Although these strategies are distinct from condom use, it may be useful to consider condom-related PBS as primary behavioral outcome variables in certain types of situations. For example, for interventions with shorter follow-up timeframes, there may be some individuals who have not had the opportunity to use condoms but who have had time to use condom-related PBS. Even with longer follow-up assessments, there may be a subset of individuals who may not be engaging in any sexual behavior. These individuals may get missed if the sole outcome measure examined is condom use. In these cases, it may be desirable to evaluate condom-related PBS as an intervention outcome variable.

Limitations and Future Directions

A primary limitation of this research is that condom-related PBS and condom use behavior were measured concurrently. Although it is logical that planning and preparing to use a condom occurs prior to condom use, future research should examine this relationship longitudinally. A second limitation is that all data were assessed via self-report, which may be influenced by socially desirable responses. Last, this study was restricted to a sample of college students. Although this is a very important group to study, as they are at high risk for STI transmission (ACHA, 2008) and are often failing to use condoms at a high rate (ACHA, 2008), the findings may fail to generalize to other groups who also may not be using condoms. For example, these findings would need to be replicated for men who have sex with men or in populations where negotiation regarding condom use may be more difficult due to cultural factors. It is possible that additional PBS may need to be identified for other high-risk populations.

Conclusion

In conclusion, this research demonstrates that both active behavior and mental planning condom-related PBS are associated with sexual behavior at both the global and event level. Finally, this research supports the inclusion of condom-related PBS in preventative interventions aimed to increase safer sexual behavior among college students.

Acknowledgments

Data collection and manuscript preparation was supported by the National Institute on Alcohol Abuse and Alcoholism Grant No. K01AA016966.

References

- American College Health Association. American College Health Association—National College Health Assessment Spring 2007 reference group data report [Abridged]. *Journal of American College Health* 2008;56:469–479. [PubMed: 18400658]
- Bagozzi RP. The self-regulation of attitudes, intentions, and behavior. *Social Psychology Quarterly* 1992;55:178–204.
- Bryan A, Fisher JD, Fisher WA. Tests of the mediational role of preparatory safer sexual behavior in the context of the theory of planned behavior. *Health Psychology* 2002;21:71–80. [PubMed: 11846347]
- Cameron, AC.; Trivedi, PK. Regression analysis of count data. New York: Cambridge University Press; 1998.
- Centers for Disease Control and Prevention. HIV/AIDS surveillance report, 2007, Vol. 19. Atlanta: U.S. Department of Health and Human Services; 2008. Retrieved July 22, 2009, from <http://www.cdc.gov/hiv/topics/surveillance/resources/reports/>
- Cohen, J.; Cohen, P.; West, SG.; Aiken, LS. Applied multiple regression/correlation analysis for the behavioral sciences. 3rd ed.. Mahwah, NJ: Lawrence Erlbaum Associates, Inc.; 2003.
- Collins RL, Parks GA, Marlatt GA. Social determinants of alcohol consumption: The effects of social interaction and model status on the self-administration of alcohol. *Journal of Consulting and Clinical Psychology* 1985;53:189–200. [PubMed: 3998247]
- Cooper ML, Peirce RS, Huselid RF. Substance use and sexual risk taking among Black adolescents and White adolescents. *Health Psychology* 1994;13:251–262. [PubMed: 8055860]
- Goldstein AL, Barnett NP, Pedlow CT, Murphy JG. Drinking in conjunction with sexual experiences among at-risk college student drinkers. *Journal of Studies on Alcohol and Drugs* 2007;68:697–705. [PubMed: 17690803]
- Henshaw SK. Unintended pregnancy in the United States. *Family Planning Perspectives* 1998;30:24–29. [PubMed: 9494812]

- Kiene SM, Barta WD, Tennen H, Armeli S. Alcohol, helping young adults to have unprotected sex with casual partners: Findings from a daily diary study of alcohol use and sexual behavior. *Journal of Adolescent Health* 2009;44:73–80. [PubMed: 19101461]
- Lewis MA, Logan DE, Neighbors C. Condom-related protective behavioral strategies: Scale development and association with alcohol-related sexual behavior among college students. 2009 Manuscript submitted for publication.
- Youth and HIV/AIDS 2000: A new American agenda. Washington, DC: The White House; 2000. Office of National AIDS Policy.
- Sheeran, P. Intention–behaviour relations: A conceptual and empirical review. In: Stroebe, W.; Hewstone, M., editors. *European review of social psychology*. Vol. 12. Chichester, England: Wiley; 2002. p. 1-36.
- Sheeran P, Abraham C, Orbell S. Psychosocial correlates of heterosexual condom use: A meta-analysis. *Psychological Bulletin* 1999;125:90–132. [PubMed: 9990846]
- Temple MT, Leigh BC. Alcohol consumption and unsafe sexual behavior in discrete events. *Journal of Sex Research* 1992;29:207–219.
- van Empelen P, Kok G. Action-specific cognitions of planned and preparatory behaviors of condom use among Dutch adolescents. *Archives of Sexual Behavior* 2008;37:626–640. [PubMed: 18193348]
- Webb TL, Sheeran P. Does changing behavioral intentions engender behavior change? A meta-analysis of the experimental evidence. *Psychological Bulletin* 2006;132:249–268. [PubMed: 16536643]
- Weinstock H, Berman S, Cates W Jr. Sexually transmitted diseases in American youth: Incidence and prevalence estimates, 2000. *Perspectives on Sexual and Reproductive Health* 2004;36:6–10. [PubMed: 14982671]

Table 1

Means, Standard Deviations, and Zero-Order Correlations

Variable	M	SD	1	2	3	4	5
1. Sexual behavior frequency (global)	8.66	6.25	—				
2. Drinks per week (global)	8.30	9.49	-.03	—			
3. Condom-related PBS (global)	2.03	1.18	-.17**	.05	—		
4. Condom use (global)	4.81	5.46	.38**	-.04	.57***	—	
5. Number of drinks (event)	1.29	2.70	-.23**	.43***	.06	-.10*	—
6. Perceived number of drinks for partner (event)	1.27	2.60	-.23**	.34***	.04	-.10*	.83***

Note. Ns ranged from 522 to 620 due to missing data. PBS = protective behavioral strategies.

Table 2
Summary of Zero-Inflated Negative Binomial Regression Analysis Predicting Condom Use at a Global Level

Predictor	B	SE	Z Statistic	95% Confidence Interval	
				Lower	Upper
Condom use frequency					
Sex	−0.024	0.053	−0.45	−0.127	0.080
Relationship status	−0.063	0.059	−1.05	−0.179	0.054
Frequency of sexual behavior	0.128	0.006	19.95**	0.116	0.141
Typical drinks per week	0.001	0.003	0.30	−0.006	0.001
Condom-related PBS	0.273	0.026	10.41**	0.221	0.324
Non-users					
Sex	−0.276	0.294	−0.94	−0.853	0.301
Relationship status	−0.329	0.317	−1.04	−0.951	0.293
Frequency of sexual behavior	0.090	0.038	2.40*	0.017	0.163
Typical drinks per week	0.011	0.167	0.67	−0.022	0.044
Condom-related PBS	−1.63	0.161	−10.07**	−1.94	−1.31

Note. N = 521. Sex was coded as 0 = women and 1 = men. Relationship status was coded as 0 = no relationship and 1 = relationship. PBS = protective behavioral strategies.

*
p < .05.
**
p < .001.

Table 3
Summary of Logistic Regression Analysis Predicting HIV Discussion at an Event Level

Predictor	B	SE	Wald Statistic	Odds Ratio	95% Confidence Interval for Odds Ratio	
					Lower	Upper
Nagelkerke $R^2 = .183$						
Sex	−0.385	0.183	4.406*	0.681	0.475	0.975
Relationship with sexual partner	0.435	0.098	19.788***	1.545	1.276	1.872
Sexual behavior frequency	0.039	0.015	6.472*	1.040	1.009	1.071
Number of drinks	0.027	0.068	0.159	1.028	0.899	1.175
Perceived number of drinks for partner	−0.144	0.069	4.301*	0.866	0.756	0.992
Condom-related PBS	0.194	0.076	6.603**	1.215	1.047	1.409

Note. $n = 606$. Sex was coded as 0 = women and 1 = men. PBS = protective behavioral strategies.

*
 $p < .05$.
**
 $p < .01$.

 $p < .001$.

Summary of Logistic Regression Analysis Predicting Sexually Transmitted Infection History Discussion at an Event Level

Table 4

Predictor	B	SE	Wald Statistic	Odds Ratio	95% Confidence Interval for Odds Ratio	
					Lower	Upper
Nagelkerke $R^2 = .199$						
Sex	−0.450	0.185	5.903*	0.637	0.443	0.917
Relationship with sexual partner	0.432	0.097	19.713**	1.541	1.273	1.865
Sexual behavior frequency	0.035	0.015	5.011*	1.035	1.004	1.067
Number of drinks	−0.043	0.068	0.392	0.958	0.838	1.096
Perceived number of drinks for partner	−0.099	0.067	2.188	0.905	0.794	1.033
Condom-related PBS	0.266	0.078	11.778**	1.305	1.121	1.519

Note. $n = 606$. Sex was coded as 0 = women and 1 = men. PBS = protective behavioral strategies.

* $p < .05$.

** $p < .001$.

Summary of Logistic Regression Analysis Predicting Protection Against HIV and Sexually Transmitted Infections Discussion at an Event Level

Table 5

Predictor	B	SE	Wald Statistic	Odds Ratio	95% Confidence Interval for Odds Ratio	
					Lower	Upper
Nagelkerke $R^2 = .170$						
Sex	−0.375	0.187	4.050*	0.687	0.477	0.990
Relationship with sexual partner	0.368	0.097	14.346**	1.445	1.194	1.748
Sexual behavior frequency	0.034	0.016	4.761*	1.035	1.003	1.067
Number of drinks	−0.051	0.063	0.659	0.950	0.841	1.075
Perceived number of drinks for partner	−0.038	0.062	0.369	0.963	0.853	1.087
Condom-related PBS	0.436	0.080	29.522**	1.547	1.322	1.811

Note. n = 606. Sex was coded as 0 = women and 1 =men. PBS = protective behavioral strategies.

* p < .05.

** p < .001.

Table 6
Summary of Logistic Regression Analysis Predicting Condom Use at an Event Level

Predictor	B	SE	Wald Statistic	Odds Ratio	95% Confidence Interval for Odds Ratio	
					Lower	Upper
Nagelkerke $R^2 = .397$						
Sex	−0.247	0.210	1.383**	0.782	0.518	1.179
Relationship with sexual partner	−0.207	0.107	3.771*	0.813	0.659	1.002
Sexual behavior frequency	−0.019	0.017	1.257	0.981	0.949	1.014
Number of drinks	0.159	0.075	4.520*	1.173	1.013	1.358
Perceived number of drinks for partner	−0.090	0.073	1.528	0.914	0.793	1.054
Condom-related PBS	1.135	0.103	122.196***	3.111	2.544	3.804

Note. $n = 607$. Sex was coded as 0 = women and 1 = men. PBS = protective behavioral strategies.

* $p < .05$.
** $p < .10$.
*** $p < .001$.