Published in final edited form as:

AIDS Behav. 2016 December ; 20(12): 2893–2903. doi:10.1007/s10461-016-1351-8.

Partnership-level analysis of African American women's risky sexual behavior in main and non-main partnerships

Michelle Broaddus¹, Jill Owczarzak², Maria Pacella³, Steven Pinkerton¹, and Cassandra Wright¹

¹Center for AIDS Intervention Research, Medical College of Wisconsin, Milwaukee, WI

²Department of Health, Behavior, and Society, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD

³Department of Emergency Medicine, University of Pittsburgh, Pittsburgh, PA

Abstract

The majority of research on risky sexual behavior in African American women has examined global associations between individual-level predictors and behavior. However, this method obscures the potentially significant impact of the specific relationship or relationship partner on risky sexual behavior. To address this gap, we conducted partnership-level analysis of risky sexual behavior among 718 African-American women recruited from HIV counseling, testing, and referral sites in four states. Using mixed model regressions, we tested relationships between condomless vaginal intercourse with men and variables drawn from the Theory of Planned Behavior, Theory of Gender and Power, and previous research specifically on sexual risks among African American women. Significant associations with risky sexual behavior indicate the need for continued emphasis on condom attitudes, condom negotiation behaviors, and overcoming partner resistance to condoms within both main and non-main partnerships when implementing interventions designed to address HIV and sexually transmitted infection risks among African American women.

Keywords

African American women; Theory of Gender and Power; Theory of Planned Behavior; risky sexual behavior; condom negotiation

INTRODUCTION

African American women are at an increased risk for HIV and sexually transmitted infections (STIs). Compared to White women, they have incidence levels that are 20 times higher for HIV (1), 21 times higher for syphilis, 16 times higher for gonorrhea, and 7 times higher for chlamydia (2). Therefore, successful sexual health interventions are needed to address these disparities in African American women. However, to design appropriate and

efficacious interventions for this high-risk population, greater clarity is also necessary regarding the population-specific precursors and contexts of risky sexual behaviors, specifically within the context of sexual and romantic partnerships with men. The majority of previous research on risky sexual behavior in African American women has examined global associations between individual-level predictors (e.g., self-efficacy to negotiate condoms) and behavior. A limitation of this approach is that it overlooks the potentially significant impact of the specific relationship or relationship partner on risky sexual behavior. The purpose of this study was to examine both individual- and partnership-level associations with condomless vaginal intercourse with men in a large sample of African American women. The Theory of Planned Behavior (TPB) and factors drawn from previous research specific to African American women provide rationale for our hypothesized individual-level variables, while the Theory of Gender and Power (TGP) and factors drawn from previous research on the influence of partner risks provide rationale for our hypothesized partnership-level variables.

Predictors of Sexual Behavior at the Individual Level

The Theory of Planned Behavior—The TPB, has been used to predict myriad health behaviors, and includes core constructs of attitudes, norms, self-efficacy, and intentions to engage in a health behavior (3). These core constructs of the TPB have demonstrated validity in a meta-analysis predicting risky sexual behavior and condom use in several populations (4).

Population-specific variables—However, other individual-level variables may be important considerations in risky sexual behavior, specifically among African American women. First, ethnic identity, or the extent to which one positively identifies with one's ethnic group, has been identified as a potential protective factor against sexual risks. A study of adolescent African American women found a negative association between ethnic identity and sexual risk acts (5). Research among African American adolescent women has also found that high self-esteem is important for positive condom attitudes, condom negotiation self-efficacy, and frequency of communication with sexual partners (6). Additional research among this population found that a composite variable of self-concept, consisting of self-esteem, ethnic pride, and body image, was positively related to refusal of condomless sex (7). This relationship was mediated by condom negotiation fear and self-efficacy, and sex-related discussions with partners. However, this study did not examine actual risky sexual behaviors, and used a measure of ethnic pride that did not reference gender-specific pride. Further examination of how self-esteem and gender-specific pride in being an African American woman affect actual risky sexual behavior is therefore warranted.

Predictors of Sexual Behavior at the Partnership Level

The Theory of Gender and Power—Beyond aspects of the individual, Wingood and DiClemente's (2000) application of the TGP to women's experiences with HIV risks suggests several barriers to safe sex particular to African American women within the context of romantic or heterosexual relationships (8). The TGP suggests that women's risk for HIV are shaped by economic inequalities, various social norms about gender and relationships that may discourage condom use, and heterosexual partnerships defined by

gendered power differences. These constructs may manifest in lack of power for women in partnerships and in difficulties with condom negotiation or communication with partners. While the TPB highlights the importance of intentions, it ignores the fact that both individuals in the sexual partnership have their own intentions to use condoms that must be negotiated if they are in conflict. Previous research has demonstrated that males and individuals with greater power in the relationship are more likely to have their condom intentions actually enacted (9). Similarly, among rural African American young women, power equity is associated with consistent condom use (10). Previous research bolsters the importance of a focus on condom negotiation as a mediator for potential issues of gender and power to affect potential HIV risks. Although women are often seen as responsible for condom negotiation (11, 12), differential power levels may limit their ability to make decisions in the relationship or cause them not to negotiate for condom use (13). Similarly, Wingood and DiClemente (2000) also suggest that the threat of financial insecurity may lead women to avoid condom negotiation or insistence within a relationship, and that passivity in sexual relationships is expected due to gendered double standards (8). In other words, women who engage in assertive behaviors within a romantic or sexual encounter may be judged harshly, while men are expected to and applauded for engaging in similar assertive behaviors. In modeling the TGP's ability to predict condom use among African American young women, condom communication was the most proximate predictor of condom use, which was affected by having older partners, more parental communication about sex, and less negative psychological affect and substance use preceding sex (14).

Previous research has examined these issues by focusing on African American women's self-efficacy to negotiate condoms with partners, expectations or experiences of resistance from partners, and how these factors are related to condom use (15, 16). However, this research typically uses global assessments of these variables with the current or most recent partner, or for sexual partners overall (with some exceptions) (17). This approach does not allow for the potential for variation across partners. Variables that differ across partnerships and may influence risky sexual behavior include the length of the relationship, the specific power dynamics within that relationship (9), and partners' resistance to condoms (18). Finally, while self-efficacy to *use* condoms is perhaps a stable, individual-level trait, self-efficacy to *negotiate* condom use may also vary depending on partner.

Partner risk perceptions—In addition to self-efficacy regarding condom negotiation and use, previous research suggests that perceptions of a partner's risks for HIV may also influence women's risky sexual behavior. Each partner will have a different history of injection drug use, incarceration, and sex with men and other women, all of which are associated with the riskiness of having condomless sexual intercourse with that partner (19). Therefore, deciding whether or not to use condoms may be altered by these partnership-level characteristics. Previous research has examined these questions of partner risk in event/partner-level analysis, obtaining data about the last instance of sexual intercourse with up to five partners in a sample of drug-using women (74% African American) (20). In univariate analyses, perceptions that the partner had other sexual partners were associated with higher likelihood of condom use. Also, not knowing if the partner had concurrent partners, a history of sex with men, injected drugs, or had been infected with HIV were associated with higher

likelihood of condom use. However, in multivariate analyses, the addition of partner type caused these associations to decrease to non-significance, such that having a main partner was highly associated with condom non-use. This is not surprising given the lack of condom use in main partnerships (18), and qualitative results indicating a perceived lack of need to use condoms and high level of difficulty with negotiating condoms with these main partners among African American women (21). Therefore, predictors of condom use are potentially distinct among main partnerships and non-main partnerships, and we propose to examine these predictors separately for main and non-main partnerships in a sample of African American women who partner with men.

Examination of Both Individual-level and Partnership-Level Variables

The current study examines associations of risky sexual behavior with variables drawn from TPB, TGP, perceptions of partner risks, and other individual and partnership-level variables suggested by previous research. Previous research has typically examined global associations between TGP variables of condom negotiation and power with overall risky sexual behavior (e.g., frequency of condomless vaginal intercourse in the previous 6 months). However, specific questions asked about each of several recent partners may result in a more accurate depiction of actual behavior (22). This approach to measuring risky sexual behavior has the added benefit of being able to examine associations with risky sexual behavior at the level of the partnership. Specifically, we can examine at the partnership level the number of instances of condomless vaginal intercourse with both main and non-main partners. We conducted analysis of demographic variables potentially associated with condomless vaginal intercourse with men as potential covariates, including 1) housing, 2) income, 3) employment, and 4) age. Drawing from the TGP we hypothesized that housing and employment instability, lower income, and younger age would be associated with more condomless vaginal intercourse. We also hypothesized associations of the individual-level and partnership-level variables shown in Table 1 with condomless unprotected vaginal intercourse with men. At the individual level, we hypothesized that 1) more positive condom attitudes, 2) peer norms encouraging condom use, 3) self-efficacy to use condoms, 4) African American woman pride, and 5) self esteem would all be associated with fewer instances of condomless vaginal intercourse. At the partnership level, we hypothesized that 1) partnership with older male partners and 2) existence of partner resistance to condoms would be associated with more instances of condomless vaginal intercourse. Finally, we hypothesized that 3) higher levels of condom negotiation behaviors, 4) greater decision-making power, and partnerships where the partner 5) had sex with other women, 6) had sex with men, 7) injected drugs, or 8) were incarcerated would be associated with fewer instances of condomless vaginal intercourse.

METHODS

Procedures and Participants

Data for this study were collected as part of a larger project examining the effectiveness and cost-effectiveness of the Sisters Informing Sisters about Topics on AIDS (SISTA) intervention delivered by front-line service providers. Participants in the current study were not exposed to the SISTA intervention, but instead consisted of the participants in the

comparison group--African American women who recently completed HIV counseling, testing, and referral (CTR) at the intervention sites. Service providers at four agencies in Tennessee, Texas, Missouri, and New Jersey referred potential participants. These agencies were either AIDS Service Organizations or Community Based Organizations that provided both SISTA and CTR services, some of which had multiple branches in different cities. After women had been tested for HIV, but before test results were given, service providers who conducted HIV testing asked potential participants if they would be interested in participating in a research study. If interested, participants were given a card with an individual username and password, and told they could complete the survey either using a computer at the agency, or later at their convenience. When potential participants logged on with their username, they were first asked to complete eligibility screening to ensure they identified as an African American/Black female over the age of 18. If eligible, they were directed to an online informed consent process and—if they agreed to participate—provided contact information, and were then directed to the survey questions. After completion of the survey, participants were directed to pick up a \$35 incentive either in the form of a gift card or cash from the agency, or if they had moved out of the area, were mailed a money order or gift card.

A total of 1,093 women completed the online survey between August 2011 and February 2015, of which 718 African American women indicated they had vaginal sex with a man in the past 90 days. Although sexual activity was not an eligibility criterion for participation in the larger study, only these 718 participants who indicated sexual activity with a man in the previous 90 days were used in our analyses. Five participants gave answers above 1000 or below 10 for their age and were excluded from all analyses including age. These participants were between the ages of 18 and 74 ($M = 33.14$, $SD = 11.08$). Descriptive statistics are given in Table 1.

Measures

Individual-level variables—These included demographic variables, TPB variables, and population-specific variables.

Demographics: Housing status included options of: In your own house or apartment; In a friend or family member's house or apartment; In someone else's house or apartment; In a rooming house, boarding house, half-way house, or shelter; and On the street(s) (abandoned building, park, vacant lot, etc.). The vast majority of participants lived in their own house or apartment and this was seen as an indicator of stable housing, therefore this was the reference category for a dichotomized variable. Income included options of: \$0 – \$499 a month; \$500 – \$999 a month; \$1000–\$1,999 a month; \$2,000–\$4,999 a month; and \$5000 or more a month. Approximately half of participants indicated they made less than \$500 a month and therefore this variable was dichotomized with under \$500 a month as the reference category. Employment status included options of: Working full-time, Working part-time, Homemaker, Out of work/unemployed, and On disability or unable to work. A plurality of participants indicated that they worked either full- or part-time and this was seen as an indicator of relative financial security and less financial dependence within relationships. Therefore participants were classified as working full/part-time versus Other.

Theory of Planned Behavior: These variables included a measure of Condom Attitudes drawn from the “Effect on sexual experience” subscale of the Condom Barriers Scale (23) (example item: “Condoms feel unnatural,” reverse coded; see Table 1 for number of items, range of response options, and alpha coefficients for all scales). Peer norms were measured with items of peer support for protective behaviors (example item: “I wouldn’t want my friends to know I use condoms,” reverse coded). Self-efficacy to use condoms was measured with items assessing participants’ confidence on the mechanics of using condoms (e.g., putting a condom on an erect penis, unrolling a condom all the way to the base of the penis)

Population-specific variables: These included African American Woman Pride, a 7-item scale adapted from a scale of racial pride for African American women (24) (example item: “Women are the backbone of African-American culture”). Self-esteem was measured with the 10-item Rosenberg Self-Esteem scale (25) (example item: “I have a number of good qualities”).

Partnership-level variables—These included TGP and partner riskiness variables, describing the participants’ last three male sexual partners in the previous 90 days.

Theory of Gender and Power: These variables were asked about each partner and included the type of relationship (Do you consider this partner to be a “main,” “steady,” or “regular” partner, like a husband or boyfriend?). Age difference between partners was calculated by subtracting the participant’s age from the partner’s age. Length of relationship was assessed (less than 1 month, 1–6 months, 7–12 months, more than a year). Condom negotiation behaviors for each partner were a summed measure of 3 yes/no items assessing if participants had ever 1) talked to their partner about condoms, 2) asked him to use condoms, and 3) demanded he use condoms. Decision-making power for each partnership was assessed with the average of four items drawn from the Decision-Making Dominance subscale of the Sexual Relationship Power Scale (26) assessing who has more say about whether to have sex, what they do sexually, whether they used condoms (0 = “He has more say,” 1 = “We have equal say,” 2 = “I have more say”), and who has more overall power in the relationship (0 = “He has more power,” 1 = “We have equal power,” 2 = “I have more power”). One item assessed if the partner was abusive: whether the partner ever hit, slapped, or physically abused them. The last item assessed partner resistance to condoms.

Partner risk perception: These variables included if the partner had sex with another woman, had sex with a man, or injected drugs in the past 90 days, or spent time in jail or prison in the last year.

Outcome variables—For each partner, participants were asked how many times they had “unprotected (no condom) vaginal intercourse” with this partner in the past 90 days. All questions were asked about partners who were men. This variable was used as the outcome variable for all partnership-level analyses. Additional questions were asked about anal sex, but there was overall low prevalence of anal sex. Given the potential for different associations of vaginal versus anal sex, we did not include anal sex in our analysis to ensure clarity.

Data Analysis

Data were analyzed using SAS 9.4 software. Due to the large number of variables, we conducted both bivariate and multivariate analyses. We examined bivariate associations between the variables of interest and instances of condomless vaginal sex at the level of partnership using mixed model regressions with participant as a random factor, and using a Poisson distribution to account for skew in the outcome variable. Variables significant in bivariate regressions were entered into one multiple mixed model regression including both individual-level and partnership-level variables. Due to the qualitative difference in partnerships with main and non-main partners, we also conducted analyses separately by type of partnership. We conducted the described sequence of data analysis twice, with main and with non-main partners.

RESULTS

To investigate the association of individual- and partnership-level characteristics with sexual behavior among the 718 participants in the current study, we examined partnership level data using the reported 796 main partnerships representing 624 participants, and 329 non-main partnerships representing 202 participants (some participants had both main and non-main partnerships, and/or multiple main or non-main partnerships).

Main Partner Analyses

We first examined individual bivariate associations with condomless vaginal sex with main partners as the outcome, using mixed model regressions with partnership as the level of analysis and participant as a random factor. Several significant associations were found.

Individual level—More positive condom attitudes were significantly associated with fewer instances of condomless sex within main partnerships [$F(1, 172) = 49.49, p < .0001$]. Also, higher self-esteem was marginally associated with fewer instances of condomless vaginal sex in main partnerships [$F(1, 172) = 2.91, p = .09$].

Partnership level—Partnerships in which partners were older than the women participants were associated with fewer instances of condomless vaginal sex [$F(1, 155) = 8.17, p < .01$], as well as when participants reported more condom negotiation behaviors [$F(1, 171) = 11.55, p < .001$] and when partners did not resist condom use. [$F(1, 170) = 22.68, p < .0001$]. Higher levels of decision making power was marginally associated with less condomless vaginal intercourse [$F(1, 171) = 3.39, p = .07$]. Having an abusive main partner was marginally associated with having more condomless vaginal intercourse [$F(1, 170) = 2.92, p = .09$].

Multivariate model—We entered all significant participant and partnership-level variables into one multivariate mixed regression model. We found that condom attitudes [$F(1, 150) = 30.50, p < .0001$], age difference between partners [$F(1, 150) = 8.49, p < .01$], 3) condom negotiation behaviors [$F(1, 150) = 13.53, p < .001$], and lack of main partner resistance [$F(1, 150) = 24.44, p < .0001$] remained significantly associated with fewer condomless sex occasions.

Non-Main Partner Analyses

We again estimated bivariate mixed model regressions at the partnership level with non-main partners only, with instances of condomless vaginal sex as the outcome and participant as a random factor.

Individual level—We found that younger age was associated with fewer instances of condomless vaginal intercourse at the individual level [$F(1, 125) = 5.64, p < .05$]. Additionally, more positive condom attitudes [$F(1, 126) = 25.45, p < .0001$], supportive peer norms [$F(1, 126) = 20.31, p < .0001$], higher self-efficacy to use condoms [$F(1, 127) = 6.70, p < .05$], higher African American women pride [$F(1, 126) = 5.64, p < .05$], and higher self-esteem [$F(1, 127) = 14.30, p < .001$] were also associated with fewer instances of condomless vaginal sex in non-main partnerships.

Partnership level—We found that more condom negotiation behaviors [$F(1, 126) = 17.14, p < .0001$], greater decision-making power [$F(1, 125) = 45.86, p < .0001$], and a lack of non-main partner resistance to condoms [$F(1, 126) = 12.27, p < .001$] were associated with fewer instances of condomless sex (see Table 3). In non-main partnerships where abuse was reported, instances of condomless vaginal sex were higher [$F(1, 126) = 5.72, p < .05$]. Also, partnerships in which the man had sex with other women [$F(1, 126) = 6.62, p < .05$], had sex with men [$F(1, 125) = 13.86, p < .001$], or had been incarcerated [$F(1, 126) = 19.48, p < .0001$] were associated with more instances of condomless vaginal intercourse.

Multivariate model—We entered all significant participant and partnership-level variables into one multivariate mixed regression model. The only participant level variable that remained significant was positive condom attitudes [$F(1, 119) = 11.79, p < .001$], which were associated with fewer instances of condomless vaginal sex. Additionally, partnerships in which the woman participant endorsed more condom negotiation behaviors [$F(1, 119) = 7.27, p < .01$], higher decision-making power [$F(1, 119) = 26.64, p < .0001$], and lack of non-main partner resistance to condoms [$F(1, 119) = 13.73, p < .001$] remained significantly associated with fewer instances of condomless vaginal sex with non-main partners. Finally, having an abusive non-main partner was marginally associated with condomless vaginal sex [$F(1, 119) = 2.95, p = .09$], but the direction of the effect reversed from that of the bivariate results, such that these women reported fewer instances of condomless vaginal sex. To examine potential suppressor effects due to multicollinearity, we conducted Pearson and Spearman rank correlations among variables included in the model. The only variable associated with having an abusive partner above .30 was the partner also having been incarcerated (Spearman's $\rho(328) = .53, p < .0001$). Exclusion of abusive non-main partner did not change the pattern of results.

DISCUSSION

Our results confirm many findings from previous research, and highlight the continued importance of focusing on African American women's condom attitudes and condom negotiation behaviors. Regardless of the type of relationship, women who feel more positively towards condoms and engage in condom negotiation report lower levels of sexual

risk. Previous research has often focused on adolescent or young African American women (5–7, 10), while our sample included individuals across the adult lifespan. Our results suggest that issues of condom negotiation remain important even for older African American women. Our research also confirms the importance of relationship aspects in potentially shaping sexual risk, which we were able to examine using partner-by-partner data. Regardless of relationship type, having a partner who resists condom use may affect sexual risks of women, even when controlling for condom negotiation behaviors within those partnerships. These results suggest that comprehensive understanding of condom negotiation needs to include consideration of partners' reactions, not just assessment of women's requests or demands for condoms.

Results also suggested some distinct associations based on relationship type, such that condomless vaginal intercourse within main partnerships was significantly associated with less age differences between partners. This finding contradicts the TGP, which may presuppose that older male partners have more power over women partners and thus, be associated with more risky sex. Further research should delve into potential interactions of the male and female partners' ages, which was outside the scope of this study. In contrast, women's ability to make decisions was associated with sexual risk behaviors in non-main partnerships only, suggesting that women's power is particularly important in relationships without more serious commitment. Further research is also needed to understand perhaps the extreme example of power differentials in abusive relationships. In a systematic review of intimate partner violence (IPV), there is clear evidence that IPV is associated with higher levels of condomless sex (15). IPV has been linked to risky sexual behavior for African American women specifically (27), yet our results were ambiguous. The change in direction from bivariate to multivariate models suggest that other partnership-specific factors may influence how such effects could potentially be mitigated or exacerbated.

Several variables suggested by theory and previous research did not significantly correlate with sexual behavior, particularly after controlling for other significant variables. Considering the emphasis on financial stability within the TGP, it was perhaps surprising that variables such as income, employment, housing status and length of relationship were unrelated to risky sexual behavior in main and non-main partnerships. African American woman pride and self-esteem, as well as several perceptions of male partners' potential riskiness showed bivariate relationships with behavior within non-main partnerships, yet did not remain significant in a multivariate model. Even at the bivariate level, however, results contradicted hypotheses, with partner risk perceptions associated with engaging in more instances of condomless sex in these partnerships. Women who perceived their partner to be engaging in behaviors potentially putting them at risk for STIs and HIV did not compensate by engaging in less risky sexual behavior. However, these factors may instead reflect power differentials in relationships, as their effects were outweighed by decision-making power, negotiation behaviors, and partner resistance to condoms.

Taken together, these results support a continued emphasis on teaching condom negotiation skills, especially in the face of partner resistance to condoms. A meta-analysis of behavioral HIV interventions with African American women indicates that successful interventions are more likely to include culturally-tailored material emphasizing empowerment, with skills

training in condom negotiation (28). Similarly, mediational analyses suggest that increasing partner communication frequency may be most effective at positively changing condom use behavior, above general self-efficacy (29). SISTA, which was designed for African American young women, contains activities specifically aimed at increasing effective communication, including condom negotiation. However, research showing its efficacy has only been conducted within controlled trials; less is known about its widespread efficaciousness in field settings. The research described here represents data from a larger study specifically designed to evaluate the effectiveness of SISTA as delivered by frontline service providers, therefore future analysis will provide more insight regarding this question.

Our results should be interpreted in light of limitations. First, all data are cross-sectional, and therefore no causal inferences can be drawn from results. Future research using longitudinal data would provide a stronger basis for such inference, as well as allow for examination of how gendered power dynamics may change over time within the same partnership. Additionally, all data were gathered online, with no control over potentially distracting environments, which may have affected data quality (30). We did not assess the reproductive goals of our participants; and if women were trying to become pregnant, this issue could greatly influence sexual behavior. Our study also only drew upon data from one partner in each partnership, and therefore we cannot draw any direct conclusions about the male partners' condom intentions, attitudes, or perceptions of power. Future research utilizing dyadic data from both partners would contribute to a more accurate understanding of the complex power dynamics potentially affecting risky sexual behavior. A potentially interesting avenue for future research is the influence of partner's race, considering the previous research on African American women pride (7). Participants were restricted to individuals who identified as female, and partnerships also were restricted to men; therefore our research cannot speak to how condom use may vary in African American women's partnerships with transgender partners. Additionally, although we have broadened our focus from the effect of the individual to the effect of the partnerships, it should be acknowledged that risky sexual behavior also takes place within an institutional and structural context. Although we did not find an effect of income on risky sexual behavior, a context of poverty and financial insecurity may contribute to power inequalities and HIV risks (31). Similarly, factors further influencing this interpersonal power dynamic include structures of sexual networks in African American communities due to high rates of incarceration among African American men, leading to a reduced number of available partners (32, 33).

Conclusions

Previous research on African American women's sexual risks has often relied on individual-level variables, such as attitudes, norms, and self-efficacy, or global assessments of power within relationships. However, associations between these global variables and condomless sex do not allow for variation between partners of the same participant. These models also do not recognize that different partnerships will be marked by different levels of power equality or inequality, and finally that each partner will have their own condom attitudes and intentions potentially resulting in resistance to condoms. Our research utilized statistical models which allowed for repeated measurement of different partnerships, and indicated the continued importance of both TPB and TGP. Our data were uniquely positioned to address

these questions because we collected partner-by-partner level data on up to three previous partner, and our large sample size ensured an adequate number of women who have had (multiple) main and/or non-main partners. Researchers should consider this approach in future efforts to ensure that theoretical constructs specific to particular relationships or relationship partners are assessed appropriately, by partner. Finally, intervention efforts could potentially increase their effectiveness by using a partner-centered approach to condom negotiation skills rather than a generalized approach.

Acknowledgments

Funding was provided by the National Institute of Mental Health, grant number R01-MH089828. Preparation of this manuscript was provided in part by was supported, in part, by an NRSA postdoctoral training grant (T32-MH19985) from the National Institute of Mental Health, and Center grant P30-MH52776. We'd like to thank Tim McAuliffe and Sergey Tarima for advice regarding the analysis plan. Finally, we'd like to thank the four participating agencies in Missouri, New Jersey, Tennessee, and Texas, and our participants.

References

- Centers for Disease Control and Prevention. [Accessed March 20, 2014] HIV among African-Americans. 2014. Available at: <http://cdc.gov/hiv/topics/aa/index.htm>
- Centers for Disease Control and Prevention. [Accessed October 22, 2014] Health Disparities in HIV/AIDS, Viral Hepatitis, STDs, and TB. 2014. Available at: <http://www.cdc.gov/nchhstp/healthdisparities/AfricanAmericans.html>
- Ajzen I. The Theory of Planned Behavior. *Organ Behav Hum Decis Process*. 1991; 50(2):179–211.
- Albarracín D, Johnson BT, Fishbein M, Muellerleile PA. Theories of Reasoned Action and Planned Behavior as models of condom use: A meta-analysis. *Psychol Bull*. 2001; 127(1):142–61. [PubMed: 11271752]
- Beadnell B, Stielstra S, Baker S, Morrison D, Knox K, Gutierrez L, et al. Ethnic identity and sexual risk-taking among African-American women enrolled in an HIV/STD prevention intervention. *Psychol Health Med*. 2003; 8(2):187–98.
- Salazar LF, Crosby RA, DiClemente RJ, Wingood GM, Lescano CM, Brown LK, et al. Self-esteem and theoretical mediators of safer sex among African American female adolescents: Implications for sexual risk reduction interventions. *Health Educ Behav*. 2005; 32(3):413–27. [PubMed: 15851547]
- Salazar LF, DiClemente RJ, Wingood GM, Crosby RA, Harrington K, Davies S, et al. Self-concept and adolescents' refusal of unprotected sex: A test of mediating mechanisms among African American girls. *Prev Sci*. 2004; 5(3):137–49. [PubMed: 15470935]
- Wingood GM, DiClemente RJ. Application of the Theory of Gender and Power to examine HIV-related exposures, risk factors, and effective interventions for women. *Health Educ Behav*. 2000; 27:539–65. [PubMed: 11009126]
- VanderDrift LE, Agnew CR, Harvey SM, Warren JT. Whose intentions predict? Power over condom use within heterosexual dyads. *Health Psychol*. 2013; 32(10):1038. [PubMed: 23025301]
- Kogan SM, Simons LG, Chen Yf, Burwell S, Brody GH. Protective parenting, relationship power equity, and condom use among rural African American emerging adult women. *Fam Relat*. 2013; 62(2):341–53. [PubMed: 23729949]
- Carter JA, McNair LD, Corbin WR, Williams M. Gender differences related to heterosexual condom use: The influence of negotiation styles. *J Sex Marital Ther*. 1999; 25:217–25. [PubMed: 10407794]
- Pulerwitz J, Dworkin SL. Give-and-take in safer sex negotiations: The fluidity of gender-based power relations. *Sex Res Social Policy*. 2006; 3(3):40–51.
- Sobo, EJ. Choosing unsafe sex: AIDS-risk denial among disadvantaged women. University of Pennsylvania Press; 1995.

14. DePadilla L, Windle M, Wingood G, Cooper H, DiClemente R. Condom use among young women: Modeling the Theory of Gender and Power. *Health Psychol.* 2011; 30(3):310–09. [PubMed: 21553975]
15. Bergmann JN, Stockman JK. How does intimate partner violence affect condom and oral contraceptive use in the United States? A systematic review of the literature. *Contraception.* 2015; 91(6):438–55. [PubMed: 25708504]
16. Crosby RA, DiClemente RJ, Salazar LF, Wingood GM, McDermott-Sales J, Young AM, et al. Predictors of consistent condom use among young African American women. *AIDS Behav.* 2013; 17(3):865–71. [PubMed: 21796442]
17. Matson PA, Chung S-e, Sander P, Millstein SG, Ellen JM. The role of feelings of intimacy on perceptions of risk for a sexually transmitted disease and condom use in the sexual relationships of adolescent African–American females. *Sex Transm Infect.* 2012; 88(8):617–21. [PubMed: 22707479]
18. Wingood GM, DiClemente RJ. Partner influences and gender-related factors associated with noncondom use among young adult African American women. *Am J Community Psychol.* 1998; 26(1):29–51. [PubMed: 9574497]
19. Swartzendruber A, Zenilman JM, Niccolai LM, Kershaw TS, Brown JL, DiClemente RJ, et al. It takes two: Partner attributes associated with sexually transmitted infections among adolescents. *Sex Transm Dis.* 2013; 40(5):372–8. [PubMed: 23588126]
20. Ober AJ, Iguchi MY, Weiss RE, Gorbach PM, Heimer R, Ouellet LJ, et al. The relative role of perceived partner risks in promoting condom use in a three-city sample of high-risk, low-income women. *AIDS Behav.* 2011; 15(7):1347–58. [PubMed: 20976538]
21. Noar SM, Webb E, Van Stee S, Feist-Price S, Crosby R, Willoughby JF, et al. Sexual partnerships, risk behaviors, and condom use among low-income heterosexual African Americans: A qualitative study. *Arch Sex Behav.* 2012; 41(4):959–70. [PubMed: 22194089]
22. McAuliffe TL, DiFranceisco W, Reed BR. Effects of question format and collection mode on the accuracy of retrospective surveys of health risk behavior: A comparison with daily sexual activity diaries. *Health Psychol.* 2007; 26(1):60–7. [PubMed: 17209698]
23. St Lawrence JS, Cahapdelaine AP, Devieux JG, O'Bannon RE III, Brasfield TL, Eldridge GD. Measuring perceived barriers to condom use: Psychometric evaluation of the Condom Barriers Scale. *Assessment.* 1999; 6:391–400. [PubMed: 10539985]
24. Lukwago SN, Kreuter MW, Bucholtz DC, Holt CL, Clark EM. Development and validation of brief scales to measure collectivism, religiosity, racial pride, and time orientation in urban African American women. *Fam Community Health.* 2001; 24(3):63–71. [PubMed: 11563945]
25. Rosenberg, M. *Society and the adolescent self-image.* Princeton University Press; Princeton, NJ: 1965.
26. Pulerwitz J, Gortmaker SL, DeJong W. Measuring sexual relationship power in HIV/STD research. *Sex Roles.* 2000; 42:637–60.
27. Teitelman AM, Ratcliffe SJ, Morales-Aleman MM, Sullivan CM. Sexual relationship power, intimate partner violence, and condom use among minority urban girls. *J Interpers Violence.* 2008; 23(12):1694–712. [PubMed: 18349344]
28. Crepaz N, Marshall KJ, Aupont LW, Jacobs ED, Mizuno Y, Kay LS, et al. The efficacy of HIV/STI behavioral interventions for African American females in the United States: A meta-analysis. *Am J Public Health.* 2009; 99(11):2069–78. [PubMed: 19762676]
29. Sales JM, Lang DL, DiClemente RJ, Latham TP, Wingood GM, Hardin JW, et al. The mediating role of partner communication frequency on condom use among African American adolescent females participating in an HIV prevention intervention. *Health Psychol.* 2012; 31(1):63–9. [PubMed: 21843001]
30. Hardré PL, Crowson HM, Xie K. Examining contexts-of-use for web-based and paper-based questionnaires. *Educ Psychol Meas.* 2012; 72(6):1015–38.
31. Sharpe TT, Voûte C, Rose MA, Cleveland J, Dean HD, Fenton K. Social determinants of HIV/ AIDS and Sexually Transmitted Diseases among Black women: Implications for health equity. *J Womens Health.* 2012; 21(3):249–54.

32. Hodder SL, Justman J, Haley DF, Adimora AA, Fogel CI, Golin CE, et al. Challenges of a hidden epidemic: HIV prevention among women in the United States. *J Acquir Immune Defic Syndr*. 2010; 55(Supplement 2):S69–S73. [PubMed: 21406990]
33. Newsome V, Airhihenbuwa CO. Gender ratio imbalance effects on HIV risk behaviors in African American women. *Health Promot Pract*. 2013; 14(3):459–63. [PubMed: 23041754]

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table I

Demographic sample description and descriptive statistics.

Individual level variables		Number, Frequency of individuals	
Housing Status: In own house or apartment ^a		517 (72%)	
Income: Under \$500/month ^b		373 (52%)	
Employment: Work full- or part-time ^c		325 (45%)	
	# of items, Range, Reliability	M (SD)	
Age	1, 18–74	33.14 (11.08)	
Condom Attitudes ^d	8, 1–4, $\alpha = .80$	2.79 (.60)	
Peer Norms ^d	4, 1–4, $\alpha = .55$	3.33 (.59)	
Self-Efficacy to Use Condoms ^d	8, 1–3, $\alpha = .91$	2.58 (.53)	
African American Woman Pride ^d	7, 1–4, $\alpha = .74$	3.45 (.47)	
Self Esteem ^d	10, 1–4, $\alpha = .84$	3.45 (.51)	
Partnership level variables		Main Partnerships ^e	Non-Main Partnerships ^f
	# of items, Range, Reliability	M (SD)	
Age Difference ^g	1, –26–43	2.85 (7.62)	1.92 (8.04)
Length of Relationship ^d	1, 1–4 ^h	3.40 (.94)	2.02 (1.14)
Condom Negotiation Behaviors ^d	3, 0–3, $\alpha = .74$	2.07 (1.03)	1.91 (1.19)
Decision-Making Power ^d	4, 0–2, $\alpha = .87$	1.26 (.53)	1.37 (.66)
		Number, Frequency of partnerships	
Abusive partner		93 (12%)	38 (12%)
Partner resistance to condoms		283 (36%)	141 (43%)
Partner had sex with other women		123 (15%)	120 (36%)
Partner had sex with men		278 (35%)	110 (33%)
Partner injected drugs		38 (5%)	22 (7%)
Partner incarcerated		124 (16%)	54 (16%)

Note: N = 718

^aCompared to: In a friend or family member's house or apartment; In someone else's house or apartment; In a rooming house, boarding house, half-way house, or shelter; and On the street(s) (abandoned building, park, vacant lot, etc.)

^bCompared to over \$500/month

^cCompared to Homemaker, Out of work/unemployed, and On disability or unable to work

^dHigher numbers indicate higher endorsement of construct

^e796 partnerships from 624 participants

^f329 partnerships from 202 participants

^gNegative numbers indicate participant is older

h_1 = less than 1 month, 2 = 1–6 months, 3 = 7–12 months, 4 = more than a year

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table II

Mixed regression models predicting times had condomless vaginal sex within main partnerships.

	Bivariate Models		Multivariate Model ^a	
	β	<i>F</i>	β	<i>F</i>
Participant level variables				
<i>Demographics:</i>				
Housing Status ^b	-.07	.28	-	-
Income ^c	-.05	.20	-	-
Employment ^d	-.10	.80	-	-
Age	.001	.01	-	-
<i>Theory of Planned Behavior:</i>				
Condom Attitudes ^e	-.64	49.49***	-.53	30.50***
Peer Norms ^e	-.12	1.66	-	-
Self-Efficacy to Use Condoms ^e	-.08	.60	-	-
<i>Population-Specific Variables:</i>				
African American Woman Pride ^e	-.18	2.14	-	-
Self Esteem ^e	-.19	2.91 ⁺	.05	.20
Partnership level variables				
<i>Theory of Gender and Power:</i>				
Age Difference ^f	-.02	8.17**	-.02	8.49**
Length of Relationship ^g	.03	.28	-	-
Condom Negotiation Behaviors ^e	-.14	11.55***	-.17	13.53***
Decision-Making Power ^e	-.14	3.39 ⁺	-.02	.05
Abusive partner ^h	.16	2.92 ⁺	.11	1.22
Partner resistance to condoms ^h	.37	22.68***	.44	24.44***
<i>Partner Risk Perceptions:</i>				
Partner had sex with other women ^h	-.11	.92	-	-
Partner had sex with other men ^h	-.03	.11	-	-
Partner injected drugs ^h	.18	1.10	-	-
Partner incarcerated in last year ^h	-.01	.02	-	-

Note: 796 partnerships from 624 participants

⁺ p < .10,^{*} p < .05,^{**} p < .01,^{***} p < .001^a All variables entered into one multivariate model simultaneously

^b In own house or apartment compared to: In a friend or family member's house or apartment; In someone else's house or apartment; In a rooming house, boarding house, half-way house, or shelter; and On the street(s) (abandoned building, park, vacant lot, etc.)

^c Under \$500/month compared to over \$500/month

^d Work full- or part-time compared to Homemaker, Out of work/unemployed, and On disability or unable to work

^e Higher numbers indicate more endorsement of construct

^f Scored such that negative numbers on age difference variable indicate participant is older.

^g 1 = less than 1 month, 2 = 1–6 months, 3 = 7–12 months, 4 = more than a year

^h Participant answered yes compared to no

Table III

Mixed regression models predicting times had condomless vaginal sex within non-main partnerships.

	Bivariate Models		Multivariate Model ^a	
	β	<i>F</i>	β	<i>F</i>
Participant level variables				
<i>Demographics:</i>				
Housing Status ^b	.004	.0004	-	-
Income ^c	-.20	.70	-	-
Employment ^d	-.13	.27	-	-
Age	.03	5.64 *	.01	1.9
<i>Theory of Planned Behavior:</i>				
Condom Attitudes ^e	-1.07	25.45 ***	-.79	11.79 ***
Peer Norms ^e	-.82	20.31 ***	-.31	2.23
Self-Efficacy to Use Condoms ^e	-.50	6.70 *	.02	.01
<i>Population-Specific Variables:</i>				
African American Woman Pride ^e	-.55	5.64 *	-.02	.01
Self Esteem ^e	-.77	14.30 ***	-.19	.58
Partnership level variables				
<i>Theory of Gender and Power:</i>				
Age Difference ^f	.003	.32	-	-
Length of Relationship ^g	.07	2.11	-	-
Condom Negotiation Behaviors ^e	-.21	17.14 ***	-.14	7.27 **
Decision-Making Power ^e	-.51	45.86 ***	-.45	26.64 ***
Abusive partner ^h	.31	5.72 *	-.23	2.95 +
Partner resistance to condoms ^h	.31	12.27 ***	.35	13.73 ***
<i>Partner Risk Perceptions:</i>				
Partner had sex with other women ^h	.30	6.62 *	-.001	.0001
Partner had sex with men ^h	.38	13.86 ***	.10	.97
Partner injected drugs ^h	.20	2.48	-	-
Partner incarcerated in last year ^h	.63	19.48 ***	.10	.34

Note: 329 partnerships from 202 participants

+
p < .10,*
p < .05,**
p < .01,***
p < .001^a All variables entered into one multivariate model simultaneously

^b In own house or apartment compared to: In a friend or family member's house or apartment; In someone else's house or apartment; In a rooming house, boarding house, half-way house, or shelter; and On the street(s) (abandoned building, park, vacant lot, etc.)

^c Under \$500/month compared to over \$500/month

^d Work full- or part-time compared to Homemaker, Out of work/unemployed, and On disability or unable to work

^e Higher numbers indicate more endorsement of construct

^f Scored such that negative numbers on age difference variable indicate participant is older.

^g 1 = less than 1 month, 2 = 1–6 months, 3 = 7–12 months, 4 = more than a year

^h Participant answered yes compared to no