

The Effects of Alcohol, Relationship Power, and Partner Type on Perceived Difficulty Implementing Condom Use Among African American Adults: An Experimental Study

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Abstract African American adults are disproportionately affected by HIV in the United States, underscoring the need for additional research on barriers to condom use. Guided by the theory of gender and power, this experimental study used a series of vignettes to test causal hypotheses regarding the influence of event-level alcohol use (present and absent), partner type (serious and casual), and relationship power (low and equal) on perceived difficulty implementing condom use. A total of 299 (151 women and 148 men) heterosexual African American adults indicated how “difficult” it would be to use a condom after reading 8 hypothetical sexual encounters, presented in a random order. A $2 \times 2 \times 2 \times 2$ repeated measures analysis of covariance with one between subjects factor (gender) and one covariate (condom use self-efficacy) was used to estimate the effects of these variables on an index of perceived difficulty. The women in the study reported significantly higher ratings of difficulty implementing condom use in vignettes characterized by low relationship power ($p < .001$) and presence of alcohol use ($p < .001$); the manipulated independent variables did not produce any main effects for men. Both men and women’s ratings of perceived difficulty decreased as condom use self-efficacy increased ($p < .001$). This is the first study to use an experimental methodology to test hypotheses about barriers to condom use among a community-based sample of African American adults. These data can be used to enhance existing HIV prevention interventions.

Keywords Condom use · African American · Alcohol · Relationship power · Partner-type

Introduction

African American adults are disproportionately affected by HIV/AIDS and other sexually transmitted infections (STIs) (Centers for Disease Control and Prevention [CDC], 2010). Black men are 6.5 times more likely to be HIV-positive than White men, and Black women are 20 times more likely to be HIV-positive than White women (CDC, 2010). Even among samples of exclusively heterosexual adults, HIV prevalence among Black men and women in urban areas is estimated to be almost 3 times higher than HIV prevalence among White adults (CDC, 2013). The reasons for the astounding disparities have proven to be complex, underscoring the need for continued research attention (CDC, 2014). Although Black men and women, compared to White men and women, report less sexual risk behavior overall, the consequences of risky sex, when it does occur, are more severe (Aral, Adimora, & Fenton, 2008). A high background prevalence of HIV and STIs, coupled with a comparatively high tendency to prefer sexual partners of the same racial background, means that having unprotected (i.e., without a condom) sex with an infected partner is the most prominent risk factor for acquiring HIV or another STI in the African American community (Aral et al., 2008). For Black women in particular, the low sex-ratio imbalance contributes to a dynamic where even women who rarely engage in high risk sexual behaviors are often paired with higher risk men, increasing the probability of STI acquisition associated with each unprotected sexual event (Aral et al., 2008; Ferguson, Ferguson, Quinn, Eng, & Sandelowski, 2006).

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Conceptualizing Sexual Risk Behavior

To understand the sexual risk behavior of African American women at the individual-level, the broader social and structural determinants of that behavior must be considered. Despite numerous calls for research (e.g., Amaro, 1995; Amaro & Raj, 2000; Campbell, 1995), the impact of social forces on individual-level sexual risk behavior among African American women has received insufficient attention in the literature (Aral et al., 2008). Individual-level models and theories typically applied to HIV/STD prevention (e.g., information-motivation-behavioral skills model) insufficiently capture the dyadic nature of sexual events and the potential for social and contextual variables to influence event-level sexual decision making (Amaro, 1995; Amaro & Raj, 2000; Campbell, 1995). The theory of gender and power (TGP) (Connell, 1987; Wingood & DiClemente, 2000) has been advocated as one alternative approach to understanding the complex determinants of condom use for women of color. This broad social structural theory describes gender-based inequities and structures that adversely affect women's health, particularly women's risk of HIV infection. Risk factors for poor health outcomes are grouped into: (1) socioeconomic inequalities (e.g., being an ethnicity-minority woman), (2) relationship power inequalities (e.g., being in a relationship where the distribution of relationship power favors the male partner), and (3) inequalities in social norms and affective attachments (e.g., being in a long-term relationship) (Connell, 1987; Wingood & DiClemente, 2000). For the purposes of this study, we were interested in the effect (and interaction) of gender, relationship power, partner type, and alcohol use on perceived difficulty implementing condom use among African American men and women.

Power, Partner-Type, and Presence of Alcohol Use

Relationship power, or the ability to “influence the actions of others” and to enact “change in a desired direction” (Wingood & DiClemente, 2000), is a potent predictor of condom use behavior among African American women. Indeed, when relationship power disproportionately favors men, sexual encounters are less equitable and condom use implementation is adversely affected (Bowleg, Belgrave, & Reisen, 2000; Gomez & Marin, 1996; Gutierrez, Oh, & Gillmore, 2000). Comparable relationship power-related variables, such as high levels of sexual assertiveness (Wingood & DiClemente, 1998b), decision-making dominance (Harvey, Bird, Galavotti, Duncan, & Greenburg, 2002), and perceived control over own and partner's condom use (Wingood & DiClemente, 1998a), are also all significantly associated with consistent condom use. The association of relationship power with condom use may depend, in part, on the length and/or commitment-level of the sexual partners.

In general, condom use occurs with more frequency early on in a relationship, but tapers as supposed monogamy and trust

replaces the perceived need for protection from STI acquisition (Corneille, Tademy, Reid, Belgrave, & Nasim, 2008; Miso-vich, Fisher, & Fisher, 1997; Thorburn, Harvey, & Ryan, 2005; Woodsong & Koo, 1999). Accordingly, African American women in long-term relationships, compared to women in casual partnerships, typically report less condom use (Bralock & Koniak-Griffin, 2007; Jones, 2004; Stark et al., 1998; Wingood & DiClemente, 1998b) and prescribe to the belief that “known partners are safe partners” (Thorburn, Harvey, & Ryan, 2005). Existing relationship power inequities may be amplified in sexual encounters with long-term partners (Soet, Dudley, & Dilorio, 1999; Woodsong & Koo, 1999) due to fear of relationship loss (Cabral, Pulley, Artz, Brill, & Macaluso, 1998), the belief that condom use implies mistrust and/or infidelity (Ferguson et al., 2006; Jemmott & Brown, 2003; Jones, 2004; Stark et al., 1998; Wingood & DiClemente, 1998a, b; Woodsong & Koo, 1999), and the aforementioned sex-ratio imbalance in the Black community (Ferguson et al., 2006). Relationship power, partner-type, and the interaction of these two variables may also be influenced by a final behavioral factor: alcohol used by one or both partners during a sexual event.

Consistent with numerous studies published over the last ~20 years (e.g., Dingle & Oei, 1997; Hendershot & George, 2007; Moss & Albery, 2009), the TGP identifies alcohol use as a behavioral risk factor that increases the likelihood of unprotected sex (Wingood & DiClemente, 1998b, 2000). Alcohol's effect on sexual risk behavior is theorized to occur via both pharmacological (i.e., alcohol myopia) and psychological (i.e., expectancies) pathways. As alcohol myopia theory suggests, alcohol used immediately prior to a sexual event narrows attention to the immediate, contextual cues of a sexual situation (e.g., desire to engage in sex without a condom, partner pressure to forego condom use) while simultaneously suppressing attention to cues about long-term consequences (e.g., increased risk of contracting an STI) (Steele & Josephs, 1990). Additionally, the psychological expectation that alcohol use results in sex without a condom motivates, and increases the likelihood of, a sexual event characterized by both alcohol use and unprotected sex (Goldman, Del Boca, & Darkes, 1999).

Although there is a large body of research on the association between alcohol use and condom use, only a small proportion of this research has been conducted with samples of African American adults. Of the seven cross-sectional studies that we identified, four found alcohol and condom use to be significantly, and negatively, related (Morrison, DiClemente, Wingood, & Collins, 1998; Seth, Wingood, DiClemente, & Robinson, 2011; Wang, Matthew, Chiu, Yan, & Bellamy, 2007; Wingood & DiClemente, 1998c) while the other three did not (Graves & Hines, 1997; Jones, 2004; Wingood & DiClemente, 1998a). The lack of clarity in these data is compounded by an exclusive reliance on cross-sectional research designs—a methodological limitation that characterizes all of the research

we have reviewed thus far—which substantially limits any conclusions about causality.

Experimental Studies and Sexual Risk Behavior

Experimental, laboratory-based studies provide an alternative approach to better describe the causal relationship between event-level variables (e.g., alcohol use) and condom use decision making (Hendershot & George, 2007). Although this has been advocated as the best method for understanding the causal mechanisms underlying high-risk sexual behavior, there is a near absence of experimental research on condom use behavior that specifically targets African American adults (Hendershot & George, 2007). One laboratory-based approach used to investigate sexual decision making involves the manipulation of independent variables with experimental vignettes. Previous research on condom use and sexual behavior has demonstrated the utility and effectiveness of experimental vignettes for investigating highly sensitive material prone to self-report biases (Finkelstein & Brannick, 1997, 2000). Typically, participants are asked to read a series of sexual scenarios that describe a couple as on the verge of engaging in sexual intercourse under a variety of circumstances (e.g., with a casual or a serious partner). The participant is asked to imagine him or herself in each situation and subsequently estimate difficulty, intent, or likelihood of condom use based on the information provided. Several studies have used vignettes to conduct experimental research on high-risk sexual behavior (Castaneda & Collins, 1998; Davis, Hendershot, George, Norris, & Heiman, 2007; Finkelstein & Brannick, 1997, 2000; Hoefnagels, Hospers, Hosman, Schouten, & Schaalma, 2006; Stoner et al., 2008; Stoner, George, Peters, & Norris, 2007; Woolf & Maisto, 2008); however, this research is mostly characterized by samples of White, undergraduate college students and, to our knowledge, there is no published research on the use of experimental vignettes with samples of exclusively African American adults.

Summary and Hypotheses

Understanding the connection between gender, relationship power, partner type, and alcohol use would enhance our understanding of the complex dynamics of event-level sexual decision making that puts African American adults at-risk for HIV infection. We present here the first experimental study with a sample of African American adults designed to examine the effects of the following constructs on difficulty implementing condom use during a simulated sexual event: (1) relationship power (low or equal), (2) partner type (serious or casual), and (3) alcohol use immediately prior to the sexual event (present or not present). The hypotheses were as follows:

Hypothesis 1 A significant four-way interaction among gender, power, partner-type, and alcohol use was predicted. Specifically, a significant three-way interaction among alcohol use, power, and partner type was expected to emerge for the women only. It was hypothesized that the interaction between presence of alcohol use and partner type would differ as a function of power such that in vignettes characterized by unequal power, presence of alcohol use, and a serious partner type, women would find it more difficult to implement condom use compared to every other condition.

Hypothesis 2 The TGP does not make any predictions for how relationship power or partner type affects a man's perceived level of difficulty implementing condom use. Furthermore, given that the act of condom use is inherently controlled by the male partner, only a main effect for alcohol use was predicted and no interactions were expected.

Method

Participants

Criteria for participation included: sexually active (at least one episode of vaginal sexual intercourse within the last year), consumption of alcohol at least once in the last year, self-identification as heterosexual based on a response of 1 or 0 on the Kinsey Scale (Kinsey, Pomeroy, & Martin, 1948), and demonstrated ability to read at a 9th grade level. Participants were recruited using: (1) placement of flyers at several community-based organizations (e.g., Planned Parenthood), (2) online advertisement via Facebook, (3) in-person at community events, and (4) through participant-driven recruitment whereby former participants informed friends/family about the study. Of these methods, participant-driven recruitment was by far the most useful strategy, accounting for 90 % ($n = 270$) of the participants recruited.

A total of 419 individuals were screened to participate in the study. The screening process occurred in three different phases. In phase I, a screening script was read to each potential participant immediately after he or she expressed interest in the study either in-person or over the phone. A total of 84 participants were screened-out at this phase, mostly due to not having consumed alcohol in the last year (30 %), expression of concern regarding the literacy requirement (24 %), not identifying as African American (17 %), or self-report of no sexual intercourse in the last year (15 %). If the potential participant was deemed eligible to participate after phase I, he or she was scheduled for an appointment at the laboratory. Upon arrival at the laboratory, each participant was given an eligibility checklist and the Rapid Estimate of Adult Literacy in Medicine (REALM), a standardized literacy screen (Davis, Long, Jackson, Mayeaux, George,

Murphy et al., 1993). A total of 26 additional participants were screened out in phase II, mostly due to literacy (84 %). Finally, during the data analysis phase of the study an additional 4 women and 7 men were screened out for endorsing answers on the demographics questionnaire that were inconsistent with study eligibility (e.g., having a Kinsey score >1).

In total, 299 ($n = 151$ women, $n = 148$ men) African American adults between the ages of 18 and 62 years ($M = 39.85$, $SD = 11.47$) participated in the study. The sample was roughly divided among single participants (49 %) and those who reported being married or in a serious relationship (43 %). Participants reported an average of 12 years of education and approximately 50 % of the sample was unemployed or on some type of government assistance while 31 % worked full-time. The majority of the participants were classified as “heavy” (58 %) or “moderate” (23 %) drinkers, reported a range of 0–30 heavy drinking episodes in the last month (median = 6.15), and consumed approximately four drinks per drinking occasion (median = 3.64, range, 1–29). The men and women in the sample reported “sometimes” using condoms over the past year ($M = 3.04$, $SD = 1.62$).

Procedure

This experimental study used a $2 \times 2 \times 2 \times 2$ factorial repeated measures design with one between subjects factor (gender) and three within subjects factors: relationship power (low and equal), alcohol consumption immediately prior to the sexual event (present and not present), and partner type (serious and casual). Consistent with other vignette-based research (e.g., Finkelstein & Brannick, 1997, 2000; Woolf & Maisto, 2008), a within-subjects design was used in order to allow each participant to serve as his/her own control and to increase statistical power for detection of complex interactions. The experimental protocol consisted of one session and all study procedures took place in an alcohol-research laboratory on the campus of a large private university in the northeastern United States. Participants completed all of the procedures described below in a private room adjacent to the main offices of the laboratory. Individuals who called the lab to express interest in the study were screened for eligibility and informed that, in order to be eligible to complete the study, they would have to demonstrate at least a 9th grade reading level by reading aloud a list of medical terms upon arrival at the laboratory. Upon arrival at the lab, the experimenter administered an eligibility checklist followed by a standard literacy screen. Participants who did not satisfy all of the eligibility requirements received \$5.00 for their time.

Following the screening, informed consent was obtained and the individual difference questionnaires were administered. Participants then received eight vignettes describing a variety of sexual scenarios, which were presented in a random order. Each vignette was followed by a series of questions

(i.e., manipulation checks and dependent variables), that the participant was directed to answer before moving on to the next vignette. After completion of the protocol, participants were given a written and oral debriefing, compensated \$20.00 for their time and encouraged to inform friends and/or family about the study. All of the study procedures were approved by the Institutional Review Board at Syracuse University.

Experimental Vignettes

Extensive formative work was conducted to develop experimental vignettes specifically for this study. A total of 99 ($n = 52$ women) African American adults who satisfied all of the inclusion criteria previously specified participated in qualitative and quantitative studies designed to create and pilot an initial pool of 16 vignettes (two for each experimental condition). The final set of eight experimental vignettes was chosen after it was determined that the manipulated independent variables were being perceived as intended and that the situations depicted in the vignettes were acceptably realistic (Woolf-King, Maisto, & Pinto, 2010). Each participant received the following instructions (Woolf & Maisto, 2008):

You are about to read a series of scenarios that describe a romantic encounter between you and a hypothetical partner. Please imagine how you might feel or react if you were to find yourself in the various situations depicted in the scenarios. Please answer the questions following the scenarios by circling the number that corresponds to the response that best describes how you feel. It is understandable that you might be tempted to answer some of the following questions based on what seems to be the “right” answer. However, in order to do a meaningful study, we need to know what you would do, not what you think you should do. There are no right or wrong answers. In each scenario, “sex” refers to vaginal sex.

The relationship power manipulation involved themes of decision-making dominance, emotional attachment, and control. The partner type manipulation involved themes of mutual monogamy and emotional commitment or the understanding that the relationship depicted in the vignette was not monogamous and strictly sexual. The alcohol manipulation depicted the partner and the participant in the vignette as either “intoxicated” or “under the influence, but not completely wasted.” An example of a vignette from the low power, casual partner, and alcohol use present condition is presented below:

One night, a male “friend” contacts you and asks if he may come over. You and this person both have a mutual understanding that your relationship is not monogamous and that you meet up just to have sex. However, the two of you have never talked about STDs or how he feels

about using condoms. You feel as if your partner has more control in the relationship. He is the one who makes all of the decisions, including decisions about when, how, and how often you have sex. Furthermore, you feel more emotionally attached than your partner and wish the relationship involved more commitment. You have been drinking during the evening and, when he arrives, you notice that he has been drinking too. Although you're both not completely wasted, it is clear that you're both under the influence. You feel a strong physical attraction to this person and you both begin kissing passionately. As things get more intense, it becomes clear that you will end up having sex.

Measures

Demographic and Individual Difference Measures

Participants were asked to indicate: gender, age, ethnicity, years of education completed, religious orientation, main source of income, city of permanent residence, current relationship status, length of current relationship (if applicable), and how often, in the past year, he or she had used a condom during vaginal intercourse (1 = never to 5 = always).

Quantity-Frequency-Variability (QFV) Questionnaire (Cahalan, Cisin, & Crossley, 1969)

The QFV is a measure of usual drinking patterns that classified each participant as a “heavy,” “moderate,” “light” or “abstinent” alcohol consumer based on his or her quantity and frequency of consumption in the previous three months. In order to further clarify the amount of alcohol consumed per drinking occasion, two questions were added to the QFV that asked participants how many drinks they typically consumed and how many times in the past month they consumed five or more drinks in two consecutive hours on one drinking occasion.

Modified Condom Use Self-Efficacy Scale (CUSES) (Brafford & Beck, 1991)

Previous experimental research on power and partner type has found condom use self-efficacy to be significantly correlated with difficulty implementing condom use (Woolf & Maisto, 2008), prompting our inclusion of self-efficacy as a potential covariate. While the concepts of perceived difficulty and self-efficacy are closely related, they are distinct and account for independent variance. Perceived self-efficacy is “the estimate of one’s capability or confidence to execute a well-defined set of behaviors” while perceived difficulty is “one’s perception of how easy or difficult it would be to perform a specific behavior”

(Rodgers, Conner, & Murray, 2008, p. 608). It is this specificity we were most interested in given that we were examining event-level condom use under a specific set of circumstances (e.g., intoxication) rather than global judgments about condom use averaged over a variety of circumstances.

The original 28-item CUSES uses a Likert-type scale of 1 (strongly disagree) to 6 (strongly agree) to assess self-efficacy for, and feelings about, using condoms in a variety of situations. In the interest of brevity, a modified 16-item version of the CUSES (MCUSES) was administered to research participants and assessed the following factors: behavioral performance of condom use, discussion of condom use, and impact of substance use on condom use (Brown & Vanable, 2005). The MCUSES showed excellent internal consistency (Cronbach’s alpha = .89). Because the total scores on the MCUSES exhibited significant negative skew ($M = 81.06$, $SD = 14.68$; skewness = -1.76 , $SE = .14$), the “ladder” command in STATA was used to test for normality of various transformations. As a result, we squared the data and the negative skew improved considerably (skewness = $.14$; $SE = .14$).

Rapid Estimate of Adult Literacy in Medicine (REALM) (Davis et al., 1993)

The REALM is a standardized literacy-screening questionnaire designed to assess an individual’s ability to read and comprehend written materials. Given the significant amount of reading required for the study protocol, and formative work with the study population, a cut off score of ≥ 61 was used to identify participants who had a least a 9th grade reading level, whom the REALM describes as “able to read most patient education materials.”

Manipulation Checks

After reading each vignette, participants responded to the following manipulation checks to evaluate the degree to which the independent variables were processed as intended and to ensure that the vignettes were perceived as realistic: (1) How realistic do you think this scenario was (1 = not realistic at all to 4 = very realistic)? (2) How serious do you perceive the relationship to be (1 = not serious at all to 4 = very serious)? (3) Who appears to have more power in the relationship (0 = my partner appears to have all of the power to 4 = I appear to have all of the power)? (4) How intoxicated was your partner (1 = not intoxicated at all to 4 = very intoxicated)? The decision to only query about partner’s level of intoxication was based on the fact that all of the vignettes explicitly depicted both partners as consuming the same amount of alcohol and that all of the other manipulation checks referred to the partner in the scenario.

Dependent Variables

Consistent with other experimental studies on sexual behavior (e.g., Maisto, Carey, Carey, Gordon, & Schum, 2004; Maisto et al., 2004), our main dependent variable was a behavioral proxy that has been shown to correlate with actual behavior. We chose “perceived difficulty” given its strong correlation with both behavioral intentions ($r = .56$, 90 % CI .38–.75) and actual behavior ($r = .39$, 90 % CI .23–.56) across a variety of behavioral outcomes, including condom use (Rodgers et al., 2008). Each participant was asked how “difficult” it would be to initiate, negotiate, and engage in condom use after reading the situation depicted in each vignette and responded using a Likert-type scale of 1 (not difficult at all) to 4 (very difficult). In order to estimate the degree to which our measure of perceived difficulty correlated with behavioral intentions, we also asked participants to indicate the “likelihood” of condom use in each scenario (1 = very unlikely to 4 = very likely).

Statistical Analyses

Descriptive statistics were conducted for all of the manipulation checks, individual differences measures, and dependent variables. Paired t tests were used to assess the strength of the manipulation checks. Bivariate associations between the individual difference variables and the dependent variables were examined and variables that were significantly correlated were retained in subsequent analyses as covariates. Analysis of covariance (ANCOVA) was used to test the main study hypotheses. Analyses were conducted with PASW Statistics version 18.0 (SPSS, Inc., Chicago, IL, USA) and STATA version 12.0 (STATACorp, College Station, TX, USA).

Results

Manipulation Checks

Mean ratings for each manipulation check are shown in Table 1. The average rating of realism across the vignettes was 3.03 (range 2.84–3.20), indicating that the participants found the vignettes to be “realistic.” Paired t tests were conducted on each manipulation check to test for significant mean differences (and the effect size estimates [Cohen’s d] of those differences). For example, differences in average ratings of relationship power were assessed while holding alcohol use and partner type constant (e.g., Vignette 1 was compared to Vignette 3) to test for the effective manipulation of relationship power. Results were as follows: mean differences in ratings of relationship power between low and equal power vignettes were all statistically significant at $p < .001$ (average Cohen’s $d = 1.36$), mean differences in ratings of partner-type between casual and serious partner vignettes were all statistically

Table 1 Mean (SD) ratings of realism, seriousness, power, and alcohol for all experimental conditions

Experimental condition	Realism	Seriousness	Power	Alcohol
1 Casual partner Equal power Alcohol	3.06 (.81)	1.48 (.70)	1.99 (.50)	2.37 (.67)
2 Casual partner Equal power No alcohol	2.98 (.76)	1.55 (.73)	1.96 (.53)	1.25 (.65)
3 Casual Partner Low Power Alcohol	2.88 (.80)	1.49 (.69)	1.06 (.92)	2.35 (.64)
4 Casual partner Low power No alcohol	2.84 (.84)	1.63 (.77)	1.01 (.87)	1.25 (.67)
5 Serious partner Equal power Alcohol	3.20 (.76)	2.95 (.83)	2.01 (.38)	2.31 (.64)
6 Serious partner Equal power No alcohol	3.20 (.74)	3.02 (.79)	2.00 (.44)	1.19 (.53)
7 Serious partner Low power Alcohol	3.04 (.80)	2.33 (.82)	1.03 (.85)	2.38 (.62)
8 Serious partner Low power No alcohol	3.02 (.80)	2.55 (.81)	1.03 (.89)	1.19 (.55)

Note. “Realism” based on response to: How realistic do you think this scenario was (1 = not realistic at all to 4 = very realistic)? “Seriousness” based on response to: How serious do you perceive the relationship to be (1 = not serious at all to 4 = very serious)? “Power” based on response to: Who appears to have more power in the relationship (0 = my partner appears to have all of the power to 4 = I appear to have all of the power)? “Alcohol” based on response to: How intoxicated was your partner (1 = not intoxicated at all to 4 = very intoxicated)

significant at $p < .001$ (average Cohen’s $d = 1.53$), and mean differences in ratings of level of intoxication between alcohol present and alcohol not present vignettes were all statistically significant at $p < .001$ (average Cohen’s $d = 1.83$). In sum, the manipulation checks demonstrated that the three independent variables were perceived as intended and that the vignettes were perceived as acceptably realistic.

Main Analyses

Consistent with previous vignette-based experimental work (Woolf & Maisto, 2008), the three main dependent variables were highly correlated (range $r = .73$ to $.87$, $p < .01$) and were therefore combined to create an index of perceived “difficulty.” This index of difficulty showed significant skew and the “ladder”

Table 2 Mean (SD) ratings of perceived difficulty implementing condom use for all experimental conditions

	Low power		Equal power	
	Alcohol present	Alcohol absent	Alcohol present	Alcohol absent
Serious partner	1.99 (.89)	1.75 (.78)	1.62 (.76)	1.43 (.69)
Casual partner	1.86 (.88)	1.66 (.77)	1.56 (.73)	1.32 (.55)

Note. “Perceived difficulty” scores based on Likert-type responses of 1 (not difficult at all) to 4 (very difficult)

command in STATA was again used to test for effective transformations. No transformation emerged as superior to the use of the raw data and, thus, the raw data were used for all subsequent analyses. We chose this approach rather than using a dichotomous variable (such as difficulty vs. no difficulty) for two main reasons. First, ANCOVA is robust against violation of the assumption of normality of cell (sample) distribution of scores (distribution of sample means) under conditions met in this experiment, i.e., equal sample sizes and no outliers (Tabachnick & Fidell, 2007). Second, staying at the level of the raw data is preferable to recoding or redefining variables for purposes of interpretation of findings. Table 2 shows descriptive information on the mean ratings of perceived difficulty across all experimental conditions. Perceived difficulty was significantly correlated with mean ratings of likelihood, such that as perceived difficulty increased, likelihood of condom use decreased (range $r = -.37$ to $-.53$, $p < .01$).

None of the demographic, condom use or alcohol use variables were significantly associated with perceived difficulty implementing condom use for any of the experimental vignettes. The MCUSES was negatively, and significantly, correlated with perceived difficulty implementing condom use for a majority of the experimental vignettes and was thus included as a covariate in the main analyses.

A $2 \times 2 \times 2 \times 2$ repeated measures ANCOVA with three within-subjects factors (relationship power, presence of alcohol use, and partner type), one between-subjects factor (gender), and one covariate (condom use self-efficacy) was used to test for the effects of these variables on perceived difficulty implementing condom use. The following interactions were statistically significant: gender \times power ($p < .05$, $\eta_p^2 = .02$), gender \times alcohol ($p < .05$, $\eta_p^2 = .02$) and gender \times power \times alcohol ($p < .05$, $\eta_p^2 = .02$). We probed these interactions with gender-stratified analyses (see Table 3).

Men

For men, only a main effect of condom use self-efficacy was observed ($p < .001$, $\eta_p^2 = .18$), such that as condom use self-efficacy increased, difficulty implementing condom use decreased

Table 3 Gender-stratified repeated measures analysis of covariance estimating the effect of relationship power, partner-type and alcohol use on perceived difficulty implementing condom use

Independent Variable	SS	df	F	p	ES
<i>Women (n = 151)</i>					
Main effects					
Power	11.80	1	16.16	<.001	.10
Partner-type	.26	1	.35	.55	.00
Alcohol	6.59	1	14.97	<.001	.09
CUSE	21.89	1	12.90	<.001	.08
Significant interactions					
CUSE \times alcohol	1.95	1	4.42	.04	.03
<i>Men (n = 148)</i>					
Main effects					
Power	1.10	1	2.98	.09	.02
Partner-type	1.06	1	2.04	.16	.01
Alcohol	.11	1	.32	.57	.00
CUSE	49.34	1	31.01	<.001	.18

Note. $N = 299$. ES effect size, Power relationship power (low or equal), Partner-type sexual partner (casual or serious), Alcohol alcohol use by both partners or neither partner. CUSE modified version of the Condom Use Self-Efficacy scale that includes 18-items (e.g., “I feel confident in my ability to put a condom on myself or a partner”) with response options ranging from 1 (strongly disagree) to 6 (strongly agree). “Perceived difficulty” scores based on Likert-type responses of 1 (not difficult at all) to 4 (very difficult). Total CUSE scores have been transformed (squared) to address negative skew. Relationship power, partner-type and alcohol use were entered as fixed factors and CUSE as the covariate in the model. Only significant interactions are shown

across all vignette conditions. There were no significant main effects for any of the manipulated independent variables, indicating that perceived difficulty implementing condom use was unaffected by relationship power, partner-type, and alcohol use for the men in the study.

Women

For women, there were statistically significant main effects for power ($p < .001$, $\eta_p^2 = .10$), alcohol ($p < .001$, $\eta_p^2 = .09$), and condom use self-efficacy ($p < .001$, $\eta_p^2 = .08$). The power and alcohol main effects were in the expected direction with women reporting significantly more perceived difficulty implementing condom use in vignettes where the male partner was depicted as having more relationship power and vignettes where the couple consumed alcohol immediately prior to the sexual event. The condom use self-efficacy main effect was qualified by a significant alcohol \times condom use self-efficacy interaction ($p < .05$, $\eta_p^2 = .03$). In stratified analyses, condom use self-efficacy was significantly associated with difficulty implementing condom use in vignettes where the couple consumed alcohol immediately prior to the sexual event ($p < .01$, $\eta_p^2 = .05$), but not in vignettes where no alcohol was consumed ($p = .051$).

Discussion

This was the first experimental study to examine predictors of condom use with a sample of exclusively African American adults. As hypothesized, and consistent with the TGP, only women perceived condom use to be significantly more difficult in sexual scenarios where the partner was described as having more relationship power. This finding highlights the unique effect of relationship power on women's difficulty implementing condom use, a difficulty that persists even when controlling for baseline levels of condom use self-efficacy. Presence of alcohol use and partner-type did not enhance the effects of relationship power on women's perceived difficulty implementing condom use, as predicted. We found the effects of relationship power to be robust whether the woman was presented with a sexual scenario depicting a casual or a serious sexual partner and whether or not the couple had consumed alcohol.

These data add to the growing awareness that condom promotion interventions must address gender relations and social inequalities in order to achieve efficacy and effectiveness (Rothe-Ramus, Swendeman, & Chovnick, 2009). Additionally, continued research on female-controlled HIV prevention methods that do not require partner-cooperation (e.g., topical microbicides, pre-exposure prophylaxis) and concomitant behavioral interventions to promote sustained use of these new biomedical approaches, would eliminate the need for women in power imbalanced relationships to convince their partner to use a condom (Adimora et al., 2013). For now, until biomedical HIV prevention has demonstrated effectiveness in real world settings, carefully considered behavioral interventions that address the dyadic and context-dependent nature of condom use negotiation (e.g., El-Bassel et al., 2010) could help ameliorate the difficulty women in power-imbalanced relationships perceive with implementing condom use.

In addition to the findings on relationship power, women perceived condom use to be significantly more difficult in scenarios where the couple was described as having consumed alcohol immediately prior to the sexual event. This finding was consistent with some studies on alcohol-associated sexual risk behavior with samples of African American adults (Morrison et al., 1998; Wang et al., 2007), but less consistent with others (Graves & Hines, 1997; Jones, 2004). Although we could not locate any experimental studies on alcohol-associated sexual risk behavior with samples of African American adults, acute alcohol intoxication studies that have used vignettes to assess condom use decision-making among college students have also found significant alcohol main effects (Davis et al., 2007; Stoner et al., 2007, 2008). Less consistent with our a priori hypotheses was the absence of an alcohol main effect for the men in our study. This result may be attributable to the focus of both the vignettes and the manipulation check on partner alcohol use. It cannot be stated with certainty that the differential alcohol main

effect findings were due to partner use, own use, or a combination of both. An absence of definitive conclusions about the differential effects of own versus partner alcohol intoxication and how these effects would differ by gender characterizes the current state of the literature. Future research could query participants about the reasons for their sexual decision-making subsequent to reading the vignettes (e.g., "Regarding your response about difficulty implementing condom use in this scenario, how much of a factor was your partner's level of intoxication compared to your own level of intoxication") to clarify this point. For now, it can be concluded that alcohol used by one and/or both partners influenced only women's perceived difficulty with condom use implementation.

The absence of a partner type main effect was also unexpected. Given the consistency of the published research on partner type and condom use, our findings were likely attributable to the way in which partner type was presented in our vignettes. Although the partner type manipulation was successful (i.e., "serious" vignettes were perceived as significantly more serious than "casual" vignettes), the mean ratings of "seriousness" were relatively low for both vignettes depicting serious and casual partners. It is possible that the partner type manipulation was actually testing different gradations of commitment in a casual relationship. Based on our formative research, we did not include any information on relationship length in the vignettes in an effort to appeal to a wide variety of conceptions about what length determines "seriousness." However, failing to include this information may have unintentionally diminished the perception of how committed and/or serious the couple was perceived to be. What we can conclude from our data is that in this sample of African American men and women, having a partner with whom one is "serious and monogamous" compared to a partner with whom one "meets up (with) just to have sex" did not enhance perceived difficulty implementing condom use.

Also noteworthy was our observation that condom use self-efficacy was associated with perceived difficulty implementing condom use across most of the vignettes for both women and men. It is reasonable that one's belief in the ability to implement condom use was strongly associated with one's perceived difficulty implementing condom use, regardless of the circumstances of the sexual encounter. Previous research has also observed robust correlations between self-efficacy and perceived difficulty (Rodgers et al., 2008). The exception to this finding was that, for women, condom use self-efficacy was unrelated to perceived difficulty in vignettes where alcohol use did not occur. This may be partially explained by the fact that the MCUSES included a question that asked the participant to rate confidence in his/her ability to use a condom "even after (he/she) had been drinking" (whereas the MCUSES did not have any questions specific to the other two independent variables). It is possible that this question caused the MCUSES scores to be differentially correlated with alcohol present versus alcohol absent vignettes.

The conclusions from our study must be interpreted in the context of the following additional limitations. First, participants generally reported low ratings of perceived difficulty implementing condom use across all study conditions. This is consistent with other research using a vignette-based methodology (Finkelstein & Brannick, 2000; Woolf & Maisto, 2008) and is likely attributable to the influence of normative demands on the accuracy of participant responses (Finkelstein & Brannick, 2000). Including a measure of social desirability (e.g., the Marlowe–Crowne Social Desirability Scale) in future vignette-based research would at least allow for control of baseline tendencies for biased reporting (Crowne & Marlowe, 1960).

Second, the external validity of experimental paradigms is a popular criticism of this type of research (Hendershot & George, 2007). Certainly, experimental studies on condom use are restricted to analog procedures (e.g., vignette methodology) and theoretical proxy measures of sexual risk behavior (e.g., perceived difficulty) assumed to correlate with actual behavior. Although research described earlier supports the legitimacy of perceived difficulty as a correlate of actual health behavior (Rodgers et al. 2008), the extent to which the phenomena we observed through experimental manipulation generalize to actual condom use behavior is hard to quantify.

Assessing the outcomes of sexual events as they occur over time and correlating these events with participant responses in an analogue task would be one way to estimate the generalizability of our findings. However, we were unable to identify such a study in our review of the literature.

Even if such a study had been published, it is important to note that experimental research is not necessarily designed to ask whether or not certain behaviors occur in real-world settings, but to ask if they can occur under a specific set of conditions (Hendershot & George, 2007). In the absence of direct observation of sexual behavior, experimental studies allow for the evaluation of theoretical mechanisms and offer a necessary complement to the preponderance of cross-sectional research in the literature on sexual risk behavior (Hendershot & George, 2007).

Conclusions

The effects of gender, alcohol use, relationship power, and partner type on sexual risk behavior were explored using a novel research method with a target population at high-risk for HIV acquisition. The results of the experiment revealed that the balance of power in a relationship and the consumption of alcohol prior to a sexual event significantly influenced African American women's perceived difficulty implementing condom use. Behavioral HIV prevention initiatives, whether alone or in combination with biomedical

prevention, should include gender-specific content and address the contextual and relationship-level aspects of sexual risk behavior.

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