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How Do Alcohol and Relationship Type Affect Women's Risk Judgment of Partners with Differing Risk Histories?

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Abstract

Understanding how women judge male partners' sexual risk is important to developing risk reduction programs. Applying a cognitive mediation model of sexual decision making, our study investigated effects of alcohol consumption (control, low dose, high dose) and relationship type (disrupted vs. new) on women's risk judgments of a male sexual partner in three sexual risk conditions (low, unknown, high). After random assignment to an experimental condition, 328 participants projected themselves into a story depicting a sexual interaction. The story was paused to assess primary appraisals of sexual and relationship potential and secondary appraisals of pleasure, health, and relationship concerns, followed by sexual risk judgments. In all risk conditions, alcohol and disrupted relationship increased sexual potential whereas disrupted relationship increased relationship potential in the low- and high-risk conditions. In the unknown-risk condition, women in the no-alcohol, new relationship condition had the lowest primary sexual appraisals. In all conditions, sexual appraisals predicted all secondary appraisals, but primary relationship appraisals predicted only secondary relationship appraisals. Secondary health appraisals led to increased risk judgments whereas relationship appraisals predicted lower risk

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judgments. Possible intervention points include helping women to re-evaluate their safety beliefs about past partners, as well as to develop behavioral strategies for decreasing hazardous drinking.

Keywords

sexual risk taking; alcohol intoxication; social cognition; interpersonal relationships

Women are at high risk of contracting HIV and other sexually transmitted infections (STIs) from male sexual partners. As of 2006, almost three-quarters of American women living with HIV acquired the disease through heterosexual transmission (Centers for Disease Control and Prevention [CDC], 2008). In addition, young women have the highest rates of chlamydia, gonorrhea, and syphilis of any age or gender group (CDC, 2009). Judging sexual risk is considered an important element in decisions to have unprotected sex (for a review, see Gerrard, Gibbons, & Bushman, 1996). It is difficult for women to truly know the risk level of almost any potential sex partner, especially a new one, and, therefore, the most rational approach would be to assume that a partner is high risk. Unfortunately, many women underestimate the risks of having sex and often use irrelevant information to determine that a partner poses little risk (Knauper, Kornik, Atkinson, Guberman, & Aydin, 2005). Two factors related to many aspects of women's sexual decision making are alcohol consumption (Cooper, 2002) and relationship characteristics (Canin, Dolcini, & Adler, 1999; Misovich, Fisher, & Fisher, 1997). In the present study, we applied a cognitive mediation model (Norris, Masters, & Zawacki, 2004) to investigate how alcohol consumption, type of relationship, and information about a male partner's sexual risk history influence how women make sexual risk judgments.

Cognitive Mediation of Sexual Decision Making

The cognitive mediation model (Norris et al., 2004), which was derived from cognitive-motivational-relational theory (Lazarus, 1991), proposes a mechanism through which women's sexual decisions are influenced by situational factors. The model asserts that background and situational effects on women's in-the-moment sexual judgments and decisions are mediated through a series of cognitive appraisals. A woman enters a social situation with a man with a set of goals, some of which may be sex-related, such as achieving sexual intimacy, and some of which may be relationship-related, such as developing a long-term relationship. The woman then appraises the situation first for its goal-relevance; that is, she undertakes a set of primary appraisals to determine whether the situation is one in which she can fulfill her goals. Thus, according to the cognitive mediation model, if a woman encounters an attractive man, she would first evaluate his sexual potential (How much do I want to have sex with him?), as well as his relationship potential (How much do I want to have a long-term relationship with him?).

Furthermore, according to this theory, if it appears likely that the woman will have sex with the man, she would next undertake a series of secondary appraisals. Secondary appraisals focus on the pros and cons of having sex without a condom in the context of a woman's sexual and relationship goals; thus, they serve as impelling or inhibiting influences on her sexual decisions. To the extent that a woman views sexual potential as high, she would appraise impelling pleasure-related reasons for unprotected sex as high and inhibiting health concerns as low, leading to judging a man's risk as lower. Similarly, if a woman viewed relationship potential as high, she might view impelling relationship-enhancement reasons for unprotected sex as high, resulting in a lowered risk judgment.

The cognitive mediation model has previously been applied to predicting how both sexual (Norris, Stoner, Hessler, Zawacki, George, et al., 2009) and relationship (Zawacki et al., 2009) appraisals can lead to decisions about condom use and unprotected sex. Norris, Stoner, Hessler, Zawacki, George, et al. (2009) found that primary appraisals of sexual potential were positively related to impelling secondary appraisals concerned with having unprotected sex and were negatively related to inhibiting appraisals. Impelling appraisals were negatively related, in turn, to direct condom request and positively related to unprotected sex intentions. With regard to relationship appraisals, Zawacki et al. (2009) found that primary appraisals of relationship potential were positively related to impelling secondary appraisals concerning relationship facilitation. These relationship-related reasons for having sex were positively linked to using relationship-related reasons for insisting on using a condom, as well as to abdicating decision-making to the partner and unprotected sex intentions. To date no known research has applied the cognitive mediation model to predicting women's risk judgments. Because these judgments are essential to subsequent decisions about having unprotected sex (Thornton, Gibbons, & Gerrard, 2002), application of the cognitive mediation model to understanding how women form judgments of a male sex partner's risk level fills an important gap in knowledge.

Alcohol, Cognitive Appraisals, and Risk Judgment

Findings concerning alcohol's effects on risky sex-related cognitive appraisals and risk judgments are limited and mixed. In two experimental studies, participants viewed a film and subsequently judged aspects of the situation presented. Abbey, Saenz, Buck, Parkhill, and Hayman (2006) found that intoxicated men and women did not differentiate between a high- and a low-risk partner whereas sober individuals indicated that they would be more likely to date the low-risk partner. However, Murphy, Monahan, and Miller (1998) found that alcohol intoxication did not decrease women's ability to notice risk cues embedded in a video.

Four experimental studies have found that alcohol affects cognitive appraisals related to sexual decisions. Norris, Stoner, Hessler, Zawacki, George, et al. (2009) showed that alcohol consumption increased women's appraisals about a man's sexual potential whereas Zawacki et al. (2009) found that alcohol interacted with partner familiarity and relationship motivation to increase women's ratings of relationship potential. Murphy et al. (1998) demonstrated that alcohol increased women's ratings of relationship potential, but only when they experienced conflict between the man's attractiveness and his level of risk. That is, intoxicated women were more likely than sober ones to judge an attractive, high-risk man as having relationship potential. Zawacki (2011) conducted an experiment that delineated associations leading from alcohol consumption to appraisals of sexual relationship potential to risk judgments. Path analyses showed that alcohol consumption increased primary sexual relationship appraisals, which led to decreased partner risk judgment.

It seems clear that cognitive appraisals are an important element in determining alcohol's effects on risk judgments. One way in which alcohol affects cognitive appraisals has been labeled "myopia." That is, as someone becomes intoxicated, the amount of information that the person can process is increasingly limited. Thus, the person's attention is focused on the most salient situational cues (Steele & Josephs, 1990; Taylor & Leonard, 1983). To the extent that salient cues in a sexual situation are pleasure-related and therefore impelling, women may be inclined to judge a partner as less risky than if cues related to risk are salient. The present study examined this "myopia" effect by comparing alcohol and control (no alcohol) conditions.

To date, few studies have investigated how information about a partner's sexual risk history, in conjunction with alcohol consumption, might influence cognitive appraisals and judgments of sexual risk. Although providing important information, neither experiment conducted thus far (Abbey et al., 2006; Murphy et al., 1998) examined the process through which individuals arrive at risk judgments. Zawacki's (2011) experiment examined combined primary sexual and relationship appraisals, but it did not include secondary appraisals; moreover, it did not allow comparisons of partners with differing sexual risk histories. Thus in the present study, we addressed an important knowledge gap by investigating effects of three partner risk conditions—low, unknown, and high—as well as two alcohol doses on primary and secondary appraisals associated with judging sexual risk.

Relationship Type and Risk Judgments

The type of relationship that a woman has with a man may influence her judgment of his sexual risk. The finding that new or casual partners are perceived as more risky than regular or committed partners has long been established in survey research (for a review, see Misovich et al., 1997). Another type of relationship that may present substantial sexual risk, but may not be judged as such, is a disrupted relationship. Couples often break up and get back together, and familiarity with the previous partner may engender feelings of trust, comfort, and safety (Bajos & Marquet, 2000; Bourne & Robson, 2009; Misovich et al., 1997). Moreover, it is common for sexually active young people to have sex with former partners. Employing a representative sample of adolescents, Manning, Giordano, and Longmore (2006) found that almost two-thirds of those having sex outside a dating relationship did so with ex-boyfriends or ex-girlfriends. These authors noted that feelings of safety engendered by familiarity often lead to a lack of vigilance about using condoms. Thus, we examined the effects of two types of relationships on cognitive appraisals and subsequent risk judgments: (a) a new relationship in which the couple had not previously had sex and (b) a disrupted relationship in which the couple had previously had sex, ended the relationship, and subsequently renewed it.

Study Overview and Hypotheses

Using the cognitive mediation (Norris et al., 2004) and alcohol myopia models (Steele & Josephs, 1990; Taylor & Leonard, 1983) as underlying theoretical frameworks, our study combined data from two methodologically identical experiments to examine how alcohol consumption, relationship type, and partner's sexual history affected cognitive appraisals and subsequent risk judgment of the partner. In both experiments, female social drinkers were randomly assigned to a beverage condition after which they projected themselves into an experimental story depicting a sexual encounter with a desirable man. In addition, the male partner's sexual risk history was varied (low, unknown, high). The two studies differed in only one aspect. In one experiment, the woman and the man had never had sex (new relationship) whereas in the other experiment the couple had previously had a sexual relationship, had mutually agreed to end it, and were meeting again (disrupted relationship).

Multiple groups path analysis (Boomsma, 2000; Kline, 2011; Olsson, Foss, Troye, & Howell, 2000) was used to test the hypothetical model across the three partner risk conditions (low, unknown, and high; see Figure 1). This approach allows testing the covariance structure of relationships among variables in a hypothesized model to determine differences across groups (Rigdon, Schumacker, & Wothke, 1998). We chose partner risk type because we were interested in examining how women's cognitive appraisals were affected by knowledge of potential partners' risk. We believed this approach would allow us to understand how women decide to judge some men as high risk and others as low risk, in particular when faced with a partner who does not present clear cues about his risk level.

We proposed two sets of hypotheses. The first set tested the main predictions of, and extended, the cognitive mediation model. We predicted that primary appraisals of the situation's sexual potential would positively predict secondary appraisals concerned with experiencing pleasure from the encounter and negatively predict secondary appraisals of health concerns. Analogously, we hypothesized that primary appraisals of relationship potential would positively predict secondary appraisals concerned with maintaining a relationship. We hypothesized that all secondary appraisals would predict judgment of the man's sexual riskiness—specifically, health concerns positively; pleasure and relationship appraisals negatively. Finally, we hypothesized that all associations between primary and secondary appraisals and judgment of partner risk would be the same across all three partner risk conditions.

Our second set of hypotheses outlined expected differences across risk conditions for effects of the manipulated variables (beverage and relationship type) on primary appraisals. Regarding the low-risk group, we hypothesized a significant main effect of alcohol on the primary appraisal of sexual potential and a main effect of relationship type on relationship potential. Because the man posed no obvious risk to the woman in the low-risk condition, alcohol's myopia effect would focus women's attention on the situation's pleasure cues, regardless of relationship status. Consistent with our previous research finding that alcohol increased sexual potential ratings (Norris, Stoner, Hessler, Zawacki, George, et al., 2009), we hypothesized that alcohol consumption would increase appraisal of sexual potential, but not relationship potential. Concomitantly, based on previous research showing that familiarity increases relationship potential (Zawacki et al., 2009), we expected that women in the disrupted relationship condition would judge the man as having greater relationship potential than those in the new relationship condition.

We hypothesized that there would be a significant interaction between alcohol and relationship type for the unknown- and high-risk conditions such that women who had consumed alcohol and were presented with a disrupted relationship would perceive the highest sexual and relationship potential compared to women who received no alcohol and were presented with a new relationship. When a man manifests sexual risk to a woman, as portrayed in the high-risk condition, she has to balance this information against the potential pleasure and emotional intimacy she might receive from having sex with him. We proposed that having previously had a relationship with the man would increase women's comfort with him regarding both having sex and for the possibility of resuming the relationship. Combined with alcohol's effect of focusing women's attention on the situation's pleasure cues, we expected information about the partner's risk level to be counteracted. For the unknown-risk condition, we proposed that the uncertainty of how much risk the man posed would also be counteracted by increased comfort resulting from having dated him in the past and that alcohol would similarly focus her attention on situational pleasure cues.

Method

Participants

A total of 364 women (M_{age} = 25.24, SD = 3.89, range = 21 – 35) recruited from the community through posted flyers and online ads participated. Self–reported ethnicities were: 244 (67%) Caucasian; 27 (7.4%) African-American; 22 (6%) Asian-American/Pacific Islander; 12 (3.3%) American Indian/Native Alaskan, 30 (8.2%) multi-racial, and 29 (8%) other; 35 (9.6%) identified as Hispanic. Approximately one-third (n = 119) were either full- or part-time students. Participants reported consuming an average of 11.29 (SD = 8.99, range = 1 – 89) alcoholic drinks per week. There were no significant differences in demographics or average weekly drinks between participants in the two experiments (all ps> .05). A total of 36 cases were dropped due to either failing the risk condition

manipulation check (n = 28), failing the beverage condition manipulation check (n = 2), or providing insufficient data (n = 6). Thus, the final sample size was 328.

Procedure

All procedures were approved by the university's Human Subjects Division and complied with the National Institutes on Alcohol Abuse and Alcoholism (NIAAA) guidelines for administering alcohol to human participants (NIAA, 2005). Women interested in participating contacted the lab and were screened by phone to ensure eligibility. Advertisements recruited single non-problem drinkers between the ages of 21 and 35 for a study of male-female social interactions. Abstainers and anyone with a history of problem drinking or currently taking medications contraindicating alcohol consumption were excluded. To enhance the realism and self-relevance of our experimental story, participants were required to have had prior consensual sexual intercourse with a man, to be interested in relationships with men in the future, and to not currently be in a committed, exclusive relationship with anyone. Eligible participants were scheduled, told to neither eat for 3 hours prior to their appointment nor to consume any alcohol that day, and not to drive to the lab in case they received alcohol.

Upon arrival, the participant was seated in a private room and given a breath analysis test (Alco-Sensor IV, Intoximeters Inc., St. Louis, MO) to confirm a blood alcohol content (BAC) of zero. The participant then verified her health screening information, provided informed consent, and was left in private to complete a set of background measures. Afterwards, the experimenter debriefed the participant, explained the second part of the session, and obtained informed consent for the rest of the study. Those participants assigned to an alcohol condition completed a urine-based pregnancy test (OSOM hCG Urine, Genzyme Diagnostics, San Diego, CA) to insure that they were not pregnant before receiving alcohol.

In the second part of the session, the participant consumed a beverage before reading a stimulus story and completing the dependent measures. Intoxicated participants remained in the lab until their BAC fell below .03%. At the end of the session, participants were debriefed, paid $15/hour, and given information about HIV and STI prevention.

Beverage administration—Participants were randomly assigned to one of the beverage conditions: control, low dose alcohol (target BAC = 0.04%), or high dose alcohol (target BAC = 0.08%). Alcohol dosages were .325 g ethanol/kg body weight for the low dose and .682 g ethanol/kg body weight for the high dose. For participants in the alcohol conditions, 100-proof vodka was mixed in a 1:4 ratio with orange juice and poured evenly into 3 cups. Participants in the control condition received an equivalent volume of pure orange juice. Drinks were mixed in front of the participant using a brand name bottle of vodka. Participants were given 3 minutes to consume each cup of beverage.

In the alcohol conditions, participants were given a 5-minute absorption period and were then breathalyzed every 2 to 5 minutes until they reached a criterion BAC of .025% (low dose) or .055% (high dose). These criterion BACs were selected to ensure that participants began reading the story while their BACs were ascending toward the target. After participants reached the criterion BAC, she immediately began reading the stimulus story. Each alcohol participant had a control participant "yoked" to her to control for individual variation in time to criterion BAC. The yoked control participant was breathalyzed at the same time points and began reading the story after the same number of minutes as her counterpart in the alcohol condition (Giancola & Zeichner, 1997; Schacht, Stoner, George, & Norris, 2010).

Stimulus story—Participants read a story that depicted a social interaction between a woman and a man ("Nick"). In the new relationship versions of the story, the couple had met and interacted several times previously, but had never had intercourse. In the disrupted relationship versions, the couple had had a relationship that included sex, but mutually agreed to break up when the man moved away for a new job a year ago. He recently moved back to the same city.

The story was written in the second person (i.e., "You are…"), and the participant was instructed to project herself into the story. The beverage consumed in the story matched the participant's alcohol condition; participants in the low and high alcohol conditions read a version of the story in which the couple consumed alcoholic beverages and those in the control condition read a version in which the couple consumed non-alcoholic beverages. This beverage matching was done to enhance the realism of the story for the participant because she was supposed to be the woman in the story. The story began with a conversation between the woman (i.e., the participant) and a female friend, Anita, in which Anita invited her to Anita's boyfriend's place to watch movies and mentioned that Nick would be there. The evening progressed with Nick and the woman talking, watching movies, and drinking either alcoholic or nonalcoholic drinks, depending on the beverage condition, and ultimately engaging in sexual activity.

Information about Nick's sexual history was embedded in the story and manipulated to create three types of risk. In an effort to keep Nick's likability consistent across conditions, partner risk was manipulated through the reported behavior of Nick's ex-girlfriend and Nick's STI testing in this context. In the *high partner risk condition*, Nick said that his ex-girlfriend had been cheating on him with several other guys and did not always use condoms; he intended to get tested for STIs but had not yet. In the *low partner risk condition*, Nick said that his ex-girlfriend did not want to be in an exclusive relationship any longer and broke off the relationship to start dating other guys. Although they had been monogamous and just to be safe, Nick had recently had an STI test that came back negative. In the *unknown partner risk condition*, Nick said that his ex-girlfriend had started dating another man and although she told Nick she had never had sex with the other man, Nick was unsure; he recently had had an STI test but had not yet received the results. In all conditions, Nick said he had not had sex with anyone since he and his ex-girlfriend broke up. For the disrupted relationship condition, the ex-girlfriend was someone Nick had dated after previously dating the participant whereas in the new relationship condition, she was simply a previous girlfriend.

The story was paused twice to assess primary and secondary appraisals. The first pause occurred after the couple was left alone in a bedroom and the man kissed her on the cheek. At this point primary appraisals were assessed. The story continued with descriptions of the couple's escalating passionate sexual acts until both were undressed. This second portion of the story established that the woman was on a birth-control pill to insure that pregnancy risk would not be the main reason for using a condom. At this point secondary appraisals were assessed. The story ended with Nick suggesting that they engage in vaginal penetration without a condom. Judgment of the man's sexual risk was assessed at the end of the story.

Measures

Primary appraisals—Table 1 presents means, standard deviations, and correlations for all measured variables by risk group. Our two primary appraisals included ratings of the man's sexual potential and relationship potential. Sexual potential comprised five items which assessed desire, expectation, and likelihood to have sex ("How much do you want to have sex with Nick?," "How much does Nick want to have sex with you?," "How much do you expect to have sex with Nick?," "How much does Nick expect to have sex with you?," and

"How likely are you to have sex with Nick in this situation?"); Cronbach's α = .85. Relationship potential was measured with two items assessing interest in ("How interested are you in a long-term relationship with Nick?") and likelihood of ("How likely are you to have a long-term relationship with Nick?") having a relationship with the man (r = .66). All but the likelihood items were rated from 0 (*not at all*) to 6 (*extremely*); the likelihood items, from 0 (*definitely unlikely*) to 6 (*definitely likely*). The items composing both sexual and relationship potential were averaged so that higher scores indicated a higher level of each.

Secondary appraisals—Three separate secondary appraisals focused on pleasure, health concerns, and relationship concerns, all rated on scales from 0 (*not at all*) to 4 (*extremely*). (a) Five items assessed the importance of each pleasure-related appraisal in thinking about whether to have sex with Nick (α = .86): "Having sex now would feel great," "I am really horny," "I feel desirable," "The chemistry is right," and "I am physically attracted to him." (b) Three items assessed the importance of each health concern in thinking about whether to have sex with Nick (α = .78): "I might get an STD," "I might get pregnant," and "I might get HIV/AIDS." (c) Five items captured the importance of each relationship concern in thinking about whether to have sex with Nick (Cronbach's α=.78): "I really like him so we should have sex now"; "A perfect situation doesn't come along too often, so I should go for it"; "We could end up being boyfriend and girlfriend if we have sex now"; "Maybe this is the right guy for me, so we should go ahead and have sex"; and "He'll like me more if we have sex now."

Judgment of partner risk—Three items assessed each participant's judgment of the male partner's sexual risk (α = .74): "How would you rate Nick's sex history?," rated 0 (*low risk*) to 6 (*high risk*); "How likely is it that Nick has an STD?"; and "How likely is it that Nick got an STD from his ex-girlfriend?" The latter two items were rated 0 (*definitely unlikely*) to 3 (*50-50*) to 6 (*definitely likely*). These items were averaged so that higher scores indicated elevated perceived risk.

Manipulation checks and story ratings—Two multiple-choice items asked participants to identify the man's sex history with his ex-girlfriend as depicted in the story. The first asked participants to identify the man's reason his previous relationship ended. The second required participants to identify whether the man had been tested for sexually transmitted diseases after he and his ex-girlfriend broke up along with the test's outcome. Participants were also asked two items concerning how many drinks containing alcohol they had consumed in the story and in the lab. To assess engagement with the story, two items used in previous studies (Davis et al., 2010; Norris, Stoner, Hessler, Zawacki, George, et al., 2009) were asked at the end of the story: "How much were you able to project yourself into the story?" and "How realistic did you think the story was?," with both rated from 0 (*not at all*) to 6 (*extremely*).

Analysis Plan

Multiple groups path analysis with maximum likelihood estimation with robust standard errors (MLR; Boomsma, 2000; Kline, 2011; Olsson et al., 2000) was conducted in MPlus Version 4.21 (Muthen & Muthen, 2006) to test differences among risk groups (low, unknown, and high partner risk conditions) as shown in the hypothesized model (see Figure 1). We first ran a model constraining all paths to be equal across groups (i.e., fully constrained; Model 0) and then ran a second model in which the constraints were released on the paths hypothesized to differ across groups (Model 1). To improve model fit, modification indices were examined to determine paths to add or constraints to release that were consistent with the underlying theories that served as the basis for the original model (Models 2 and 3). Finally, we compared the final partially constrained model to an identical

model with no constraints (i.e., fully unconstrained; Model 4) to ascertain whether or not the constraints were warranted (Byrne, Shavelson, & Muthen, 1989; Cheung & Rensvold, 2002; Meade, Johnson, & Braddy, 2008).

We assessed model fit using multiple indicators including chi-square likelihood ratio, comparative fit index (CFI; Bentler, 1990; Bentler & Bonett, 1980; Browne & Cudeck, 1993), root mean square error of approximation (RMSEA; Browne & Cudeck, 1993), and standardized root mean square residual (SRMR; Hu & Bentler, 1999). We combined Hu and Bentler's (1999) recommendation of a two-index strategy (CFI ≥ .95 and SRMR ≤ .08) with the suggestion by Meade et al. (2008) and Cheung and Rensvold (2002) that CFI is an appropriate index for multiple groups analyses.

For comparing the final partially constrained model to the fully unconstrained model, we used a test of change in chi-square as well as change in CFI. Although the chi-square difference test is routinely used for this comparison, simulation studies of multiple groups confirmatory factor analyses have revealed that change in chi square is sensitive to sample size (Cheung & Rensvold, 2002; Meade et al., 2008). These authors recommended examining change in CFI (a decrease of ≤ .002 for Meade et al., 2008; ≤ .01 for Cheung & Rensvold, 2002). Cheung and Rensvold (2002) indicate that an increase in CFI is evidence that the null hypothesis of invariance is true; that is, the constraints are appropriate.

Beverage and relationship type were coded as contrasts so that their effects could be interpreted as mean differences. Beverage was coded as alcohol (+.5) versus control (−.5). Relationship type was coded as disrupted (+.5) versus new (−.5). The interaction was the product of these two variables and is interpreted as the difference in beverage effect between relationship groups, that is, disrupted relationship's beverage effect minus new relationship's beverage effect.

Results

Preliminary Analyses

Participants in the low dose (.04 target BAC) condition had a mean BAC of .037% (SD = .009) immediately before beginning the scenario and a mean BAC of .034% (SD = .008) after completing dependent measures. Participants in the high dose (.08 target BAC) condition had a mean BAC of .062% (SD = .008) immediately before beginning the scenario and a mean BAC of .080% (SD = .010) after completing the dependent measures. Therefore, it appears that participants were on the ascending limb and/or at peak BAC while completing the dependent measures.

We conducted a 2 (alcohol dose) × 3 (risk group) MANOVA to test for mean differences between low and high alcohol doses for primary sexual and relationship appraisals because only these two variables should have been affected by alcohol dose according to the cognitive mediation model. There was no significant difference between the low and high dose alcohol conditions for either primary appraisal, *Hotelling's Trace* = 0.00, $F(2, 157) = 0.13$, $p = .88$, nor was there an interaction with risk group, *Hotelling's Trace* = 0.02, $F(4, 312 = 0.80$, $p = .53$. Because no differences were found, we collapsed across alcohol dose conditions for model testing.

Participants' ratings of the man's sexual risk differed across risk groups, $F(2, 325) = 21.90$, $p < .001$. Scheffe post hoc tests showed that women in the high-risk group had higher perceived risk ($M = 3.89$, $SD = 1.36$) than in the unknown ($M = 2.93$, $SD = 1.25$) and low-risk groups ($M = 2.85$, $SD = 1.32$). Sexual risk ratings between the unknown- and low-risk groups did not significantly differ.

One sample *t*-tests comparing means to the midpoint scale value of 3 showed a significantly higher mean both for participants' ability to project themselves into the story ($M = 4.36$, $SD = 1.36$), $t(326) = 18.12$, $p < .001$, and for perceived story realism ($M = 4.79$, $SD = 1.31$), $t(326) = 24.62$, $p < .001$. Using one-way ANOVAs to test for differences across all manipulated conditions, no differences were found either for ability to project into the story, $F(17, 308) = 0.86$, $p = .62$, or for story realism, $F(17, 308) = 1.29$, $p = .20$.

Model Testing

Bivariate correlations among all variables are presented in Table 1. Fit indices for each model are presented in Table 2. The initial fully constrained model (Model 0) was not a good fit for the data. We next released the constraints on the paths from manipulated variables to the primary appraisals based on our hypothesized model (Model 1). Because we did not expect a causal relationship between the primary appraisals (sex and relationship potential) or among the secondary appraisals (pleasure, health, and relationship), we estimated the correlations between their error terms (MacCallum, Wegener, Uchino, & Fabrigar, 1993). Model 1 was not a significantly better fit than Model 0. An examination of the modification indices guided by the underlying theory suggested better fit with the addition of a path from primary sexual appraisals to secondary relationship appraisals, which was constrained to be equal across risk groups (Model 2). Although Model 2 fit the data better, preliminary analyses showed that the unknown-risk group was significantly different from the high-risk group with respect to their judgments of the partner's sexual risk, whereas the unknown-risk group did not differ significantly from the low-risk group. Based on this unanticipated finding, we made a final modification to the model and released all constraints on paths from the manipulated variables to the primary appraisals in order to determine whether there were significant differences between the high and unknown-risk groups that we were unable to determine when the paths were constrained to be equal (Model 3). This final model was closely aligned with our original hypothesized model and was a good fit for the data. Finally, the change in model fit from Model 3 to a fully unconstrained model (Model 4) suggests that Model 3 adequately captures the differences and similarities across the three partner risk groups and thus the constraints included in this model were warranted.

Figure 2 shows the standardized path coefficients for the final model (Model 3) for each of the three risk groups. The final model accounted for 9.3% of the variance in risk judgment for the low-risk group, 18.4% for the unknown-risk group, and 10.9% for the high-risk group. With regard to relationships between primary and secondary appraisals and risk judgment, the tenets of the cognitive mediation model were upheld and were similar in all three risk groups, as evidenced by constraining all paths to be equal across risk groups from primary to secondary appraisals and from secondary appraisals to partner risk judgment. First, primary appraisal of sexual potential significantly predicted secondary appraisals in the expected directions. Although not hypothesized, primary sexual appraisals were also significantly positively related to secondary relationship appraisals. Second, consistent with the cognitive mediation model, primary relationship appraisals significantly predicted secondary relationship appraisals. As hypothesized, there was a significant positive path from secondary health appraisals to partner risk judgment and a significant negative path from secondary relationship appraisal to partner risk judgment. Contrary to our hypotheses, there was not a significant association between secondary pleasure appraisals and partner risk judgment for any of the groups.

Hypotheses related to the manipulated variables were partially supported. As expected, for the low-risk group, alcohol consumption significantly increased sexual potential appraisals, and participants in the disrupted relationship indicated significantly higher primary relationship appraisals than participants in the new relationship condition. Although not hypothesized, women in the disrupted relationship condition rated the man's sexual potential

significantly higher than those in the new relationship condition. As hypothesized, the low-risk group's primary appraisals were not affected by the interaction between alcohol and relationship type.

For both the high- and unknown-risk groups, as hypothesized, primary sexual appraisal was significantly higher for both the alcohol (compared with the control) and disrupted relationship (compared with the new relationship) conditions. For the unknown-risk group, there was a significant interaction between alcohol and relationship type predicting primary sexual appraisals, but not relationship potential. As predicted, women in the no-alcohol, new relationship condition had lower primary sexual appraisals than women in the alcohol, disrupted relationship condition. They also reported lower primary sexual appraisals than all other conditions (all ps < .01; see Figure 3); the other conditions did not differ from one another. Contrary to our hypotheses, there was not a significant interaction for the high-risk group. Also contrary to hypotheses, primary relationship appraisal was not affected by the interaction in either high- or unknown-risk conditions. Participants in the disrupted relationship condition (compared to new relationship) had significantly higher primary relationship appraisals for the low- and high-risk groups, whereas this association was nonsignificant (p = .06) for the unknown-risk group.

To further examine relationships between the manipulated variables and partner risk judgment, we tested the indirect effects (Bryan, Schmiege, & Broaddus, 2007) of alcohol and relationship type to risk judgment through primary and secondary appraisals for each risk group (Table 3). For all three groups, disrupted relationship significantly indirectly reduced risk judgment through paths to primary sexual appraisals and to secondary health appraisals. For the high- and low-risk groups, there was an additional significant indirect effect of alcohol reducing risk judgment via a path through primary sexual appraisals to secondary health appraisals. For the low-risk group, there was an additional significant indirect effect of alcohol reducing risk judgment through primary sexual appraisals to secondary relationship appraisals.

Discussion

Our study increases understanding of how the contextual variables of relationship type, information about a man's sexual history, and alcohol consumption may influence women's judgment of a man's sexual risk through her cognitive appraisals, thus following the cognitive mediation model (Norris et al., 2004). Although understudied, a woman's judgment of a man's sexual risk is important to understand because these judgments have been found to influence subsequent cognitions and risk-taking behavior (Thornton et al., 2002). It is notable that although women in the high-risk group rated the man's sexual risk significantly higher than those in the low-risk group, the low and unknown groups did not differ from each other. In other words, women perceived a man who was portrayed as having had some possibility of being exposed to STIs and did not know his STI status as low risk. Health professionals and prevention programs stress the importance of not taking chances with sex partners whose STI status is unknown and to treat such partners as high risk (Branson et al., 2006); yet, at least some women do not heed this advice.

We expected to find differences in the combined effects of alcohol and relationship type across risk groups. Where the man was presented as low-risk, we expected only main effects of alcohol on the primary appraisal of sexual potential (based on alcohol's myopia effect) and relationship type on relationship potential (based on Zawacki et al.'s, 2009 findings). For partners who were presented as representing unknown or high potential risk, we expected an interaction: The higher sexual and relationship potentials associated with a former partner would be magnified by the myopia-engendering effects of alcohol—leading

to discounting his risk in the alcohol condition, but not in the no-alcohol condition. Hypotheses regarding these effects were partially supported. There was an alcohol x relationship type interaction in the unknown-risk condition for primary sexual appraisals. Sober women who were portrayed as having a new relationship with a man of unknown risk viewed him as having the lowest sexual potential. Given women's uncertainty about the man's sexual risk, portraying a past relationship with him perhaps increased comfort with him. Familiarity can be a key component of feeling safe with a sex partner even in the absence of emotional involvement or a longstanding relationship (Bourne & Robson, 2009). We had expected alcohol to enhance this effect by focusing women's attention on this comfort, as well as on his sexual attractiveness, thus leading to heightened sexual potential ratings (Cooper, 2002; Steele & Josephs, 1990). However, contrary to our hypotheses, this interaction effect was not found for relationship potential in the unknown-risk condition, nor was there an interaction between these variables for either sexual or relationship potential in the high-risk condition. Zawacki et al. (2009) found an interaction between alcohol consumption and relationship type for relationship potential only for those with high relationship motivation. Perhaps our hypothesized interaction might have been significant if we had examined the same background variable.

As expected across all risk groups, there was a main effect of alcohol consumption on sexual potential appraisals. This effect is consistent with Norris, Stoner, Hessler, Zawacki, George, et al.'s (2009) finding that alcohol consumption increased ratings of sexual potential in a similar scenario. Consistent with the alcohol myopia model (Steele & Josephs, 1990; Taylor & Leonard, 1983), intoxicated women apparently focused their attention on cues related to the man's attractiveness and potential for a pleasurable sexual encounter. Similarly, there were significant main effects for relationship type on relationship potential for the low- and high-risk groups. As expected, there were main effects for relationship type on sexual potential for the unknown- and high-risk groups, but unexpectedly, there was also a relationship main effect for the low-risk group. This suggests that women in general do not compartmentalize their appraisals regarding sexual and relationship potential, but rather approach potential sexual situations with men in an integrated way. Previous research has found that women commonly identify interest in a long-term relationship as part of their sexual goals (Lindgren, Schacht, Pantalone, & Blayney, 2009). Our study has demonstrated that a man's apparent STI likelihood has little bearing on a woman's judgment about a past partner's potential for sex in the short-term or for a long-term relationship. Rather, having had a past positive relationship with a man may overcome initial wariness that a woman might have with a new partner.

We also found support for the basic tenets of the cognitive mediation model. As predicted, across all partner risk groups, primary appraisals of sexual potential were positively related to secondary pleasure appraisals and negatively related to health appraisals. Unexpectedly, sexual potential appraisals were also positively related to secondary relationship appraisals. Thus, women's desire for a sexual relationship seemed to be intertwined with relationship concerns. This pattern is not surprising because, as noted above, relationship type affected both sexual and relationship potential. As predicted as well, secondary relationship appraisals were negatively related to risk judgments. The stronger women's concerns were about harming their relationship with the man, the lower their risk judgment of him. This finding is consistent with Zawacki's (2011) conclusion that women's interest in a sexual relationship was negatively related to their perception of his sexual risk. Hennessy, Fishbein, Curtis, and Barrett (2007) also suggested that initial romantic attraction may decrease consideration of sexual risk information. As expected, too, across all risk groups, health appraisals were positively related to risk judgments. To the extent that concerns about detrimental effects to their own health were prominent, participants recognized that the man could pose a risk to them. Pleasure appraisals, on the other hand, were not related to risk

judgments in any condition. Given that the story portrayed the woman and the man as already involved in sexual activity, pleasure may have been seen as a given, thereby focusing women's attention on long-term relationship appraisals.

Our study builds on Zawacki's (2011) work by including both primary and secondary appraisals in the model tested. Moreover, previous studies using the cognitive mediation model as their theoretical underpinning (Norris, Stoner, Hessler, Zawacki, George, et al., 2009; Purdie et al., 2011; Zawacki et al., 2009) have examined only how cognitive appraisals predict behavioral intentions, not risk judgments. Thus, our current study extends the applicability of the cognitive mediation model to a new realm of responses related to women's sexual decision making.

Practice Implications

Understanding how women's sexual and relationship appraisals lead to sexual risk judgments about a potential partner provides a number of potential intervention points. The most direct strategy would be to focus on increasing perception of sexual risk. Recently, an online intervention aimed at increasing sexual risk perception among young heterosexual couples not only was successful in doing so but also resulted in greater condom use 3 months later than a general risk reduction intervention and a control group (Mevissen, Ruiter, Meertens, Zimbile, & Schaalma, 2011). However, this type of intervention can be further honed by addressing the cognitive appraisals women make with different types of partners and should incorporate information about how alcohol intoxication can influence these appraisals.

The development of effective risk reduction interventions is complicated by needing to take into account both sexual and relationship issues. Incorporating cognitive appraisal elements related to health risks and relationship considerations into sexual risk reduction interventions could enhance their effectiveness. Although practitioners cannot control environmental forces that may have affected women in the past, such as their prior relationships, it might be possible to teach them how to re-evaluate their safety beliefs about past partners in considering whether to have sex with them again in the future. It would be particularly important to focus interventions on dealing with partners of unknown risk status because this type of partner is the most common for women to encounter. A past partner with whom a woman has had a positive relationship presents an especially challenging circumstance if she is faced with the possibility of re-starting the relationship. Past associations of pleasure and intimacy could generate positive expectations about a future relationship. These expectations could lead a woman to de-emphasize any potential sexual risk resulting from the man's sexual experiences with others since their last encounter. The practitioner's challenge lies in how to direct women toward appraising risks to their own health.

One HIV/STD prevention intervention, designed specifically for women, has employed a cognitive-behavioral approach to address several issues, including risk perception and women's relationships with current male partners (Miller, Exner, Williams, & Ehrhardt, 2000). The program uses techniques, such as group discussions and role playing, to help women increase awareness of their own vulnerability and to develop behavioral skills to decrease sexual risk taking. Although somewhat successful (Ehrhardt et al., 2002), this intervention might be enhanced by further tailoring it to different types of relationships. That is, women could discuss their relationship and health appraisals with regard to new versus disrupted relationships. By doing so, women could come to understand the risks associated with each type of partner and ultimately develop skills to deal effectively with them.

Our study results also show that alcohol consumption increases the sexual potential ratings of a new partner of unknown sexual risk status. Women need to be made aware of this

potentially risky situation and provided with the skills that would enable them to increase their sexual safety. One approach could be to address women's drinking to lessen the likelihood that alcohol would have its effect on sexual potential appraisals. Alcohol behavioral skills training has shown promise in reducing hazardous drinking and may be especially effective for women (Larimer & Cronce, 2007).

Limitations

Although the experimental story portrayed a realistic scenario into which women were able to project themselves, an experiment cannot completely mimic a real-life situation. Nevertheless, in two studies that employed experimental scenarios similar to the present one, we found that women's reports of their past and projected future condom use were significantly correlated with their hypothetical likelihood of having unprotected sex in the story (Kajumulo, Davis, & George, 2009; Norris, Kiekel, Purdie, & Abdallah, 2010). In these prior studies, as well as in the present one, women reported a high ability to project themselves into the story and found it very realistic. However, future research testing the viability of the cognitive mediation model to predict women's sexual decision making should examine the extent to which women's behavior in actual sexual situations corresponds with their hypothetical responses in an experiment. The experimental paradigm allowed a test of alcohol's causal effects; however, in our study, only dose effects on cognitive judgments were tested. It is also possible that learned expectancy effects operated on women's appraisals and risk judgment. The use of an alcohol administration protocol also required that only non-problem, legal-age drinkers could participate; thus, generalizability of these findings may not extend to underage drinkers or to problem drinkers. Finally, even though findings from our study support the cognitive mediation model as one means of providing an explanatory mechanism for women's sexual decisions, there are other factors that were not assessed. Past studies (George et al., 2009; Norris, Stoner, Hessler, Zawacki, Davis, et al., 2009) have shown that affective variables, such as sexual arousal, also play an important role in determining women's sexual decisions. Future work should attempt to identify how affective and cognitive variables work in tandem to influence women's sexual decisions.

Our findings do provide insight into a cognitive mediation process through which women make sexual safety judgments, as well as how contextual factors can influence this process. Past research has shown a positive relationship between perception of sexual risk and increased condom use (Catania, Kegeles, & Coates, 1990; Sheeran, Abraham, & Orbell, 1999). These findings suggest that a woman's perception of a potential partner's sexual risk is a function of her desire to have sex and/or a relationship with him rather than a simple, rational function of risk information such as his STI test results. Further, these motivations can be influenced within a situation by alcohol consumption and the couple's prior relationship status.

Conclusions

Single women face many challenges as they negotiate potential sexual situations, not the least of which is safeguarding their sexual health. Women are often told that they should treat all sex partners of unknown STI status as high risk. Our findings show, however, that many women may do the opposite. Our study has demonstrated that both alcohol consumption and relationship status can affect women's appraisals of a potential partner's sexual and relationship potential. These appraisals in turn are related to evaluations of health and relationship factors that might inhibit or increase sexual risk judgments. Because risk judgments are related to sexual risk taking (Gerrard et al., 1996), understanding the process through which women form sexual risk judgments provides multiple intervention points for developing effective safer sex interventions.

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References

Abbey A, Saenz C, Buck PO, Parkhill MR, Hayman LW. The effects of acute alcohol consumption, cognitive reserve, partner risk, and gender on sexual decision making. Journal of Studies on Alcohol. 2006; 67:113–121. Retrieved from www.collegedrinkingprevention.gov/supportingresearch/journalstudiesalcohol.aspx. [PubMed: 16536135]

Bajos N, Marquet J. Research on HIV sexual risk: Social relations-based approach in a cross-cultural perspective. Social Science and Medicine. 2000; 50:1533–1546.10.1016/S0277-9536(99)00463-3 [PubMed: 10795961]

Bentler PM. Comparative fit indices in structural models. Psychological Bulletin. 1990; 107:238–246.10.1037/0033-2909.107.2.238 [PubMed: 2320703]

Bentler PM, Bonett DG. Significance tests and goodness of fit in the analyses of covariance structures. Psychological Bulletin. 1980; 88:588–606.10.1037/0033-2909.88.3.588

Boomsma A. Reporting analyses of covariance structures. Structural Equation Modeling. 2000; 7:461–483.10.1207/S15328007SEM0703_6

Bourne AH, Robson MA. Perceiving risk and (re)constructing safety: The lived experience of having ‘safe’ sex. Health, Risk & Society. 2009; 11:283–295.10.1080/13698570902906421

Branson, BM.; Handsfield, HH.; Lampe, MA.; Janssen, RS.; Taylor, AW.; Lyss, SB.; Clark, JE. MMWR. Vol. 55. Washington, DC: Centers for Disease Control and Prevention; 2006. Revised recommendations for HIV testing for adults, adolescents, and pregnant women in health-care settings; p. 1-17.Retrieved from http://www.cdc.gov/mmwr/PDF/rr/rr5514.pdf

Browne, MW.; Cudeck, R. Alternative ways of assessing model fit. In: Bollen, KA.; Long, JS., editors. Testing structural equation models. Newbury Park, CA: Sage; 1993. p. 136-162.

Bryan A, Schmiege SJ, Broaddus MR. Mediational analysis in HIV/AIDS research: Estimating multivariate path analytic models in a structural equation modeling framework. AIDS and Behavior. 2007; 11:365–383.10.1007/s10461-006-9150-2 [PubMed: 16917669]

Byrne BM, Shavelson RJ, Muthen B. Testing for the equivalence of factor covariance and mean structures: The issue of partial measurement invariance. Psychological Bulletin. 1989; 105:456–466.10.1037/0033-2909.105.3.456

Canin L, Dolcini MM, Adler NE. Barriers to and facilitators of HIV-STD behavior change: Intrapersonal and relationship-based factors. Review of General Psychology. 1999; 3:338–371.10.1037/1089-2680.3.4.338

Catania JA, Kegeles SM, Coates TJ. Towards an understanding of risk behavior: An AIDS risk reduction model (ARRM). Health Education Quarterly. 1990; 17:53–72.10.1177/109019819001700107 [PubMed: 2318652]

Centers for Disease Control and Prevention. HIV surveillance report, Vol 20. Atlanta: US Department of Health and Human Services; 2008. Retrieved from http://www.cdc.gov/hiv/surveillance/resources/reports/2008report/pdf/2008SurveillanceReport.pdf

Centers for Disease Control and Prevention. STDs in adolescents and young adults. Atlanta, GA: US Department of Health and Human Services; 2009. Retrieved from http://www.cdc.gov/std/stats09/adol.htm

Cheung GW, Rensvold RB. Evaluating goodness-of-fit indexes for testing measurement invariance. Structural Equation Modeling. 2002; 9:233–255.10.1207/S15328007SEM0902_5

Cooper ML. Alcohol use and risky sexual behavior among college students and youth: Evaluating the evidence. Journal of Studies on Alcohol. 2002; 14:101–117. Retrieved from www.collegedrinkingprevention.gov/supportingresearch/journalstudiesalcohol.aspx.

Davis KC, Norris J, Hessler DM, Zawacki T, Morrison DM, George WH. College women’s sexual decision making: Cognitive mediation of alcohol expectancy effects. Journal of American College Health. 2010; 58:481–489.10.1080/07448481003599112 [PubMed: 20304760]

Ehrhardt AA, Exner TM, Hoffman S, Silberman I, Leu C-S, Miller S, Levin B. A gender-specific HIV/STD risk reduction intervention for women in a health care setting: Short- and long-term results of a randomized clinical trial. AIDS Care. 2002; 14:147–161.10.1080/09540120220104677 [PubMed: 11940275]

George WH, Davis KC, Norris J, Heiman JR, Stoner SA, Schacht RL, Kajumulo KF. Indirect effects of acute alcohol intoxication on sexual risk-taking: The roles of subjective and physiological sexual arousal. Archives of Sexual Behavior. 2009; 38:498–513.10.1007/s10508-008-9346-9 [PubMed: 18431618]

Gerrard M, Gibbons FX, Bushman BJ. Relation between perceived vulnerability to HIV and precautionary sexual behavior. Psychological Bulletin. 1996; 119:390–409.10.1037/0033-2909.119.3.390 [PubMed: 8668745]

Giancola PR, Zeichner A. The biphasic effects of alcohol on human physical aggression. Journal of Abnormal Psychology. 1997; 106:598–607.10.1037/0021-843X.106.4.598 [PubMed: 9358690]

Hennessy M, Fishbein M, Curtis B, Barrett DW. Evaluating the risk and attractiveness of romantic partners when confronted with contradictory cues. AIDS Behavior. 2007; 11:479–490.10.1007/s10461-006-9156-9 [PubMed: 17028997]

Hu LT, Bentler P. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. Structural Equation Modeling. 1999; 6:1–55.10.1080/10705519909540118

Kajumulo, KF.; Davis, K.; George, W. Experimental vignettes in assessing alcohol-involved risky sexual decision making: Evidence for external validity. Paper presented at the annual meeting of the Society for the Scientific Study of Sexuality; Puerto Vallarta, Mexico. 2009 Nov.

Kline, RB. Principles and practice of structural equation modeling. 3. New York: Guilford; 2011.

Knauper B, Kornik R, Atkinson K, Guberman C, Aydin C. Motivation influences the underestimation of cumulative risk. Personality and Social Psychology Bulletin. 2005; 31:1511–1523.10.1177/0146167205276864 [PubMed: 16207770]

Larimer ME, Cronce JM. Identification, prevention, and treatment revisited: Individual-focused college drinking prevention strategies 1999–2006. Addictive Behaviors. 2007; 32:2439–2468.10.1016/j.addbeh.2007.05.006 [PubMed: 17604915]

Lazarus, RS. Emotion and adaptation. New York: Oxford University Press; 1991.

Lindgren KP, Schacht RL, Pantalone DW, Blayney JA. Sexual communication, sexual goals, and students' transition to college: Implications for sexual assault, decision-making, and risky behaviors. Journal of College Student Development. 2009; 50:491–503.10.1353/csd.0.0095 [PubMed: 20502624]

MacCallum RC, Wegener DT, Uchino BN, Fabrigar LR. The problem of equivalent models in applications of covariance structure analyses. Psychological Bulletin. 1993; 114:185–199. [PubMed: 8346326]

Manning WD, Giordano PC, Longmore MA. Hooking up: The relationship contexts of 'nonrelationship' sex. Journal of Adolescent Research. 2006; 21:459–483.10.1177/0743558406291692

Meade AW, Johnson EC, Braddy PW. Power and sensitivity of alternative fit indices in tests of measurement invariance. Journal of Applied Psychology. 2008; 93:568–592.10.1037/0021-9010.93.3.568 [PubMed: 18457487]

Mevissen FF, Ruiter RC, Meertens RM, Zimbile F, Schaalma HP. Justify your love: Testing an online STI-risk communication intervention designed to promote condom use and STI-testing. Psychology & Health. 2011; 26:205–221.10.1080/08870446.2011.531575 [PubMed: 21318930]

Miller S, Exner TM, Williams SP, Ehrhardt AA. A gender-specific intervention for at-risk women in the USA. AIDS Care. 2000; 12:603–612.10.1080/095401200750003789 [PubMed: 11218546]

Misovich SJ, Fisher JD, Fisher WA. Close relationships and elevated HIV risk behavior: Evidence and possible underlying psychological processes. Review of General Psychology. 1997; 1:72–107.10.1037/1089-2680.1.1.72

Murphy ST, Monahan JL, Miller LC. Inference under the influence: The impact of alcohol and inhibition conflict on women's sexual decision making. Personality and Social Psychology Bulletin. 1998; 24:517–528.10.1177/0146167298245007

Muthen, LK.; Muthen, B. MPlus user's guide. 4. Los Angeles, CA: Muthen & Muthen; 2006.

National Institutes on Alcohol Abuse and Alcoholism. Administering alcohol in human studies. Bethesda, MD: National Institutes of Health; 2005. Retrieved from http://www.niaaa.nih.gov/research/guidelines-and-resources/administering-alcohol-human-studies

Norris, J.; Kiekel, PA.; Purdie, MP.; Abdallah, DA. Using experimental simulations to assess self-reported sexual behavior: Further evidence of external validity; Presentation at a symposium on Alternative Conceptualizations of Assessing Sexual Behavior, Society for the Scientific Study of Sexuality meeting; Las Vegas, NV. 2010 Nov.

Norris J, Masters N, Zawacki T. Cognitive mediation of women's sexual decision making: The influence of alcohol, contextual factors, and background variables. Annual Review of Sex Research. 2004; 15:258–296. Retrieved from www.tandf.co.uk/journals/spissue/hjsr-si.asp.

Norris J, Stoner SA, Hessler DM, Zawacki T, Davis KC, George WH, Morrison DM, Parkhill MR, Abdallah DA. Influences of sexual sensation seeking, alcohol consumption, and sexual arousal on women's behavioral intentions related to having unprotected sex. Psychology of Addictive Behaviors. 2009; 23(1):14–22. doi: 10.1037/a0013998. [PubMed: 19290686]

Norris J, Stoner SA, Hessler DM, Zawacki T, George WH, Morrison DM, Davis KC. Cognitive mediation of alcohol's effects on women's in-the-moment sexual decision making. Health Psychology. 2009; 28:20–28.10.1037/a0012649 [PubMed: 19210014]

Olsson UH, Foss T, Troye SV, Howell RD. The performance of ML, GLS, and WLS estimation in structural equation modeling under conditions of misspecification and nonnormality. Structural Equation Modeling. 2000; 7:557–595.10.1207/S15328007SEM0704_3

Purdie MP, Norris J, Davis KC, Zawacki T, Morrison DM, George WH, Kiekel PA. The effects of acute alcohol intoxication, partner risk level, and general intention to have unprotected sex on women's sexual decision making with a new partner. Experimental and Clinical Psychopharmacology. 2011; 19(5):378–388.10.1037/a0024792 [PubMed: 21859223]

Rigdon, EE.; Schumacker, RE.; Wothke, W. A comparative review of interaction and nonlinear modeling. In: Schumacker, RE.; Marcoulides, GA., editors. Interaction and nonlinear effects in structural equation modeling. Mahwah, NJ: Lawrence Erlbaum Associates; 1998. p. 1-16.

Schacht RL, Stoner SA, George WH, Norris J. Ideographically-determined versus standard absorption periods in alcohol administration studies. Alcoholism: Clinical and Experimental Research. 2010; 34:925–927.10.1111/j.1530-0277.2010.01165.x

Sheeran P, Abraham C, Orbell S. Psychosocial correlates of heterosexual condom use: A meta-analysis. Psychological Bulletin. 1999; 125:90–132.10.1037/0033-2909.125.1.90 [PubMed: 9990846]

Steele CM, Josephs RA. Alcohol myopia: Its prized and dangerous effects. American Psychologist. 1990; 45:921–933.10.1037/0003-066X.45.8.921 [PubMed: 2221564]

Taylor, SP.; Leonard, KE. Alcohol and human physical aggression. In: Geen, RG.; Donnerstein, EJ., editors. Aggression: Theoretical and empirical reviews, Issues in research. Vol. 2. New York: Harper Collins; 1983. p. 77-101.

Thornton B, Gibbons FX, Gerrard M. Risk perception and prototype perception: Independent processes predicting risk behavior. Personality & Social Psychology Bulletin. 2002; 28:986–999.10.1177/014616720202800711

Zawacki T. Effects of alcohol on women's risky sexual decision making during social interactions in the laboratory. Psychology of Women Quarterly. 2011; 35:107–108.10.1177/0361684310384106

Zawacki T, Norris J, Hessler DM, Morrison DM, Stoner SA, George WH, Abdallah DA. Effects of alcohol, partner familiarity, and relationship motivation on women's risky sexual decision making. Personality and Social Psychology Bulletin. 2009; 35:723–736.10.1177/0146167209333043 [PubMed: 19332435]

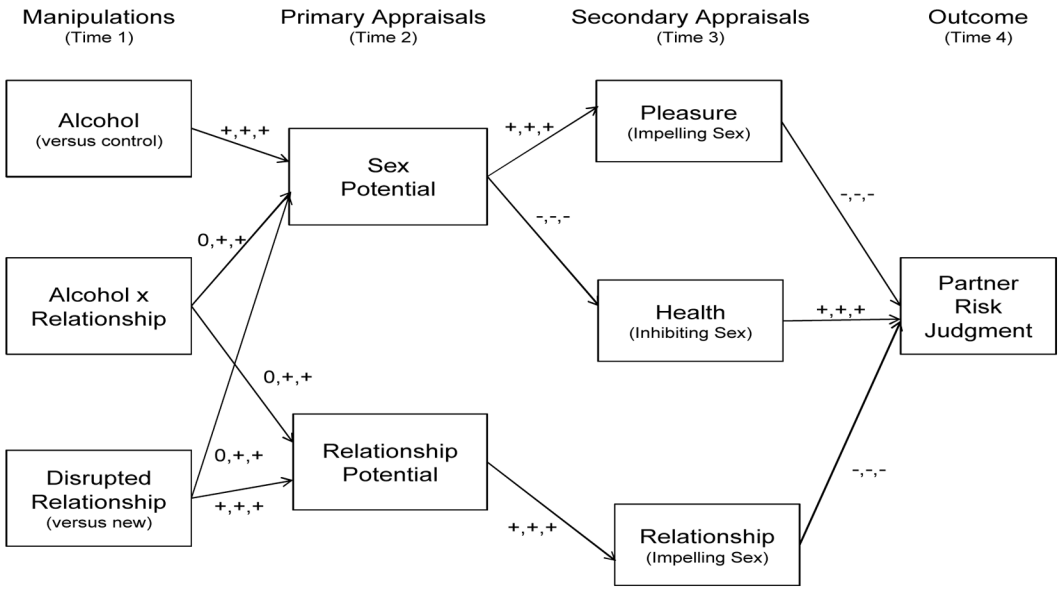
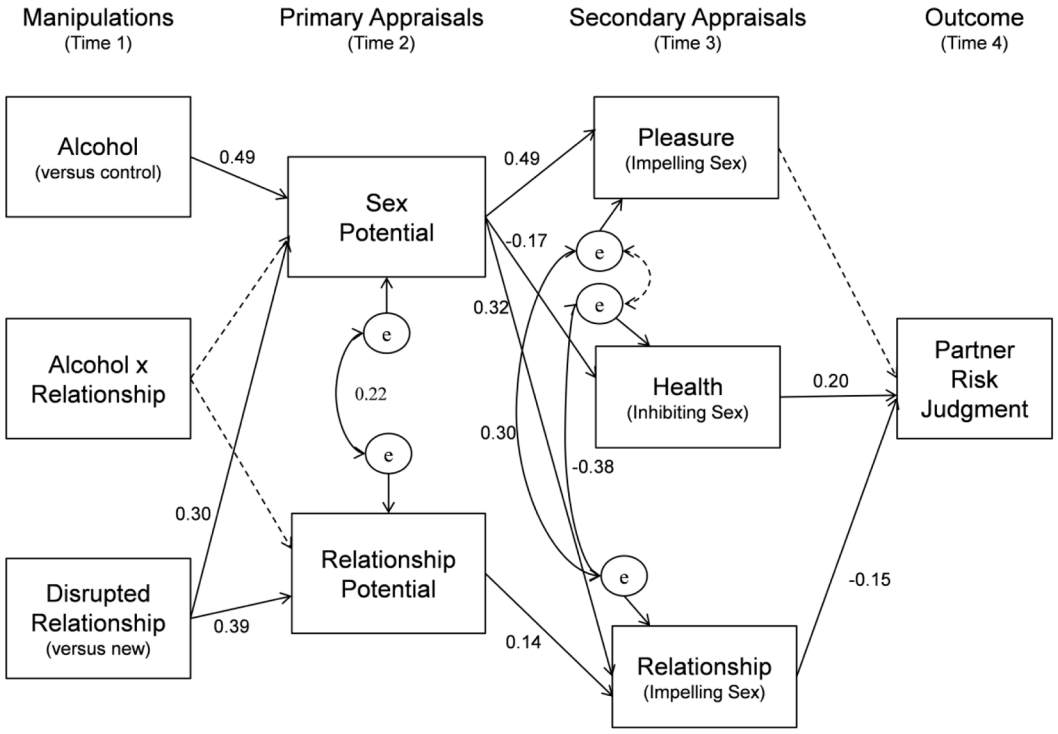
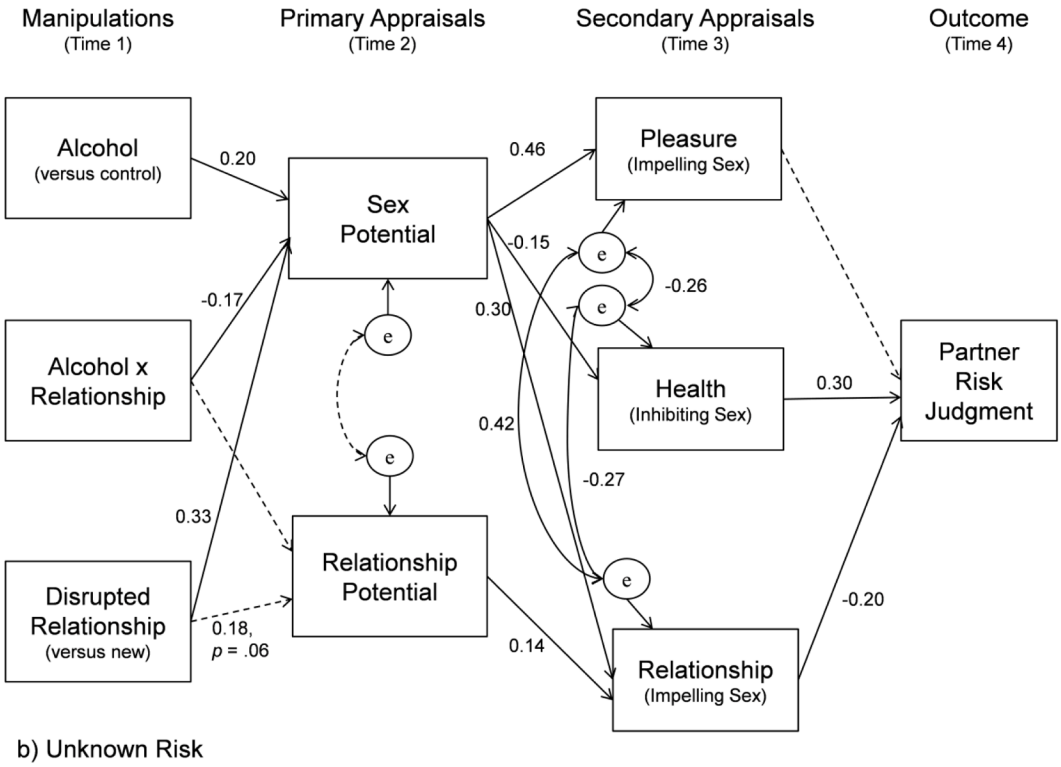


Figure 1.

Hypothesized multiple groups model. Hypothesized path valences are indicated above the arrows in the following order: Low Risk, Unknown Risk, High Risk. Zeros indicate predicted null paths.



a) Low Risk



b) Unknown Risk

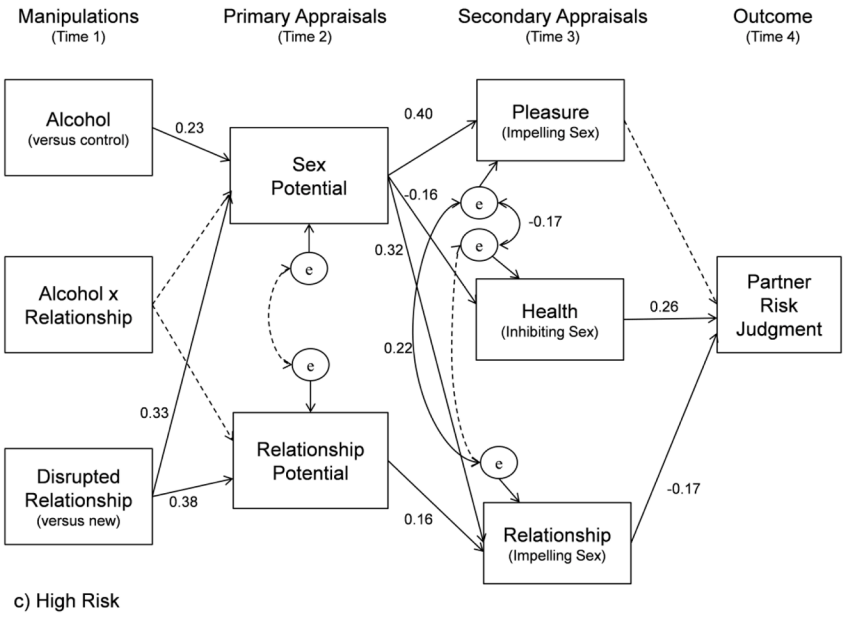


Figure 2.

Final constrained multiple groups model. Separate path models are shown for (a) low-risk, (b) unknown-risk, and (c) high-risk groups. Standardized loadings are presented. All solid line paths are significant at $p < .05$; all dashed paths are included in the multiple groups model, but are not significant at the $p < .05$ level. All paths from primary appraisals to secondary appraisals and from secondary appraisals to partner risk judgment were constrained to be equal across risk groups.

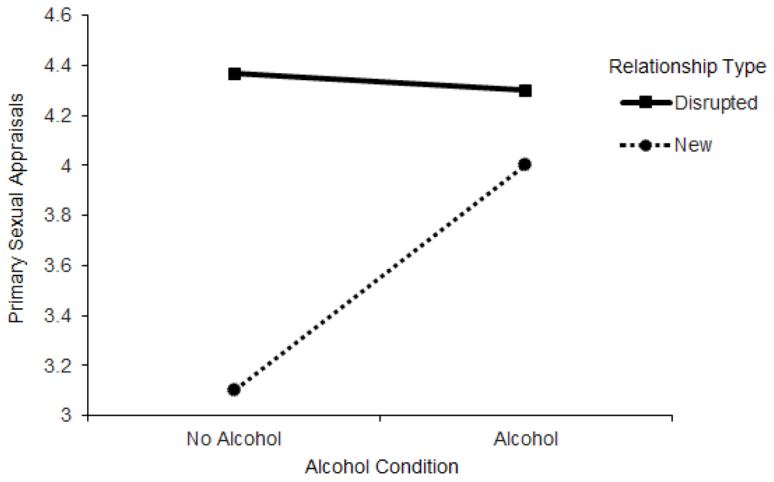


Figure 3.
Unknown-risk group interaction: Relationship type by alcohol on primary sexual appraisal. All comparisons for the no-alcohol, new relationship condition are significant at $p < .01$.

Table 1

Means, Standard Deviations, and Correlations among Predictor and Outcome Variables

	M	*SD*	1	2	3	4	5	6	7
Low Partner Risk (*N* = 108)									
1. Alcohol Effect	--	--	--						
2. Relationship Type	--	--	−0.02	--					
3. Primary Relationship Appraisal	4.06	1.17	−0.03	0.39**	--				
4. Primary Sex Appraisal	4.03	1.26	0.47**	0.28**	0.32**	--			
5. Secondary Relationship Appraisal	2.16	0.98	0.09	0.27**	0.35**	0.37**	--		
6. Secondary Pleasure Appraisal	3.42	0.66	0.17	0.35**	0.25**	0.44**	0.48**	--	
7. Secondary Health Appraisal	2.81	1.05	−0.05	−0.23*	−0.16	−0.13	−0.43**	−0.20*	--
8. Partner Risk Judgment	2.74	1.18	0.17	−0.13	−0.08	0.09	−0.20*	0.04	0.21*
Unknown Partner Risk (*N* = 106)									
1. Alcohol Effect	--	--	--						
2. Relationship Type	--	--	0.02	--					
3. Primary Relationship Appraisal	3.87	1.21	−0.06	0.19*	--				
4. Primary Sex Appraisal	3.92	1.27	0.18	0.31**	0.18	--			
5. Secondary Relationship Appraisal	1.80	0.99	0.06	0.13	0.14	0.33**	--		
6. Secondary Pleasure Appraisal	3.27	0.75	−0.08	0.21*	0.18	0.55**	0.59**	--	
7. Secondary Health Appraisal	2.71	1.25	0.03	−0.17	−0.01	−0.25**	−0.34**	−0.37**	--
8. Partner Risk Judgment	2.78	0.94	−0.06	−0.23*	−0.15	−.29**	−0.35**	−0.39**	0.44**
High Partner Risk (*N*=114)									
1. Alcohol Effect	--	--	--						
2. Relationship Type	--	--	−0.02	--					
3. Primary Relationship Appraisal	3.82	1.34	−0.06	0.36**	--				
4. Primary Sex Appraisal	3.98	1.23	0.20*	0.34**	0.23*	--			

5. Secondary Relationship Appraisal	1.84	0.93	−0.19*	0.34**	0.27**	0.33**	--			
6. Secondary Pleasure Appraisal	3.16	0.77	−0.05	0.07	0.04	0.34**	0.33**	--		
7. Secondary Health Appraisal	2.89	1.13	0.03	0.04	−0.05	−0.16	−0.07	−0.24*	--	
8. Partner Risk Judgment	3.42	0.97	0.15	−0.17	−0.22**	−0.13	−0.16	−0.11	0.25**	

Note. *M* = mean; SD = standard deviation.

* $p < .05$.

** $p < .01$.

Table 2

Fit Statistics for Alternative Models

	Model	df	χ^2	*p* for $\Delta\chi$	CFI	ΔCFI	RMSEA	SRMR
0	Fully constrained with hypothesized paths	76	130.98*	-	0.855	-	0.082	0.102
1	Hypothesized model	73	130.31*	.880	0.849	.006	0.085	0.103
2	Added Prim Sex → Sec Relationship	72	98.60*	-	0.930	-	0.059	0.088
3	Released all constraints for manipulations	65	82.75	0.027	0.953	−0.023	0.050	0.076
4	Fully unconstrained	51	68.61	0.439	0.953	0.000	0.057	0.061

Note. The best fitting model was Model 3. CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual; df = degrees of freedom.

*$p < .05$.

Table 3

Indirect Paths from Manipulated Variables to Partner Risk Judgment

Indirect Paths	*B*	*SE*	*β*	*Z*
Low-risk Condition				
Total alcohol indirect paths	−0.11	0.03	−0.05	−3.14*
Via secondary health appraisals	−0.04	0.02	−0.02	−2.53*
Via secondary relationship appraisals	−0.05	0.03	−0.02	−2.07*
Total disrupted relationship indirect paths	−0.04	0.02	−0.04	−2.69*
Via secondary health appraisals	−0.01	0.01	0.01	−2.07*
Via secondary relationship appraisals	−0.02	0.01	0.02	−1.80
Unknown-risk Condition				
Total alcohol indirect paths	−0.04	0.02	−0.02	−1.84
Via secondary health appraisals	−0.02	0.01	−0.01	−1.82
Via secondary relationship appraisals	−0.02	0.01	−0.01	−1.50
Total disrupted relationship indirect paths	−0.04	0.01	−0.04	−2.78*
Via secondary health appraisals	−0.01	0.01	−0.02	−2.25*
Via secondary relationship appraisals	−0.02	0.01	−0.02	−1.88
High-risk Condition				
Total alcohol indirect paths	−0.05	0.02	−0.02	−2.38*
Via secondary health appraisals	−0.02	0.01	−0.02	−1.99*
Via secondary relationship appraisals	−0.02	0.01	−0.01	−1.78
Total disrupted relationship indirect paths	−0.04	0.02	−0.05	−2.83*
Via secondary health appraisals	−0.01	0.01	−0.01	−2.32*
Via secondary relationship appraisals	−0.02	0.01	−0.02	−1.81

* $p < .05$.