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College Women's Sexual Decision Making: Cognitive Mediation of Alcohol Expectancy Effects

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Abstract

Objective—Alcohol has been linked to a variety of risky sexual practices, including inconsistent condom use. Due to the high rates of alcohol consumption among underage college women, greater understanding of the role of alcohol in young women's sexual decision making is warranted.

Participants and Methods—Female underage (18- to 20-year-old) social drinkers ($N = 94$) participated in an experiment in which they projected themselves into a written hypothetical sexual situation with a new partner. One half of the situations portrayed alcohol consumption; one half did not involve alcohol consumption. Their appraisals of the situation's sexual potential, impelling and inhibiting cognitions, and sexual behavior intentions were assessed.

Results—Results revealed that alcohol's expectancy effects on young women's unprotected sexual intentions were mediated by their cognitive appraisals of the situation.

Conclusions—These findings indicate that alcohol expectancies and their influence on women's sexual decisions should be incorporated into sexual risk reduction efforts.

Keywords

alcohol expectancy; cognitive appraisals; sexual risk; condom use

The risk of heterosexual transmission of human immunodeficiency virus (HIV) and other sexually transmitted infections (STIs) can be reduced through the consistent, correct usage of male latex condoms.¹ However, research indicates that college-age women often engage

in inconsistent condom use, and thus are at increasing risk of contracting HIV and other STIs.²⁻⁴ In one recent study, approximately 40% of college students reported not using a condom during their last occasion of vaginal sexual intercourse.⁵ Risky sexual practices such as inconsistent condom use have been linked to alcohol consumption in numerous empirical studies.^{6,7} Because many college-aged women, even those who are under the legal drinking age, frequently consume alcohol in social situations,^{8,9} examination of the role of alcohol in young women's risky sexual decisions is highly warranted. Thus, we conducted an experimental study examining these relationships in a sample of unmarried, heterosexual, college-aged women.

Although male condoms are ultimately worn (or not worn) by men, women's ability to successfully negotiate condom use has been empirically demonstrated to be an important component of the process leading to protected sex. For example, direct and assertive condom use requests are one form of condom negotiation that increases the likelihood of condom use by undergraduates.¹⁰ Despite its importance, condom negotiation is not the only form of sexual communication relevant to unprotected sex. Sexual interactions often involve complex, iterative sexual decision-making processes; indeed, it is likely that women make a multitude of situational appraisals and engage in a variety of sexual behaviors before the discussion of condom use is actually initiated. However, the sexual cognitions and behaviors that precede condom negotiation have received little scientific examination. To address this knowledge gap, the present study investigated a model of young women's risky sexual decision making comprised of alcohol-related situational variables, cognitive assessments, general sexual intentions, and unprotected sex intentions.

Cognitive Mediation Model of Women's Sexual Decision Making

A number of cognitive theories have been applied to sexual decision-making processes¹¹; however, little of the work examining the cognitive factors associated with risky sex has investigated how these decision-making processes may be influenced by situational factors. That is, although some work has assessed the ways in which individuals' attitudes, beliefs, and intentions may lead to particular sexual decisions, the ways in which aspects of the situation, such as alcohol consumption and partner relationship, may affect these decisions has been understudied. To address this omission, Norris et al¹² developed a cognitive mediation model (CMM) of women's sexual decision making that acknowledges the critical role of situational factors in these decisions. Founded upon Cognitive-Motivational-Relational Theory,¹³ the CMM proposes that situational and background effects on women's sexual responses are mediated through a series of primary and secondary cognitive appraisals—or assessments—of situation-specific information.

The model posits that 2 levels of cognitive appraisals occur: primary appraisals and secondary appraisals. Primary appraisals address whether an event is relevant to and congruent with one's goals. With regard to sexual activity, this first appraisal concerns the likelihood that sexual intercourse will occur in the situation. Secondary appraisals are cognitions that involve weighing situational concerns that may arise from primary appraisals of the encounter. In particular, once a woman appraises the situation as having some sexual potential, she must weigh not only the benefits of having sex, such as physical pleasure, but also the costs, such as disease risk. These factors are appraised relative to her goals for the situation, including sexual intimacy goals as well as sexual safety goals. Upon weighing these factors, the woman then responds behaviorally to the situation after deciding whether to continue or curtail pursuit of all, or some, sexual activities, and whether or not to use protection against pregnancy or disease.

The Situational Influence of Alcohol

Research indicates that the presence of alcohol is one situational factor that often plays a role in risky sexual encounters.⁶ Therefore, the CMM specifically focuses on the role that alcohol may play in influencing women's risky sexual decision-making processes. The CMM posits that alcohol consumption can affect women's sexual decisions directly through its physiological effects on cognitive appraisals of the situation. That is, the cognitive impairment caused by alcohol intoxication may reduce women's likelihood of making safer, more thoughtful sexual decisions. To test this premise, Norris and colleagues¹⁴ conducted an experiment with female social drinkers aged 21 to 35 comparing 4 beverage conditions: control, placebo, target blood alcohol concentration (BAC) = .04%, and target BAC = .08%. Participants projected themselves into a hypothetical sexual encounter with a new sex partner and rated the situation's sexual potential (primary appraisal), their impelling and inhibiting cognitions regarding having sex in this situation (secondary appraisals), and their behavioral intentions to engage in condom negotiation and unprotected sexual activity. Findings supported the theoretical model, indicating that alcohol's physiological effects on cognitive appraisals are an important component of women's risky sexual intentions.

Additionally, the CMM posits that alcohol expectancies play a role in women's sexual decisions. Alcohol Expectancy Theory contends that alcohol influences behavior through individuals' outcome expectancies about alcohol's emotional, physiological, and behavioral effects, which are often influenced by larger cultural beliefs about alcohol-related outcomes.¹⁵ According to this theory, alcohol consumption results in increased sexually risky behavior due to beliefs commonly held in western society that alcohol enhances sexuality and increases sexual risk taking.¹⁶

Experimental alcohol administration studies have enabled investigators to disentangle alcohol expectancy effects from physiological effects by independently manipulating alcohol content and alcohol expectancy set (one's belief about whether alcohol was consumed). However, findings on the effects of alcohol expectancies have been mixed and somewhat difficult to interpret. Expectancy set effects regarding risky sexual behavior have not been frequently found,^{14,17-19} although one study found that women who believed they had consumed alcohol reported increased confidence in their ability to detect a sexual partner's risk level.²⁰ These findings may indicate that alcohol expectancies are less relevant than actual alcohol consumption to risky sexual decisions; however, it may also be the case that experimental placebo protocols are not particularly well-suited to capturing the influence of alcohol expectancies on risky sexual intentions. For example, some researchers have found that experimental placebo conditions may result in unexpected compensatory effects in which participants compensate for anticipated cognitive impairment through increased effort and attention.²¹ Moreover, legal and ethical issues prohibit the administration of alcohol to underage drinkers, thereby precluding the use of experimental placebo designs with participants under legal drinking age. Because of the high prevalence of alcohol consumption by underage (18- to 20-year-old) college women and the escalation of alcohol consumption that occurs between the ages of 18 and 20,²² it is critical for researchers to gain a better understanding of the role of alcohol in these young women's sexual decision-making processes. Thus, experimental researchers must use alternative methods for examining the situational influence of alcohol with underage college women.

Alcohol expectancies can be triggered not only by the belief that one has consumed alcohol, but also by merely portraying alcohol as a situational component.²³ The presence of alcohol within a sexual situation can act as a cue to evoke individuals' expectancies about alcohol's effect on their own sexual behavior. Some studies have found that situational alcohol consumption appears to enhance the sexual aspects of a hypothetical interaction between a

man and a woman, even among individuals who are not themselves drinking.^{24,25} Thus, alcohol expectancies can be evoked by reading a story that portrays alcohol consumption.²³ Because this technique of evoking individuals' alcohol expectancies does not require the actual administration of alcohol, it is a viable method for studying the influence of alcohol on the sexual decisions of female social drinkers who are not yet of legal drinking age.

Study Overview and Hypothesized Model

The purpose of this study was to examine experimentally the influence of alcohol expectancies on the cognitive mediation processes involved in underage college women's risky sexual intentions. After a background questionnaire session, participants projected themselves into a story that simulated a consensual sexual encounter with a first time partner in which no condom was available. Participants were randomly assigned to read a story in which the situation either did or did not involve alcohol. Because the CMM posits that women's sexual decision making is a multistage process, participants completed dependent measures at 4 key points in the story. These dependent measures included primary appraisals of the situation's sexual potential, secondary appraisals of the positive and negative consequences of engaging in sexual behavior, initial sexual intentions to encourage or discourage continued sexual behavior, and intentions to ultimately engage in unprotected sex.

The hypothesized model is shown in Figure 1. Based on the CMM, as well as the findings of Norris et al,¹⁴ the activation of alcohol expectancies through the presence of alcohol in the story was expected to lead to greater primary appraisals of the situation's sexual potential. In turn, primary appraisals of sexual potential were hypothesized to be positively related to sexually impelling cognitions and negatively related to sexually inhibiting cognitions. The secondary appraisals were expected to then predict women's general sexual intentions, such that sexually impelling cognitions are positively related to sexual encouragement intentions and negatively related to sexual discouragement intentions. Sexually inhibiting cognitions were expected to relate to these general sexual intentions in the opposite manner. Finally, sexual encouragement intentions were hypothesized to be positively related to endorsement of having sex without a condom, whereas sexual discouragement intentions were hypothesized to be negatively related to it.

METHODS

Participants

Participants were recruited primarily from a university located in a large West Coast city, as well as through advertisements in local newspapers and flyers posted in coffee shops and other places frequented by young women. These ads recruited "single female social drinkers between the ages of 18 and 20 to participate in a study on social interactions between men and women." Two participants were dropped because of incomplete data, resulting in a final sample of 94 women with a mean age of 18.82 ($SD = 0.80$). Sixty-nine percent identified their race as European American/White, 11.7% as Asian American/Pacific Islander, 4.3% as African American, 2.1% as American Indian or Alaskan, 7.4% as multiracial, and 5.3% as "other." Of the total sample 5.3% identified their ethnicity as Hispanic or Latina. Ninety percent were students, 85% of which attended school full-time. Forty-four percent were also employed. Most (77.8%) had incomes of less than \$21,000 a year.

Potential participants called the phone number provided and were screened to ensure they fit the study's criteria. Exclusion criteria included being in a committed, exclusive relationship, having no interest in a relationship with a man, and never having had consensual vaginal sex with a man. This ensured that all participants would find the experimental story relevant to

their current dating status and lifestyle. We also limited our sample to “moderate social drinkers.” Although definitions of both “moderate” and “social” drinking vary,²⁶ we operationalized this definition such that we excluded abstainers, very heavy drinkers, and those who reported a history of or current problem drinking.¹⁴ The average reported number of alcoholic drinks consumed per week was 10.95 ($SD = 7.79$). Participants were compensated \$15 per hour for participation.

Procedure

The session consisted of 2 parts: administration of background questionnaires, followed by the experimental protocol. Upon arrival, a female experimenter greeted the participant, seated her in a private room at a table with a desktop computer, checked her photo identification, and verified her age. The experimenter then obtained informed consent, instructed the participant on use of the computer, and left the room so that the participant could complete the questionnaires in private. After the computerized questionnaires were finished, the experimenter debriefed the participant about the questionnaires and then read a second informed consent form for the second part of the study, the stimulus story. The experimenter left the room to allow the participant privacy while reading the stimulus story and completing the dependent measures. After the participant was finished, participants were fully debriefed, paid, given resource materials on STIs and HIV, and released. Participants were paid an additional \$5 for returning a follow-up survey, which was mailed approximately 2 weeks after the laboratory session, and which concerned the effects of participation. Eighty-nine percent of women responded and no adverse effects were reported. All procedures and materials were approved by the University of Washington Institutional Review Board.

Materials

Experimental Story—The story was approximately 2200 words and depicted a social interaction between a woman and a man to whom the woman was very attracted, but with whom she had never had sex. Written in the second person, “*Your* good friend Anita invites *you*...”, the story was designed to assist the participant in projecting herself into the situation and, therefore, to the greatest extent possible, experience the encounter as if it were actually happening to her. The purpose was to capture in-the-moment decision-making processes and to enhance the realism of the experience. Additionally, the story was pilot tested with 20 participants to ensure the realism of the scenario. Based on interviews with pilot study participants, it was determined that the type of setting and the situations presented in the story were indeed realistic.

The story began with a conversation between the woman (ie, the participant) and a female friend, in which the friend invited the woman to the friend’s boyfriend’s place to watch movies. The friend mentioned that Nick, the boyfriend’s roommate, would be there and the woman responded by commenting on his attractiveness and her interest in getting to know him. The evening progressed with Nick and the woman talking, watching movies, and drinking either alcoholic or nonalcoholic drinks depending on the beverage condition. This initial portion of the story provided the background for the woman’s subsequent interaction with Nick.

The story then proceeded to describe the interactions that occurred between the participant and Nick, including kissing, touching, and other sexual activities. The story was paused 4 times to assess participants’ responses. The first—assessment of primary appraisals—occurred after the woman and Nick were alone in Nick’s room, and Nick kissed her on the cheek. The second—assessment of secondary appraisals concerned with having sex in general—occurred after the couple engaged in petting while partially clothed. At this point

the story mentioned that the woman was on the Pill; this was included to avoid having pregnancy risk be the main concern for using a condom. The third portion of the story depicted escalating passionate sexual acts until both the man and the woman were undressed, and the man could not find a condom. General sexual intentions were assessed at this point in the story. Finally the story ended with Nick suggesting that they engage in vaginal penetration without a condom. Participants' intentions to engage in unprotected sex were then assessed.

Story Beverage Manipulation—Participants were randomly assigned to a stimulus story where alcohol was present in the story ($n = 47$) or not present in the story ($n = 47$). In the *alcohol in story* condition, the female protagonist and male character were described as drinking 5 alcoholic beverages throughout their interactions. Additionally, behavioral cues in the story (eg, feeling buzzed) portrayed the female protagonist as feeling the effects of the alcohol. In the *no alcohol in story* condition, the female protagonist and male character were portrayed as drinking nonalcoholic beverages and not being intoxicated.

Measures

Primary Cognitive Appraisals: Sexual Potential—Primary cognitive appraisals were assessed after Nick first kissed the woman on the cheek but they had not yet proceeded to fondling or disrobing. These questions focused on the early expectations and desires of the woman and Nick to have sex. All responses were rated on 7-point Likert scales from 0 (*not at all*) to 6 (*extremely*). This measure was composed of 5 items ($M = 3.45$, $SD = 1.15$; Cronbach's $\alpha = .83$): How much does Nick want to have sex with you?; How much do you want to have sex with Nick even if you don't think it will actually happen?; How much does Nick expect to have sex with you?; How much do you expect to have sex with Nick?; and How likely are you to have sex with Nick in this situation?

Secondary Cognitive Appraisals: Impelling and Inhibiting Cognitions—These items were designed to assess women's evaluations of the pros and cons of having sex in the situation. The assessment occurred after both Nick and the woman had no clothes on their upper bodies, but it was not yet apparent that no condom was available. Participants responded to 20 impelling and 20 inhibiting statements. These items were developed in part from earlier focus groups with women recruited in the same way as in the present study.²⁷ All items were assessed on 7-point Likert scales from 0 (*I would not consider it at all*) to 6 (*I would consider it extremely*). Impelling cognitions focused on reasons for having sex, for instance: Having sex now would feel great. Inhibiting cognitions focused on reasons for not having sex, for example: I might have my feelings hurt. The means of impelling ($M = 2.15$, $SD = 0.69$) and inhibiting ($M = 2.46$, $SD = 0.80$) cognitions were calculated across items. Cronbach's alphas for both impelling and inhibiting cognitions were .91.

General Sexual Intentions: Sexual Encouragement and Sexual Discouragement—These items assessed women's likelihood of engaging in a range of sexually encouraging and discouraging behaviors. Sexual encouragement and discouragement intentions were assessed after the woman discovered no condom was available. Seven items assessed sexual encouragement intentions, such as: At this point in your encounter with Nick, how likely are you to let Nick know nonverbally that you want to keep going? ($M = 1.40$, $SD = 1.33$; Cronbach's $\alpha = .89$). Five items assessed sexual discouragement intentions, such as: At this point in your encounter with Nick, how likely are you to try to cool things down? ($M = 2.90$, $SD = 1.35$; Cronbach's $\alpha = .79$).

Intentions to Have Unprotected Sex—Two questions assessed the likelihood of having unprotected sex: At this point in your encounter with Nick, how likely are you to rub

your clitoris against Nick's penis without a condom? and How likely are you to allow Nick to put his penis inside your vagina without a condom? Likelihood of having unprotected sex was determined after Nick suggested having sex without a condom ($M = 2.51$, $SD = 2.16$; Cronbach's $\alpha = .84$). Responses were rated on 7-point scales from 0 (*definitely unlikely*) to 6 (*definitely likely*).

RESULTS

Preliminary Data Analyses

Manipulation Checks—Two questions, rated on 0–6 scales, assessed the realism of the experimental story: “How realistic was the story?” ($M = 4.59$, $SD = 1.23$); and “How well were you able to project yourself into the story?” ($M = 5.01$, $SD = 1.02$). Based on the means, it appeared that participants were able to relate well to the story context.

To ensure that women correctly understood the presence or absence of alcohol in the story, women were asked at the end of the story, “How many drinks containing alcohol did you have in the story?” Responses were rated on a 4-point scale ranging from 0 (no drinks) to 3 (5 or more drinks). A t test of number of drinks by story beverage condition was significant, $t(92) = -44.31$, $p < .001$; women in the no alcohol in story condition ($M = .00$, $SD = .00$) thought their character consumed fewer drinks than women in the alcohol in story condition ($M = 2.76$, $SD = .43$). Results indicated that all of the control subjects correctly identified that they had not consumed any alcoholic beverages in the story, and women with alcohol in the story all correctly identified that they had at least 3 alcoholic beverages in the story.

Bivariate Correlations

Bivariate correlations among the measured variables appear in Table 1. The presence of alcohol in the story was significantly associated with being more likely to see sexual potential in the situation and marginally related to more impelling cognitions to have sex before finding out there was no condom. The primary appraisals, secondary appraisals, general sexual behavior intentions, and unprotected sex intentions were all significantly related to one another in the expected direction.

Model Testing

Path analysis using *Mplus* statistical modeling software for Windows²⁸ with maximum likelihood estimation (ML estimator) was used to test the theoretical model (Figure 1). Path analysis, an extension of the regression model, is a correlation-based technique that establishes relationships among different levels of variables of interest within a sample. Based on the theoretical framework and correlational analyses, the following path model was tested: the outcome response of unprotected sexual intentions was regressed on the encouraging and discouraging sexual intentions. Encouraging and discouraging sexual intentions were regressed on the secondary appraisals. The secondary appraisals of impelling and inhibiting cognitions were regressed on the primary appraisal of sexual potential and alcohol in story. Finally, the primary appraisal of sexual potential was regressed on alcohol in the story. Correlations were estimated among encouraging sexual intentions and discouraging sexual intentions. Correlations were also estimated among the secondary appraisals of impelling cognitions and inhibiting cognitions.

The hypothesized model fit the data well, $\chi^2(8) = 7.885$, $p = .44$, comparative fit index (CFI) = 1.000, Tucker-Lewis Index (TLI) = 1.001, root mean square error of approximation (RMSEA) = .000, standardized root mean square residual (SRMR) = .031. The nonsignificant paths were fixed to zero in the final model (shown in Figure 2), which also fit the data well, $\chi^2(12) = 14.064$, $p = .30$, CFI = .992, TLI = .986, RMSEA = .043, SRMR = .

054. Chi-square difference testing comparing the hypothesized model to the final model indicated that the final model fit the data as well as the hypothesized model, $\Delta\chi^2(4) = 6.179$, $p = ns$. All of the paths that were free to vary in the final model remained significant. As shown in Figure 2, the only predicted paths that were not significant in the final model were the path between discouraging sexual behavior intentions and unprotected sex intentions and the path correlating the 2 secondary appraisals of impelling and inhibiting cognitions. The final model accounted for 44% of the variance in unprotected sex intention, 32% of the variance in sex encouraging intentions, 25% of the variance in sex discouraging intentions, 30% of the variance in impelling cognitions, 27% in inhibiting cognitions, and 15% of the variance in the primary appraisal of sexual potential.

Following procedures outlined by Bryan and colleagues,²⁹ a series of indirect effects of alcohol in the story on unprotected sex intentions was examined. We tested the specific indirect effects of alcohol in the story on unprotected sex intentions working through the primary appraisal and the encouraging sexual intentions, separately through the impelling and inhibiting secondary appraisals (see Table 2). Because the discouraging sexual intentions did not predict unprotected sexual intentions, this variable was not included in these tests. All specific and total indirect effects were significant.

COMMENT

The present study tested the application of the CMM developed by Norris et al¹² to underage college women's sexual decision making. In particular, we sought to expand previous work in this area by applying the CMM, with its focus on situational alcohol variables, to explicate the role of alcohol in the sexual decision-making processes of female underage drinkers. Our hypotheses were largely supported. As predicted, the presence of alcohol in the situation did not directly increase young women's intentions to engage in unprotected sex. Instead, alcohol's presence indirectly increased women's unprotected sex intentions through its effects on their cognitive appraisals of the situation and their initial sexual intentions. These findings both replicate and extend prior research in this area in a number of ways.

First, these findings replicate those of Norris et al¹⁴ in that alcohol influenced women's sexual decision making through its direct effect on their primary appraisals of the situation. In both the aforementioned and the current study, alcohol increased women's ratings of the amount of sexual potential in the situation. This finding is consistent with the notion that alcohol amplifies the level of sexuality in social situations.¹⁶ Unlike the Norris et al¹⁴ study, however, the current study did not involve actual alcohol consumption but only the description of alcohol consumption in the hypothetical sexual scenario. It thus appears that the presence of alcohol in the story triggered participants' alcohol expectancies regarding sexuality, a phenomenon that has been reported in prior research.^{23,30} The role of alcohol expectancies in sexual risk taking has received mixed support.^{14,17,20} The current study suggests that alcohol expectancies do not directly increase women's risky sexual intentions, but instead increase them indirectly through direct effects on women's primary appraisals of the situation as potentially "sexual."

Because alcohol consumption and sexual behavior are so commonly linked in Western society,¹⁶ alcohol often plays a prominent role in individuals' sexual scripts—narratives that function as guides for defining, organizing, and planning appropriate sexual behaviors.^{31,32} More specifically, research has demonstrated that expectations about alcohol's effects also play a role in sexual scripts involving risky sexual behaviors. For example, one study investigating sexual scripts involving "a stereotypic one night stand" found that almost 60% of college women spontaneously mentioned alcohol consumption in their scripting of this

event.³² Similarly, Parsons et al³¹ found that the presence of alcohol was quite common in sexual scripts and was often invoked as a way of explaining spontaneous and/or risky sexual behaviors. Scripting research also supports the idea that alcohol consumption typically occurs in the initial phases of a social situation,^{31,33} thereby starting a sequential decision-making process that can ultimately lead to risky sexual behavior. The current study supports this finding: Even though participants in this study were not intoxicated themselves, the mere presence of alcohol in the situation heightened their appraisals of the situation's sexual potential, culminating in greater unprotected sexual intentions. More research is needed to explicate the ways in which alcohol expectancies and alcohol-involved sexual scripts may influence young women's sexual decision-making processes.

Current findings also replicate and extend Norris et al's¹⁴ findings regarding the influence of primary cognitive appraisals on secondary cognitive appraisals. As expected, women who perceived greater sexual potential early in the situation endorsed greater impelling cognitions and lesser inhibiting cognitions regarding having sexual intercourse as the situation progressed. Thus, once a woman has assessed the situation as having at least some sexual potential, she then proceeds to weigh the pros and cons of engaging in sexual intercourse as the situation continues. Her initial appraisal of the situation influences this balance—the more sexual potential in the situation, the more likely the woman is to perceive greater benefits and lesser risks to actually engaging in intercourse. Women's initial appraisals of a situation's sexual potential, even fairly early in a sexual encounter, are thus both subject to the influence of alcohol and predictive of her later cognitive appraisals of the situation, rendering them a critical factor in women's risky sexual decisions.

Expanding upon previous findings, the current study demonstrated that for female underage drinkers, sexually impelling and inhibiting cognitions are a key component for predicting their sexual intentions in a situation. As expected, the more strongly women endorsed sexually impelling cognitions, the greater their endorsements of sexual encouragement intentions and the lesser their endorsement of sexual discouragement intentions. The opposite pattern was found for sexually inhibiting cognitions. Prior research has similarly found that individuals' perceptions of sexually impelling and inhibiting cues are a key predictor of their risky sex intentions.^{34,35} Such previous work has focused on the ways in which alcohol intoxication may focus individuals' attention on sexually impelling cues rather than sexually inhibiting cues due to the cognitive impairment effects of alcohol intoxication. The current study expands these previous findings in that it demonstrates that, even in the absence of actual intoxication, the mere presence of alcohol imbues a situation with greater sexual potential, thereby tipping the balance of sexual intercourse risk/benefit appraisals decidedly towards general intentions to pursue sexual intercourse.

Our findings lend credence to the idea that young women's sexual decision making is a multistage process, involving a variety of thoughts and behaviors that occur well before engagement in risky sexual behavior. This is noteworthy because the cognitive assessments and other sexual behaviors that occur prior to a woman's ultimate decision to engage in unprotected sex could prove to be targets amenable to prevention efforts. For example, women appear to weigh the pros and cons of having sexual intercourse in a given situation even before the discussion of condom use is initiated. This decisional balance could be an important point of intervention in which sexual risk reduction programs not only enhance perceptions of sexual risks, but also diminish perceptions of sexual benefits in situations where unprotected sex is the likely outcome.³⁴ Traveling further along the path model, those who more strongly endorse sexually impelling cognitions also endorse a greater likelihood of engaging in sexual encouragement (even though they know a condom is unavailable), which then predicts increased unprotected sex likelihood. Unexpectedly, sexual discouragement intentions did not predict women's intentions to engage in unprotected sex.

This pattern of findings illustrates that women's intermediary sexual behaviors, particularly those that encourage further sexual behavior despite condom unavailability, may be a particularly effective intervention target.

Limitations and Conclusions

The present study is one of few experimental investigations of the role of alcohol in underage female drinkers' sexual decision-making processes. Although an underage drinking sample is a strength of the current project, this study has limitations. For example, although a sizeable proportion of the sample reported being of racial or ethnic minority status, this representation (31%) was not enough to test for possible cultural influences on the dependent measures of interest. Similarly, these results were obtained with a sample of underage, single, heterosexual, female volunteers; thus, these results may not generalize to other populations, such as abstainers, heavier drinkers, partnered women, or women who would not participate in this type of research. Further research should investigate the application of the CMM to more diverse student populations.

Although our findings demonstrate that alcohol expectancies are a key component to understanding young women's risky sexual decisions, real-world situations invoke alcohol expectancies through the actual consumption of alcohol. The inability to administer alcohol to underage drinkers in the laboratory obviates assessment of the ways in which the state of acute intoxication might interact with expectations about alcohol's effects to influence the real-world sexual decisions of young women. Finally, another methodological limitation is the use of a sexual risk-taking analogue. Although this approach is necessary for the experimental investigation of risky sexual decision-making processes, it does somewhat limit the external validity of our findings. This type of method also relies upon the measurement of *intentions* to engage in sexual risk behavior rather than the behavior itself. Although cognitive biases may reduce our abilities to forecast our behavior or emotions accurately,³⁶ meta-analytic research reviews indicate that intentions are generally predictive of sexual risk behavior.³⁷ Further, the situation presented in the story was a specific one, and our findings may not generalize to other types of situations. That noted, participants reported finding the scenario very realistic and reported being able to place themselves into the story, thereby mitigating concerns about its relevance to college women's real-world sexual decision-making situations.

This research demonstrated that expectations about the sexual effects of alcohol directly influence underage college women's cognitive appraisals of, and expected behaviors in, a sexual situation with a new partner of unknown HIV/STI risk. Examining the model as a whole, the presence of alcohol consumption in a social situation heightens underage drinking women's perceptions of that situation's sexual potential. This heightened appraisal of sexual potential then guides their decisional progression towards unprotected sex by amplifying the perceived benefits of sexual intercourse while reducing the perceived risks, resulting in decreased likelihood of curtailing sexual behaviors, despite the known unavailability of a condom. These findings illustrate that although beliefs about alcohol's effects may steer young women towards risky sexual decisions, this process involves a multitude of cognitive appraisals and behavioral choices that precede the ultimate outcome of unprotected sex, each of which may potentially be amenable to sexual risk reduction intervention efforts. Our results suggest that prevention programs that address the role of alcohol in sexual risk situations may help guide young women towards making safer sexual decisions.

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FIGURE 1. Hypothesized path model

FIGURE 2. Final path model with standardized estimates. * $p < .05$; ** $p < .01$; * $p < .001$**

TABLE 1

Bivariate Correlations Among Variables ($N = 94$)

Variable	1	2	3	4	5	6	7
1. Alcohol in story	—	.39***	.19 ⁺	-.08	-.02	.02	.03
2. Primary appraisal: sexual potential		—	.54***	-.52***	.40***	-.30***	.22*
3. Secondary appraisal: impelling cognitions			—	-.39***	.52***	-.47***	.38***
4. Secondary appraisal: inhibiting cognitions				—	-.44***	.37***	-.34***
5. Sexual intentions after no condom: encouraging					—	-.80***	.67***
6. Sexual intentions after no condom: discouraging						—	-.47***
7. Unprotected sex intention after man suggests sex							—

Note.

⁺ $p < .10$

* $p < .05$

** $p < .01$

*** $p < .001$.

TABLE 2
Testing Total and Specific Indirect Effects of Alcohol in Story on Unprotected Sex Intentions

	<i>B</i>	<i>SE</i>	<i>β</i>	<i>Z</i> -score
Total effect of alcohol on unprotected sex	.407	.134	.095	3.027**
Effect of alcohol via impelling cognitions	.243	.094	.057	2.577*
Effect of alcohol via inhibiting cognitions	.164	.074	.038	2.207*

Note.

* $p < .05$

** $p < .01$.