The Role of Women's Alcohol Consumption in Managing Sexual Intimacy and Sexual Safety Motives[*]

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Abstract

Objective—Two studies, based on an alcohol myopia model, were designed to understand the role of women's alcohol consumption on vulnerability to sexual assault. We predicted that, in a high-conflict social situation, alcohol would make it more difficult to recognize sexual assault risk, lowering intentions to resist sexual advances.

Method—In Study 1, women ($N = 51$) were recruited in bars and classified as having a high (.06 or greater) breath alcohol concentration (BrAC) or low BrAC. They were asked to project themselves into a hypothetical scenario that portrayed interest in establishing an intimate relationship and included mild sexual aggression. In Study 2. women ($N = 101$) were randomly assigned to an alcohol (target BrAC: .08%), placebo, or no-alcohol condition. They responded at two time points to a similar hypothetical scenario that described mild sexual aggression (Time 1) and serious sexual aggression (Time 2).

Results—In Study 1, women with higher BrAC perceived less risk in the scenario and anticipated less resistance than women with low BrAC. In Study 2, similiar results were found but only following serious aggression. There were no placebo effects. Both studies suggest that effects of alcohol on resistance are partially mediated via risk perceptions.

Conclusions—Alcohol appears in reduce intentions to resist sexual advances from an acquaintance while increasing intentions to pursue relationship-enhancing behaviors. Effects are not completely explained by an alcohol myopia perspective. Differences in findings between the two studies may reflect differences in methodology, context, or sample.

An estimated 50% of sexual assaults among young adult populations involve alcohol use on the part of the victim, the perpetrator, or both (for reviews, see Abbey, 2002; Abbey et al., 2004; Testa and Parks, 1996). Sexual assaults perpetrated against an intoxicated woman are more likely to be completed (i.e., to result in sexual intercourse), compared with assaults perpetrated against sober women (for a review, see Ullman, 2003). Alcohol consumption may impair women's ability to recognize and avoid potential sexual assault and their ability to respond effectively to unwanted sexual advances. The current research was designed to examine the impact of women's alcohol consumption on risk perception and intended response to a hypothetical situation that juxtaposes desire for sexual intimacy with potential for sexual assault. By permitting manipulation of risk levels and control of extraneous variables, experimental analog methodology offers a promising means for examining potential mechanisms that may help explain the association between alcohol and sexual assault.

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Most sexual assaults are perpetrated by men known to the victims, with dating partners making up a large percentage of perpetrators (Koss, 1988). Many sexual assault incidents arise from situations involving consensual sexual activity (Harrington and Leitenberg, 1994; Testa and Livingston, 1999). Sexual assaults involving dating partners are important to study, because they are normative. Moreover, it is in such situations that alcohol may play a particularly important role. According to Norris et al. (1996), women "walk a cognitive tightrope" in socializing with men, as they seek to facilitate intimate relationships while maintaining personal safety. In social situations (e.g., bars and parties), women are more likely to focus on the dominant "good times" aspects of the situation. Contrary cognitions (e.g., danger cues) are presumed to be less salient and more difficult to access (Norris et al., 1996). Theories of alcohol-induced cognitive impairment (e.g., Steele and Southwick, 1985) offer a way of understanding how women's alcohol consumption can increase vulnerability to sexual assault in social situations. According to these models, in situations with both instigatory and inhibitory pressures on behavior, alcohol-related impairment is specific to inhibitory cues, which require more processing to access and understand relative to the more salient instigatory cues. Consider a woman who is conflicted about how to behave when faced with sexual advances from a man in whom she is interested. When sober, she may be able to access inhibitory cues that favor caution, but impaired processing of these cues after drinking may make her more likely to act to facilitate intimacy rather than to ensure her sexual safety.

Experimental research supports the notion that alcohol impairs the ability to detect risk in situations that offer potential positive consequences, thereby increasing intentions to engage in pleasurable but potentially risky activities (e.g., Fromme et al., 1997). Testa et al. (2000) examined the effect of women's alcohol consumption on their responses to a social situation involving a presumed conflict between intimacy and safety motives. Compared with sober women, women who consumed alcohol perceived that sexual approach behaviors would result in more positive outcomes and fewer negative outcomes and, not surprisingly, were more likely to anticipate engaging in those activities. In studies involving more explicit sexual aggression scenarios, alcohol consumption was associated with decreased ability to detect sexual aggression risk (Norris et al., 2003) and increased willingness to consent to sex (Norris et al., in press). Across several studies, Stoner et al. (2005) found that after consuming a high dose of alcohol, women anticipated engaging in less direct resistance and more polite resistance than women who had consumed a low dose, a placebo, or a nonalcoholic drink. Polite resistance strategies (e.g., making excuses) avoid harm to the relationship but are less effective than direct resistance strategies in stopping sexual advances (Muehlenhard et al., 1995).

To replicate and extend this research, we examined the impact of alcohol consumption on women's responses to a hypothetical scenario that described desire to facilitate an intimate relationship while providing cues suggestive of unwanted sexual advances. Steele and Southwick (1985) suggest that the risky behavior of intoxicated people reflects their difficulty in recognizing inhibiting cues or perceiving their meaning. Accordingly, we examined whether the relationship between intoxication and behavior is mediated via risk perceptions. We hypothesized that in a high-conflict situation, higher breath alcohol concentrations (BrACs) would be associated with lower perceived risk, which would predict less direct resistance to sexual advances and a greater tendency toward passive responding. We also assessed polite resistance but offered no hypothesis. Hypotheses were tested by means of a field experiment conducted in a bar. Experimental analog studies typically are conducted in an artificial environment, which may cause self-consciousness and unnatural behavior. In contrast, a bar is a natural setting for making decisions about pursuing sexual intimacy versus considering issues of safety (see MacDonald et al., 1996).

Study 1 Method

Participants

Participants in Study 1 were 51 female bar patrons, ages 20–38 (mean [SD] = 24.02 [3.17]) years, recruited in bars in Buffalo, NY. The sample was 96% white, and 96% identified themselves as heterosexual. Most (86%) of the women had at least some college education; 71% were employed full time, and 26% were employed part time.

Procedure

Two female experimenters approached women in bars, asking them to participate in a brief study of dating behaviors in exchange for a $5 gift certificate for food. Data were collected between 11:30 PM and 1:45 AM on two Saturday nights. Women who appeared to be intoxicated were not approached. The majority of those approached agreed to participate in the study, which took about 10 minutes. To minimize distraction, women were brought to a more secluded area of the bar. After providing written informed consent, they were asked to project themselves into a written scenario (available from the first author on request) as the female protagonist. The vignette described interest in initiating a relationship with an attractive man ("Michael"), consensual kissing, and, eventually, mild sexual aggression (breast fondling and forceful kissing despite the woman's hesitation). After completing questionnaires assessing perceived risk and intended resistance. BrAC was assessed with a handheld breath analyzer (Alco-Sensor; Intoximeters Inc., St. Louis, MO). Participants were debriefed, paid, and given guidelines for safe drinking as well as the phone number of a taxi company.

Dependent measures

Perceived risk in the scenario was assessed by asking how likely the situation is to result in four positive items (e.g., "another date with Michael") that were interspersed with six negative items (e.g., "concern for personal safety"). Response options ranged from 1 (not at all) to 7 (very likely). Principal components analysis revealed a single factor. Hence, items were averaged to form a composite risk-perceptions subscale with positively worded items reverse-scored so that higher scale values indicate greater perceived risk ($\alpha = .92$).

Intended direct, polite, and passive resistance were assessed using a series of items from Davis et al. (2004) and Norris et al. (in press) and six additional items, each rated on a scale of 1 (not at all likely to do) to 7 (very likely to do). The direct-resistance subscale consisted of the mean of five items (e.g., "Tell him clearly mid directly that I warn him to stop"; $\alpha = .96$). The polite-resistance subscale (eight items; $\alpha = .90$) included "Make an excuse as to why I don't want to have sex." Two items ($\alpha = .78$) assessed passivity: "Just go along with what he is doing," and "Nothing yet, just see what happens."

Study 1 Results

BrAC ranged from .00% to .15% (mean = .04 [.04]). Women were categorized as having a high BrAC ($n = 19$) if BrAC was at least .06% (.084 [.025]) and low ($n = 32$) if BrAC was less than .06% (.021 [.019]). This cut-off was chosen because cognitive impairment is commonly observed at BrAC of .06% or greater (Steele and Southwick, 1985), and it corresponds to the target BrAC of .06%–.08% used in experimental studies (e.g., Testa et al., 2000).

Risk perceptions and intended responses for high and low BrAC groups were compared using one-way analyses of variance (ANOVAs). As predicted, high-BrAC women, compared with low-BrAC women, perceived lower risk in the scenario (mean = 2.77 [1.33] vs 4.51 [1.48]; 13.85, 1/49 df, $p < .001$). They also reported lower means on measures of intentions to use direct resistance (2.01 [1.38] vs 5.61 [1.38]; $F = 80.94$, $p < .001$) and polite resistance (2.76

[1.60] vs 5.37 [.94]; $F = 53.93$, $p < .001$), and higher means on intentions to respond passively (4.32 [1.73] vs 1.94 [1.11]; $F = 35.73$, $p < .001$).

To examine whether risk perception mediates the relationship between BrAC and intended responses to sexual aggression, we performed path analysis using a series of hierarchical regressions (Figure 1). Standardized beta weights were used as estimates of the path coefficients. We controlled for demographic variables; however, because their effects were not significant, these paths are not depicted. There was a significant negative direct path from BrAC to direct resistance ($\beta = -.70$, $p < .001$). There were also significant paths from BrAC to perceived risk ($\beta = -.45$, $p < .001$) and from perceived risk to direct resistance ($\beta = .32$, $p < .01$). The path coefficient from BrAC to direct resistance was lowered from $\beta = -.70$ to $\beta = -.56$ ($p < .001$) when risk perception was entered into the equation. The Sobel test (Sobel, 1982) indicates a significant mediated effect of BrAC on anticipated resistance via risk perception ($z = 227$, $p < .02$). Similar path analyses revealed that alcohol was negatively associated with polite resistance and positively associated with passive responses, both directly and indirectly via risk perceptions.

Study 1 Discussion

Consumption of alcohol appeared to reduce women's intentions to resist sexual aggression, both directly and politely. Lower intentions to resist reflect, at least partially, lower perceived risk in the situation. Findings replicate and extend previous experimental research suggesting that alcohol impairs women's ability to recognize sexual assault risk cues (Norris et al., 2003; Testa et al., 2000). Results also are consistent with event-based studies showing that victim alcohol consumption is associated with decreased resistance (Abbey et al., 2002). Although we could not consider the effects of alcohol consumption on actual resistance, our results suggest that the lack of effective resistance after drinking may reflect lower appraisals of risk and lower intentions to resist, separate from any motor impairment.

The quasi-experimental design of Study 1 allowed us to take advantage of women's usual drinking environments and may have contributed to the large effect sizes observed in this study. The bar environment is associated with meeting members of the opposite gender; thus, it may be natural to respond to a dating questionnaire in that context. Women were not randomly assigned to that condition, however, and results may reflect effects of an unmeasured third variable. Women with high BrAC, for example, may have been more prone to risk taking in general or may have been particularly interested in meeting men, consuming alcohol as a way of facilitating interaction. We were limited in the amount of data that could be collected, because the study was conducted in bars; therefore, we cannot address these alternative explanations.

Study 2 Introduction

To eliminate ambiguity in the interpretation of findings, an experimental study was designed (Study 2) to assess the impact of administered alcohol on risk perceptions and behavioral intentions in a similar hypothetical situation, in which a woman's interest in a relationship was juxtaposed with unwanted sexual advances. Women were randomly assigned to beverage condition: alcohol (target BrAC: .08%), placebo, or no alcohol. In addition to assessing intended resistance behaviors, which presumably reflect concern for personal safety, we assessed intended sexual approach behaviors that presumably reflect desire to facilitate the relationship.

Study 1 provides evidence consistent with alcohol myopia theory; in Study 2, however we sought to test the theory's predictions explicitly. We presume that women experience response

conflict when their desire to pursue sexual intimacy is inhibited by concerns for sexual safety (Norris et al., 1996), and this is the situation that we sought to portray with our scenario. A more stringent test of Steele and Southwick's (1985) model would require that alcohol effects are observed in a high-conflict, but not in a low-conflict, situation. Supportive of alcohol myopia, Murphy et al. (1998) found that alcohol enhanced women's estimation of a man's relationship potential under conditions of high conflict (e.g, when he was described as attractive but sexually risky) but not under conditions of low conflict (e.g, unattractive sexually risky man or attractive, but not risky, man). Davis et al. (2004) found that alcohol increased women's intentions to consent to sexual advances in a high-conflict situation (serious advances from an intimate partner) but not in low-conflict situations (serious advances from a casual date).

In the current study, we attempted to manipulate response conflict. The mild aggression scenario used in Study 1 is presumed to depict a high-conflict situation, in that positive outcomes (e.g., romantic relationship) are presumed to be more salient than cues suggestive of sexual aggression. We extended the scenario by making the sexual advances increasingly aggressive, presumably lessening conflict by making the inhibitory danger cues more salient. Given the increased salience of danger cues, we hypothesized more direct resistance and less passive responding at Time 2 compared with Time 1. We tentatively predicted a decrease in polite resistance from Time 1 to Time 2, as women perceive that more direct strategies are necessary in light of more aggressive advances (Norris et al., in press). We hypothesized a main effect for alcohol across time, predicting that women who consumed alcohol, relative to those who did not, would rate Michael more positively, perceive less risk in the scenario, express stronger intentions to engage in sexual approach behaviors, and express weaker intentions to engage in direct resistance behaviors. Consistent with alcohol myopia theory, however, we expected that the effects of alcohol would be more pronounced at Time 1 (mild aggression, high conflict) than at Time 2 (serious aggression, low conflict).

We also examined whether the effects of alcohol on behavioral intentions are mediated via risk perceptions. As suggested by alcohol myopia theory and consistent with Study 1, we predicted that alcohol consumption would result in lower perceived risk and, consequently, in greater intentions toward sexual approach behaviors and lower intentions to resist. Risk perceptions are likely to be influenced by prior experiences and pre-existing characteristics as well. Women who have been sexually victimized, for example, may be more vulnerable to revictimization because of difficulty recognizing sexual assault risk (e.g., Breitenbecher, 2001). Although some studies have found support for this notion (Norris et al., 1999; Wilson et al., 1999), others have not (Breitenbecher, 1999; VanZile-Tamsen et al., 2005). In the current study, we considered the impact of prior victimization history on risk appraisal and intended responses to aggression as well as the potential impact of prior sexual experience, heavy drinking, impulsive sensation seeking, and sex-related alcohol expectancies.

Last, to examine whether the apparent effects of alcohol on risk perceptions and intended behavior are the result of alcohol expectancies, we included a placebo condition in which women were told they would be consuming alcohol but in actuality were not. A pattern of results in which placebo participants respond similarly to those in the alcohol condition would provide evidence for an expectancy effect. A pharmacological effect would be suggested, however, by the similarity between placebo and no-alcohol participants, coupled with riskier intended behavior by alcohol participants.

Study 2 Method

Participants

Female participants, 21–32 years of age, were recruited from among the 937 women who completed the "Women 2000" study (Testa et al., 2003), a three-wave longitudinal study of

alcohol, sexual behavior, and victimization. Women were potentially eligible if, at Wave 3, they reported drinking three or more drinks on occasion at least monthly, did not meet criteria for alcohol dependence, and were neither married nor pregnant. The resulting 197 women were screened by telephone. Of these, 51 were ineligible, primarily due to medical contraindications (e.g., use of medication), and 45 declined participation or could not be scheduled. The remaining 101 women were scheduled for an individual session held at the Research Institute. They were instructed to refrain from drinking alcohol or using drugs for 24 hours before the appointment and to avoid eating for 3 hours prior. They were informed that, because of the possibility that alcohol might be administered, the session could take up to 6 hours and transportation would be provided. Compensation was set at a minimum of $50 and was $100 if alcohol was consumed.

The average age for the sample was 24.79 [3.34] years. The majority (83.2%) was white, had completed at least some college (87.1%), and was employed full-time (59.4%) or part-time (29.7%). The average number of drinks consumed per drinking occasion in the past year was 2.33 (0.51). Almost half (47.6%), however, reported consuming five or more drinks per occasion at least once per month.

Stimulus vignette

A written vignette (available on request) was developed to depict (1) initial interest in "Michael" and a date ending with the woman inviting him in for coffee; (2) Michael caressing her breast and continuing to kiss her without consent (Time 1): and (3) Michael pinning her down and unzipping her jeans (Time 2). The first two sections (through Time 1) were virtually identical to the vignette used in Study 1.

Time 1 was intended to depict a high-conflict situation and Time 2 to depict a low-conflict situation. As a manipulation check, inhibition conflict and cue salience corresponding to the two parts of the scenario were assessed among a sample of female college students, with questions used by Davis et al. (2004). One subsample ($n = 77$) responded after reading the first part of the vignette (at Time 1) and again after reading the rest (Time 2). The repeated measures permitted within-subject comparison. An additional 77 women were randomly assigned to read only the first part of the vignette and respond at Time 1, and another 73 women read the entire vignette and responded at Time 2 only. Responses of these two groups were compared. To assess conflict, women were asked: "If you were in this situation, how difficult would it be to decide whether or not to continue engaging in sexual activity with Michael?" They responded on a 7-point scale that ranged from 1 (not at all difficult) to 7 (very difficult). Women who answered questions at both time points rated it more difficult to decide whether to continue at Time 1 (mean 3.10 [1.71]) compared with Time 2 (1.74 [1.12]; $t = 7.49$, 76 df, $p < .01$), suggesting greater conflict at Time 1. Findings were identical when women who responded at Time 1 only (3.04 [1.66]) were compared with women who responded at Time 2 only (2.30 [1.76]; $t = 2.64$, 148 df, $p < .01$). To assess cue salience, women were asked, "What part of the situation stands out most for you?" Responses ranged from 1 (romantic, attraction, possible relationship) to 7 (Michael coming on too strong, afraid he won't stop). As expected, within-subject comparison revealed higher salience of danger at Time 2 (mean = 6.18 [1.14]) than at Time 1 (4.84 [1.69]; $t = 7.56$, 76 df, $p < .001$). Between-subject comparison revealed the same pattern (5.66 [1.35] vs 4.96 [1.69]; $t = 7.75$, 148 df, $p < .01$).

Procedures

On arrival at the Research Institute, study procedures were explained by a female research assistant and written informed consent obtained. Women were weighed to determine the appropriate dose of alcohol. All were administered a urine-based pregnancy test and breath analyzer test to ensure that they were neither pregnant nor under the influence of alcohol.

Women were randomly assigned to one of three beverage conditions and brought into a lab that was furnished as a bar, with low lighting, music, and signs advertising alcoholic beverages. Drinks were prepared at the bar, in front of the participant, by a second female research assistant who had had no previous interaction with the participant. Women in the alcohol and placebo conditions were told, "You will be receiving some alcohol today. I will be serving you three to five glasses of vodka and tonic water. The amount of vodka you receive is based on your body weight." Women in the alcohol condition were given a 0.66 g/kg dose of ethanol administered using 80-proof vodka mixed with tonic in a 3.5:1 ratio. Standard procedures were used for placebo administration (e.g., Rohsenow and Marlatt, 1981). Women assigned to the no-alcohol condition were told they would receive no alcohol and were administered a comparable amount of tonic water. Subjects were given 20 minutes to consume their drinks.

After a 15-minute absorption period, pretask BrAC was assessed, using an Intoximeter 5000. Alcohol and placebo participants were shown a card indicating that their BrAC was .04%. Participants were then provided with the written vignette by the first research assistant (who remained blind to beverage condition) and asked to project themselves into the story as the female protagonist. They answered questions at three points in the vignette: after the introduction, after depiction of mild aggression (Time 1), and after serious aggression (Time 2).

Participants in the no-alcohol and placebo conditions were debriefed following completion of the questionnaires, paid, and sent home by taxi. Women who had consumed alcohol remained at the Institute until their BrAC dropped to .02%. They were provided with a comfortable room, videos, magazines, and a meal while they waited; they were then taken home by taxi.

Measures

Ratings of male character—After reading the introduction, describing attraction to the male character, participants rated him on eight 7-point Likert scales (e.g., cold-warm, insincere-sincere, and pleasant-unpleasant). They also rated their interest in establishing a relationship with Michael, ranging from 1 (not interested at all) to 7 (very interested). Because the nine items loaded on a single factor, negatively worded items were reverse scored and items averaged to yield a single measure of positive perceptions of the male character ($\alpha = .87$)

Risk perceptions and intended behaviors—At both Times 1 and 2, women completed a questionnaire assessing risk perceptions and intended behaviors. Item order was invariant for all participants and positive and negative items interspersed. As in Study 1, perceived risk was assessed by ratings of the likelihood the situation would result in six negative and four positive outcomes, using 7-point scales ranging from "not at all" to "very likely." Positively worded items were reverse scored and items averaged to form a composite measure of risk perception (Time 1: $\alpha = .90$; Time 2: $\alpha = .85$). Women also rated the likelihood of engaging in 11 sexual approach behaviors, ranging from "make arrangements to get together another time" to "have sexual intercourse with Michael," using 7-point scales ranging from "not at all likely" to "very likely." An average of these items had good internal consistency (Time 1: $\alpha = .92$; Time 2: $\alpha = .96$).

Resistance—Resistance items were derived from Davis et al. (2004) and Norris et al. (in press) and were similar to those used in Study 1. Items were averaged to form three subscales. Seven items assessed direct resistance, including "forcefully push him away" (Time 1: $\alpha = .89$; Time 2: $\alpha = .94$). Ten items assessed polite resistance, including "playfully push him away" (Time 1: $\alpha = .80$; Time 2: $\alpha = .87$). Three items assessed passivity, including "just go along with what he is doing even though I don't really want to" (Time 1: $\alpha = .69$; Time 2: $\alpha = .63$).

Individual difference measures—As part of the Women 2000 study (e.g., Testa et al., 2003), women were asked how many male sexual partners they had since menarche (Wave 1) and in the past year (Waves 2 and 3). As an estimate of sexual experience, we used a cumulative total of the number of sexual partners through Wave 3. At Wave 3, women were asked how frequently they consumed five or more drinks and how frequently they drank to intoxication in the past year, with responses ranging from 1 (never) to 6 (5 or more days per week). Responses to these two items were averaged to form an estimate of frequency of heavy drinking.

We assessed the extent to which women believe alcohol makes them vulnerable to sexual coercion using the 6-item sexual-vulnerability subscale of the Alcohol Expectancies regarding Sex, Aggression, and Sexual Vulnerability Questionnaire (Abbey et al., 1999). Items (e.g., "I am taken advantage of sexually") are rated on 4-point Likert scales that range from "strongly disagree" to "strongly agree" ($\alpha = .81$). Impulsive sensation seeking ($\alpha = .83$) consisted of eight items from the impulsivity subscale (e.g., "I am an impulsive person") and 11 items from the sensation-seeking subscale (e.g., "I'll try anything once") of the Zuckerman-Kuhlman Personality Questionnaire (Zuckerman et al., 1993).

At each wave, and at the end of the experiment, women were asked about experiences of sexual victimization since age 14, using a slightly modified version of the Sexual Experiences Survey (Koss et al., 1987; Testa et al., 2004). Women were assigned a score of zero if they reported no victimization at any time (64.4%); their score was 1 if unwanted contact or sexual coercion was the most serious type of victimization reported (19.8%), and their score was 2 if rape or attempted rape was the most serious type of victimization (15.8%).

Study 2 Results

BrAC and manipulation checks

Participants who consumed alcohol had a mean BrAC of .070% (.021%) just before they began reading the scenario; it was .078% (.013%) after completing the scenario and measures. All had a higher BrAC posttask compared with pretask; thus, all were on the ascending limb of the BrAC curve as they responded to the scenario. BrACs for women in the no-alcohol and placebo conditions were .00% both times. As expected, there was a significant main effect for beverage condition on perceived intoxication, assessed after completion of the study materials ($F = 106.12$, 2/98 df, $p < .001$). On a scale from 1 to 10, perceived intoxication was significantly higher among placebo participants (mean = 3.97 [1.78]) compared with those who received no alcohol (1.00 [0.00]) and highest among those who actually consumed alcohol (6.29 [1.81]). Using a 7-point scale, women rated the scenario as being very realistic (6.04 [1.00]). Ratings of realism did not differ by condition ($F = 0.01$, 2/98 df).

Beverage effects on ratings of male character

Contrary to our hypothesis, women who drank alcohol rated Michael less positively (mean = 5.61 [1.03]) than women in the no-alcohol condition (6.09 [0.64]); the placebo condition was not significantly different from either condition (5.93 [0.63]). Because of this unexpected finding, we controlled for initial ratings of the male character in subsequent analyses. Initial ratings of the man were not associated with any of the other dependent measures, however; therefore, means reported below are not adjusted for this covariate.

Repeated measures ANOVA: Time 1 and Time 2

Women completed the same questionnaire assessing risk perceptions, resistance, and approach behaviors following mild sexual aggression (Time 1) and more serious aggression (Time 2). Multivariate ANOVAs with one between-subjects factor (beverage condition) and one within-

subjects factor (time) were used to assess whether there were main effects for beverage and for time as well as a Beverage × Time interaction. As expected, there was a significant multivariate effect for time (F = 54.67, 5/94 df, p < .001). Participants appeared sensitive to the increasing aggression, reporting greater risk, greater intentions to engage in direct resistance, and lower intentions to engage in approach behaviors and polite resistance at Time 2 compared with Time 1 (univariate p's < .05). Passive resistance was not significantly lower at Time 2 (p = .21).

We predicted that, regardless of scenario risk level, women who consumed alcohol would perceive less risk and anticipate less resistance than sober women. There was a significant multivariate between-subjects effect, therefore, for beverage condition (F = 3.14, 10/188 df, p < .001). Significant univariate effects for beverage, in the expected direction, were observed for risk appraisals, polite resistance, and passive responding (p's < .05). The beverage effect for approach behaviors was marginal (p = .08) and nonsignificant for direct resistance (p = .46).

There was a significant multivariate Condition × Time effect (F = 3.68, 10/188 df, p < .001). Univariate tests revealed significant Condition × Time effects on approach, direct resistance, polite resistance, and passivity but not on risk perceptions. Means according to beverage condition and time are displayed in Table 1. The three beverage conditions did not differ on any of the dependent measures at Time 1 but did differ on all five measures at Time 2. This pattern of results was the opposite of our hypothesis, derived from alcohol myopia theory, that alcohol effects would be stronger following the high-conflict Time 1 scenario.

Tukey post hoc tests, used to probe the simple effects of beverage at Time 2, revealed that the alcohol condition differed significantly from placebo on all five measures. The no-alcohol condition did not differ significantly from either condition on three of the five measures. When the no-alcohol and placebo conditions are combined, however, they differ from the alcohol condition on all measures. Thus, findings are consistent with a pharmacological explanation of alcohol's effects.

Path analysis: Effects of risk perceptions on intended behavior

We hypothesized that alcohol would reduce perceived risk in the scenario, resulting in lower intentions to resist and greater intentions to engage in relationship-facilitating behaviors. Because beverage condition was associated with lower risk perceptions at Time 2 but not at Time 1, we examined the mediated effects of alcohol at Time 2. Because the placebo and no-alcohol groups did not differ from each other on any measures, the two groups were combined and beverage effects examined, using an alcohol versus no-alcohol contrast. We also considered the impact of demographic variables, history of sexual victimization, alcohol-sexual vulnerability expectancies, Expectancies × Alcohol interaction, frequency of heavy drinking, number of lifetime sexual partners, impulsive sensation seeking, and initial ratings of "Michael." None was associated with risk perceptions, direct resistance, or approach behaviors; therefore, these paths are not shown. As shown in Figure 2, alcohol consumption was negatively associated with Time 2 risk perceptions. Risk perceptions were positively associated with intentions to engage in direct resistance and negatively associated with intention to engage in sexual approach behaviors. There were significant direct effects of alcohol on both direct resistance (β = −.23, p < .05) and approach behaviors (β = .30, p < .01). The direct effect of alcohol on direct resistance was reduced to nonsignificance (β = −.09, p = .25) with the addition of risk perceptions, and the direct effect of alcohol on approach behaviors was reduced from .30 to .15 (p < .05). Sobel tests indicate significant mediation of alcohol's effects on direct resistance and approach behavior via risk appraisal (z = 2.17, p < .05 and z = 2.18, p < .05, respectively).

Path analysis also was used to explore the effects of alcohol and risk perceptions on polite resistance and passive responding. There were direct positive effects of alcohol on both polite resistance (β = .29, p < .01) and passive responses (β = .38, p < .001); however, neither effect was reduced by the inclusion of risk perceptions, suggesting direct effects of alcohol on these two variables. Although alcohol was negatively associated with polite resistance in Study 1, it was positively associated with polite resistance following the more serious Time 2 aggression. Interpreted in light of the lower direct resistance and greater passivity associated with alcohol consumption at Time 2, the positive association between alcohol and polite resistance following serious aggression suggests loss effective resistance after drinking.

General Discussion

Two studies provide evidence that alcohol consumption alters women's risk perceptions and behavioral intentions in a hypothetical situation pilling interest in a relationship against avoidance of unwanted sexual advances. Consistent with Stoner et al. (2005), alcohol consumption was associated with lower intentions to engage in direct resistance behaviors and greater intentions to behave passively in response to sexual advances from an acquaintance. Consistent with Testa et al. (2000), alcohol was associated with stronger intentions to engage in sexual approach behaviors that are likely to facilitate an intimate relationship but increase sexual vulnerability. Inclusion of a placebo condition in Study 2 provides evidence that alcohol's effects are pharmacological rather than expectancy based.

Identifying the mechanisms underlying alcohol's effects on sexual assault vulnerability is key to understanding the phenomenon and necessary for future prevention efforts. We proposed, consistent with theories of alcohol-induced cognitive impairment, that alcohol's effects on vulnerability-inducing behavior are the result of impaired risk perception. In support of this perspective, we found evidence in both studies that alcohol decreased perceived risk, which in turn decreased intentions to engage in direct resistance and increased intentions to engage in approach behaviors. Perceived risk strongly predicted behavioral intentions, although the link between alcohol and risk perception was modest in both studies. Moreover, risk perceptions only partially mediated the relationship between alcohol consumption and behavioral intentions.

Study 2 was designed to test explicitly predictions derived from alcohol myopia theory. We expected that alcohol's effects on risk perception and intended behavior would be more pronounced at Time 1, following subtle aggression cues, than at Time 2, when aggression is more salient and response conflict presumably is reduced. Instead, we found significant effects of alcohol only at Time 2. This contradicted both myopia-based predictions and Study 1 (which found a large alcohol effect with a scenario that ended at Time 1). Given the well-established link between intoxication and impairment of cognitive functioning (e.g., Giancola, 2000), it is premature to conclude on the basis of a single study that alcohol myopia plays no role in women's sexual decision making. Nonetheless, findings are puzzling and suggest that understanding of this complex social behavior may benefit from consideration of other mechanisms and perspectives.

The inconsistency of results between Study 1, conducted using quasi-experimental methodology in actual bars, and Study 2, conducted in a laboratory, may reflect differences in methodology, context, or sample. First, bar patrons with high BrACs may represent a particularly risk-prone group, whereas women in Study 2 were screened, in accordance with National Institute on Alcohol Abuse and Alcoholism ethical guidelines, to eliminate women who were alcohol dependent or taking psychoactive medication. Further, participants in Study 2 had participated in a longitudinal study that included assessment of sexual victimization experiences, possibly heightening their vigilance to risk cues. The setting itself may have

contributed to the failure to replicate in the lab the alcohol effects in response to mild aggression that we observed in the quasi-experimental study. In the actual bar, pharmacological effects of alcohol may have been enhanced by the context. Although Study 2 was conducted in a simulated bar, we could not recreate the mood or social atmosphere of a real bar nor could we simulate the motivations behind attending or socializing at a bar. Moreover, we followed standard alcohol administration procedures (i.e., weighing, pregnancy testing, and informed consent). This lengthy prologue to alcohol and task administration may have emphasized the artificial nature of the situation, primed participants to be serious and careful in approaching the scenario, and motivated them to overcome alcohol's anticipated effects. Participants in the lab may have been able to counter to some degree the pharmacological effects of alcohol that we believe were enhanced by the real bar setting. This notion is consistent with research showing that anticipated alcohol-related performance deficits can be overcome (e.g., Fillmore and Vogel-Sprott, 2000). Although many limitations are inherent and largely unavoidable in experimental alcohol administration studies, it is important to consider the unintended effects that standard procedures may have. Well-controlled alcohol administration studies may be underestimating the effects of alcohol relative to its effects in the real world.

Despite the strengths of experimental analog methodology, we acknowledge limitations in generalizability and external validity. Although consistent with field studies suggesting less effective resistance among intoxicated women (for a review, see Ullman, 2003), findings may not generalize to actual sexual aggression situations. Further, our study measured only behavioral intentions, whereas intoxicated women's physical ability to resist is likely to be compromised as well (e.g., Harrington and Leitenberg, 1994). Last, although we focused solely on the effects of alcohol on women's responses to sexual advances, alcohol is also an important determinant of men's behavior (Abbey, 2002). Male perpetrators ultimately are responsible for the occurrence of sexual aggression. It is important that women understand how their drinking may increase vulnerability. The ultimate goal, however, is that of preventing men from perpetrating sexual assault.

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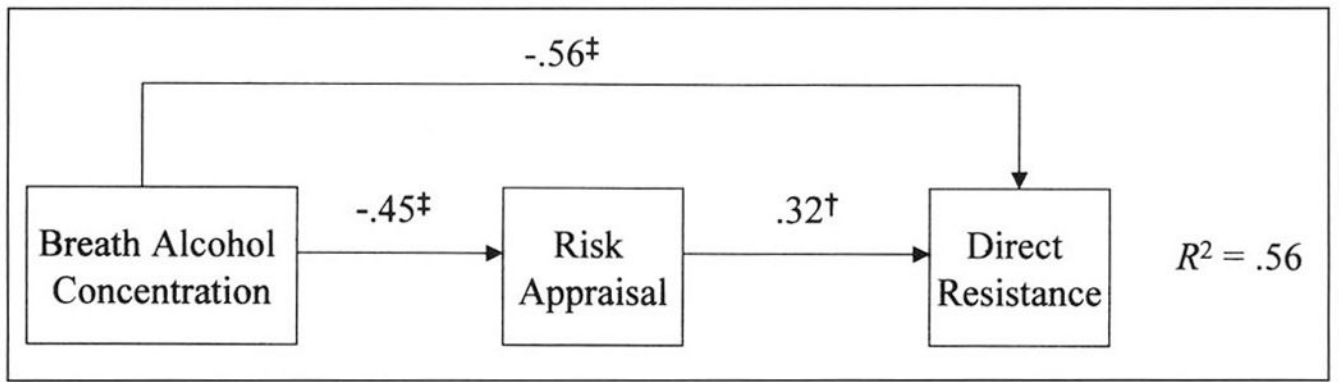
Figure 1.
Path model depicting the effects of breath alcohol concentration and risk perception on anticipated resistance: Study 1.
[†]$p < .01$; [‡]$p < .001$
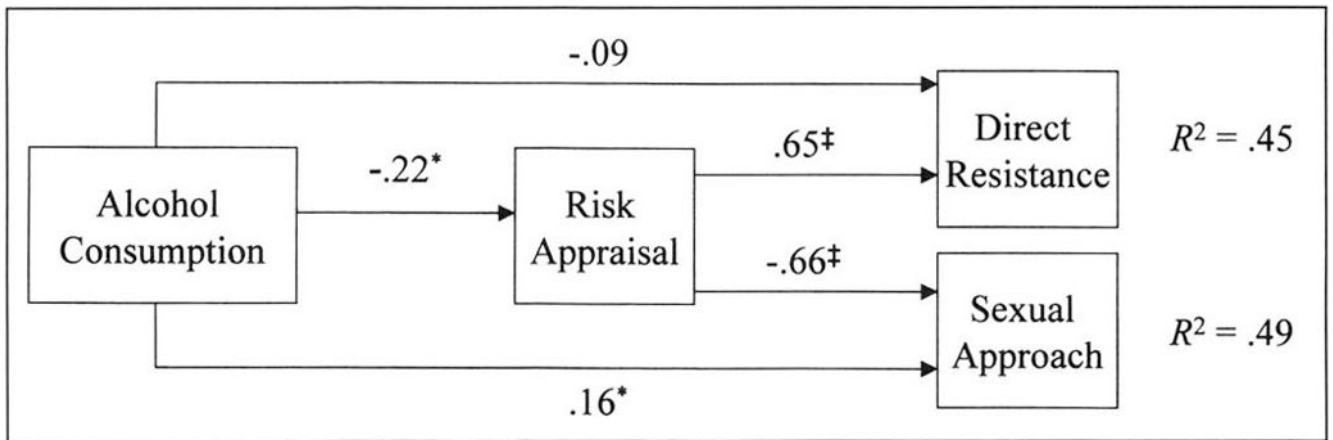
Figure 2.
Path model depicting the effects of alcohol and risk perception on anticipated resistance and sexual approach behaviors: Study 2. *$p < .05$; ‡$p < .001$.

Table 1

Perceived risk and intended behavior, by beverage condition and risk level (time)

Variable	Alcohol (*n* = 35) Mean (SD)	No Alcohol (*n* = 32) Mean (SD)	Placebo (*n* = 34) Mean (SD)
Risk appraisal			
Time 1	4.41 (1.28)	4.43 (1.08)	4.90 (0.97)
Time 2	5.46[a] (1.13)	5.74[a,b] (0.80)	6.04[b] (0.79)
Sexual approach behavior			
Time 1	3.85 (1.39)	3.63 (1.01)	3.54 (1.28)
Time 2	2.73[a] (1.67)	1.83[b] (0.93)	1.87[b] (1.37)
Direct resistance			
Time 1	3.87 (1.68)	3.58 (1.24)	3.73 (1.22)
Time 2	4.71[a] (1.89)	5.32[a,b] (1.53)	5.68[b] (1.35)
Polite resistance			
Time 1	4.98 (1.32)	4.84 (0.87)	4.84 (0.91)
Time 2	5.12[a] (1.25)	4.52[a,b] (1.46)	3.93[b] (1.62)
Passive resistance			
Time 1	1.95 (1.11)	1.72 (0.86)	1.55 (0.72)
Time 2	2.11[a] (1.14)	1.35[b] (0.62)	1.43[b] (0.70)

Note: Within a row, different superscripts indicate significant differences.