

# Inference under the influence: the impact of alcohol and inhibition conflict on women's sexual decision making

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## **Author abstract**

Integrating Zajonc's affective Primacy framework with Steele and Southwick's Inhibitory Conflict Model, we hypothesized that alcohol would have its strongest impact when one's initial affective reaction was in direct conflict with more cognitively based inhibitory cues. In an alcohol by expectancy balanced placebo design, women viewed potential partners from a fictitious video dating service who varied in attractiveness and sexual risk. Only under high inhibitory conflict (i.e., an attractive, sexually risky partner) did alcohol enhance perceived relationship potential. Interestingly, women who consumed alcohol were not less likely to notice risk cues than their sober counterparts. Alcohol expectancy resulted in both lower estimates of risk and elevated estimates of relationship potential for the high inhibitory conflict target. Thus, in situations involving high but not low inhibitory conflict, alcohol and alcohol expectancy may suppress the impact of inhibitory cues, enabling women to more readily pursue their initial affective reactions.

Unprotected sex between a man and a woman is responsible for three quarters of HIV cases worldwide (Centers for Disease Control, 1995). Despite widespread awareness of methods of transmission and risk factors associated with HIV, knowledge has not always translated into safer sexual practices, especially within the heterosexual population (Baldwin, Whiteley, & Baldwin, 1990). This lack of concordance between knowledge and behavior may be due to factors within the sexual context that are not typically taken into account. One such critical factor may be alcohol. An extensive literature links alcohol and sexual activity (see Crowe & George, 1989, for a review). For example, in a large heterosexual population, Bagnall, Plant, and Warwick (1990) found that individuals who frequently engaged in sex while drinking reported being only one seventh as less likely to consistently use condoms during vaginal intercourse. Furthermore, more than 50% of respondents in various heterosexual samples (Bagnall et al., 1990; Miller, Bettencourt, DeBro, & Hoffman, 1993) report that, in their experience, alcohol consumption and sexual behavior "go together."

The consumption of alcohol may radically alter both one's ability and one's motivation to process information regarding sexual risk. Consequently, individuals may be making sexual choices precisely when they are least likely to be rational decision makers. Sexual decision making may be most impaired by alcohol when desire conflicts with reason (e.g., wanting an attractive but sexually promiscuous partner). The present research draws on Steele and Southwick's Inhibition Conflict Model (1985) and Zajonc's primacy of affect framework (1980; Murphy & Zajonc, 1993) to examine this possibility.

The role alcohol plays--both pharmacologically and psychologically--in sexual risk taking is unclear (Cooper, 1992). If alcohol does increase risky sexual practices, how might it do so? Numerous studies attest to alcohol's ability to impair cognitive functioning by restricting the range of cues to which people can attend (Huntley, 1973; Moskowitz & DePry, 1968; Pernanen, 1976; Steele & Josephs, 1990); interfering with memory processes (Birnbaum, Johnson, Hartley, & Taylor, 1980; Rosen & Lee, 1976); decreasing one's ability to think abstractly (Tartar, Jones, Simpson, & Vega, 1971); and diminishing the capacity to consider future consequences for present actions (Washburne, 1956; Zeichner & Pihl, 1979). Importantly, alcohol consumption also lowers inhibitions about behavior, particularly sexual behavior (Crowe & George, 1989; Hull & Bond, 1986). Consequently, individuals who are drinking may be both less inhibited in engaging in risky sexual behaviors and less able to consider the consequences of their actions.

As a substance, alcohol impairs higher order cognitive processing, perhaps increasing the individual's reliance on more primitive brain structures (see LeDoux, 1986, 1987, 1995; Zola-Morgan, Squire, Alvarez-Royo, & Clower, 1991). As a result, instead of processing information in a more logic-based fashion that relies on a broad range of cues--including risk cues--the organism may respond with a more generalized affective response (e.g., approach versus avoidance). Conceptualizing emotion as playing a central role in the decision to engage in sex is consistent with an affective primacy perspective (Murphy & Zajonc, 1993; Zajonc, 1980, 1984). From this perspective, simple affective reactions to stimuli (such as good/bad or approach/avoid) can occur very early in the information-processing chain. According to Zajonc (1980), these early affective reactions are immediate, involuntary, and inescapable. They occur before and, therefore, can significantly influence subsequent cognitive processing and behavioral acts. If affect is primary and its power is enhanced by alcohol, then it follows that more cognitive considerations that typically keep behavior in check (such as concerns about contracting HIV) may be suppressed by alcohol.

This affective primacy framework is consistent with cognitive impairment models previously espoused by alcohol researchers (Hull, 1981). Steele and Southwick's Inhibitory Conflict Model (1985) suggests that alcohol impairs the information processing necessary to inhibit response impulses (e.g., the ability to foresee negative consequences of the response or to recall inhibiting standards). According to their model, "alcohol's impairment of perceptual and cognitive functioning--in particular, its narrowing of perception to more immediate cues and its weakening of abstracting cues and conceptual ability--allows the instigation of social responses but impairs their inhibition" (p. 19). As a result of alcohol consumption, then, an individual's actions will be instigated by fewer, more immediate cues (including external cues arising from drive states) and less subject to inhibitory cues that require additional information processing.

Steele and Southwick (1985) further contend that the degree to which alcohol will disinhibit behaviors is a function of the level of "inhibitory conflict." Inhibitory conflict occurs when "a response tendency instigated by one set of cues is opposed by a tendency to inhibit the response stemming from other cues that signal negative consequences of the response, or inhibiting standards of conflict" (p. 20). For example, meeting a good-looking but sexually risky stranger would represent one such high-conflict situation. When women have not been drinking, inhibitions (for example, the presence of high sexual risk cues) might dampen their desire to act on instigating cues. On the other hand, when women have been drinking, alcohol may interfere with the processing of the more cognitively based risk cues, leaving the individual free to pursue the initial positive affective response. This suggests that it is under conditions of high inhibitory conflict that alcohol will most dramatically impact judgments. Thus, we predict that when women are presented with a potential partner who is attractive but high in sexual risk, women who consume alcohol--compared to those who do not--will be more likely to envision a sexual relationship.

We would not expect this pattern in situations where the inhibitory cues are weak, and consequently, the level of inhibitory conflict is low. For example, when the target is highly attractive and low in sexual risk, there is no compelling reason not to pursue a relationship. Consequently, when women are presented with an attractive potential partner who is low in sexual risk, alcohol consumption should not affect the likelihood that they will envision a sexual relationship.

Inhibitory conflict is also low when instigating cues are weak (e.g., the target is unattractive). In this situation, the strength of the inhibitory cues (e.g., high or low risk) is irrelevant. Under conditions of low inhibitory conflict in which the instigating cues are weak, therefore, moderate amounts of alcohol should not significantly influence sexual decision making. Thus, we would expect that when women are presented with an unattractive potential partner, alcohol consumption will not affect the likelihood that they will envision a relationship.

Sexual disinhibition, however, may be the result of not only pharmacological factors but sociological and psychological factors as well. In fact, beliefs regarding the effect of alcohol on behavior are not universal but vary widely across cultures and across time within the same culture (MacAndrew & Edgerton, 1969). This suggests that "people learn about drunkenness what their society an integral component of sexual scenarios (Miller et al., 1993).

What role might the expectancy of alcohol play? Psychologically, alcohol expectancy may serve as an excuse to engage in pleasurable but illicit activities. As Marlatt and Rohsenow (1980) point out, "Later, whatever the eventual outcome, the drinker can absolve himself of responsibility for his actions by claiming that 'it wasn't my fault--I was drunk at the time'" (p. 190). In other words, alcohol, rather than the individual, becomes the locus of blame (Critchlow, 1983). Consequently, alcohol consumption may be used as a strategy --albeit not necessarily a conscious one--whereby individuals permit themselves to engage in risky but affectively positive behaviors, such as unsafe sex. If this is true, then we might predict that the mere belief that one is drinking would produce effects that mirror the pattern of results found under alcohol consumption. Alcohol expectancy, however, can produce results both similar to and diametrically opposed to the effects of alcohol consumption (Crowe & George, 1989; Hull & Bond, 1986). Therefore, although the research literature does not warrant making specific predictions regarding expectancy effects, it nevertheless does point to the need to disentangle those effects resulting from alcohol expectancy from those resulting from alcohol consumption. In an attempt to contrast these effects, the current research will employ a balanced placebo design crossing consumption by expectancy.

Moreover, it appears that the effects of alcohol consumption and expectancy vary by gender. Research consistently has shown, for example, that after consuming alcohol men's self-reported sexual arousal is positively correlated with physiological indicators of arousal, whereas for women this correlation is negative (see Crowe & George, 1989; Leigh, 1990; Wilson, 1981). Sex differences also have been documented with respect to alcohol expectancy. Although the expectancy of alcohol strongly influences men, expectancy effects are typically much weaker for women (Crowe & George, 1989; Wilson & Lawson, 1976a, 1976b). Despite evidence that significant gender differences exist, the vast majority of alcohol studies focus primarily on men. In reviewing the alcohol literature 25 years ago, Carpenter and Armenti (1971) noted that the gender imbalance was so pronounced that one might conclude that "only males drink and have sexual interests" (p. 521). Unfortunately, this sex ratio imbalance in alcohol research has improved only slightly in the intervening years. The relative shortage of studies that focus on the influence of alcohol on women's sexual decision making is particularly egregious given that 83% of women who have contracted HIV have contracted it through heterosexual sex, and women are currently one of the fastest growing segments of the AIDS epidemic (Centers for Disease Control, 1995); furthermore, by the year 2000, more women than men will be infected (Merson, 1992). In sum, women are precisely the group for whom alcohol and sex may prove a particularly deadly combination.

This is not to say that women have no control over their fate. Indeed, previous research suggests that women, through their verbal and nonverbal cues, control whether or not a relationship develops (see Schwartz, Patterson, & Steen, 1995). In other words, in heterosexual relationships, it is women who typically dictate the emotional and sexual pace of the relationship. Despite this "gatekeeping" role, relatively few studies focus on the influence of alcohol on women's sexual decision making.

In the present research, we investigate how alcohol and alcohol expectancy influence women's perceptions of potential dating partners. To do so, we examine women's preferences for potential romantic partners using a 2 (alcohol consumption: actual versus placebo) X 2 (alcohol expectancy: alcohol versus no alcohol) balanced placebo design with two additional within-subject factors (sexual risk of potential partner: high and low; target attractiveness: high and low). Drawing on both the Inhibitory Conflict Model (Steele & Southwick, 1985; see also Steele & Josephs, 1990) and an affective primacy framework (Zajonc, 1980), we predict that only when a woman's initial affective response is in conflict with more cognitively based risk cues will alcohol influence sexual

decision making. To the extent that alcohol is used as a strategy to engage in unsafe sexual behavior, the same pattern may emerge with regard to alcohol expectancy.

## METHOD

### Design

A 2 (alcohol consumption) X 2 (alcohol expectancy) X 2 (order) X 2 (target attractiveness level) X 2 (target risk level) mixed balanced placebo design was employed. Participants were randomly assigned to one of four between-subject conditions: (a) expect alcohol/receive alcohol, (b) expect no alcohol/receive alcohol, (c) expect alcohol/receive no alcohol, and (d) expect no alcohol/receive no alcohol. As noted previously, this design permits one to disentangle the pharmacological effects of alcohol (i.e., alcohol as a substance resulting in diminished cognitive reasoning capacity) from more psychological effects (i.e., alcohol as a strategy allowing individuals to engage in risky sexual behavior). To examine the role of order of presentation, targets were presented in two different orders.(1)

There were also two within-subject factors: target risk and target attractiveness. Thus, each participant viewed four videotaped introductions of potential male partners that varied on target attractiveness (high or low) and sexual risk (high or low). Each woman viewed one videotaped segment of a high-risk, high-attractiveness male, one of a low-risk, high-attractiveness male, one of a high-risk, low-attractiveness male, and one of a low-risk, low-attractiveness male.

### Participants

A total of 82 women were recruited through advertisements in a university newspaper as well as two local community newspapers. These advertisements sought female social drinkers between the ages of 21 and 30 for a study on dating relationships. When women responded to the advertisement they were screened over the telephone to ensure they met the following criteria: (a) they were currently single, (b) they fell within the target age range 21-30 (this somewhat restricted range was selected so that the stimulus materials, "potential dates" who themselves ranged in age from 24 to 32, would be considered reasonable for all participants), (c) they had no pre-existing health conditions that might be compromised by drinking alcohol (i.e., not on medication that contraindicates the consumption of alcohol; not pregnant), (d) they fell within the category of social drinker as indicated by the Michigan Alcohol Screening Test (MAST), excluding both nondrinkers and those who have a history of alcohol abuse, (e) they were willing to participate in a study that might involve the consumption of alcohol to simulate actual dating scenarios, and (f) they were willing to spend up to 4 hours in a laboratory until their blood alcohol level returned to .02 g/dl or below.

The screening survey eliminated approximately 70% of women who telephoned.(2) Those who met the aforementioned criteria were offered \$20 to participate and were scheduled for a 4-hour appointment during the first week following their menstrual cycle. The interviewers explained the necessity of scheduling the week following a participant's menstrual period because of hormonal variations that influence one's susceptibility to alcohol. This also served as a further safeguard against the inclusion of pregnant subjects.

### Independent Variables

## ALCOHOL MANIPULATION

A dose of 0.6 grams of ethanol per kilogram of body weight was prepared for participants in the alcohol present conditions. Although this alcohol dose is less than the 0.10 g/dl standard that defines legal intoxication in most states, it has nevertheless been shown to be sufficient to induce behavioral impairment and perceived intoxication in most participants (e.g., Abrams & Wilson, 1979). Pilot testing also indicated that these levels of alcohol consumption did not arouse suspicions among participants who did not expect alcohol but who nevertheless received alcohol.

## EXPECTANCY MANIPULATION

Participants in the alcohol expectancy conditions were told that their drinks would contain alcohol. Participants in the no alcohol expectancy conditions were told that their drinks would consist of nonalcoholic "mixer" beverages. Marlatt, Demming, and Reid (1973) previously demonstrated that a 1:5 mixture of vodka and tonic water cannot reliably be distinguished from tonic water alone. Pilot testing revealed that young women preferred the taste of lemon-lime soda to tonic water. Thus, each drink in the alcohol present conditions contained one part vodka to five parts lemon-lime soda. Three squirts of lime juice were added to all drinks in all conditions to further reduce taste acuity. In the expect no alcohol/receive no alcohol condition, participants received chilled lemon-lime soda and three squirts of lime juice. Participants in the expect alcohol/receive no alcohol condition received the same lemon-lime soda/lime juice mixture; however, 7 ml of vodka was floated on the surface of each drink to provide the illusion that the drink contained alcohol. In addition, the rim of each cup was rubbed with vodka.(3)

## WITHIN-SUBJECT FACTORS

As mentioned previously, all participants in the present research viewed four videotaped segments in which the male targets varied in terms of attractiveness and level of sexual risk. On the videotapes, the high-risk men suggested relatively risky first dates (e.g., going off to a remote cabin in the woods or staying out all night) and that they were sexually promiscuous (e.g., had been involved with numerous sexual partners in the past year). The low-risk men disclosed information consistent with lower sexual risk (e.g., had previously been involved in a long-term monogamous relationship or wanted to get to know someone before getting intimate) and suggested meeting in relatively safer settings (e.g., go to a museum followed by lunch or meeting in a coffeehouse).

To provide an initial assessment of the effectiveness of our attractiveness and risk cues, a small pilot study of 20 college-age women was conducted. These women rated a number of video segments of potential targets in terms of how "good looking" they thought the target was and the extent to which they thought he "slept around" on 10-point Likert-type scales. Of the final four segments chosen for the experimental study, the two attractive targets were rated as equally attractive,  $t(19) = .89$ , and significantly more "good looking" than the unattractive targets,  $M = 6.37$  for the high attractive and  $3.1$  for the low attractive,  $t(19) = .001$ . Similarly, the two high-risk targets were perceived as equally risky,  $t(19) = .76$ , but

significantly more like to sleep around than the two low-risk targets,  $M_s = 8.6$  and  $3.23$ , respectively,  $t(19) = 28.87$ ,  $p$  [is less than]  $.001$ . These initial assessments of attractiveness and risk were replicated within the experiment itself.

## Procedure

Participants were asked not to consume any drugs (including alcohol) for 12 hours prior to their appointment and not to consume any food or beverages other than water for 4 hours prior to their appointment. All experimental sessions began in the early afternoon to avoid any confound resulting from the time of day.

Upon arrival at the lab, the investigator checked each participant's driver's license to ensure that she was within the required age limits. Each participant was asked whether she met the fasting and no drug requirements. If so, she was weighed so that drinks could be prepared to a dose of 0.6 g vodka per kilogram of body weight. Next, each participant read and signed a consent form stating that she would be assigned either to a condition in which an alcoholic beverage would be consumed or to a condition in which a nonalcoholic beverage would be served. The consent form also detailed the experimental procedures and informed each participant that she would be required to remain at the lab until her blood alcohol level returned to normal.

The primary assistant had each participant fill out a series of personality measures not relevant to the current research prior to the participant ingesting any alcohol. While participants completed these items, a second assistant (who served as a "bartender") randomly assigned each participant to one of the four experimental conditions and then prepared the appropriate alcoholic or nonalcoholic mixture based on the precise weight of the individual. Because the "bartender" prepared the alcohol/tonic mixture and handed it to the participant, the primary assistant responsible for interacting with the participant was blind as to whether a given participant actually received alcohol.

The primary assistant had each participant, after filling out the questionnaire, gargle for 30 secs with 1 ounce of nonalcoholic mouthwash, indicating that this was necessary to obtain consistent estimates from the Breathalyzer. Although this is true, the mouthwash rinse also played a critical role in further reducing the ability to discriminate between the presence or absence of alcohol in the drinks. Next, baseline blood alcohol level (BAL) was assessed by the "bartender" using an AlcoSensor IV Breath Alcohol Tester.

To manipulate alcohol expectancy, the "bartender" then gave each participant a form specifying whether or not her drinks contained alcohol. The "bartender" then handed the participant her first drink and asked her to finish it within 10 minutes. After finishing the first drink, each participant waited 5 minutes and then received a second drink. After completing the second drink, all participants waited for a 20-minute absorption period. To distract attention away from the alcohol manipulation during this absorption period, each participant watched the same videotaped television show (a comedy that did not deal with any of the constructs under consideration). After the 20-minute absorption period, the blood alcohol level (BAL) of each participant was assessed by the "bartender". This reading was performed outside the view of each participant, ensuring that she remained unaware of her true condition.

Each participant was then informed that she would watch four videotaped segments from a video dating service. While viewing a segment, each approximately 40 seconds in length, every participant was instructed to think about whether the person on screen was attractive to her and whether he might be someone she would consider dating. After viewing each of the four videotape segments, each participant completed a brief questionnaire regarding the man featured. This questionnaire first assessed perceptions of the man's attractiveness using two separate scales (How good looking is the person you just viewed?, How attracted are you to the person you just viewed?) that ranged from 1 to 10. Next, each participant indicated the sort of relationship she could see herself having with this person (responses ranged from no relationship to a sexual relationship).

To assess women's perceptions of the male target's risk, each participant was then asked to watch all four tapes a second time. After viewing each tape for a second time, each participant rated how "risky" the man seemed (Does this person seem like someone who has slept around a lot? Do you think he is the type of person who would force the issue if you said you did not want to have sex? How receptive do you think this person would be to wearing a condom during sex?) on 10-point Likert-type scales. These items were placed at the end of the experimental session to avoid priming the risk dimension.(4)

## BETWEEN-SUBJECT MANIPULATION CHECKS

As a manipulation check of expectancy, each participant in all conditions was asked to guess whether the beverages that she had consumed were alcoholic or nonalcoholic. Each then estimated how much, if any, alcohol she believed she had consumed and specified what, if any, effect the alcohol had on her.

Finally, each individual in the no alcohol conditions was debriefed, paid, and thanked for her participation. Each woman in the alcohol conditions was offered snacks and given magazines to read while waiting for her blood alcohol level to return to normal. After her BAL had returned to 0.02 g/dl or lower, each was thanked, paid for her efforts, and fully debriefed as to the true purpose of this study.

## RESULTS

### Manipulation Checks

#### ALCOHOL CONSUMPTION

Women who received alcohol had significantly higher blood alcohol levels ( $M = .054$  g/dl) than women who had not received alcohol ( $M = 0.00$  g/dl),  $F(1, 78) = 904.86$ ,  $p$  [is less than]  $.001$ .<sup>(5)</sup> Within the receive alcohol condition, BALs for women who did not expect to get alcohol ( $M = .052$  g/dl) did not differ significantly from those women who expected alcohol ( $M = .056$  g/dl),  $F(1, 78) = 2.66$ ,  $p = .17$ . Thus, alcohol consumption was successfully manipulated in this study.

#### ALCOHOL EXPECTANCY

To assess the effectiveness of the alcohol expectancy manipulation, participants were asked to indicate the number of drinks they believed that they had received. There was a main effect for alcohol expectancy,  $F(1, 78) = 47.77$ ,  $p$  [is less than]  $.001$ , such that those who expected alcohol ( $M = 2.19$ ) differed significantly from those who did not expect alcohol ( $M = .33$ ).

### Dependent Measures

To operationalize the constructs of interest in the present research, two composite variables were formed. The first construct, assessment of relationship potential, was measured by two items--each participant's estimate of the type of the relationship she envisioned having with this person (ranging from no relationship at all to a sexual relationship) and the participant's assessment on a scale from 1 to 10 of the likelihood of the target being interested in a long-term relationship ( $[\text{Alpha}] = .83$ ).<sup>(6)</sup> The second construct, dealing with the more cognitive judgments of sexual risk, consisted of responses to the following items: "Does this person seem like someone who has slept around a lot?," "Do you think he is the type of person who would force the issue if you said you did not want to have sex?," and "How receptive do you think this person would be to wearing a condom during sex?" ( $[\text{Alpha}] = .69$ ). For comparability, each of these dependent variables was recoded such that values ranged from 1, indicating minimal amount, to 10, indicating a maximum amount.

### Overview

The complete experimental design included three between-subject factors (alcohol consumption, alcohol

expectancy, and order) and two within-subject factors (target attractiveness and target risk). An overall 2 X 2 X 2 X 2 X 2 repeated measures analysis of variance revealed no significant effects for the order in which the target males were presented in any analyses performed. Therefore, data were collapsed across order in all subsequent analyses, leaving two between- and two within-subject factors. Moreover, there were no significant main effects for either alcohol consumption or alcohol expectancy on participants' assessments of sexual risk.(7) Likewise, for relationship potential, there was not a statistically significant main effect of alcohol expectancy, although the effect for alcohol consumption was marginally significant.(8) Furthermore, this overall analysis revealed no significant interactions between alcohol consumption and alcohol expectancy. This pattern of results is consistent with the hypotheses currently under investigation, namely, that women's assessments of relationship potential and risk may vary as a function of the attractiveness and sexual risk of the target. These hypotheses are examined below.

## PLANNED COMPARISONS

Our hypotheses specified differential effects for alcohol consumption and perhaps even alcohol expectancy depending on the attractiveness and sexual risk of the target male. Therefore, we began by examining each target separately. Because our analyses are by target, attractiveness and risk are held constant, with only the two between-subject factors of alcohol consumption and expectancy varying. These analyses were performed for both of the primary dependent variables--relationship potential and sexual risk.

We subsequently compared judgments of relationship potential and sexual risk across the four targets who produced differing degrees of inhibitory conflict because of their unique combination of sexual risk (high or low) and attractiveness (high or low). For these analyses, an additional within-subject factor was added (either attractiveness or risk as appropriate) to the between-subject factors of consumption and expectancy. The results of all these analyses are reported in the text and figures that follow.

## ASSESSMENTS OF RELATIONSHIP POTENTIAL

Alcohol consumption. The first hypothesis involves a comparison between the alcohol and no alcohol conditions for women under high inhibitory conflict. We hypothesized that when women are presented with a potential partner who is attractive but sexually risky, women who consume alcohol--compared to those who do not--will be more likely to envision a sexual relationship. To examine this, a 2 (alcohol consumption) X 2 (alcohol expectancy) analysis of variance was performed examining women's judgments of the high inhibitory conflict target. Supporting our first hypothesis, there was a significant main effect such that women who had consumed alcohol were far more likely to envision a relationship with the high-inhibition conflict target ( $M = 4.48$ ) than were women who had not consumed alcohol ( $M = 3.18$ ),  $F(1, 80) = 11.50$ ,  $p = .001$ . This comparison and all other possible comparisons are shown in Figure 1, with means that are significantly different from one another at  $p$  [is less than] .05 indicated.

[Figure 1 ILLUSTRATION OMITTED]

We did not expect to see a similar pattern for alcohol, however, under low inhibitory conflict. One situation in which inhibitory conflict is low is when a potential partner is attractive and has minimal risk cues. This condition subsequently will be referred to as low inhibitory conflict 1 (LCI 1). As predicted, alcohol had no effect on women's propensity to envision a relationship with this low inhibitory conflict partner,  $M_s = 6.63$  and  $6.87$ ,  $F(1, 80) = .53$ , ns.

A similar pattern emerged when instigating cues were weak (e.g., when targets were low in attractiveness). As indicated in Figure 1, alcohol had no effect on women's judgments regarding men's relationship potential either when the unattractive target was low in risk,  $M_s = 4.90$  and  $4.54$ ,  $F(1, 80) = 1.31$ , ns (LIC 2), or high in risk,  $M_s = 3.19$  and  $3.21$ ,  $F(1, 80) = .003$ , ns, (LIC 3). Thus, for unattractive men, the strength of inhibitory cues (e.g., high or low risk) were irrelevant in predicting the role of alcohol on decision making. Under all conditions of low inhibitory conflict, therefore, moderate amounts of alcohol did not significantly influence sexual decision making. Thus, this set of findings supports our hypotheses.

Does alcohol completely reduce the role of risk cues in women's sexual decision making? One way to address this question is through a direct comparison of the two potential dates who produce relatively strong instigating cues (men who were highly attractive) but who differ in inhibitory risk cues (i.e., HIC versus LIC 1). To examine this, a  $2 \times 2 \times 2$  repeated measures analysis of variance was performed on women's estimates of the relationship potential for these two attractive targets with 2 levels of alcohol, 2 levels of expectancy, and 2 levels of the within subject factor of risk.

For men who are highly attractive, there was a significant main effect for alcohol on relationship potential,  $F(1, 78) = 9.32$ ,  $p = .003$ . This effect was driven, however, by the high-risk target, resulting in a significant alcohol X risk interaction,  $F(1, 78) = 4.17$ ,  $P = .04$ . This supports our prediction that alcohol affects judgments only under inhibitory conflict. For attractive men, there also was an overall main effect for risk,  $F(1, 78) = 126.08$ ,  $p = .001$ , such that the attractive but risky man--even under alcohol conditions--was not viewed as having as much relationship potential as the attractive but low-risk target. Thus, alcohol--at least in moderate doses--did not totally eliminate the role of risk in women's judgments of a man's relationship potential.

The role of inhibitory conflict (high versus low) also can be examined by comparing women's judgments of two targets who differ in the strength of instigating but not inhibitory cues (HIC versus LIC 3). When inhibitory cues (e.g., sexual risk) are strong, alcohol should affect women's judgments only of men who are also high in instigating cues (e.g., attractiveness). To examine this, a  $2 \times 2 \times 2$  analysis of variance was performed with 2 levels of alcohol, 2 levels of expectancy, and 2 levels of attractiveness, with risk of the target held constant (high risk). For these high-risk men, there were significant main effects for alcohol,  $F(1, 78) = 6.63$ ,  $p = .01$ , and for attractiveness,  $F(1, 78) = 5.60$ ,  $p = .02$ . These results, however, are somewhat misleading. Planned comparisons, collapsing across expectancy, reveal that the effect of alcohol was significant only for the high inhibitory conflict situation (high attractive/high-risk target) as indicated in the significant alcohol X attractiveness interaction,  $F(1, 78) = 5.83$ ,  $p = .02$  shown in Figure 1. No other effects were statistically significant among the high-risk targets.

There is one additional high versus low inhibitory conflict comparison, between the high-risk, high-attractiveness target (HIC) and the low-risk, low-attractiveness target (LIC 2). Once again, there was a significant main effect for alcohol,  $F(1, 78) = 3.83$ ,  $p = .05$ ; however, because alcohol affected judgments only under high inhibitory conflict, there was a significant alcohol by target interaction,  $F(1, 78) = 10.62$ . As Figure 1 indicates, in comparing judgments of relationship potential for the high-attractiveness, high-risk target (HIC) and for the low-risk, low-attractiveness target (LIC 2), only one of the four cells differed from the others. Under alcohol conditions, women viewed the high-attractiveness, high-risk target as having significantly more relationship potential.

Alcohol expectancy. Would the mere belief that one has been drinking be sufficient to produce shifts in judgments similar to those found for actual consumption? To examine this, we return to the  $2$  (alcohol consumption) X  $2$  (alcohol expectancy) analysis of variance reported previously, now focusing on the effects for alcohol expectancy. As revealed in Figure 2, women who thought they had consumed alcohol were more likely to envision a relationship with the high inhibition conflict target ( $M = 4.12$ ) than women in the no expectancy condition ( $M = 3.55$ ), although this effect was only marginally significant,  $F(1, 80) = 2.68$ ,  $p = .10$ . Interestingly, a

significant difference did emerge on judgments of the low-risk, low-attractiveness male (LIC 2) as a function of alcohol expectancy. Women who believed they were intoxicated rated this target significantly lower in relationship potential than those who believed they were sober,  $M_s = 4.42$  and  $5.03$ ,  $F(1, 80) = 3.74$ ,  $p = .05$ . This pattern 1 in which alcohol expectancy increases the relationship potential of the high-risk, high-attractiveness target while at the same time decreasing that of the low-risk, low-attractiveness target suggests that the expectancy of alcohol may facilitate our initial affective reactions--both positive and negative.

[Figure 2 ILLUSTRATION OMITTED]

Taken together, these findings suggests that it is under high but not low inhibitory conflict that alcohol, and to a lesser extent alcohol expectancy, affects judgments regarding a man's relationship potential. When the man is attractive but risky, inhibitory cues operate to reduce women's perceptions of his relationship potential. Under alcohol, however, the role of inhibitory cues is significantly suppressed--although not eliminated--allowing women to view a risky but attractive man as having much more relationship potential. Alcohol expectancy mimics, although more weakly, alcohol consumption in that it seems to increase the relationship potential of the high inhibitory conflict target. Alcohol expectancy, however, also enables women to act on their initial negative affective reaction and reject the unattractive "nice guy."

## ASSESSMENTS OF SEXUAL RISK

Alcohol consumption. Is it the case that women ignore risk cues when drinking? Or, alternatively, is it that these cues, although noticed, have less impact on sexual decision making? And does this vary under low and high inhibitory conflict? To address these questions, we examined how women's risk assessments differed under alcohol versus no alcohol conditions for each of the target men. As indicated in Figure 3, there were no significant differences for alcohol consumption on perceptions of risk. In other words, women who were drinking were just as likely to notice risk cues as their nondrinking counterparts.

[Figure 3 ILLUSTRATION OMITTED]

Alcohol expectancy. With regard to alcohol expectancy, an interesting effect emerged. As evident in Figure 4, women who believed that they had ingested alcohol rated the high inhibition conflict target (high attractive/high risk) as significantly less risky than their counterparts in the no expectancy conditions,  $M_s = 7.1$  and  $6.48$ ,  $F(1, 80) = 3.12$ ,  $p = .05$ . There were no significant effects of expectancy on ratings of the three low inhibitory conflict targets.

[Figure 4 ILLUSTRATION OMITTED]

## DISCUSSION

### Alcohol Consumption: Alcohol as a Substance

Drawing on both an affective primacy framework (Murphy & Zajonc, 1983; Zajonc, 1980) and Steele and Southwick's Inhibitory Conflict Model (Steele & Southwick, 1985; see also Steele & Josephs, 1990), it was predicted that alcohol would influence sexual decision making only when a woman's initial affective response was in conflict with more cognitively based risk cues. Our data revealed that when presented with a situation high in inhibitory conflict, namely the possibility of becoming sexually involved with an attractive but sexually risky man, women who were drinking were significantly more likely to foresee a sexual relationship. Under conditions

of low inhibitory conflict--the potential partner was either attractive and low risk or unattractive--alcohol appeared to have little impact on the decision to pursue a relationship. Thus, although risk-related inhibitory cues appear to dampen women's desire to act on instigating cues (pursue an attractive man), under high inhibitory conflict, alcohol weakens these restraints.

How might alcohol have influenced the processing of inhibitory risk cues? This question is related to a distinction made by Steele and Josephs (1990), who argue that alcohol can prevent the individual from responding to cues in one of two ways. Intoxication might consistently restrict the range of cues one can perceive in a given situation. This does not seem to be the case in the present research because, as demonstrated in Figure 3, participants who consumed alcohol were not significantly less likely to notice risk cues. Rather, the current findings seem more consistent with the second possibility: Alcohol consumption may have a particularly detrimental impact on one's ability to appropriately weigh inhibitory cues when making decisions.

Steele and Josephs use the term "alcohol myopia" to describe "a state of shortsightedness in which superficially understood, immediate aspects of experience have a disproportionate influence on behavior and emotion, a state in which we see the tree, albeit more dimly, but miss the forest altogether" (p. 923). Alcohol myopia "allows the influence of salient provoking cues but reduces the influence of inhibiting cues and meanings which may require further processing to access" (p. 923). Consistent with an affective primacy framework (Zajonc, 1980), the current research suggests that these "more immediate cues" may tend to be affective in nature, giving rise to gross positive and negative responses, whereas the inhibitory cues tend to be more cognitive. If this is the case, alcohol myopia may not be simply a random inability to process and integrate more cognitively based inhibitory cues. Rather, under alcohol, the primary affective response may partially determine the impact of inhibitory cues (e.g., high sexual risk) particularly when desire and common sense conflict. It is important to note, however, that even under conditions of high inhibitory conflict, alcohol reduced, but did not totally eliminate, the role of inhibitory risk cues in women's judgments of a man's relationship potential.

#### Alcohol Expectancy: Alcohol as a Strategy

Previous research has shown that "drunken behavior" is a result not only of the actual pharmacological effects of alcohol but also of a drinker's expectations about the effects of alcohol (Goldman, Brown, & Christiansen, 1987; Hull & Bond, 1986). Numerous studies have demonstrated that the mere belief that one has consumed alcohol lowers sexual inhibitions and enhances sexual arousal (Crowe & George, 1989; Hull & Bond, 1986; Lang, 1985; Wilson & Lawson, 1976a). For example, Wilson and Lawson (1976b; also Lang, 1985) found that women who were led to believe that they consumed alcohol self-reported stronger sexual arousal than women who were told that they had not consumed alcohol. If alcohol is used as a strategy whereby individuals allow themselves to engage in pleasurable but socially unsanctioned behavior, then we might expect the mere belief that one is drinking to produce a pattern of results similar to that found under actual alcohol consumption.

Alcohol expectancy resulted in a slight but nonsignificant increase in women's assessments of relationship potential for the attractive but sexually risky target. Thus, in the high-conflict situation, it appears that alcohol expectancy tends to mimic (albeit less strongly) the effects of alcohol consumption. Interestingly, women who thought they had consumed alcohol also gave significantly lower estimates of the relationship for the low-attractiveness and low-risk target. These results suggest that expectancy may allow the individual to not only follow her initial positive affective reactions but her initial negative reactions. In other words, the ability to "blame the booze" for one's behavior may lead to more candid assessments of both what women want and what they do not.

The expectancy of alcohol also interacted with more cognitive considerations of sexual risk. Women who

believed that they had consumed alcohol rated the attractive but sexually risky man as being less risky and were more likely to envision a relationship. What could account for this effect? Perhaps the participants in the present study were operating under the heuristic that alcohol impairs judgments (MacAndrew & Edgerton, 1969) and attempted to compensate for this loss of accuracy by making less extreme judgments. In that event, however, we would expect more conservative judgments across all targets. This was not the case. Only in the high inhibitory conflict situation did the expectancy of alcohol result in a lower estimate of sexual risk. This suggests that the expectancy of alcohol may serve as an excuse to ignore obvious warning signals that, if heeded, might threaten one's subsequent sexual gratification.

#### Additional Considerations and Potential Limitations

Although for present purposes we have discussed the effects of alcohol consumption and alcohol expectancy separately, they typically do not exist in isolation. Rarely do we believe that we have been drinking when, in fact, we have not. Consequently, the pharmacological and psychological effects of alcohol are apt to co-occur and reinforce one another, resulting in potentially more extreme judgments.

In interpreting these results, it is also important to remember that both alcohol consumption and alcohol expectancy have been shown to interact with the characteristics of the individual (Cooper, 1992). Consider for a moment the issue of gender. In a study of male drinkers, Wilson and Lawson (1976b) found that alcohol had no effect on sexual arousal whereas expectancy of alcohol caused a significant increase in arousal, regardless of actual alcohol content. In a replication using females, the effects of alcohol expectancy were considerably weaker. Clearly, individual level factors such as gender, sex guilt (Mosher, 1966), or self-esteem could significantly alter the pattern of results reported here. As Cooper (1992) points out, "the key to understanding alcohol's effects on sexual risk behavior lies in understanding what a given behavior signifies or means to an individual" (p. 70).

Moreover, it is important to note that this study involved perceptions of videotaped targets in a laboratory setting. The extent to which these results would generalize to actual romantic prospects is unclear. As Leigh (1990) noted, it is a substantial step from psychological measures to overt sexual behaviors. Furthermore, for ethical reasons the current research used a relatively low blood alcohol level that may also limit the generalizability of these findings. Crowe and George (1989) found that alcohol tends to disinhibit psychological sexual arousal at lower doses and suppress physiological arousal at higher doses. They also point out that disinhibition can be the result of both pharmacological (cognitive impairment) and psychological effects (socially learned expectancies) and that expectancies and impairment can disinhibit either jointly or separately. Finally, one must keep in mind that although the effects of alcohol expectancy and alcohol consumption can be differentially examined by virtue of a balanced-placebo design, in real life they typically covary.

#### GENERAL CONCLUSIONS

In the present research, it was hypothesized that alcohol would have its strongest impact on decisions in which one's initial affective reaction (e.g., sexual desire) was in direct conflict with inhibitory cues (e.g., sexual risk). This was indeed the case. Women in the alcohol consumption conditions, when faced with a situation of high inhibitory conflict--an attractive but sexually risky partner--appeared to give substantially less weight to the inhibitory risk cues when considering whether to pursue a sexual relationship. Interestingly, women who consumed alcohol were no less likely to notice risk cues than their more sober counterparts. Moreover, alcohol did not appear to influence decisions in which inhibitory conflict was low. When the target was either attractive and low in sexual risk or unattractive, there were no differences in judgments between the alcohol and no alcohol conditions. Finally, target risk interacted with alcohol expectancy such that women who expected to receive

alcohol rated the attractive but risky target as being significantly less risky and as having somewhat enhanced relationship potential. Alcohol expectancy did not influence judgments of risk for the low inhibitory conflict targets. These results support the intriguing possibility that when people have been drinking, the restraining forces of reason may weaken and yield under the pressure of their desires.

## NOTES

(1.) The two orders were as follows: Order 1 (high risk/high attractive, low risk/low attractive, low risk/high attractive, high risk/high attractive) and Order 2 (high risk/low attractive, low risk/high attractive, low risk/low attractive, high risk/high attractive). Subsequent analyses revealed no significant order effects.

(2.) Approximately 65%-70% of those who failed to pass the screener scored too high on the MAST. Two of the most common reasons for exclusion were that potential participants drank too much (e.g., 8-9 drinks a setting) or too often (e.g., 4-5 times a week). Of the remaining 25%-35%, exclusion was based on one or more of the following: they were currently in a committed relationship, they could not participate the week following their period, and/or they were the wrong age group. Those who passed the screener were randomly assigned to one of the four experimental conditions. A subsequent analysis of actual participants revealed no significant differences in terms of typical alcohol consumption between experimental conditions.

(3.) In pilot testing, participants could not distinguish between drinks that contained alcohol and drinks that were nonalcoholic ( $N = 12$ ).

(4.) At the end, subjects also filled out Maibach and Flora's (1993) AIDS Self-Efficacy Questionnaire. Results of these analyses are reported elsewhere (Monahan, Murphy, & Miller, in press).

(5.) Blood alcohol level (BAL) was assessed at four points during this study. The first assessment, the baseline measure, was taken prior to receiving alcohol to ensure that women had not consumed alcohol before beginning the study. The final three BAL readings were taken every 10 minutes throughout the study. For the manipulation check, we report the third BAL reading, which was not significantly different from the second or fourth reading.

(6.) Because it was assumed that alcohol might impair cognitive functioning, the degree of internal consistency reported in the text was computed on participants in the no alcohol condition.

(7.) Mean judgments of sexual risk also did not vary as a function of alcohol consumption,  $M = 4.95$  for those who received alcohol and  $M = 4.87$  for those who did not receive alcohol,  $F(1, 78) = .25$ ,  $p = .62$ , or as a function of expectancy,  $M = 4.87$  for those who expected alcohol and  $M = 4.96$  for those who did not,  $F(1, 78) = .28$ ,  $p = .45$ . Nor, was the interaction of consumption by expectancy statistically significant,  $F(1, 78) = .45$ ,  $p = .50$ .

(8.) Alcohol consumption produced a marginally significant difference in mean judgments of relationship potential,  $M = 4.78$  for those who received alcohol and  $M = 4.48$  for those who did not receive alcohol,  $F(1, 78) = 3.12$ ,  $p = .08$ . No significant difference was revealed for alcohol expectancy,  $M = 4.62$  for those who expected alcohol and  $M = 4.64$  for those who did not,  $F(1, 78) = .02$ ,  $p = .88$ . Nor was the interaction of consumption by expectancy statistically significant,  $F(1, 78) = .135$ ,  $p = .25$ .

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