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Alcohol, Sexual Arousal, and Intentions to Use Condoms in Young Men: Applying Alcohol Myopia Theory to Risky Sexual Behavior

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Data from 7 studies were aggregated to examine how reported sexual arousal and alcohol intoxication interact to affect attitudes and intentions toward engaging in unprotected sexual intercourse in college-age men ($N = 358$). When participants were in a sober or placebo condition, their self-reports of sexual arousal had no effect on their responses. When participants were intoxicated, however, those who felt sexually aroused reported more favorable attitudes, thoughts, and intentions toward having unprotected sex than did those who did not feel aroused. These findings support alcohol myopia theory (C. M. Steele & R. A. Josephs, 1990), which states that alcohol intoxication restricts attentional capacity so that people are highly influenced by the most salient cues in their environment. It is suggested that sexual arousal is a powerful internal cue that interacts with alcohol intoxication to enhance attitudes and intentions toward risky sexual behaviors.

Key words: alcohol, attitudes, condom use, intentions, sexual arousal

Many social programs have funded public health campaigns designed to educate people about the dangers of risky health-related behaviors, such as having sex without a condom. To some extent, these "safe sex" campaigns promoting condom use have successfully increased public awareness of the dangers of risky sexual behavior. Unfortunately, statistics show that despite these efforts, the incidence of sexually transmitted diseases (STDs), including AIDS, continues to grow at an alarming rate, particularly among adolescents and young adults: Recent estimates report that half of the newly infected HIV cases occur in the 15–24 age group (World Health Organization, 1998).

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Past research has shown that alcohol is associated with the decision to engage in risky behaviors (for a review, see Leigh & Stall, 1993). In experimental studies, we have demonstrated that alcohol intoxication causes people to hold more favorable attitudes and intentions toward sexual intercourse without a condom (T. K. MacDonald, Fong, Zanna, & Martineau, 2000; T. K. MacDonald, Zanna, & Fong, 1996, 1998; see also Gordon & Carey, 1996). We have tested two competing theories on the psychosocial consequences of alcohol intoxication that might explain the effects of alcohol on the decision to engage in risky behaviors: disinhibition theory versus alcohol myopia theory.

There is a popular assumption that alcohol acts as a general disinhibitor (Critchlow, 1986), sometimes acting as a social lubricant, causing people to be more outgoing, and sometimes acting as a source of antisocial behavior. How can alcohol cause a person to become the life of a party in some situations and aggressive in others? To resolve this discrepancy, Steele and his colleagues formulated the *alcohol myopia theory* (Steele, Critchlow, & Liu, 1985; Steele & Josephs, 1990; Steele & Southwick, 1985), which postulates that alcohol does not act a general disinhibitor; rather, alcohol causes a restriction in attentional capacity, such that intoxicated people no longer have the requisite processing skills to attend to all of the information in their environment. Instead, they are likely to focus on the aspects of their environment that are most salient, or immediate.

When one is deciding whether to engage in a risky health behavior (e.g., having unprotected sexual intercourse), both impelling cues and inhibiting cues are usually present. Impelling cues are those that emphasize the benefits of risky behaviors, whereas inhibiting cues are those that emphasize the costs of risky behaviors. A sober person possesses the requisite attentional capacity to weigh both types of cues. An intoxicated person, however, cannot attend to all of the cues in the environment and is likely to focus

on either the impelling or the inhibiting cues in a situation. When impelling cues are more immediate and vivid than inhibiting cues, alcohol myopia theory suggests that an intoxicated person will focus on impelling cues in the situation, and doing so might prevent this person from accessing relevant inhibiting cues. We maintain that in many situations, the impelling cues associated with risky behaviors (e.g., being sexually aroused) are more immediate than the inhibiting cues (e.g., the possibility of contracting an STD), and so alcohol intoxication causes people to engage in risky behaviors, even when these behaviors contradict their baseline (i.e., sober) attitudes and intentions.

In the present research, our goal was to examine whether an internal cue—reported sexual arousal—can act as a powerful impelling cue that will moderate the relationship between alcohol intoxication and intentions to engage in unprotected sex. Specifically, we hypothesized that sober and intoxicated participants not experiencing sexual arousal would report equally negative attitudes and intentions toward engaging in unprotected sex; that is, when sexual arousal was not a persuasive impelling cue, all participants should have been able to access inhibiting cues associated with this risky behavior. In contrast, we also hypothesized that intoxicated participants experiencing sexual arousal would report more positive attitudes and intentions toward having unprotected sex than would sober participants. The restriction of attentional capacity that is associated with alcohol would cause intoxicated participants to focus on their feelings of sexual arousal, at the expense of attending to relevant inhibiting cues. Sober participants, however, would not experience restriction in attentional capacity and would thus be able to attend to competing cues (i.e., acknowledge feelings of sexual arousal as well as access inhibiting cues associated with having unprotected sex).

Thus, we expected that alcohol would have a greater impact on attitudes and intentions toward unprotected sex when individuals were sexually aroused. There are two forms that this interaction might take, depending on the relative strength of impelling and inhibiting cues present. In the strongest form, the interaction would be such that when individuals are not aroused, there should be no difference between sober and intoxicated individuals, whereas when aroused, intoxicated individuals should be more likely than sober individuals to report intentions to have unprotected sex. In a weaker form, the interaction would be such that when individuals are not aroused, intoxicated individuals should be more likely than sober individuals to report intentions to have unprotected sex, and this difference should be exacerbated when participants are aroused. This may occur when impelling cues other than sexual arousal are present. In our research, participants viewed a video containing impelling and inhibiting cues. Thus, the balance of cues was expected to be fairly equal when participants were not aroused, and so we expected the strong form of the interaction (i.e., alcohol will not affect participants' attitudes and intentions when they are not sexually aroused).

Murphy, Monahan, and Miller (1998) found evidence consistent with alcohol myopia theory. They examined female participants' ratings of male targets as potential relationship and sexual partners. Sober and intoxicated women viewed four male targets who varied in attractiveness and sexual risk. Intoxicated women rated the male targets as having more relationship potential than did sober women only when positive affective cues conflicted with negative cognitive cues (i.e., an attractive but sexually risky target). Presumably, the intoxicated women could not simultaneously attend to conflicting cues and focused on the salient affective information, thereby failing to attend to the relevant risk information. Although conceptually related, our research differs in that we examined different independent (participants' reports of sexual arousal) and dependent (intentions to have unprotected sex) variables.

The present research also differs in many respects from other research assessing the relationship between alcohol and sexual arousal. Several researchers have investigated whether alcohol intoxication increases or decreases sexual arousal. There are many different factors that affect the direction and magnitude of this relationship, including gender, blood alcohol level, and expectancy (for reviews, see Crowe & George, 1989; Lang, 1985). We focus not on whether alcohol intoxication causes a change in sexual arousal but on how alcohol intoxication and reported sexual arousal interact to cause changes in intentions toward engaging in unprotected sex.

Method

Overview

We conducted seven separate studies in which we varied two factors: alcohol condition (sober, placebo, and intoxicated) and cue condition (impelling and inhibiting cues).[1] Over these seven studies, cue condition had no reliable effect on the dependent measures, so we collapsed across cue condition, leaving alcohol condition as the manipulated independent variable.

One of the dependent measures was an item asking participants to report how sexually aroused they felt ("I found the situation presented in this video to be sexually arousing"). For this investigation, we divided participants into two groups based on a median split on the reported arousal variable (median score = 3.0 on a 9-point rating scale, in which a score of 9 indicated high arousal). Participants scoring at or below the median were classified as low arousal (n = 172, mean arousal score = 1.94, SD = 0.79) and those scoring above the median were classified as high arousal (n = 186, mean arousal score = 6.01, SD = 1.34). Thus, the design of our study was a 3 × 2 factorial design, crossing an experimentally manipulated variable (alcohol condition: sober, placebo, or intoxicated) with a nonexperimentally manipulated variable (reported arousal level: high or low).

Participants

Overall, 358 men were selected for participation. We selected men from introductory psychology classes on the basis of their responses to a mass testing questionnaire administered at the beginning of the term. In each

[1] We manipulated cue condition using a variety of methodologies. In each of these studies, we attempted to provide subtle impelling and inhibiting cues to the participants, for our goals were to provide cues that influenced intoxicated participants' statements but were not so strong or obvious as to result in a main effect of cue condition due to demand characteristics. For example, in two of the studies, a confederate made either impelling statements (e.g., "Wow, she's really hot") or inhibiting statements (e.g., "Too bad she smokes") while watching the video. In many of these studies, the cue manipulation was too subtle, and thus cue condition had no effect on participants' responses. For example, in the two confederate studies, the participants did not attend to what the confederate was saying, as evidenced by the fact that few could recall what he had said when questioned during a manipulation check. Therefore, aggregating across all seven studies, there are no reliable effects for cue condition.

study, we selected men (because of the potential negative health consequences of consuming alcohol while pregnant, we chose not to administer alcohol to women) who were of legal drinking age (18 in Alberta, 19 in Ontario), were sexually active, and were not in an exclusive dating relationship of more than 2 years. Importantly, we also selected men who reported that they used condoms regularly (i.e., we selected those who scored at 5 or above on a 9-point rating scale assessing condom use with endpoints labeled 1 [*never*] and 9 [*always*]). Participants who were assigned to the sober condition were given course credit and paid $5. Participants who were assigned to either the placebo or intoxicated conditions were given course credit and paid $10. The sober condition lasted approximately 30 min, whereas the placebo and alcohol conditions lasted at least 90 min. Therefore, participants in the latter two conditions were paid more money for the extra time spent in the laboratory.

Procedure

Participants were invited to the laboratory in groups of 3. Each group was randomly assigned to a sober (n = 128), placebo (n = 98), or intoxicated (n = 132) condition. Participants in the sober condition completed consent forms and then were brought into separate rooms where they watched a video that was designed for our research. In this video, two students named Mike and Rebecca meet after a class, go out on a date to a campus pub, and then go back to Rebecca's apartment. At Rebecca's apartment, they begin to kiss on the couch and continue to make out until Mike awkwardly discloses that he did not bring any condoms. Rebecca states that she also does not have condoms but is taking birth control pills. The two characters appear embarrassed but discuss whether it is possible to obtain a condom (they decide that this is not feasible) and discuss their sexual history (Mike states that he is "clean" and Rebecca states that she does not "sleep around"). It is important to note that we intentionally built impelling cues into this video: For example, the woman who plays the character of Rebecca is very attractive and discloses that she is on the pill (thus alleviating the threat of causing an unwanted pregnancy) and clearly indicates that she is interested in having sexual intercourse (thus alleviating the threat of a potential date rape situation). At the end of the video, Mike asks Rebecca, "What do you want to do?" Rebecca responds, "I don't know. What do you want to do?" The video ends with a freeze frame, and participants completed the dependent measures while viewing the freeze frame.

Participants in the placebo condition were led to believe that they were consuming three alcoholic beverages before viewing the video. Participants were weighed, and the experimenter calculated the amount of alcohol necessary to reach a blood alcohol level (BAL) of 0.080%. The experimenter mixed "alcohol" (in reality, it was flattened tonic water poured into an alcohol bottle) and soft drinks within view of the participants. The experimenter surreptitiously dipped the rim of each glass in alcohol, so that as the participants brought the glasses to their lips, the top rim was close to their nose and smelled of alcohol. In addition, the experimenter put 1 tablespoon of alcohol (participants were told that it was lemon juice) on the top of each drink. Because alcohol is less dense than the mix, it floats on top of the drink, so that the first sip that participants took had a strong taste of alcohol. This procedure was convincing to participants; as a manipulation check, participants were asked to estimate their BAL, and the mean estimation was 0.052% (SD = .031). Participants were given three drinks, spaced 20 min apart and were then taken to separate rooms where they watched the video and completed the dependent measures. After completing the measures, the participants were breathalyzed, and in all cases their BAL was .000% or .001% (i.e., the 3 tablespoons of alcohol over the course of an hour did not cause the participants to be intoxicated).

Participants in the intoxicated condition did consume three alcoholic beverages, spaced 20 min apart. Participants were weighed, and the experimenter calculated how much alcohol they would need to reach a BAL of 0.080%. The drinks were mixed using a 1:2 alcohol to soft drink ratio. After consuming the three beverages, participants were taken to separate rooms, where they watched the video and completed the dependent measures. After completing the dependent measures, participants were breathalyzed (mean BAL = 0.075%, SD = .015).

Measures

Intentions. The first item on the questionnaire assessed participants' intentions to engage in sexual intercourse without a condom if they were in the situation presented in the video. This item was worded as follows: "If I were in this situation, I would engage in sexual intercourse with Rebecca." Participants responded to this item on a 9-point rating scale, with endpoints labeled 1 (*very unlikely*) and 9 (*very likely*).

Thought listing. Immediately after the intentions item, participants were asked to list up to eight thoughts or factors that influenced their decision whether to have sexual intercourse with Rebecca. Participants were provided with eight boxes in which they could list their thoughts. On average, participants listed 4.42 thoughts (SD = 1.83). The number of thoughts that participants listed was not influenced by intoxication condition or reported level of arousal. The first author and a research assistant read the thought listings and developed a coding scheme that would reflect the wide variety of statements listed by participants. Two other research assistants were trained as coders. The coders independently rated each thought listed on two dimensions: valence and content. After the coders had rated the open-ended data, the first author checked to ensure that there was adequate intercoder reliability. When there were discrepancies in the coding, those discrepancies were resolved through discussion between the two coders.

The valence dimension had two codes: impelling or inhibiting. A statement was classified as impelling if it described a reason to have sexual intercourse (e.g., "Rebecca is on the pill"). A statement was classified as inhibiting if it described a reason not to have sexual intercourse (e.g., "Rebecca might have a disease"). The two coders agreed on 1,521 of 1,582 (Cohen's κ = .91) of the classifications for the valence dimension.

The content dimension had ten codes. *Alternatives* statements referred to alternative choices (or lack thereof) for the situation. *Willingness* statements addressed Rebecca's willingness to have sexual intercourse in the situation. *Risk* statements were those indicating that sexual intercourse would be either risky or not risky. *Attractiveness* statements included any comments about the physical attractiveness of Rebecca. *Past experience* statements were those pertaining to the participants' prior behavior in similar situations. *Future* statements reflected comments about potential future outcomes of having unprotected sexual intercourse. *Arousal* statements included specific references to sexual arousal. *Intoxication* statements included specific references to alcohol. *Personal rules* included references to general rules of conduct. Finally, *dating or religious reasons* pertained to dating status or religious convictions. In some cases, the statements could potentially be classified as more than one code (e.g., "I wouldn't get aroused if I was drunk" could potentially be classified as arousal or intoxication). In these cases, the coders were instructed to deduce the main point of the statement and select the appropriate code (i.e., each statement received one code only). For the content code, there was also a miscellaneous code that was used if the statement did not reflect any of the content codes (e.g., "she lives alone"). The two coders agreed on 1,327 of 1,582 (Cohen's κ = .77) of the classifications for the content dimension. An example of an impelling and an inhibiting statement for each content code, as well as the number of impelling and inhibiting statements listed for each content code are shown in Table 1.

Justifications. Five items assessed participants' willingness to endorse justifications to engage in unprotected sexual intercourse if they were in a situation similar to the one presented in the video. These items were "A situation like this only occurs once in a while, so it would be worth the risk involved for me to have intercourse," "Because Rebecca's on the pill and won't get pregnant, there's little for me to worry about if we have intercourse," "Because she looks totally healthy, it's all right if we have

Table 1
Codes for Content Category

Content category	Example	No. of statements
Alternatives		
Impelling	I'd have no choice but to go for it.	22
Inhibiting	It's possible to have fun in bed without having sex.	104
Willingness		
Impelling	She is more than willing—she really wants me.	47
Inhibiting	She seems a bit eager, too eager.	35
Risk		
Impelling	She takes birth control pills, so she won't get pregnant.	120
Inhibiting	I could get a disease.	567
Attractiveness		
Impelling	I find Rebecca very attractive.	86
Inhibiting	She's not overly good-looking—she's too skinny.	41
Past experience		
Impelling	I have had sex before in a similar situation.	10
Inhibiting	I have been in a similar situation and I controlled myself.	22
Future		
Impelling	This could lead to a relationship.	8
Inhibiting	The next day, how would we feel about each other?	61
Arousal		
Impelling	I'd probably be horny.	57
Inhibiting	I wouldn't get aroused if I was drunk.	3
Intoxication		
Impelling	After drinking, your inhibitions are lower.	43
Inhibiting	We might be too drunk to enjoy it or remember it.	59
Personal rules		
Impelling	I like to strike while the iron is hot.	7
Inhibiting	No glove, no love—you have to stand by your values.	98
Dating or Religious		
Impelling	It seems like Mike and Rebecca are both single.	2
Inhibiting	Casual sex does not fit in with my religious beliefs.	41

intercourse," "Because I can tell that Rebecca is not the type who sleeps around, it's all right if we have intercourse," and "There's no reason for me to be worried about using a condom if she's not." Participants responded to these items on 9-point rating scales, with endpoints labeled 1 (*strongly disagree*) and 9 (*strongly agree*). These five items were highly correlated and were aggregated into one scale (Cronbach's $\alpha = .85$).

Attitudes. Two items assessed participants' attitudes toward engaging in unprotected sexual intercourse if they were in a situation similar to the one presented in the video. These items were, "My having sexual intercourse in this situation is: foolish/not foolish," and "My having sexual intercourse in this situation is: irresponsible/not irresponsible." Participants responded to these items on 9-point rating scales. The negative descriptors (foolish, irresponsible) were at the low end of the scale, so that high scores represent positive attitudes toward having sexual intercourse without a condom. These two items were highly correlated, $r(356) = .54$, $p = .0001$, and were aggregated into one scale.

Results

We conducted preliminary analyses using 3 (intoxication condition: sober, placebo, or intoxicated) × 2 (cue condition: impelling or inhibiting cues) × 2 (reported arousal level: low or high) × 7 (study) factorial analyses of variance (ANOVAs). There were no main effects of cue condition, and cue condition did not interact with the other independent variables. Study did not interact with any of the other independent variables, indicating that the pattern of results was consistent across all seven studies. Therefore, we collapsed over cue condition and study in the analyses that follow. Moreover, there were no mean differences between participants in the sober and placebo conditions, so these groups are combined in the analyses that follow. Therefore, all dependent measures were analyzed in 2 (intoxication condition: sober/placebo or intoxicated) by 2 (reported arousal level: low or high) ANOVAs. There was no relationship between intoxication condition and arousal level; a comparison between the mean reported arousal of participants in the sober/placebo condition ($M = 3.93$) and participants in the intoxicated condition ($M = 4.24$) revealed no difference, $t(356) = 1.21$, *ns*.

Intentions

The intentions item was analyzed using a 2 (intoxication condition: sober/placebo or intoxicated; experimental) × 2 (reported arousal level: low or high) ANOVA. There was a main effect of arousal level, $F(1, 353) = 5.40$, $p = .021$, such that participants who were high in reported sexual arousal ($M = 3.88$, $SD = 2.53$) expressed more favorable intentions than did those who were low in reported sexual arousal ($M = 3.27$, $SD = 2.35$). Importantly, there was also a significant interaction between intoxication condition and reported arousal level, $F(1, 353) = 6.87$, $p = .009$. Comparisons revealed that when participants were low in reported sexual arousal, there were no differences between sober/placebo ($M = 3.38$, $SD = 2.49$, $n = 113$) and intoxicated participants ($M = 3.07$, $SD = 2.07$, $n = 59$), $t(353) = 1.31$, *ns*. In contrast, when participants reported that they were highly aroused, those in the intoxicated condition ($M = 4.57$, $SD = 2.78$, $n = 69$) reported

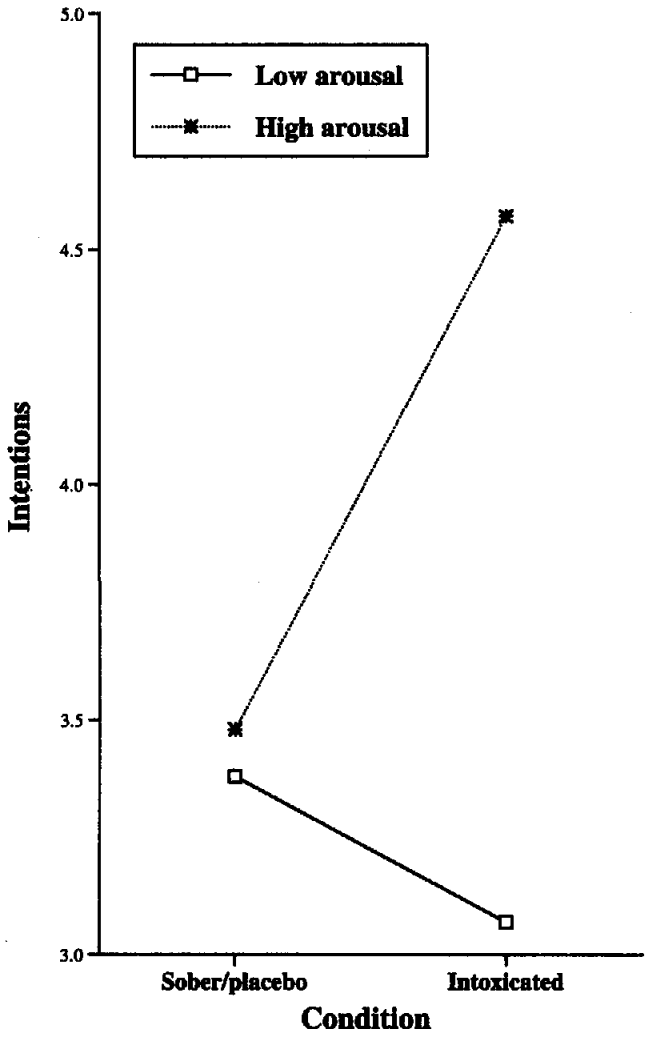

Figure 1. Mean reported intentions as a function of alcohol condition and arousal level.

stronger intentions to engage in unprotected sexual intercourse than did those in the sober/placebo condition (M = 3.48, SD = 2.30, n = 117), $t(353) = 4.84$, $p < .001$. As expected, intoxicated participants who were high in reported arousal reported more favorable intentions to engage in unprotected sex than did those who were low in reported arousal, $t(353) = 5.73$, $p < .0001$. In contrast, for sober/placebo participants there was no difference between those who were high and those who were low in reported arousal, $t(353) = 0.52$, *ns*. These data are presented in Figure 1.

Thought Listing

Valence. The number of impelling statements listed by each participant were analyzed using a 2 (intoxication condition: sober/placebo or intoxicated) × 2 (reported arousal level: low or high) ANOVA. There was a main effect of reported arousal level, $F(1, 354) = 5.76$, $p = .017$, such that participants who were high in reported arousal (M = 1.54, SD = 1.95) listed more impelling statements than did participants who were low in reported arousal (M = 1.08, SD = 1.58). There was also a main effect of intoxication condition, $F(1, 354) = 6.07$, $p = .014$, such that participants in the intoxicated condition (M = 1.63, SD = 2.05) listed more impelling statements than did participants in the sober/placebo condition (M = 1.14, SD = 1.62). There was a marginal interaction between intoxication condition and reported arousal level, $F(1, 354) = 3.10$, $p = .078$. Comparisons revealed that when participants were low in reported arousal, there were no differences between sober/placebo (M = 1.04, SD = 1.56) and intoxicated (M = 1.15, SD = 1.62) participants, $t(354) = 0.39$, *ns*. In contrast, when participants were high in reported arousal, those in the intoxicated condition (M = 2.04, SD = 2.29) listed more impelling statements than did those in the sober/placebo condition (M = 1.24, SD = 1.66), $t(354) = 2.99$, $p < .01$. As expected, for intoxicated participants, those who reported that they were highly aroused listed more impelling statements than did participants who were low in reported arousal, $t(354) = 2.84$, $p < .01$. For sober/placebo participants, there was no difference between those who were low and high in reported arousal, $t(354) = 0.86$, *ns*.

For the inhibiting statements, there was a main effect of reported arousal level, $F(1, 354) = 6.04$, $p = .014$, such that participants who were high in reported arousal (M = 2.80, SD = 2.23) listed fewer inhibiting statements than did participants who were low in reported arousal (M = 3.37, SD = 2.15). There was also a significant interaction between intoxication condition and reported arousal level, $F(1, 354) = 6.47$, $p = .011$. Comparisons revealed that when participants were low in reported arousal, there were no differences between sober/placebo (M = 3.30, SD = 2.15) and intoxicated (M = 3.51, SD = 2.16) participants, $t(354) = 0.60$, *ns*. In contrast, when participants were high in reported arousal, those in the intoxicated condition (M = 2.16, SD = 2.07) listed fewer inhibiting statements than did those in the sober/placebo condition (M = 3.17, SD = 2.25), $t(354) = 3.06$, $p < .01$. As expected, for intoxicated participants, those who reported that they were highly aroused listed fewer inhibiting statements than did those low in arousal, $t(354) = 3.51$, $p < .001$. In contrast, for sober/placebo participants there was no difference between those who were high and low in reported arousal, $t(354) = 0.45$, *ns*.

Content. As noted in Table 1, risk statements (inhibiting valence) were listed more frequently than any other code. The risk statements were analyzed in a 2 (intoxication condition: sober/placebo or intoxicated) × 2 (reported arousal level: low or high) ANOVA. There was a main effect of arousal level, $F(1, 354) = 4.83$, $p = .029$, such that participants who were high in reported arousal (M = 1.43, SD = 1.36) listed fewer inhibiting or risk statements such as "I could get a disease or cause an unwanted pregnancy" than did participants who were low in reported arousal (M = 1.75, SD = 1.33). There was also a main effect of intoxication condition, $F(1, 354) = 4.95$, $p = .027$, such that participants in the intoxicated condition (M = 1.37, SD = 1.26) listed fewer inhibiting or risk statements than did participants in the sober/placebo condition (M = 1.70, SD = 1.40). These main effects were qualified by an interaction between intoxication condition and arousal level, $F(1, 354) = 4.25$, $p = .040$. Comparisons revealed that when participants were low in reported arousal, there were absolutely no differences between intoxicated (M = 1.75, SD = 1.38) and sober/placebo (M = 1.75, SD = 1.24) participants, $t(354) = 0.00$, *ns*. In contrast, when participants were high in reported arousal, those in the intoxicated condition (M = 1.04,

SD = 1.19) listed fewer inhibiting or risk statements than did those in the sober/placebo condition (*M* = 1.66, *SD* = 1.42), $t(354) = 3.07$, $p < .01$. As expected, for intoxicated participants, those who reported that they were highly aroused listed fewer inhibiting or risk statements than did those low in reported arousal, $t(354) = 3.01$, $p < .01$, whereas reported arousal level did not affect the responses of sober/placebo participants, $t(354) = 0.51$, *ns*.

Justifications

There was a main effect of reported arousal level, $F(1, 354) = 10.53$, $p = .001$, such that participants who were high in reported arousal (*M* = 2.51, *SD* = 1.53) were more likely to endorse justifications to have unprotected sexual intercourse than were participants who were low in reported arousal (*M* = 2.05, *SD* = 1.16). There was also a significant interaction between intoxication condition and reported arousal level, $F(1, 354) = 3.88$, $p = .050$. Comparisons revealed that when participants were low in reported arousal, there were no differences between sober/placebo (*M* = 2.14, *SD* = 1.23) and intoxicated participants (*M* = 1.86, *SD* = 1.00), $t(354) = 1.28$, *ns*. In contrast, when participants were high in reported arousal, those in the intoxicated condition (*M* = 2.71, *SD* = 1.74) were somewhat more likely to endorse justifications to engage in unprotected sexual intercourse than were those in the sober/placebo condition (*M* = 2.40, *SD* = 1.39), although not significantly so, $t(354) = 1.50$, *ns*. Moreover, as expected, for intoxicated participants, those reporting high arousal were more likely to endorse justifications to engage in unprotected sexual intercourse than were participants reporting low arousal, $t(354) = 3.50$, $p < .001$. In contrast, for sober/placebo participants there was no difference between those who were high and low in reported arousal, $t(354) = 1.45$, *ns*. These data are presented in Figure 2.

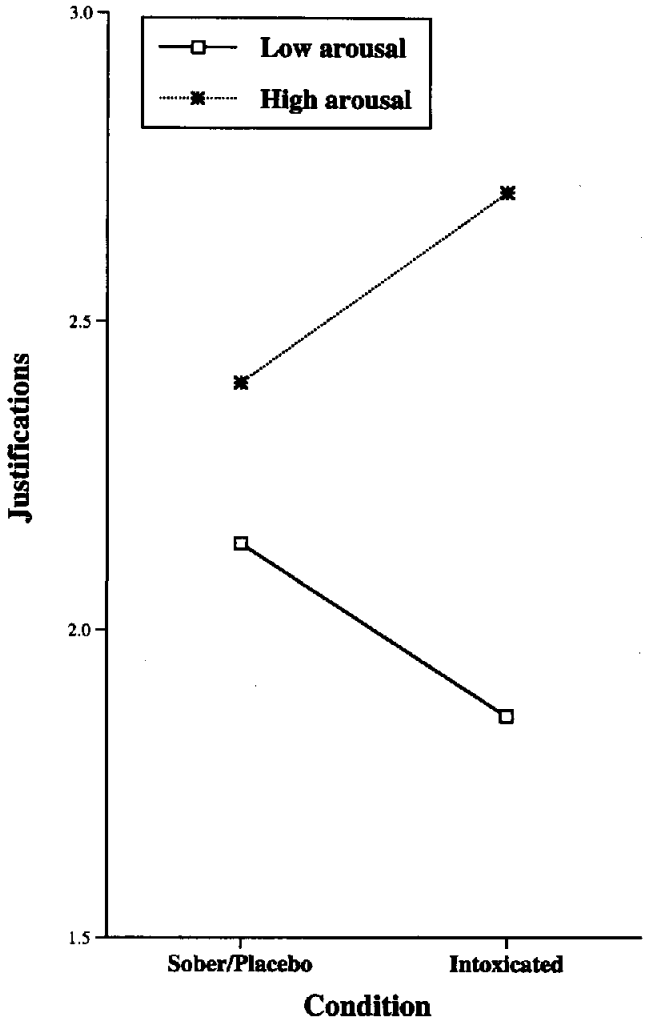

Figure 2. Mean reported justifications as a function of alcohol condition and arousal level.

Attitudes

There was a main effect of reported arousal level, $F(1, 354) = 7.46$, $p = .007$, such that participants who were high in reported arousal (*M* = 2.31, *SD* = 1.61) reported more favorable attitudes toward having unprotected sexual intercourse than did those who were low in reported arousal (*M* = 1.89, *SD* = 1.30). As expected, there was an interaction between intoxication condition and reported arousal level, $F(1, 354) = 5.26$, $p = .022$. Comparisons revealed that when participants were low in reported arousal, there were no differences between sober/placebo (*M* = 1.99, *SD* = 1.32) and intoxicated participants (*M* = 1.70, *SD* = 1.24), $t(354) = 1.24$, *ns*. In contrast, when participants were high in reported arousal, those in the intoxicated condition (*M* = 2.60, *SD* = 1.94) were more likely to report favorable attitudes toward engaging in unprotected sex than were those in the sober/placebo condition (*M* = 2.15, *SD* = 1.36), $t(354) = 2.05$, $p < .05$. Intoxicated participants reporting high arousal were more likely to express favorable attitudes toward unprotected sex than were those reporting low arousal, $t(354) = 3.47$, $p < .001$. In contrast, for sober/placebo participants there was no difference between those who were high and low in reported arousal, $t(354) = 0.83$, *ns*. These data are presented in Figure 3.

Do Impelling and Inhibiting Thoughts Mediate the Relation Between Intoxication Level and Intentions?

To test whether the number of impelling and inhibiting thoughts reported by participants mediated the relationship between condition and intentions we conducted a series of regression analyses (Baron & Kenny, 1986). Because impelling and inhibiting thoughts were highly correlated, $r(357) = -.60$, $p = .0001$, we computed a thought index by subtracting the number of inhibiting thoughts listed from the number of impelling thoughts listed. We found that the thought index mediated the relation between the interaction term for condition (Intoxication Condition × Arousal Level) and intentions. There was a significant relationship between the interaction term (controlling for the main effects of intoxication condition and reported arousal level) and the thought index ($\beta = .55$, $p = .014$). There was also a significant relationship between the thought index (controlling for the main effects of the intoxication condition, cue condition and the interaction term) and intentions ($\beta = .78$, $p = .0001$). Importantly, the interaction term (controlling for the main effects) was significantly

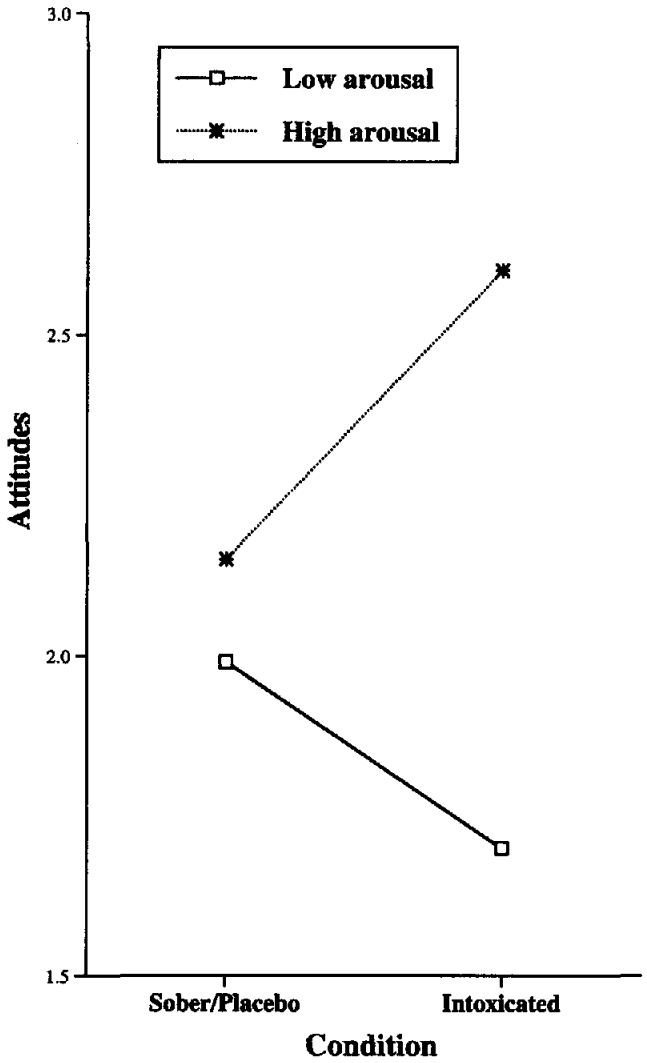

Figure 3. Mean reported attitudes as a function of alcohol condition and arousal level.

associated with intentions ($\beta = .59, p = .009$) when the thought index was not included in the regression analysis. In contrast, the interaction term (controlling for the main effects) was not significantly associated with intentions (partial $\beta = .18$, *ns*) when the thought index was entered into the regression equation. A Goodman test (Goodman, 1960) revealed a significant reduction in variance in intentions explained by condition when the thought index was entered into the equation ($z = 2.47, p = .014$). This mediation analysis is presented in Figure 4. It should be noted that these mediational analyses should be interpreted with some caution because intentions were assessed before the thought listing measure. Thus, these mediational analyses are consistent with the notion that impelling and inhibiting thoughts mediate the relation between condition and intentions, but not definitive.

Discussion

Our findings are consistent with alcohol myopia theory and are inconsistent with disinhibition theory. Disinhibition theory would predict a main effect of alcohol intoxication, such that intoxicated men should always be more likely than sober men to report intentions to engage in risky sexual behavior. Instead, we found an interaction that is consistent with alcohol myopia theory. Among those who reported low sexual arousal, there were no differences between the responses of intoxicated and sober participants (if anything, intoxicated participants who were low in reported arousal were somewhat less likely than sober participants to report intentions to have sex without a condom). In contrast, among participants who reported high levels of sexual arousal, intoxicated participants were more likely than sober participants to report intentions to have unprotected sex. Presumably, the restriction in attentional capacity caused by alcohol intoxication precluded the ability to attend to both impelling cues (e.g., sexual arousal) and inhibiting cues (e.g., the potential risks associated with unprotected sex). The intoxicated participants' feelings of sexual arousal may have been the most salient cue, and focusing on their feelings of arousal may have limited their ability to attend to potential risks. The results of the thought listing task are consistent with this hypothesis: Intoxicated participants who reported that they were highly aroused were more likely to list thoughts that were impelling in nature and less likely to list statements that were inhibiting in nature (especially pertaining to the potential risks of having unprotected sexual intercourse) than were sober men or intoxicated participants who were low in reported arousal.

It is important to note that all of the participants in this research were heterosexual male undergraduate students who were assessed in a laboratory environment. We propose that a cognitive mechanism (i.e., restriction of attentional capacity) underlies the relationship between alcohol and intentions to engage in risky sexual behaviors. We maintain that this cognitive explanation would apply to other populations and across different situations. For example, although the nature of impelling cues may vary somewhat among different populations (e.g., male and female, heterosexual and homosexual), the restriction of attentional capacity associated with alcohol intoxication will cause intoxicated individuals of any population to focus on the most salient cues in their environment. Therefore, impelling cues such as sexual arousal may have a disproportionate influence on behavior when a person is intoxicated. To be sure, however, the relationship between alcohol intoxication and sexual behavior is very complex, and there are many other social and biopsychosocial factors that can affect this relationship. Research assessing the effects of alcohol on sexual behavior across diverse populations and employing different methodologies will contribute further to the understanding of how alcohol affects risky sexual behavior.

One advantage of this research is that assessing sexual arousal holds great ecological validity. It is likely that when people are

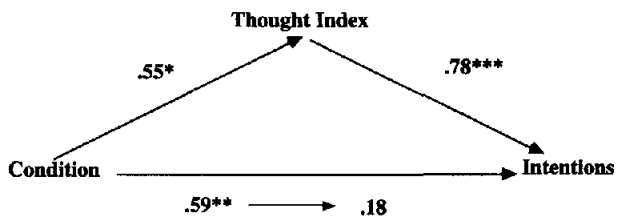

Figure 4. Mediation analysis. * $p < .05$. ** $p < .01$. *** $p < .0001$.

deciding whether to have unprotected sexual intercourse, they are doing so while sexually aroused. Our findings indicate that the restriction of attentional capacity associated with alcohol myopia may cause people who are sexually aroused to overlook potential inhibiting cues in their environment and to engage in behaviors that could have potentially disastrous consequences for themselves and their sexual partners. It is also important to note, however, that in the studies reported here sexual arousal was not manipulated. Therefore, we are not able to make unequivocal claims about how alcohol intoxication and sexual arousal interact to exert a causal effect on intentions to engage in risky behaviors.

However, one study that we have conducted (G. MacDonald, MacDonald, Zanna, & Fong, 1997) provides tentative support for the causal account that is consistent with the present research. We manipulated the attractiveness of the female character in the vignette by using photographs and an audio recording instead of the video. There were two photographs: one of a very attractive woman, and one of a moderately attractive woman. Participants in the intoxicated and very attractive condition reported more favorable intentions to engage in unprotected sex than did those in the other three conditions (i.e., sober and very attractive, intoxicated and moderately attractive, and sober and moderately attractive), who did not differ from one another. The experimental manipulation of attractiveness, along with a reasonable assumption that attractiveness of a potential sexual partner may be positively correlated with sexual arousal, suggests that alcohol intoxication and sexual arousal may interact to cause people to report greater intentions to engage in risky sexual behaviors.

Our program of research suggests that it may be possible to counteract the negative effects of alcohol intoxication by ensuring that inhibiting cues are present in the environment. If there were enough persuasive inhibiting cues present, these cues might become more prominent than impelling cues that are in the situation, including feelings of sexual arousal. Under these specific circumstances, one would expect that intoxicated people may focus on, and act on, these inhibiting cues, leading to more prudent or cautious behavior (see T. K. MacDonald et al., 2000).

How could one make inhibiting cues salient? We believe that there are a number of factors to consider when delivering programs designed to reduce the coincidence of alcohol intoxication and unsafe sexual activity, including population and context (see also Cooper, 1992; Cooper & Orcutt, 1997). Adolescents and young adults may be among the most critical populations to consider when designing interventions to educate people about the effects of alcohol on safe sex behaviors. High school students and university students away from home for the first time may be experimenting with sex. Importantly, people also tend to experiment with alcohol at these ages, and often these behaviors may coincide. Leigh and Morrison (1991) found that 50% of male and female adolescents had been drinking alcohol at the time of their first sexual experience. Other researchers have shown that alcohol intoxication at the time of first sexual intercourse is associated with decreased condom use, particularly when intercourse is unplanned (e.g., Flanigan & Hitch, 1986; Robertson & Plant, 1988).

Our research suggests that interventions designed to reduce the incidence of unsafe sex might be best implemented in contexts where people will be making the decision to have unprotected sex. It might be possible to provide inhibiting cues (e.g., HIV- and AIDS-prevention posters) in relevant situations, such as singles bars or college dorms. Making inhibiting cues salient might actually increase the likelihood that an intoxicated person would pay attention to the potential costs of unsafe sex, and in doing so might counteract or at least reduce the effect of impelling cues that are present, whether those impelling cues are internal (e.g., sexual arousal) or external (e.g., normative influences) (see, for example, T. K. MacDonald et al., 2000).

It is important to note that although this research focuses on alcohol and intentions to engage in unprotected sex, our hypotheses can generalize beyond this domain. We believe that alcohol myopia theory holds theoretical and practical importance for a number of risky behaviors whose incidence is alcohol-induced or alcohol-related. Such research would be of great value, because knowledge of the effects of alcohol on these costly behaviors would facilitate understanding of why people engage in these behaviors, and in turn, this knowledge could be applied to interventions designed to reduce the negative social and health behaviors that are associated with alcohol.

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