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Problematic alcohol use and sexual assault among male college students: The moderating and mediating roles of alcohol outcome expectancies

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Problematic alcohol use and sexual assault among male college students: The moderating and mediating roles of alcohol outcome expectancies

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Abstract

Background and Objectives*:* Extant research shows a strong relationship between alcohol use problems and sexual aggression. However, less is known about the effect of intermediary factors (eg, alcohol expectations) that may increase the likelihood of and/or explain sexual aggression during alcohol-related incidents. The present study examined alcohol outcome expectancies' (OE) mediating and/or moderating influence on the relationship between problematic alcohol use severity and sexual aggression among male college students.

Methods and Result: One hundred and forty eight (n =148) male college students volunteered for the study. Seventy-seven males self-reported committing at least one act of sexual aggression in their lifetime. Among those who sexually aggressed, 74% also reported symptoms of problematic drinking. Results show that sexuality-related alcohol OE fully mediated the relationship between problematic alcohol use severity and sexual aggression. Results also showed that aggression-related alcohol OE moderated the relationship between problematic alcohol use severity and sexual aggression. Specifically, aggression-related alcohol OE only influenced the relationship between problematic alcohol use and sexual aggression when alcohol problems were less severe.

Conclusions and Scientific Significance: Discussion implicates the possible role alcohol prevention may play in reducing sexual aggression on college campuses, particularly as it relates to adjusting alcohol OE among those most likely to perpetrate. (Am J Addict 2014;23:321–328)

Introduction

In a nationally representative study of higher education students, 25% of men self-report perpetrating some form of sexual aggression and 4% self-report committing rape.[1, 2] General factors associated with male sexual coerciveness against women include, but are not limited to childhood abuse, attitudes supportive of violence, hostile masculinity, negative attitudes and stereotypes, low empathy towards women, sexual promiscuity, and impersonal sexual relations.[3-6] Further research implicate disinhibiting agents, such as alcohol, as catalyst to sexual aggression among college students with such factors.[3, 7] For instance, half of all sexual aggressive acts on college campuses involve alcohol use.[1, 3, 8] In addition, 74% of perpetrators self-report drinking alcohol leading up to the assault[9] and approximately 53% of college men who admit to rape or sexual aggressive behavior meet criteria for alcohol abuse or dependence.[10] Despite this evidence, research has not fully explored bio-psychosocial mechanisms that would enhance or explain the strong relationship between alcohol use and sexual aggression.

Theoretical mechanisms that could influence sexual aggression during alcohol consumption presumably contribute to cognitive impairment that diminishes decision-making capabilities. Although yet to be tested for causal influences, attention/information processing deficits and alcohol-related cognition reflect viable mechanisms that would contribute to alcohol's influence on sexual aggressive acts. First, alcohol consumption hampers attention and information processing of contextual and interpersonal stimuli.[11] These pharmacological effects potentially contribute to a man's misperception of a woman's sexual interest.[1, 5] Over time these presumed alcohol-related misperceptions about sexual attraction/interest assist in the development of alcohol outcome expectancy (OE) that reinforce future use[12] Once developed, other research suggests that OE affect subjective experiences, regardless of drug or placebo administration.[13, 14] As such, alcohol-related cognitions [particularly alcohol OE about sexuality and aggression] are postulated as being as indispensable as cognitive impairment when examining alcohol influences on sexual aggression.[3]

Evidence consistent with these assumptions show that alcohol OE are related to men feeling less inhibited, more bold and more aggressive, which in turn could justify using force against women.[3] When men are also presented with erotic material and forcible rape scenarios,

those made to believe they were drinking an alcoholic beverage reported becoming more sexually aroused, regardless of whether they were actually administered alcohol.[14, 15] Overall, these data support the notion that beliefs that alcohol increases sex drive increases the likelihood of sexual assault and potentially differentiate alcohol-induced sex assault perpetrators from non-perpetrators and non-alcohol involved perpetrators.[16]

Despite evidence to suggest alcohol-related expectancies specific to sexuality and aggression may influence sexual aggression among college-aged men, research has yet to comprehensively explore the links among alcohol consumption, other alcohol OE and sexual aggression. For example, individuals exposed to alcohol cues and who had an elevated tension reduction alcohol outcome expectancy were more willing to meet with an opposite gender stranger.[17] The anxiolytic properties of tension reduction and liquid courage alcohol OE could reduce inhibition and anxiety associated with social or dating norms, which may escalate to sexual aggression. Similarly, individuals who expect to have cognitive and behavioral impairment from drinking alcohol could use intoxication to rationalize engaging in socially inappropriate behavior. Conversely, men who are more self-focused and aware of the deleterious effect of alcohol (eg, self-perception alcohol OE) may be able to mobilize cognitive resources to stop subsequent sexually aggressive behavior.[18]

Furthermore, the precise relationship between problematic alcohol use severity, sexual assault perpetration, and alcohol OE, both global (positive vs. negative) and facet scales (eg, tension reduction), has yet been explored. Although alcohol-induced cognitive impairments presumably influences sexual assault perpetration, alcohol OE could very well impact the relationship between the two variables. In other words, it is not yet clear whether problematic alcohol use severity and alcohol OE are independent predictors, or if alcohol OE is embedded within a mediating or moderating relationship with problematic alcohol use and sexual assault perpetration. In this paper, we aim to (a) examine the effects of alcohol consumption on sexually aggressive behavior among a college population, and (b) explore possible mediating or moderating roles of alcohol OE, both global (positive and negative) and facet level, between the two focal variables. Consistent with prior studies,[16] we define sexual assault or sexual aggression as behaviors that constitute legal definitions of rape as well as forced sexual contact and verbally coerced sexual intercourse to test these aims. We use the terms "sexually aggressive behavior" and "sexual aggression" hereafter to contextualize rape and other unwanted sexual acts.

Methods

Participants

The present study was a secondary analysis that combined data from Klanecky et al.[19] and McChargue et al.[20] to test our aims. Participants (n = 534) volunteered using an undergraduate subject pool from a large Plains-state university. For the purposes of the study questions, 209 men (mean age = 19.80, SD = 1.92) were selected from the larger datasets. A majority reported their ethnicity to be White, non-Hispanic (n = 189, 90%), followed by African-American (n = 7, 3%) and Asian-American (n = 7, 3%), Hispanic (n = 3, 2%), and others (n = 3, 2%). Sixty (29% of the total male sample) either never had sexual intercourse or did not answer the question, and were subsequently dropped from the study. We were unable to ascertain whether reported sexual intercourse were all heterosexual in nature. An additional participant was dropped due to having at least one missing score, leaving a total sample of 148.

Measurements

Sexual Assault Perpetration

A revised 13-item version of the sexual experiences survey—males (SES-M)[2] was used in this study to operationalize sexually aggressive behavior. Items 1 ("Have you ever had sexual intercourse?") and 2 ("Have you ever misinterpreted the level of sexual intimacy of a woman you desired?") were subsequently excluded in the analyses because they did not reflect sexual aggression as defined in this study. Other items of the SES-M describe various forms of sexual aggression, ranging from unwanted kissing to sexual intercourse without consent, and the means in which victimization was achieved, such as using false promises, threats and intimidation, and physical force. Another item was added pertaining to impaired consent due to intoxication, a tactic added in subsequent revisions.[21] For each item, participants are asked to divulge the frequency of committing such acts, ranging from 1 (Never) to 5 (Often). Internal consistency was reported to be .89 for male college students and a 1-week test–retest reliability with a mean item agreement of 93%.[22] Scores for sexual perpetration were dichotomized, with those answering 3 (Occasionally) to 5 (Often) on at least one item were coded as 1. Otherwise it was coded as 0.

Severity of Alcohol Use Problems

Severity of alcohol use problems was measured using the Alcohol Use Disorder Identification Test (AUDIT).[23] The 10-item AUDIT asks participants to rate the frequency and severity of alcohol consumption and the occurrence of various alcohol-related problems. A cut-off score of eight points suggests the presence of problematic drinking. Alpha coefficient of the AUDIT for the present study was .75.

Alcohol Outcome Expectancy

The 38-item Comprehensive Effects of Alcohol Questionnaire (CEAQ)[24] was used to measure alcohol OE. Participants were asked their agreement towards statements using a scale ranging from 1 (Disagree) to 4 (Agree). The CEAQ is composed of two global factors: Positive and Negative OE. Positive OE include facet scales such as sociability ("It would be easier to talk to people," eight items), tension reduction ("I would feel

calm," three items), liquid courage ("I would feel brave and daring," five items), and sexuality ("I would enjoy sex more," four items). Negative OE include facet scales such as cognitive and behavioral impairment ("I would be clumsy," nine items), risk and aggression ("I would act aggressively," five items), and self-perception ("I would feel moody," four items). Responses were added to come up with subscale scores, which eventually were aggregated to achieve global scores for positive and negative OE. For the present study, subscale alpha coefficient for positive outcome expectancy ranged from .67 to .84, .69 to .82 for negative outcome expectancy subscales, and .90 and .87 for positive and negative global outcome expectancy, respectively.

Data Analysis

The present study tested the mediating and moderating role of alcohol OE on the relationship between alcohol use problems and sexual aggression. The INDIRECT macro[25] was used to test mediation analysis as it is amenable to dichotomous outcome variables, tests multiple mediator variables simultaneously, and provides bootstrap confidence estimations for mediated effects. For mediation analysis, alcohol use severity was treated as the predictor variable, alcohol OE global and facet scales were treated as mediators, and sexual aggression was treated as the criterion variable. Ninety-five percent bias corrected and accelerated confidence intervals were used and the number of bootstrap resamples was set at 1,000. We interpreted a significant indirect effect only when zero was not included in the 95% confidence interval ($p < .05$).

Moderation analyses were conducted following the recommendations of Jaccard and Turrisi.[26] Using hierarchical logistic regression, alcohol use severity was entered in the first step, alcohol OE global or facet scales in the second step, and the interaction terms in the third step. Bootstrap resamples were also set at 5,000. All analyses were conducted using the IBM Statistical Package for the Social Sciences version 20.

Results

Preliminary Analysis

Prior to the analyses, outliers were winsorized, and subsequent univariate analyses suggested that all the predictor variables were normally distributed. Table 1 presents the descriptive statistics and correlation of the study variables. Approximately half of the sample self-reported at least one form of sexual aggression and, among those who perpetrated, 74% were problematic drinkers compared with non-problematic drinkers ($x^2_{(1)}=17.78$, $p < .001$). Among non-perpetrators, 64% were classified as problematic drinkers. Most of the sexual assault reported involved sexual intercourse acquired through verbal coercion, such as saying things that were not meant ($n=51$, 34%), pressuring the woman with continual arguments ($n=12$, 8%), and threatening to end the relationship ($n=1$, .7%). Twenty-three (15%) reported having sexual intercourse when the woman was too drunk to resist. None of the participants reported ever attempting or engaging in oral sex or anal or vaginal intercourse with a woman through the use of threats of physical violence. One participant (.7%) reported using some degree of physical force to make the woman engage in kissing or petting.

Mediation Analysis

Global Scales

Results suggest that problematic alcohol use severity was positively associated with sexually aggressive behavior, as well as with positive and negative global alcohol OE scores. However, the relationship between global alcohol OE scores and sexual aggression was not significant. Results of the 95% bias corrected and accelerated confidence interval bootstrap estimates suggest that neither positive (−.054 to .009) nor negative (−.002 to .043) global alcohol OE mediate the relationship between alcohol use severity and sexual assault perpetration. Pseudo-R^2 showed low effect sizes for the final model, with a Cox

Table 1. Descriptive statistics and intercorrelations among sexual assault perpetration, alcohol use severity, alcohol outcome expectancy global and facet scales

	M (SD)	*n* (%)	1	2	3	4	5	6	7	8	9	10
1. SES-M		78 (37%)	—									
2. AUDIT	10.45 (5.05)		.24**	—								
3. Positive OE	57.57 (8.74)		.04	.29**	—							
4. Tension reduction	8.18 (1.82)		.05	.23**	.63**	—						
5. Liquid courage	13.88 (2.89)		−.02	.25*	.79**	.36**	—					
6. Sociality	25.80 (3.85)		−.09	.17**	.82**	.43**	.48**	—				
7. Sexuality	9.80 (2.65)		.23**	.25**	.73**	.34**	.51**	.40**	—			
8. Negative OE	43.38 (8.51)		.14	.19**	.51**	.17*	.52**	.31**	.49**	—		
9. Risk and aggression	11.96 (3.22)		.16	.34**	.65**	.31**	.65**	.46**	.50**	.76**	—	
10. Self-perception	7.58 (2.46)		.18*	.01	.15	.01	.15	.01	.29**	.73**	.36**	—
11. CBI	23.80 (4.72)		.04	.11	.41**	.09	.43**	.24**	.40**	.91**	.51**	.56**

SES-M, sexual experiences survey—males; AUDIT, alcohol use disorders identification test; OE, outcome expectancy, CBI, cognitive behavioral impairment.
* $p < .05$; ** $p < .01$.

and Snell R^2 of .06 and Nagelkerke R^2 of .09. Table 2 presents the results of the mediation analyses.

Facet scales

Similar to the global scales, problematic alcohol use severity was positively associated with sexually aggressive behavior. Problematic alcohol use severity was also positively associated with the alcohol OE facet scales with the exception of cognitive behavioral impairment and self-perception. Among the alcohol OE facet scales, only sociability and sexuality were associated with sexual aggression. Results of the 95% bias corrected and accelerated bootstrap estimates suggested that only sexuality-related alcohol OE (.005 to .078) did not contain a zero in the confidence interval. Hence, only sexuality-related alcohol outcome expectancy mediated the relationship between problematic alcohol use severity and sexual aggression. Cox and Snell R^2 Nagelkerke R^2 were .16 and .25, respectively.

Table 2. Mediation analysis ($n = 148$)

	b	SE	*t*	Wald
Alcohol outcome expectancy global scales				
AUDIT → mediator variables				
Positive outcome expectancy	.50	.14	3.64**	
Negative outcome expectancy	.32	.14	2.31*	
Mediator variables → SES-M				
Positive outcome expectancy	−.03	.02		1.19
Negative outcome expectancy	.04	.02		2.54
AUDIT → SES-M	.10	.04		7.15**
Alcohol outcome expectancy facet scales				
AUDIT → mediator variables				
Tension reduction	.08	.03	2.83**	
Liquid courage	.15	.05	3.13**	
Sociability	.13	.06	2.06*	
Sexuality	.13	.04	3.09**	
Risk and aggression	.22	.05	4.30**	
Self-perception	<.01	.04	.10	
Cognitive and behavioral impairment	.10	.08	1.32	
Mediator variables → SES-M				
Tension reduction	.03	.11		.07
Liquid courage	−.19	.10		3.95
Sociability	−.14	.06		4.73*
Sexuality	.27	.10		7.94**
Risk and aggression	.15	.09		2.79
Self-perception	.16	.10		2.48
Cognitive and behavioral impairment	−.07	.05		1.78
AUDIT → SES-M	.10	.04		7.15**

SES-M, sexual experiences survey—males; AUDIT, alcohol use disorders identification test.
* $p < .05$;
** $p < .01$

Moderation Analysis

Global Scales

Results suggested that problematic alcohol use severity was significantly and positively associated with sexually aggressive behavior only at Steps 1 and 2 of the moderation analysis. Negative and positive alcohol OE were not significantly associated with sexual aggression at Step 2. When interaction terms were included at Step 3, the effects of problematic alcohol use severity disappeared and results indicated that negative OE was significantly and positively associated with sexually aggressive behavior ($b = .11$, SE = .06, $p = .03$). However, 95% bias-corrected and accelerated (BCa) bootstrap estimate for negative OE ranged from −.03 to .28. Inclusion of problematic alcohol use severity, global alcohol OE, and interaction effects to the model was significantly better than the null model ($\chi^2 = 14.11$, df = 5, $p = .01$). Pseudo-R^2 suggested low effect sizes for the final model, with a Cox and Snell R^2 of .08 and Nagelkerke R^2 of .12 (Table 3).

Facet Scales

An examination of the alcohol OE facet scales further elucidated the results of the moderation analysis of the global scores. Similar to the results in the moderation analysis of global OE scales, higher problematic alcohol use severity was related to higher probability of sexually aggressive behavior among males at Steps 1 and 2. At Step 2, results suggest that lower sociability ($b = -.14$, SE = .06, $p = .03$) and higher sexuality-related alcohol OE ($b = .27$, SE = .10, $p < .01$) were associated with higher probability of sexual aggression. When interaction terms were included at Step 3, the only main effect that remained significant was between aggression-related alcohol OE and sexual aggression ($b = .75$, SE = .40, $p < .01$). Moreover, aggression-related alcohol OE produced the only significant interaction with problematic alcohol use severity to predict sexual aggression ($b = -.05$, SE = .03, $p = .03$). No other interaction terms were significantly related to sexual aggression.

As illustrated in Figure 1, individuals with higher aggression-related alcohol OE had a higher risk of committing sexual aggression compared to those with lower aggression-related alcohol OE scores, but only among people with lower levels of problematic drinking ($b = .72$, SE = .26, $p < .01$). As problematic alcohol use severity increased, the effect of aggression-related alcohol OE diminishes. For example, when AUDIT scores were at 25, the effect of aggression-related alcohol OE was no longer significant ($b = -.46$, SE = .30, $p = .12$).

Discussion

In this paper we aimed to further elucidate the relationship between problematic alcohol use severity and sexual aggression by exploring possible mediating and moderating effects of alcohol OE. Consistent with previous research,[1-4] problematic drinking was associated with sexual aggression. Expectations were also confirmed

Table 3. Moderation analysis ($n = 148$)

	b	SE	BCa	95% CI	Wald
Alcohol outcome expectancy global scales					
Step 1					
AUDIT	.10	.04	.026	.183	7.15**
Step 2					
AUDIT	.10	.04	.023	.200	6.86**
Positive outcome expectancy	−.03	.03	−.086	.024	1.18
Negative outcome expectancy	.04	.03	−.013	.096	2.54
Step 3					
AUDIT	.51	.34	−.209	1.327	3.62
Positive outcome expectancy	−.02	.07	−.151	.115	.12
Negative outcome expectancy	.11	.06	−.025	.282	4.62*
AUDIT × positive outcome expectancy	<.01	.01	−.012	.012	.01
AUDIT × negative outcome expectancy	−.01	.01	−.020	.001	2.70
Alcohol outcome expectancy facet scales					
Step 1					
AUDIT	.10	.04	.021	.187	7.15**
Step 2					
AUDIT	.10	.05	−.001	.232	5.28*
Tension reduction	.03	.14	−.233	.322	.07
Liquid courage	−.19	.12	−.421	−.029	3.95
Sociability	−.14	.07	−.278	−.036	4.73*
Sexuality	.27	.11	.046	.613	7.94**
Risk and aggression	.15	.10	−.047	.399	2.79
Self-perception	.16	.11	−.073	.405	2.48
Cognitive behavioral impairment	−.07	.06	−.179	.014	1.78
Step 3					
AUDIT	.03	.61	−1.045	.978	<.01
Tension reduction	−.55	.51	−1.402	.115	2.18
Liquid courage	−.38	.55	−1.522	.008	2.02
Sociability	−.25	.22	−.651	.017	1.85
Sexuality	.60	.48	−.310	2.820	4.43
Risk and aggression	.75	.40	−.008	3.245	7.17**
Self-perception	−.10	.48	−1.082	.411	.120
Cognitive behavioral impairment	−.05	.21	−.457	.289	.110
AUDIT × tension reduction	.05	.04	−.054	.184	2.35
AUDIT × liquid courage	.02	.05	−.054	.189	.67
AUDIT × sociability	.01	.02	−.033	.060	.54
AUDIT × sexuality	−.03	.04	−.103	−.003	1.36
AUDIT × risk and aggression	−.05	.03	−.100	−.039	5.13*
AUDIT × self-perception	.02	.04	−.056	.164	.66
AUDIT × cognitive behavioral impairment	−.01	.02	−.044	.036	.11

BCa, bias corrected and accelerated; AUDIT, alcohol use disorder identification test.
*$p < .05$; **$p < .01$

with our data showing that sexuality-related alcohol OE predicted sexually aggressive behavior, and fully mediated the relationship between problematic alcohol use severity and the outcome variable. More specifically, beliefs that alcohol would make one feel more sexually attractive, be better lovers, and enjoy sex more explained the relationship between problem drinking and sexually coercive behaviors. This data adds to the growing evidence that alcohol primes sexually motivated intentions[17, 27] and increases the likelihood of risky sexual behavior,[28] particularly sexual aggression. Our data suggests that sexually related alcohol OE may partially explain why men with problematic drinking behavior are more likely to commit sexually aggressive acts.

Results of the moderation analyses show that aggression-related alcohol OE were positively associated with

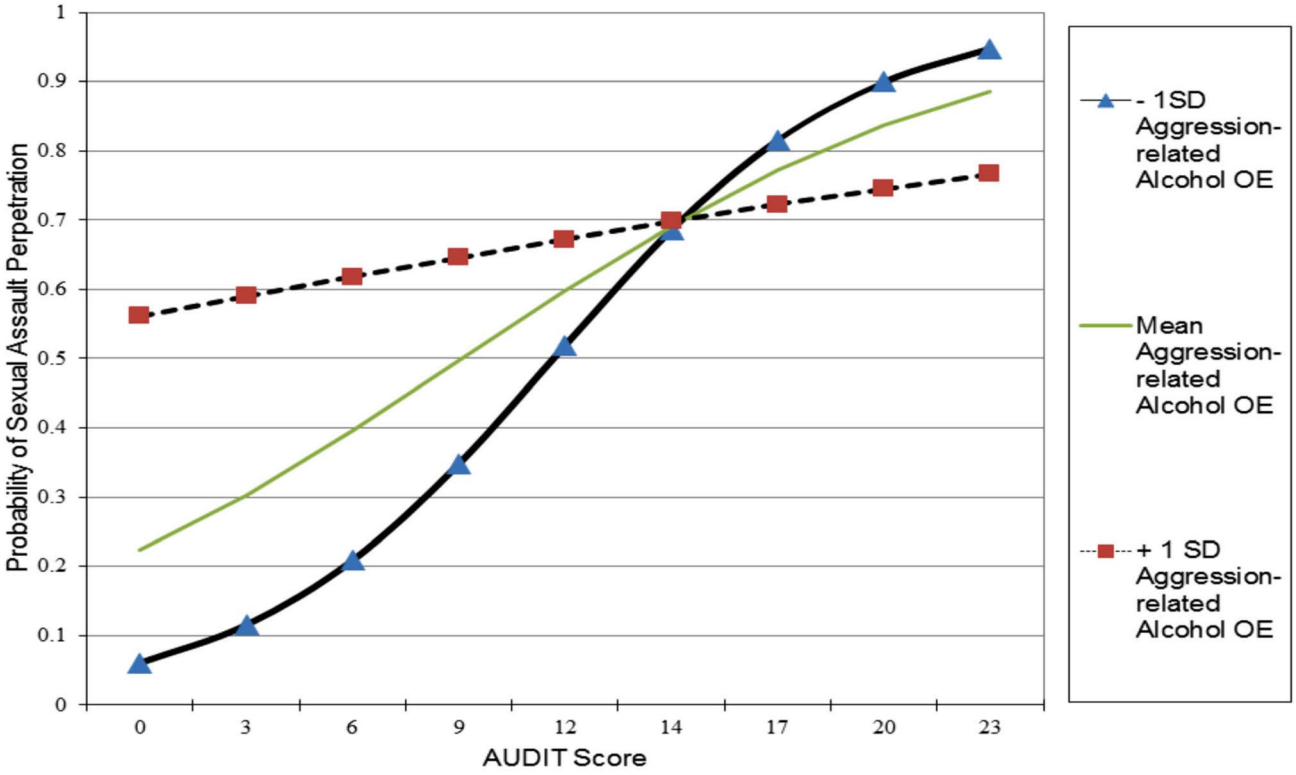

Figure 1. Interaction Effects Between Alcohol Use Severity and Aggression-Related OE Conditional On All Other OE At Their Mean. *Note*: OE = Outcome Expectancy; AUDIT = Alcohol Use Disorder Identification Test.

sexual coercive behavior. These results are consistent with evidence that aggressive behavior is influenced by aggression-related alcohol OE.[27] Contrary to our assumptions, the significant interaction between aggression-related alcohol OE and problematic drinking to predict sexual aggression was primarily among those with high levels of aggression related alcohol OE and low levels of problematic drinking. As Figure 1 illustrated, aggression-related alcohol OE did not significantly contribute to the prediction of sexual aggression when problematic drinking patterns became more severe.

In sum, our data show two distinct emerging sexual aggressive patterns that appear based on the type of alcohol OE and the severity of problematic drinking. Those with low levels of problematic drinking only perpetrated sexual aggression if they also had very aggressive alcohol OE. However, the more severe problematic drinkers were more likely to perpetrate sexual aggression regardless of their level of aggression-related alcohol OE. Their sexual aggressive behavior appeared better explained by sexually-related alcohol OE within our data as well as other misogynistic factors (eg, hostile attitudes towards women, sexual dominance, and peer approval of forced sex, sexual OE) as evidenced in other research.[1, 4, 5, 16]

Our findings associated with aggression-related alcohol OE also highlight that greater problematic drinking does not only activate mechanisms that lead to sexual aggression. Rather, those with less severe drinking patterns may also be susceptible to commit sexual aggressive acts when they possess exaggerated expectations about alcohol-related aggression. Interpreting our findings within the context of alcohol-related aggression, to some extent, suggests that aggression-specific alcohol OE may be expressed differently depending on the severity of problematic drinking among male college students. Those with more severe drinking problems may be more prone to aggress physically (eg, fighting),[27] while those with lower problematic drinking patterns appear selectively susceptible to sexual aggression.

Furthermore, our moderating finding may suggest that those who hold a greater amount of alcohol-related OE aggression are possibly globally aggressive when drinking, which may be differentially expressed contingent on the environment and appears orthogonal to problematic drinking patterns. More specifically, if the male with high alcohol-related OE aggression is in an intimate situation when drinking, his aggression may turn sexual in nature. Where as, other situations could exacerbate his aggression differently. Future research should explore whether there is a global aggression that has the possibility to be expressed differentially and whether certain stimuli elicit such a response (eg, intimate rejection).

Practical Implications and Limitations of the Study

The results of this study emphasized the provision of alcohol interventions for problematic drinkers as a

means to reduce sexual perpetration among college men. Testa and Livingson[7] suggested that women who engage in voluntary heavy episodic drinking were more at-risk of sexual victimization, and recommended that prevention efforts should focus on reducing heavy drinking in social settings. Due to the association between alcohol use severity and sexual assault perpetration, we maintain that the same recommendation applies to college men and sexual aggression. In this study, the centrality of sexuality-related and aggression-related OE were emphasized. Research has shown the efficacy of outcome expectancy challenge in reducing problematic alcohol use severity,[29] and of normative re-education in reducing misogynistic attitudes among college men.[30] Incorporating sexual assault-related information and alcohol outcome expectancy challenges in brief alcohol intervention and in normative re-education among college students could help curb sexual assault perpetration by increasing awareness of alcohol's contribution to sexual aggression. Considering that alcohol OE develop even before the first alcohol consumption[31] and that our data suggest that aggression-specific alcohol OE influence sexual aggression among those with lower levels of problematic drinking, challenging alcohol OE despite the degree of alcohol use severity could also be beneficial.

Contextualizing our results within study limitations helps with interpretation. First, it is important to emphasize that sexual assault perpetration is a multifaceted phenomenon, and not the sole domain of alcohol use severity. This fact is highlighted by the low effect sizes gathered in the study. Future studies expanding this research should also focus on other well established variables, such as impulsivity, attitudes supportive of violence and against women, rape myths, hostile masculinity, sexual promiscuity, and impersonal sexual relations.[3-6, 16] Second, it is important to emphasize that the range of sexual aggression committed by the current sample is limited mostly to non-physical coercions. The pattern of alcohol consumption and the influence of alcohol OE could be different among college men who reported more physical coercions. Third, future research should include a more diverse sample to assess the degree to which our results are ethnically specific. Fourth, the present study was not equipped to address the influence of social context (eg, drinking at a fraternity party) on our variables of interest. Social context was beyond the scope of this paper, but should be considered in future research. Finally, future studies should test our study questions longitudinally to fully explore the influence of problematic alcohol use and alcohol OE on sexual aggression. Mediation analysis presumes causal processes that unfold over time, and our use of cross-sectional data is insufficient to test these temporal changes.[32] Furthermore, it is important to emphasize the possibility that cross-sectional mediation analyses can generate substantially biased and possibly misleading effects compared to a longitudinal mediation analyses.[32]

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