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## HIV-related thought avoidance, sexual risk, and alcohol use among men who have sex with men

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### Abstract

HIV-related “cognitive escape” refers to a tendency to avoid thoughts associated with HIV, which may be particularly common among men who have sex with men (MSM) who are often inundated with HIV information, potentially to the point of fatigue. HIV-related cognitive escape is associated with increased sexual risk behaviors, such as condomless sex, and heavier alcohol use patterns. Other studies show that some MSM may use alcohol specifically to facilitate sex. These sexual motives for drinking (SMDs) could be one mechanism whereby cognitive escape leads to health risk behaviors. In this study, we tested models exploring whether cognitive escape was associated with markers of sex risk (condom use, number of sex partners) and alcohol use/problems, and examined whether SMDs mediated these associations. Heavy drinking, HIV-negative men ( $N = 196$ ) aged  $\geq 21$  years who self-reported past year condomless anal sex with men completed assessments as part of a larger study. Results suggest that cognitive escape was associated with higher number of anal sex partners (incidence rate ratio [ $IRR$ ] = 1.50,  $SE = 0.04$ ,  $p < .001$ ), decreased condom use ( $B = -0.30$ ,  $SE = 0.14$ ,  $p = .028$ ), and increased alcohol-related problems ( $IRR = 1.28$ ,  $SE = 0.07$ ,  $p = .001$ ) but not with drinking quantity. Sexual motives for drinking appeared to partially mediate the observed relationship between cognitive escape and alcohol-related problems, but other relationships did not show evidence of mediation. Findings suggest that those who tend to avoid HIV-related thoughts may be at increased risk for HIV and alcohol-related problems. Drinking to facilitate sex may partially account for the higher risk for alcohol-related problems conferred by cognitive escape. Alcohol interventions for MSM may be more effective if they address alcohol’s role in coping with HIV threat and in facilitating sex under these circumstances.

### Keywords

cognitive escape; men who have sex with men; HIV; alcohol use

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## INTRODUCTION

Men who have sex with men (MSM) make up over 50% of people living with HIV in the United States (Centers for Disease Control and Prevention, 2017). As a result of high HIV burden among this population, MSM are often inundated with HIV-related information (Centers for Disease Control and Prevention, 2001; Williams, Elwood, & Bowen, 2000) and efforts to increase condom use and HIV testing in order to reduce HIV transmission and promote health outcomes. However, unmoderated exposure to HIV-related messages and content may result in stress, anxiety, and perhaps fatigue, potentially leading to a desire to avoid thinking and being vigilant about protecting oneself from HIV (McKirnan, Ostrow, & Hope, 1996; Williams et al., 2000). “Cognitive escape” refers to a set of beliefs and behaviors that some individuals may use to avoid thinking about HIV and their risk. This construct was initially explored in qualitative studies (McKirnan, Vanable, Ostrow, & Hope, 2001; Williams et al., 2000) but was more recently formalized into a measurement tool, the Cognitive Escape Scale (CES) (Nemeroff, Hoyt, Huebner, & Proescholdbell, 2008).

Those motivated to avoid thinking or worrying about HIV may be more prone to engage in sexual risk behaviors that increase their HIV risk. That is, these efforts may signify a desire to avoid considering the risks and consequences of their behavior, to allow them to engage in sex without the burden of such thoughts. Past studies have shown that cognitive escape is associated with condomless anal sex with a male casual, non-monogamous, or partner of less than six months (Hoyt, Nemeroff, & Huebner, 2006) and, qualitatively, that the cognitive escape model is consistent with explanations of motivations for condomless anal sex events among MSM (Williams et al., 2000). Similarly, other studies have shown that those motivated to avoid HIV-related thoughts may also exhibit heavier patterns of drug use, presumably because drug use can facilitate that avoidance. For example, cognitive escape has been associated with heavier patterns of alcohol use among MSM (McKirnan et al., 2001). This is problematic, given that alcohol use has been shown to increase HIV risk (Sander et al., 2013). Heavy drinking on specific occasions has also been shown to increase the odds of engaging in condomless anal sex among MSM (Kahler et al., 2015a; Vosburgh, Mansergh, Sullivan, & Purcell, 2012).

Studies have also shown that some MSM may drink specifically to facilitate sex (Allen, Myers, & Ray, 2015; Kahler et al., 2015b), with the expectation that alcohol may reduce inhibitions and/or increase pleasure (Wells, Golub, & Parsons, 2011). These sexual motives for drinking (SMDs) have been associated with higher sexual risk and more alcohol-related problems (Kahler et al., 2015b; Wray, Pantalone, Kahler, Monti, & Mayer, 2016). SMDs could be one mechanism whereby cognitive escape leads to increased sexual risk behaviors and heavier patterns of drinking. Specifically, MSM who endorse a motivation to evade HIV-related thoughts may use alcohol in sexual situations in order to ease any concerns about risk that could arise. This tendency to drink to “have more fun” or to facilitate sex by reducing discomfort could, in turn, be associated with a tendency to forgo condom use during sex. It may also be associated with a tendency to drink more heavily.

Given cognitive escape has the potential to undermine HIV prevention efforts, understanding how cognitive escape can lead to risk behaviors among MSM is critical. Research exploring

specific mechanisms involved could also help address mediating influences on risk behaviors in order to increase intervention effectiveness. The current study investigates whether cognitive escape is associated with the number of past year male anal sex partners, reduced frequency of condom use during anal sex, greater alcohol consumption on drinking days, and alcohol-related problems. We also investigated whether sexual motives for drinking mediated these relationships. We hypothesized that higher cognitive escape scores would be associated with greater sexual motives for drinking which, in turn, would be associated with higher HIV-risk behaviors and heavier patterns of drinking/alcohol problems.

## METHODS

### Participants

Participants were men who have sex with men (MSM) recruited for an experimental, laboratory-based study investigating the effects of alcohol on men's sexual decision-making ( $n = 196$ ). Eligible participants: 1) were aged 21–50 years, 2) self-reported condomless anal intercourse (CAI) with a man in the past year, 3) reported drinking 14 alcoholic drinks per week or drinking 5+ drinks at least once per month, 4) were not in an exclusive committed relationship for 3 months, 5) self-reported HIV-negative or unknown status, and 6) completed the Short Michigan Alcohol Screening Test (SMAST) and cognitive escape scale measures.

### Procedures

MSM were recruited via advertisements placed on websites and smartphone apps, flyers, and at local community events. Eligibility was determined using a brief (10-minute) online survey. Eligible individuals were contacted by project staff to schedule an appointment for the lab-based session. Participants also completed an online survey prior to their lab session, which included self-report measures of sexual behavior, alcohol use, and related constructs. The current study focused specifically on data collected within the baseline survey. All study procedures were approved by the Brown University Institutional Review Board.

### Measures

**Cognitive escape**—Cognitive escape was assessed using a 15-item measure that asked participants to assess how much they agreed with statements such as “life is too short to be bothered worrying about HIV/AIDS” and how often they had certain thoughts or performed certain behaviors, such as “us[ing] alcohol or drugs to forget about HIV/AIDS” (Nemeroff et al., 2008). Items were rated on a 5-point Likert scale (1 *Strongly disagree/never*, 2 *Disagree/Hardly ever*, 3 *Neutral/Sometimes*, 4 *Agree/often*, 5 *Agree strongly/regularly*). Composite rather than subscale scores were used given our limited sample size (see Nemeroff et al., 2008). For each participant, the mean of all items was used to create an overall cognitive escape score used in analyses. Internal consistency of the cognitive escape scale in this sample was high ( $\alpha = 0.86$ ).

**Sexual motives for drinking**—Sexual motives for drinking were assessed using a 5-item measure (Kahler et al., 2015b). Example items include “to feel more confident in

approaching sex partners” and “to make you feel less nervous about sex”. Items were rated on a 5-point Likert scale (1 *Almost never/never*, 2 *Some of the time*, 3 *Half of the time*, 4 *Most of the time*, 5 *Almost always/always*). A mean score was calculated for each participant and used in analyses. Internal consistency of the SMDs measure in this sample was high ( $\alpha = 0.89$ ).

**Sexual behavior and risk**—Sexual behavior and risk were measured using the Sexual Behavior Survey (SBS) (Gordon, Carey, & Carey, 1997), which was modified to fit the MSM population that was the focus of this study. The SBS assesses the number of lifetime and past year male, female, and transgender sexual partners. Two constructs assessed via the SBS served as key outcomes for this study: number of past year male anal sex partners and condom use frequency during receptive/insertive anal sex. Number of past year male anal sex partners was a count variable, with higher responses indicating more anal sex partners. Ratings for condom use ranged from 1 (*Never*) to 5 (*Always*) and were provided separately for receptive and insertive anal sex. We took the mean of each participant’s responses to represent each participant’s overall condom use frequency during anal sex.

**Alcohol use and problems**—Alcohol use was assessed with a single item that inquired about how many drinks participants had “on a typical day when [they] drank” in the past month, and response options ranged from (1) *1 drink* to (10) *10 or more drinks*. Alcohol-related problems were measured using the Short Michigan Alcoholism Screening Test (SMAST) (Selzer, Vinokur, & van Rooijen, 1975). The SMAST is a 13-item measure that assesses alcohol-related problems, such as guilt about drinking, neglecting obligations as a result of drinking, and trouble with the law, during the past six months. Internal consistency of the measure in this sample was acceptable ( $\alpha=0.62$ ).

## Analytic Methods

We used Mplus 8.0 to test the hypothesized associations. Given the count nature of number of anal sex partners and alcohol-related problems, these models were estimated using Poisson regression, while linear models were used for remaining analyses. In each model, sexual motives for drinking was specified as a mediator of associations between cognitive escape and each outcome. Indirect effects were estimated using bootstrapped, bias-corrected confidence intervals (Hayes, 2009).

## RESULTS

Demographic characteristics are shown in Table 1 ( $n = 196$ ). The average age was 28.0 ( $SD = 7.2$ ) and 82.6% of the sample was white or of mixed race including white. Nearly 85% of the sample was single or never married, and approximately 60% reported an annual household income of \$30,000 or more. About 75% self-identified as gay/homosexual. Mean number of past year male anal sex partners was 10.69 ( $SD = 24.74$ ), mean condom use frequency 3.21 ( $SD = 1.18$ ), mean number of drinks on drinking days 4.06 ( $SD = 1.79$ ), and mean SMAST score 2.30 ( $SD = 1.99$ ). Table 2 presents the means, standard deviations, and pairwise correlations of study variables.

### Associations between cognitive escape and sexual risk/alcohol use

Cognitive escape was positively associated with having more sex partners in the past year (incidence rate ratio [*IRR*] = 1.50, *SE* = 0.04, 95% CI [1.40, 1.61], *p* < .001) and negatively associated with the frequency of condom use during anal sex (*B* = -0.30, *SE* = 0.14, 95% CI [-0.58, -0.03], *p* = .028). However, findings about the association between cognitive escape and alcohol use were mixed. Cognitive escape was not associated with number of drinks (*B* = 0.18, *SE* = 0.23, 95% CI [-0.27, 0.62], *n.s.*) but was positively associated with alcohol-related problems (*IRR* = 1.28, *SE* = 0.07, 95% CI [1.11, 1.48], *p* = .001).

### Mediation analyses

Cognitive escape scores were significantly positively associated with our proposed mediator, sexual motives for drinking (*B* = 0.44, *SE* = 0.12, 95% CI [0.22, 0.68], *p* < .001). However, SMDs were not associated with the number of sex partners reported in the past year (*IRR* = 0.97, *SE* = 0.03, 95% CI [0.92, 1.02], *n.s.*) or frequency of condom use during anal sex (*B* = -0.11, *SE* = 0.09, 95% CI [-0.29, 0.05], *n.s.*). SMDs were positively associated with both the average number of drinks consumed on drinking days (*B* = 0.31, *SE* = 0.14, 95% CI [0.04, 0.55], *p* = .025) and alcohol-related problems (*IRR* = 1.13, *SE* = 0.05, 95% CI [1.03, 1.24], *p* = .010).

The indirect effects of cognitive escape on number of past year partners (*IRR* = 0.99, 95% CI [0.96, 1.01]), condom use (*B* = -0.05, 95% CI [-0.17, 0.02]), and number of drinks (*B* = 0.14, 95% CI [0.02, 0.29]) through SMDs were not significant. However, SMDs significantly mediated the association between cognitive escape and alcohol-related problems (*IRR* = 1.06, 95% CI [1.01, 1.11]). Overall, this pattern of results suggests that while sexual motives for drinking did not mediate relationships between cognitive escape and HIV-risk outcomes and alcohol use, there was a small but significant indirect effect of cognitive escape on alcohol-related problems through sexual motives for drinking.

## DISCUSSION

These findings suggest that heavy drinking, HIV-negative MSM who tend to avoid HIV-related thoughts may be at higher risk for alcohol-related problems and sexual risk behaviors that increase HIV risk. Specifically, those with higher cognitive escape scores had more past year male anal sex partners and reported using condoms less often during anal sex. This finding is consistent with a similar past study (Hoyt et al., 2006), adding to a very limited quantitative literature on the role of HIV-related thought avoidance in HIV risk behavior.

Interestingly, we found that cognitive escape was not associated with the average number of drinks per drinking occasion but was associated with alcohol-related problems. This pattern of results is novel and suggests that while those who acknowledge being motivated to avoid HIV-related thoughts may not be more likely to drink more heavily than others, they may be more likely to experience problems due to their drinking. Finally, the positive relationship we observed between cognitive escape and SMDs suggests that those who tend to avoid thinking about HIV may specifically drink more often to facilitate or enhance sex. As our results further show, while drinking specifically for sexual reasons does not necessarily lead

to behavior that increases HIV risk (e.g., not using condoms during anal sex), past studies show that those who acknowledge this tendency to drink for sexual reasons may be more likely to engage in sex while under the influence of alcohol (Kahler et al., 2015b). In turn, this may increase the likelihood of failure to use condoms due to intoxication (Maisto, Palfai, Vanable, Heath, & Woolf-King, 2012; Rehm, Shield, Joharchi, & Shuper, 2012). Our data are unable to test these hypotheses, but future research using event-level data should explore whether cognitive escape and sexual motives for drinking are associated with failure to use a condom more often during sex, compared with occasions in which drinking was not involved.

Consistent with prior research, our results show that those who drink specifically to facilitate sex may be more likely to drink to intoxication when they drink and experience more alcohol-related problems (Kahler et al., 2015b). Together, these findings could suggest that motivation to drink specifically to feel less inhibited about sex or to feel more confident approaching sex partners may play a role in the development of alcohol-related disorders among MSM. As such, interventions aiming to reduce alcohol-related problems among MSM may benefit from addressing the role alcohol plays in people's sex lives.

Finally, testing whether sexual motives for drinking mediated relationships between cognitive escape and HIV risk behaviors largely did not support our hypotheses. That is, a tendency to drink specifically to facilitate sex did not account for the relationship between motivations to avoid HIV-related thoughts and sexual risk behaviors. This pattern of results suggests that these constructs may represent two distinct processes that could independently contribute to certain risk behaviors among MSM. However, another possibility is that the HIV risk behavior outcomes were too broad and non-specific for hypothesized relationships to emerge. For example, sexual motives for drinking could mediate relationships between cognitive escape and sexual risk behaviors that occur specifically when drinking or intoxicated, such as engaging in sex with casual partners or failing to use condoms during anal sex after drinking.

Mediation analyses did suggest, however, that sexual motives for drinking partially mediated relationships between cognitive escape and alcohol-related problems. This pattern lends further support to the importance of addressing drinking specifically to facilitate sex in treatments for alcohol disorders designed for MSM. Furthermore, it is important to address the role that these motives play in avoiding the stress involved in thinking about HIV and the need to be vigilant about protecting oneself. Interventions should incorporate information about coping, specifically alcohol's role in coping with the threat of HIV. Providing more adaptive ways of coping with this stress and facilitating romantic partnerships that do not involve drinking could reduce the frequency and/or severity of certain alcohol-related problems, including feeling guilty because of drinking.

This study has several limitations. This was a cross-sectional study, so we were unable to examine temporality and could only examine associations between predictor and outcome variables. Similarly, the data collected were broad and allowed us to examine possible associations only generally. This lack of specificity may have accounted for some relationships that did not emerge. For example, drinking frequently to facilitate sex may not

be associated with outcomes such as having more anal sex partners, but may be associated with more specific risk outcomes such as having more casual partners specifically when drinking. Condom use was measured using a 5-point Likert scale, so we were unable to utilize a more specific condom use outcome, such as number of partners or anal sex events without a condom, which may be a better indicator for STI risk. Future research should explore this possibility with more detailed data (e.g., event-level data). Likewise, causal relationships between the constructs explored cannot be inferred because the analyzed data were collected at a single time point. Finally, this sample was comprised of heavy drinking MSM, so results may not be generalizable to MSM who drink more moderately. Furthermore, the majority of our sample was white and nearly 90% reported at least some college education, which further limits the generalizability of our results.

## CONCLUSIONS

While our mediation analyses were largely unsupported, these findings nevertheless add important knowledge to the existing literature about the role of HIV-related thought avoidance in sexual risk behavior and alcohol-related outcomes, as well as the role of drinking specifically to facilitate sex in these associations. HIV prevention interventions should acknowledge the role of “HIV fatigue” and thought avoidance when possible and incorporate content providing adaptive ways of coping. Similarly, alcohol disorder treatments specifically designed for MSM may benefit from incorporating similar content, as well as content challenging beliefs about the effects of alcohol on sex.

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**Table 1**

## Demographic characteristics of the sample

Characteristics	Mean (SD) or N (%)
Age	28.0 (7.2)
Race	
White	152 (82.6)
Black or African American	29 (15.8)
American Indian/Alaska Native	7 (3.8)
Asian	8 (4.4)
Pacific Islander	1 (0.5)
Ethnicity (Hispanic or Latino)	37 (19.0)
Marital status	
Single/Never married	165 (84.2)
Married/Domestic partnership	9 (4.6)
In a committed relationship	6 (3.1)
Divorced/separated	4 (2.0)
Other	12 (6.1)
Education	
< High school	5 (2.6)
High school diploma/GED	19 (9.7)
Some college education	63 (32.1)
College graduate	58 (29.6)
Some graduate school	14 (7.1)
Technical or business school	6 (3.1)
Graduate or professional degree	31 (15.8)
Household income	
\$0 – \$29,999	80 (42.1)
\$30,000 – \$99,999	94 (49.5)
\$100,000 or more	16 (8.4)
Sexual identity	
Straight/Heterosexual	2 (1.0)
Gay/Homosexual	148 (75.5)
Bisexual	33 (16.8)
Other	10 (5.1)
Not sure	3 (1.5)

*Note.* The proportion of missing data was small and ranged from 0.51% ( $n=1$ ) for ethnicity to 6.12% ( $n=12$ ) for race. Participants who identified with more than one race are counted in each racial group. Other percentages may not add to 100 due to rounding.

**Table 2**

Means, standard deviations, and pairwise correlations of study variables

Variable	Mean	SD	1	2	3	4	5	6
1. Cognitive escape	1.97	0.61	1.00					
2. Sexual motives for drinking	2.23	1.0	0.27***	1.00				
3. Number of sexual partners <sup>a</sup>	10.69	24.74	0.11	0.05	1.00			
4. Condom use <sup>b</sup>	3.21	1.18	-0.18*	-0.14	-0.09	1.00		
5. Average # of drinks	4.06	1.79	0.11	0.19**	-0.05	0.01	1.00	
6. Alcohol-related problems	2.30	1.99	0.23**	0.20**	0.01	0.00	0.23**	1.00

\* p &lt; .05,

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p &lt; .01

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p &lt; .001

<sup>a</sup>Number of male anal sex partners in the past year<sup>b</sup>Condom use frequency during anal sex<sup>c</sup>Average number of drinks consumed on drinking days

**Table 3**

## Mediation analyses

Variable	Coef.	SE	<i>p</i>	95% CI
CE → SMD	<b>0.44</b>	<b>0.12</b>	<b>&lt; .001</b>	<b>(0.22, 0.68)</b>
<b>Number of past year male anal sex partners</b>				
CE → # partners	<b>1.50</b>	<b>0.04</b>	<b>&lt; .001</b>	<b>(1.40, 1.61)</b>
SMD → # partners	0.97	0.03	.223	(0.92, 1.02)
CE → SMD → # partners (Indirect)	0.99	0.01	.244	(0.96, 1.01)
<b>Condom use frequency during anal sex</b>				
CE → Condom use	<b>-0.30</b>	<b>0.14</b>	<b>.028</b>	<b>(-0.58, -0.03)</b>
SMD → Condom use	-0.11	0.09	.233	(-0.29, 0.05)
CE → SMD → Condom use (Indirect)	-0.05	0.05	.318	(-0.17, 0.02)
<b>Average # of drinks on drinking days</b>				
CE → # of drinks	0.18	0.23	.431	(-0.27, 0.62)
SMD → # of drinks	<b>0.31</b>	<b>0.14</b>	<b>.025</b>	<b>(0.04, 0.55)</b>
CE → SMD → # of drinks (Indirect)	0.14	0.07	.056	(0.02, 0.29)
<b>Alcohol-related problems (SMAST)</b>				
CE → SMAST	<b>1.28</b>	<b>0.07</b>	<b>.001</b>	<b>(1.11, 1.48)</b>
SMD → SMAST	<b>1.13</b>	<b>0.05</b>	<b>.010</b>	<b>(1.03, 1.24)</b>
CE → SMD → SMAST (Indirect)	<b>1.06</b>	<b>0.03</b>	<b>.031</b>	<b>(1.01, 1.11)</b>

*Note.* Poisson regression was used for number of sexual partners and alcohol-related problems, and incidence rate ratios (IRRs) are presented for these outcomes. Bolded values are statistically significant at 0.05 level.