Drinking to Cope among African-American College Students: An Assessment of Episode-specific Motives

Ross E. O'Hara[1], **Marcella H. Boynton**[1], **Denise Scott**[2], **Stephen Armeli**[3], **Howard Tennen**[1], **Carla Williams**[2], and **Jonathan Covault**[4]

[1]Department of Community Medicine & Health Care, University of Connecticut Health Center

[2]Collaborative Alcohol Research Center, Howard University College of Medicine

[3]Department of Psychology, Fairleigh Dickinson University

[4]Department of Psychiatry, University of Connecticut Health Center

Abstract

Despite evidence that African Americans are disproportionately affected by drinking to cope relative to European Americans, African-American college students' drinking motives remain understudied. Additionally, most research has only examined between-person differences in drinking to cope as a predictor of alcohol use, ignoring within-person variability. In the current daily diary study of 462 African-American undergraduates from a historically Black university, associations between episode-specific drinking to cope and alcohol use were tested, an approach more consistent with motivational theories of drinking. At baseline, students completed traditional global drinking motive measures; then for 30 days they reported the number of standard drinks they consumed the previous night, and, if they drank, their coping, enhancement, and social reasons for doing so. Students who reported higher mean levels of episode-specific coping motives, on average, consumed more alcohol on drinking evenings. Furthermore, mean episode-specific coping motives, but not global coping motives, predicted average levels of alcohol use. Additionally, coping motives were particularly important for predicting nonsocial (versus social) drinking. Finally, during evenings for which students reported higher than usual episode-specific coping motives, men consumed more alcohol in both social and nonsocial contexts; in contrast, women reporting higher than usual drinking-to-cope motives only consumed more nonsocial drinks. In conclusion, drinking among African-American college students was related to coping motives, particularly among men and in the context of nonsocial alcohol consumption. Moreover, motivational theories of alcohol use may be refined by measuring episode-specific drinking motives that more accurately capture the drinking-to-cope process.

Keywords

drinking to cope; college students; African Americans; daily diary

Correspondence concerning this article should be addressed to Jonathan Covault or Howard Tennen, Department of Psychiatry, 263 Farmington Avenue, Farmington, CT 06030-1410; jcovault@uchc.edu or tennen@nso1.uchc.edu.

Many college students consume excessive amounts of alcohol and are therefore at increased risk for alcohol-related problems (Hingson, Heeren, Winter, & Wechsler, 2005; O'Malley & Johnston, 2002). A plethora of research has identified drinking motives as important predictors of this behavior (for reviews, see Ham & Hope, 2003; Kuntsche, Knibbe, Gmel, & Engels, 2005). Of particular interest is when college students drink to mitigate stress or negative affect, referred to as drinking to cope (Cooper, 1994), which is reported by upwards of 40% of students and often predicts drinking problems to a greater degree than do other motivations for drinking (Kassel, Jackson, & Unrod, 2000; Park & Levenson, 2002; Patrick, Lee, & Larimer, 2011; Simons, Gaher, Correia, Hansen, & Christopher, 2005). Moreover, drinking to cope in college appears to impede the diminishment of alcohol use with age (i.e., "maturing out") and may lead to future alcohol use disorders (Littlefield, Sher, & Wood, 2010). Much of what is known in this area, however, derives from samples of primarily European-American students. Although African-American students drink relatively less than their European-American counterparts, excessive use and alcohol-related problems are still prevalent among this group (Meilman, Presley, & Cashin, 1995; Siebert, Wilke, Delva, Smith, & Howell, 2003). Furthermore, evidence suggests that drinking to cope is more pronounced among young African Americans (Bradizza, Reifman, & Barnes, 1999) and rapidly escalates among this subgroup during the transition from adolescence to young adulthood (Cooper et al., 2008). Due to the dearth of research on drinking to cope among African-American college students, we conducted a daily diary study to help us better understand the motivations that underlie their drinking during discrete episodes, and the drinking-to-cope process more generally.

Drinking to Cope

Motivational models of alcohol use identify drinking to moderate one's internal affective state as particularly relevant for predicting levels of use and drinking-related consequences (Cooper, Frone, Russell, & Mudar, 1995; Simons et al., 2005). The most common reason for drinking is to attain, maintain, or amplify positive affect, an appetitive process known as drinking to enhance (Cooper, 1994). Enhancement drinking predicts increased alcohol use and, subsequently, more drinking problems (Cooper et al., 1995; Simons et al., 2005). Drinking to cope, however, is considered a reactive process in which alcohol is used to escape or avoid negative affect (Cooper, 1994), and has been theorized to reflect a lack of other coping resources, thereby reinforcing the use of alcohol in response to emotional duress (Cooper et al., 1995; Kassel et al., 2000). This motive may be especially hazardous as it has been shown to uniquely predict drinking problems and alcohol dependence beyond level of consumption (Carpenter & Hasin, 1998; Cooper et al., 1995; Kassel et al., 2000; Patrick et al., 2011; Simons et al., 2005).

Most prior research has treated drinking motives as trait-like characteristics (i.e., measured globally and on a single occasion) and only examined how between-person differences in motivation influence alcohol use. However, the motivational model conceptualizes drinking as a dynamic phenomenon that varies as a function of motivation and mood (Cooper et al., 1995). A between-person approach that assumes individuals generally drink for the same reasons across time and situations, therefore, may not be appropriate. In fact, global coping motives have been shown to deviate substantially from daily coping motives (Flynn, 2000;

Todd, Tennen, Carney, Armeli, & Affleck, 2004), and significant within-person variation in drinking motives has been observed (Arbeau, Kuiken, & Wild, 2011). Using a global measure, therefore, may obfuscate the varying circumstances under which people drink, and how much drinking may result from differing *in situ* motives.

Daily Diary Studies of College Student Drinking

In the current study, we used daily diary methodology to better capture the dynamic processes related to drinking at the temporal level at which they unfold (Armeli, Todd, & Mohr, 2005). Daily studies are particularly well-suited for examining discrete behaviors such as drinking that, in general, occur over a limited course of the day and at predictable times, and are both distinct and memorable (Gunthert & Wenze, 2012). These methods also allow for measurement of drinking behavior and motives close to their occurrence, thus greatly reducing retrospective bias. Prior daily studies have, for the most part, conceptualized drinking to cope as a trait-like construct and tested it as a moderator of within-person relations between mood and drinking behavior. These studies have not produced clear and consistent evidence of greater mood-contingent drinking among individuals who report high levels of global drinking-to-cope motivation (e.g., Armeli, Conner, Cullum, & Tennen, 2010; Grant, Stewart, & Mohr, 2009; Hussong, Galloway, & Feagans, 2005; Mohr et al., 2005; Park, Armeli, & Tennen, 2004). More important, none have examined the association between coping motives and drinking at the within-person level. We extended this work by having students report drinking motives for each evening they consumed alcohol (i.e., episode-specific drinking motives), which allowed us to examine within-person effects of motives on drinking behavior. Moreover, we were able to compare the predictive validity of mean episode-specific drinking motives (i.e., average level of motives reported across all drinking occasions) with global drinking motives (i.e., typical motives reported at baseline) to determine the degree to which they capture different components of the drinking-to-cope process.

Drinking to Cope among African Americans

The current study examined drinking to cope among a relatively understudied sample, African-American college students. Studying this novel sample may further our understanding of the drinking-to-cope process as African Americans as young as 13 years old have been shown to be more likely than European Americans to endorse coping motives (Bradizza et al., 1999; Cooper, Russell, Skinner, & Windle, 1992). Moreover, drinking-to-cope motivation appears to escalate throughout young adulthood among African Americans, and this group has exhibited stronger links from coping motives to alcohol use and drinking problems than European Americans (Cooper et al., 1995, 2008). It has been theorized that African Americans may be more likely to drink to cope due to their elevated exposure to chronic stressors, such as social disadvantage, racial stigma/discrimination, and unfair treatment, all of which predict problematic drinking (Boynton, O'Hara, Covault, Scott, & Tennen, in press; Gerrard et al., 2012; Mulia, Ye, Zemore, & Greenfield, 2008; Mulia & Zemore, 2012). Although the current study focused on a well-educated population of African Americans, these students likely still experience many stressors related to race and other social factors that could motivate alcohol use as a means of coping. Theoretical

considerations aside, examining coping motives in an African-American college sample is important from a public health perspective as doing so may inform why African-American adults are at higher risk for alcohol-related consequences compared to European Americans at comparable levels of use (Mulia, Ye, Greenfield, & Zemore, 2009).

The Current Study

This daily diary study of college student drinking, the first to our knowledge to focus on a large sample of African Americans, examined whether relations between episode-specific drinking motives and alcohol use conform to motivational theories of drinking (e.g., Cooper et al., 1995) among students from a Historically Black College/University (HBCU). Conducting this study at an HBCU was ideal because it maximized African-American students' participation, and African-American drinking rates do not significantly differ between HBCUs and other institutions (Meilman et al., 1995). More generally, this study extends earlier investigations by measuring episode-specific drinking motives, allowing us to predict alcohol outcomes from both within- and between-person variation in motives. Aside from coping and enhancement motives, motivational models have also identified as relevant social (i.e., drinking to improve gatherings or bond with others) and conformity motives (i.e., drinking due to social pressure; Cooper, 1994). We included social motives in the analyses because they are particularly important in predicting college student drinking, which occurs mostly in peer contexts (Christiansen, Vik, & Jarchow, 2002); however, we omitted conformity motives as these tend to show low endorsement among college students, as well as much weaker relations with drinking outcomes (Ham, Zamboanga, Bacon, & Garcia, 2009; Martens, Rocha, Martin, & Serrao, 2008).

We hypothesized that students' mean levels of episode-specific coping motives, as well as within-person variation in episodic reports of coping motives, would positively predict drinking outcomes (i.e., stronger endorsement of coping motives would be associated with a higher number of drinks consumed and a higher likelihood of heavy episodic drinking). Importantly, we expected these effects even when controlling for enhancement and social motives measured at both the episode-specific and global levels. Furthermore, we hypothesized that mean episode-specific coping motives would be a better predictor of average levels of drinking behavior than global coping motives. We also examined social versus nonsocial drinking, as prior evidence indicates that drinking to cope is associated with more solitary alcohol use (Cooper, 1994; Cooper et al., 1992; Gonzalez, Collins, & Bradizza, 2009; Gonzalez & Skewes, 2012; Mohr et al., 2005). This distinction is important given that nonsocial drinking has been more strongly linked to alcohol-related problems than social drinking among college students (Christiansen et al., 2002; Gonzalez & Skewes, 2012). We therefore anticipated stronger relations between drinking-to-cope measures and alcohol outcomes for nonsocial versus social drinking. Finally, differences between men and women were examined (Nolen-Hoeksema, 2004); however, due to contradictory evidence regarding gender differences in drinking to cope (e.g., Cooper et al., 1995; Ham & Hope, 2003; Park & Levenson, 2002), as well as a lack of prior evidence with regard to African Americans, no *a priori* hypotheses are offered.

Method

Participants

All procedures for this study were approved by the institutional review boards at the study site and the corresponding authors' institution. The baseline sample consisted of 741 undergraduates from an HBCU, of which 564 (76%) began the diary portion of the study. Participants were excluded from analyses if they provided less than 2 weeks' worth of data (i.e., fewer than 14 of the 30 possible daily surveys; $n = 66$); therefore, 498 students (67% of those initially recruited) completed the study. Comparisons between students who completed 14 or more surveys and those who did not (including those who did not participate in the diary phase of the study) revealed that non-completers were more likely to be male, $\chi^2 (1) = 17.9$, $p < .001$. No differences were found for age, past 30-day alcohol consumption, or global drinking-to-cope motivation, ps > .05. Students were also excluded from analyses if they met one or more of the following criteria: self-identified as other than Black/African-American, African ancestry, or mixed race including African ancestry ($n = 12$); were less than 18 years old ($n = 1$); had ever sought treatment for alcohol issues (because we were interested primarily in studying a non-clinical sample; $n = 8$); had not consumed alcohol in the past month ($n = 34$); or reported no drinking episodes during the study month ($n = 12$). These criteria resulted in a final sample for analysis of 462 students who completed 10866 diary entries ($M = 23.5$, $SD = 4.5$; 78% adherence rate). Most participants (59%) were female and they ranged in age from 18 to 26 years old ($M = 20.1$, $SD = 1.6$).

Measures

Alcohol use was measured each day by asking participants how many standard alcoholic drinks they consumed the night before (from 0 to 15, in 1-drink increments, with an option for >15), both while interacting with others (*social drinking*) and while alone or not interacting with others (*nonsocial drinking*). Students were reminded each day that a standard drink was defined as one 12-oz can or bottle of beer or wine cooler, one 5-oz glass of wine, or a 1-oz measure of liquor straight or in a mixed drink. We conducted analyses in which social and nonsocial drinking were combined (i.e., total drinking), as well as analyzed separately. We also examined heavy episodic drinking as an outcome by dichotomizing number of drinks using cutoffs of 4+ drinks for women and 5+ drinks for men (National Institute on Alcohol Abuse and Alcoholism, 2004). Because drinking motives were only reported if participants drank, analyses focus on level of drinking (i.e., number of drinks consumed and the odds of heavy drinking on evenings when students drank), rather than whether drinking occurred.

Global drinking motives were assessed at baseline with an adapted version of the Drinking Motives Questionnaire-Revised (DMQ-R; Cooper, 1994). Students reported how often their drinking was due to various reasons, using a 5-point scale from *almost never/never* to *almost always/always*. Five items each measured coping (e.g., "to forget your worries," α = .86), enhancement (e.g., "because it's fun," α = .88), and social motives (e.g., "to be sociable," α = .91).

Episode-specific drinking motives were measured for each evening in which students reported alcohol use with 11 items adapted from the DMQ-R (Cooper, 1994). These items were in reference to the entire evening's drinking, and did not, therefore, differentiate between social and nonsocial drinking. Coping motives were measured with seven items: one of the original five items ("depressed or nervous") was split into separate items, and an item was added about drinking in response to anger. Enhancement and social motives were measured with two items each, based on items with the highest factor loadings from the DMQ-R (Cooper, 1994). Students responded on a 3-point scale of *no*, *somewhat*, and *definitely*. A confirmatory factor analysis (Figure 1), discussed in greater detail in the results, demonstrated both good internal validity and adequate reliability for each of the episode-specific drinking motive scales.

Procedure

Undergraduate students at an HBCU were recruited via flyers, campus newspaper advertisements, emails, and face-to-face interactions to participate in a study examining how college students' daily experiences and moods influence their health and academics. Data were collected across seven semesters, thereby decreasing the likelihood that results are attributable to the particular circumstances of any one semester. Interested students attended an introductory session with up to four other students, at which time they gave informed consent; no students declined to provide consent at this session nor withdrew consent during the study. Participants then provided salivary DNA (for an unrelated study; Kranzler et al., 2012) and were given log-in information for the secure website at which they could complete the baseline and daily diary surveys. Each diary entry took 5–7 min to complete, and could be accessed online daily between 2:30 PM (at which time an email reminder was sent to participants) and 7:00 PM. This window was chosen to approximate the time after students finished that day's classes, but before they were likely to begin drinking. Participants who missed the designated time for the daily survey could request to complete it late (up to 12:00 noon the next day). Participants were compensated for completing both the baseline ($20) and daily diary surveys (up to $100 for perfect adherence, plus entry into a drawing with a 5% chance to win $100 for completing at least 25 surveys).

Analysis Plan

Hypotheses were tested with multilevel modeling, an analytic method that accounts for nesting of data collected on individual days within persons (i.e., non-independence). Number of drinks consumed and heavy drinking episodes (0 = *no*, 1 = *yes*) were the outcomes of interest. Because these outcomes were non-normal, models were estimated with the PROC GLIMMIX procedure in SAS 9.3 (SAS Institute Inc., 2011) using a quasi-likelihood estimation strategy (Hox, 2010) and a log link function specified with either a Poisson or binary distribution, respectively. Given no *a priori* hypotheses with respect to random effects, only the intercept was treated as random. Episode-specific drinking motives were person-mean centered, and mean levels of episode-specific drinking motives were simultaneously entered into the models at the between-person level to allow us to examine separately within- and between-person effects of interest (Curran & Bauer, 2011). Additionally at the between-person level, age and global drinking motives were grand-mean centered, and gender was dummy-coded (0 = *female*, 1 = *male*). At the within-person level,

we controlled for whether the drinking event occurred on a weeknight or a weekend (coded 0, 1, respectively), as college student drinking tends to cluster on Friday and Saturday nights (Armeli, Todd, Conner, & Tennen, 2008).

The analysis strategy employed a bottom-up building approach to multilevel models (Hox, 2010). For each outcome, an intercept-only model was first estimated and the intraclass correlation was computed. Daily predictors were then individually tested, followed by person-level predictors and interaction terms. All significant effects from prior models were then used to build the final model, trimming any non-significant terms. Because these multilevel generalized linear models employed quasi-likelihood estimation, only the Wald statistic determined whether an effect was maintained in the final model.

Results

Descriptive Results

A total of 2438 drinking episodes with corresponding daily motives data were reported during the 30 days ($M = 5.1$, $SD = 3.6$), ranging from 1 to 24 episodes per participant.[1] In terms of endorsing one or more drinking motive items, 46% of episodes were associated with coping motives, 70% with social motives, and 85% with enhancement motives. The distribution of number of drinks per episode was skewed, with a range from 1 to 32 (or more) drinks, and a mean and mode, respectively, of 5.0 and 2.0 for men and 3.5 and 1.0 for women. A total of 941 heavy drinking episodes (39% of all episodes) were included in these analyses, of which approximately half were enacted by women. Due to the non-normal nature of the drinking outcomes, the intraclass correlations were computed assuming a threshold model (Snijders & Bosker, 1999), which constrains the residual variance at 1.0 for the drink count model and $\pi^2/3$ for the heavy drinking model. The values were .17 and .19, respectively, indicating that 83% of the variance for number of drinks consumed and 81% of the variance for heavy drinking was at the daily level, showing a substantial degree of within-person variability in these outcomes.

Construct Validity of Episode-specific Drinking Motives

Given that assessment of drinking motives at the episodic level is a relatively novel approach, it seemed prudent to examine the construct validity and reliability of the items. Of particular concern was whether social and enhancement motives should be treated as unique predictors considering their high degree of collinearity. To test the factor structure of the episode-specific motives, a multilevel confirmatory factor analysis employing a robust weighted least squares estimator with a diagonal weight matrix (WLSMV) was performed using M*plus* 7 (Muthén & Muthén, 2012). This analysis controlled for non-independence of the data, and treated indicators of the latent constructs as categorical. Results of the 2-factor and 3-factor models are depicted in Figure 1. Both models showed reasonably good fit, with nearly identical fit indices: CFI = .97, TLI = .96, RMSEA = .05 (95% confidence interval: .

---

[1]An additional 791 drinking events were reported without corresponding episode-specific drinking motives. This was due to the fact that students who missed a diary entry were queried at their next log-in about their drinking for up to 3 days preceding. However, because drinking motives are theorized to be more fleeting than reports of concrete behavior (i.e., alcohol use), these reports did not include drinking motives and, therefore, were not included in the analyses.

05, .06). However, the 3-factor model with social and enhancement motives separated was significantly better-fitting than the 2-factor model, as demonstrated by the χ^2 difference test, χ^2 (2) = 15.8, p = .0004. In the main analyses, therefore, episode-specific social and enhancement motives were tested separately for both theoretical (Cooper, 1994) and empirical reasons. However, because these latent factors were highly correlated (r = .88), and the fit statistics between the two models nearly equivalent, both conceptualizations of drinking motives were deemed valid.

Effects of Episode-specific Drinking Motives

Results from models predicting total number of drinks consumed during drinking episodes are shown in Table 1. Coping, social, and enhancement episode-specific motives were initially tested in separate models, all of which showed positive between- and within-person effects, ps < .05. In the final model, students who reported higher mean episode-specific coping motives consumed more drinks on average, p < .05. Moreover, the influence of within-person variation in coping motives was qualified by an interaction with gender, p < .0001. As displayed in Figure 2 (top panel), on evenings when drinking occurred, men who reported higher than usual coping motives for that evening consumed more drinks, b = 0.06, p < .001. In contrast, women drank fewer drinks on evenings for which they reported higher than usual coping motives, b = −0.02, p = .02.

Results from models predicting odds of a heavy drinking episode are shown in Table 2. Again, all between- and within-person effects of episode-specific drinking motives were positive in individual models, ps < .05. In the final model, however, only the between- and within-person effects of social motives and the within-person effect of enhancement motives remained significant, ps < .05. Finally, similar to the total number of drinks model, the effect of episode-specific coping motives varied by gender. As displayed in Figure 2 (top panel), on days when women reported higher than usual coping motives, they were less likely to engage in heavy drinking, b = −0.07, p = .03. In contrast, relative levels of episode-specific coping motives were unrelated to heavy drinking for men, b = 0.13, p = .24.[2]

Mean Episode-specific versus Global Drinking Motives

Mean episode-specific drinking motives were only moderately correlated with their global counterparts (coping: r = .40, p < .001; enhancement: r = .47, p < .001; social: r = .34, p < .001), suggesting that each measure might tap distinct aspects of students' typical drinking motives. As such, we compared the unique additive value of these two ways of measuring between-person differences in drinking motives in predicting mean levels of drinking outcomes. In the individual models (see Tables 1 and 2), higher global coping and social motives were associated with a higher average number of drinks consumed, and higher global social and enhancement motives were associated with higher rates of heavy drinking, ps < .05. However, when global measures were entered simultaneously with mean episode-specific drinking motives (see final models in Tables 1 and 2), global enhancement motives

---

[2]Additional models were tested that included mean episode-specific coping motives × gender and global coping motives × gender interactions at the between-person level. These effects failed to reach significance for either outcome and their inclusion did not significantly alter the results.

emerged as the only significant global predictor for both outcomes, ps < .05. Global coping motivation, therefore, failed to predict number of drinks consumed and heavy drinking whereas mean episode-specific coping motives predicted both.

Social versus Nonsocial Drinking

We also examined both outcomes separately for social and nonsocial drinking. As expected, students reported far more social drinking (Christiansen et al., 2002): Of the 2438 drinking events, 1692 (69.4%) included only social drinking, 542 (22.2%) included social and nonsocial drinking, and 204 (8.4%) included only nonsocial drinking. When drinking socially, the average number of drinks consumed was 3.3 ($SD = 2.8$), whereas students averaged 2.6 drinks ($SD = 2.1$) when drinking non-socially. In addition, there were 766 social heavy drinking episodes and 139 nonsocial heavy drinking episodes reported. Finally, 290 participants (62.8%) reported any nonsocial drinking, and 74 (16.0%) reported at least one nonsocial heavy drinking episode.

For social drinking, results for both outcomes were similar to the overall models (see Tables 1 and 2): positive between- and within-person effects for episode-specific social motives and a positive within-person effect for episode-specific enhancement motives, ps < .001. For the final drink count model, however, mean episode-specific coping motives were not significant. Finally, within-person episode-specific coping motives × gender interactions emerged for both outcomes, ps < .05, similar to those observed for total drinking. As displayed in Figure 2 (middle panel), men who reported higher than usual coping motives also consumed more social drinks that evening, $b = 0.04$, $p = .0001$, but were not more likely to have a heavy drinking episode, $b = 0.07$, $p = 0.19$. Women who reported higher than usual coping motives, on the other hand, drank significantly fewer social drinks, $b = -0.06$, $p < .0001$, and were less likely to experience a heavy drinking episode, $b = -0.14$, $p = .01$.

For nonsocial drinking, the pattern was much different from the overall models, with coping motives playing a predominant role (see Tables 1 and 2). For each outcome, both the between- and within-person effects of episode-specific coping motives were positive and significant, ps < .005, as were the effects for global coping motives, ps < .05. Finally, a significant within-person episode-specific coping motives × gender interaction emerged for nonsocial number of drinks, but with a different pattern of results than found for either total or social drinking. As illustrated in Figure 2 (bottom panel), both men and women who reported higher than usual coping motives for that evening reported consuming more nonsocial drinks, $b = 0.11$, $p < .0001$ and $b = .07$, $p < .0001$, respectively.

Discussion

This was the first study to examine the influence of episode-specific coping motives on alcohol use, and to do so among African-American students at an HBCU. In models examining total evening drinking, male and female students who reported higher mean episode-specific coping motives over the study month consumed more alcohol overall. Additionally, within-person variation in men's episode-specific coping motives positively predicted number of drinks consumed, whereas women's variation *negatively* predicted both drinking outcomes. Additionally, global drinking-to-cope motives failed to predict total

number of drinks consumed or heavy drinking when controlling for mean episode-specific measures. Finally, coping motives appeared to be particularly influential for nonsocial drinking, with positive between- and within-person effects for episode-specific coping motives, as well as significant effects for global coping motives.

Effects of Episode-specific Drinking Motives

These results supported the hypothesis that African-American students' episode-specific coping motives would predict their alcohol use at both the between- and within-person levels. However, episode-specific social and enhancement motives were both significant predictors, especially of social drinking. It appears, therefore, that African-American students' drinking levels correspond to the same reasons found in earlier studies of primarily European-American students—to socialize and to get "buzzed" (e.g., Armeli et al., 2010; Patrick et al., 2011; Simons et al., 2005). The influence of coping motives, however, appears to provide these students with an additional context in which to consume alcohol, namely when experiencing negative affect or stress. This additional reason to drink may represent a risk factor for drinking-related consequences, which have previously been associated with drinking to cope (e.g., Cooper et al., 1995; Simons et al., 2005).

Gender differences revealed that when students reported higher within-person levels of coping motives, men showed increased social and nonsocial drinking, whereas women only showed higher levels of nonsocial drinking. In fact, women appeared to *decrease* their social alcohol use when they reported higher than typical coping motives. These findings support earlier reports of a stronger link between coping motives and alcohol outcomes for men than women (e.g., Cooper et al., 1995; Park & Levenson, 2002). Researchers have speculated that men may be socially permitted to drink more excessively than women, including in response to negative affect, due to gender differences in perceived drinking norms and social sanctions (Nolen-Hoeksema, 2004). African-American women, on the other hand, have been shown to be more likely to seek social support in response to interpersonal stressors (e.g., prejudice or discrimination; Swim, Hyers, Cohen, Fitzgerald, & Bylsma, 2003). Women in the current study, therefore, may have drawn on other coping resources while drinking that men did not, thereby mitigating the former group's level of use. Better understanding of these gender differences appears to be fruitful territory for future investigation.

Patterns found in the main analyses were true generally for social drinking, which was more common among students (Christiansen et al., 2002). Nonsocial drinking, on the other hand, was almost exclusively predicted for both genders by episode-specific and global coping motives. These findings, which are consistent with prior studies (e.g., Cooper et al., 1992; Gonzalez et al., 2009; Mohr et al., 2005), help to elucidate the drinking-to-cope process. Motives to alleviate or escape negative affect may lead to more nonsocial drinking, which could separate individuals from social support and may prompt rumination. Future research should further examine how episode-specific drinking motives influence alcohol use in different social contexts, and how these variations in person and environment may result in increased risk for alcohol-related problems and dependence symptoms, as seen in longitudinal studies (e.g., Carpenter & Hasin, 1998; Cooper et al., 1995; Littlefield et al., 2010; Simons et al., 2005).

Comparing Episode-specific and Global Measures

Another goal of this study was to compare the validity of mean episode-specific drinking motives to traditionally-used global measures for predicting average levels of alcohol use. For coping motives, only mean episode-specific measures predicted total drinking. These findings suggest that global coping measures may be subject to recall errors and biases that impede their ability to predict overall drinking behavior. Given that coping motives were generally less endorsed for drinking episodes than either social or enhancement motives, these instances may be less memorable or cognitively accessible, leading to greater error in the measurement of global coping motives versus other drinking motives. Global coping motives did, however, uniquely predict nonsocial drinking when controlling for mean episode-specific coping motives, suggesting that both approaches tap distinct processes that explain nonsocial drinking. It is possible that previously found associations between drinking to cope and nonsocial drinking (e.g., Cooper et al., 1992; Gonzalez & Skewes, 2013; Mohr et al., 2005) may be due, in part, to attributions made for drinking alone. In other words, individuals may more readily perceive drinking alone as a coping response; global coping measures, therefore, may serve as a proxy for frequency and/or intensity of nonsocial drinking. These findings reinforce the utility of a within-person approach to studying drinking motives, which not only allows researchers to examine how episodic variation in motives influence alcohol use, but also may provide a more accurate assessment of participants' typical drinking motives across situations than retrospective, global measures.

Limitations and Future Research

Although these findings highlight the importance of examining how deviations from individuals' mean levels of drinking-to-cope motivation are related to alcohol use, past research indicates that coping motives are particularly associated with drinking problems (Cooper et al., 1995; Kuntsche et al., 2005). Future research should determine whether episode-specific coping motives are proximally associated with reports of alcohol-related negative outcomes. Our findings also highlight the importance of examining the social context of drinking episodes, though our evaluation of the nature of the social interaction (i.e., interacting versus not interacting) was less than optimal. Future studies should assess whether interactions that occur alongside drinking are related to maladaptive coping (e.g., venting), adaptive coping (e.g., seeking social support), or unrelated to coping. Further explication of such reports could help to better understand how drinking-to-cope motivation is related to drinking levels and problems in both the short- and long-term (Cooper et al., 1995; Littlefield et al., 2010; Simons et al., 2005), as well as how these processes differ between men and women. These reports should also include discrete measures of time, as heavy drinking is currently defined as occurring within approximately 2 hours (NIAAA, 2004), yet our conceptualization did not account for the duration of the drinking episode.

Students in the current study were not asked to identify the specific cause of the negative emotions that prompted their coping motives. Future research should explore whether different stressors produce different styles of drinking to cope, and their impact on drinking level and consequences. Of particular importance may be experiences with racial discrimination and stigma, which are common among African-American college students

(Swim et al., 2003), and have been shown to influence alcohol use and related cognitions (Boynton et al., in press; Gerrard et al., 2012; Mulia et al., 2008; Mulia & Zemore, 2012).

Future research should also strive to collect racially and ethnically diverse college (and non-college) samples. In the current study, data were collected at an HBCU in order to obtain a sufficiently large sample of African-American college students; however, this methodology precluded analyzing racial/ethnic differences. Evidence suggests, however, that these results should generalize to African Americans enrolled at institutions with predominantly European-American students (Meilman et al., 1995). However, we hesitate to generalize our findings to other racial/ethnic groups before these results can be replicated, and we encourage researchers to adopt this within-person approach to studying drinking motives, which we feel confident will shed additional light on these processes among other populations.

Finally, although collecting daily level data approximates a causal chain of events in close to real-time, this method cannot definitively argue for causation. It is possible that students reconstructed their motives for drinking the next day as a function of how much they drank, the contexts in which they drank, or the consequences they experienced. Although the limited retrospection relied upon in the current study (i.e., remembering the night before) is likely less susceptible to error and bias than traditional global measures of alcohol use and motives, future studies may consider using ecological momentary assessment (Shiffman, Stone, & Hufford, 2008) to measure drinking motives at drinking onset, as well as possible change in drinking motives over the course of a drinking episode.

Conclusion

Examination of within-person variation in drinking motives produced findings consistent with theory pertaining to drinking to cope (Cooper et al., 1995). Coping motivation was shown to be an important predictor of levels of alcohol use among African-American college students, an at-risk yet heretofore understudied population. These results emphasize the value of daily survey designs for studying discrete, intermittent behaviors such as drinking and suggest that researchers may gain much added insight by measuring drinking motives in a daily or episodic fashion.

Acknowledgments

References

Arbeau KJ, Kuiken D, Wild TC. Drinking to enhance and cope: A daily process study of motive specificity. Addictive Behaviors. 2011; 36:1174–1183. [PubMed: 21864984]

Armeli S, Conner TS, Cullum J, Tennen H. A longitudinal analysis of drinking motives moderates the negative affect-drinking association among college students. Psychology of Addictive Behaviors. 2010; 24:38–47. [PubMed: 20307111]

Armeli S, Todd M, Conner TS, Tennen H. Drinking to cope with negative moods and the immediacy of drinking within the weekly cycle among college students. Journal of Studies on Alcohol and Drugs. 2008; 69:1–10.

Armeli S, Todd M, Mohr C. A daily process approach to individual differences in stress-related alcohol use. Journal of Personality. 2005; 73:1657–1686. [PubMed: 16274449]

Boynton MH, O'Hara RE, Covault J, Scott D, Tennen H. A mediational model of racial discrimination and alcohol-related problems among African American college students. Journal of Studies on Alcohol and Drugs. (in press).

Bradizza CM, Reifman A, Barnes GM. Social and coping reasons for drinking: Predicting alcohol misuse in adolescents. Journal of Studies on Alcohol. 1999; 60:491–499. [PubMed: 10463805]

Carpenter KM, Hasin D. A prospective evaluation of the relationship between reasons for drinking and DSM-IV alcohol-use disorders. Addictive Behaviors. 1998; 23:41–46. [PubMed: 9468741]

Christiansen M, Vik PW, Jarchow A. College student heavy drinking in social contexts versus alone. Addictive Behaviors. 2002; 27:393–404. [PubMed: 12118627]

Cooper ML. Motivations for alcohol use among adolescents: Development and validation of a four-factor model. Psychological Assessment. 1994; 4:117–128.

Cooper ML, Frone MR, Russell M, Mudar P. Drinking to regulate positive and negative emotions: A motivational model of alcohol use. Journal of Personality and Social Psychology. 1995; 69:990–1005. [PubMed: 7473043]

Cooper ML, Krull JL, Agocha VB, Flanagan ME, Orcutt HK, Grabe S, Jackson M. Motivational pathways to alcohol use and abuse among Black and European-American adolescents. Journal of Abnormal Psychology. 2008; 117:485–501. [PubMed: 18729604]

Cooper ML, Russell M, Skinner JB, Windle M. Development and validation of a three-dimensional measure of drinking motives. Psychological Assessment. 1992; 4:123–132.

Curran PJ, Bauer DJ. The disaggregation of within-person and between-person effects in longitudinal models of change. Annual Review of Psychology. 2011; 62:583–619.

Flynn HA. Comparison of cross-sectional and daily reports in studying the relationship between depression and use of alcohol in response to stress in college students. Alcoholism: Clinical and Experimental Research. 2000; 24:48–52.

Gerrard M, Stock ML, Roberts ME, Gibbons FX, O'Hara RE, Weng CY, Wills TA. Coping with racial discrimination: The role of substance use. Psychology of Addictive Behaviors. 2012; 26:550–560. [PubMed: 22545585]

Gonzalez VM, Collins RL, Bradizza CM. Solitary and heavy social drinking, suicidal ideation, and drinking motives in underage college drinkers. Addictive Behaviors. 2009; 34:993–999. [PubMed: 19556066]

Gonzalez VM, Skewes MC. Solitary heavy drinking, social relationships, and negative mood regulation in college drinkers. Addiction Research and Theory. 2013; 21:285–294.

Grant VV, Stewart SH, Mohr CD. Coping-anxiety and coping-depression motives predict different daily mood-drinking relationships. Psychology of Addictive Behaviors. 2009; 23:226–237. [PubMed: 19586139]

Gunthert, KC.; Wenze, SJ. Daily diary methods. In: Mehl, MR.; Conner, TS., editors. Handbook of research methods for studying daily life. New York: Guilford Press; 2012. p. 144-159.

Ham LS, Hope DA. College students and problematic drinking: A review of the literature. Clinical Psychology Review. 2003; 23:719–759. [PubMed: 12971907]

Ham LS, Zamboanga BL, Bacon AK, Garcia TA. Drinking motives as mediators of social anxiety and hazardous drinking among college students. Cognitive Behaviour Therapy. 2009; 38:133–145. [PubMed: 19306146]

Hingson R, Heeren T, Winter M, Wechsler H. Magnitude of alcohol-related mortality and morbidity among U.S. college students ages 18–24: Changes from 1998 to 2001. Annual Review of Public Health. 2005; 26:259–279.

Hox, JJ. Multilevel analysis: Techniques and applications. Routledge Academic; 2010.

Hussong AM, Galloway CA, Feagans LA. Coping motives as a moderator of daily mood-drinking covariation. Journal of Studies on Alcohol. 2005; 66:344–353. [PubMed: 16047523]

Kassel JD, Jackson SI, Unrod M. Generalized expectancies for negative mood regulation and problem drinking among college students. Journal of Studies on Alcohol. 2000; 61:332–340. [PubMed: 10757145]

Kranzler HR, Scott D, Tennen H, Feinn R, Williams C, Armeli S, Covault J. The 5-HTTLPR polymorphism moderates the effect of stressful life events on drinking behavior in college students of African descent. American Journal of Medical Genetics, Part B: Neuropsychiatric Genetics. 2012; 159B:484–490.

Kuntsche E, Knibbe R, Gmel G, Engels R. Why do young people drink? A review of drinking motives. Clinical Psychology Review. 2005; 25:841–861. [PubMed: 16095785]

Littlefield AK, Sher KJ, Wood PK. Do changes in drinking motives mediate the relation between personality change and "maturing out" of problem drinking? Journal of Abnormal Psychology. 2010; 119:93–105. [PubMed: 20141246]

Martens MP, Rocha TL, Martin JL, Serrao HF. Drinking motives and college students: Further examination of a four-factor model. Journal of Counseling Psychology. 2008; 55:289–295.

Meilman PW, Presley CA, Cashin JR. The sober social life at the historically Black colleges. The Journal of Blacks in Higher Education. 1995; 9:98–100.

Mohr CD, Armeli S, Tennen H, Temple M, Todd M, Clark C, Carney MA. Moving beyond the keg party: A daily process study of college student drinking motivations. Psychology of Addictive Behaviors. 2005; 19:392–403. [PubMed: 16366811]

Mulia N, Ye Y, Greenfield TK, Zemore SE. Disparities in alcohol-related problems among European-American, Black, and Hispanic Americans. Alcoholism: Clinical and Experimental Research. 2009; 33:654–662.

Mulia N, Ye Y, Zemore SE, Greenfield TK. Social disadvantage, stress, and alcohol use among Black, Hispanic, and European-American Americans: Findings from the 2005 U.S. National Alcohol Survey. Journal of Studies on Alcohol and Drugs. 2008; 69:824–833. [PubMed: 18925340]

Mulia N, Zemore SE. Social adversity, stress, and alcohol problems: Are racial/ethnic minorities and the poor more vulnerable? Journal of Studies on Alcohol and Drugs. 2012; 73:570–580. [PubMed: 22630795]

Muthén, LK.; Muthén, BO. Mplus User's Guide. 7. Los Angeles, CA: Muthén & Muthén; 1998–2012.

National Institute on Alcohol Abuse and Alcoholism. NIAAA Newsletter. Vol. 3. Washington, D.C: Office of Research Translation and Communication; 2004 Winter. NIAAA council approves definition of binge drinking; p. 3

Nolen-Hoeksema S. Gender differences in risk factors and consequences for alcohol use and problems. Clinical Psychology Review. 2004; 24:981–1010. [PubMed: 15533281]

O'Malley PM, Johnston LD. Epidemiology of alcohol and other drug use among American college students. Journal of Studies on Alcohol. 2002; (Supplement No. 14):23–39.

Park CL, Armeli S, Tennen H. The daily stress and coping process and alcohol use among college students. Journal of Studies on Alcohol. 2004; 65:126–135. [PubMed: 15000512]

Park CL, Levenson MR. Drinking to cope among college students: Prevalence, problems, and coping processes. Journal of Studies on Alcohol. 2002; 63:486–497. [PubMed: 12160108]

Patrick ME, Lee CM, Larimer ME. Drinking motives, protective behavioral strategies, and experienced consequences: Identifying students at risk. Addictive Behaviors. 2011; 36:270–273. [PubMed: 21159445]

SAS Institute Inc. SAS® 9.3. Cary, NC: SAS Institute Inc; 2011.

Shiffman S, Stone AS, Hufford MR. Ecological momentary assessment. Annual Review of Clinical Psychology. 2008; 4:1–32.

Siebert DC, Wilke DJ, Delva J, Smith MP, Howell RL. Differences in African American and White college students' drinking behaviors: Consequences, harm reduction strategies, and health information sources. Journal of American College Health. 2003; 52:123–129. [PubMed: 14992297]

Simons JS, Gaher RM, Correia CJ, Hansen CL, Christopher MS. An affective-motivational model of marijuana and alcohol problems among college students. Psychology of Addictive Behaviors. 2005; 19:326–334. [PubMed: 16187813]

Snijders, T.; Bosker, R. Multilevel analysis. London: Sage Publications; 1999.

Swim JK, Hyers LL, Cohen LL, Fitzgerald DC, Bylsma WH. African American college students' experiences with everyday racism: Characteristics of and responses to these incidents. Journal of Black Psychology. 2003; 29:38–67.

Todd M, Tennen H, Carney MA, Armeli S, Affleck G. Do we know how we cope? Relating daily coping reports to global and time-limited retrospective assessments. Journal of Personality and Social Psychology. 2004; 86:310–319. [PubMed: 14769086]

LAST NIGHT I DRANK…
(0 = *no*; 1 = *somewhat*; 2 = *definitely*)

Episode-specific Coping Motives

C1 … to feel more confident or sure of myself

C2 … because I was angry

C3 … to feel less insecure

C4 … to forget ongoing problems or worries

C5 … to feel less depressed

C6 … to feel less nervous

C7 … to cheer up
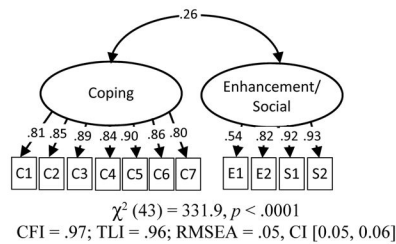
Episode-specific Enhancement Motives

E1 … because I like the pleasant feeling

E2 … to have fun

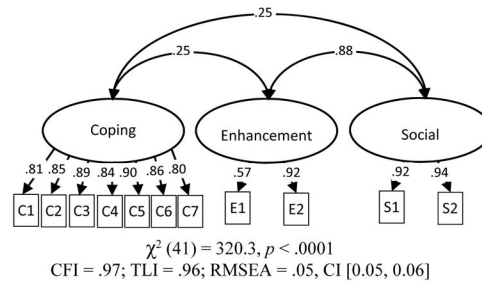Episode-specific Social Motives

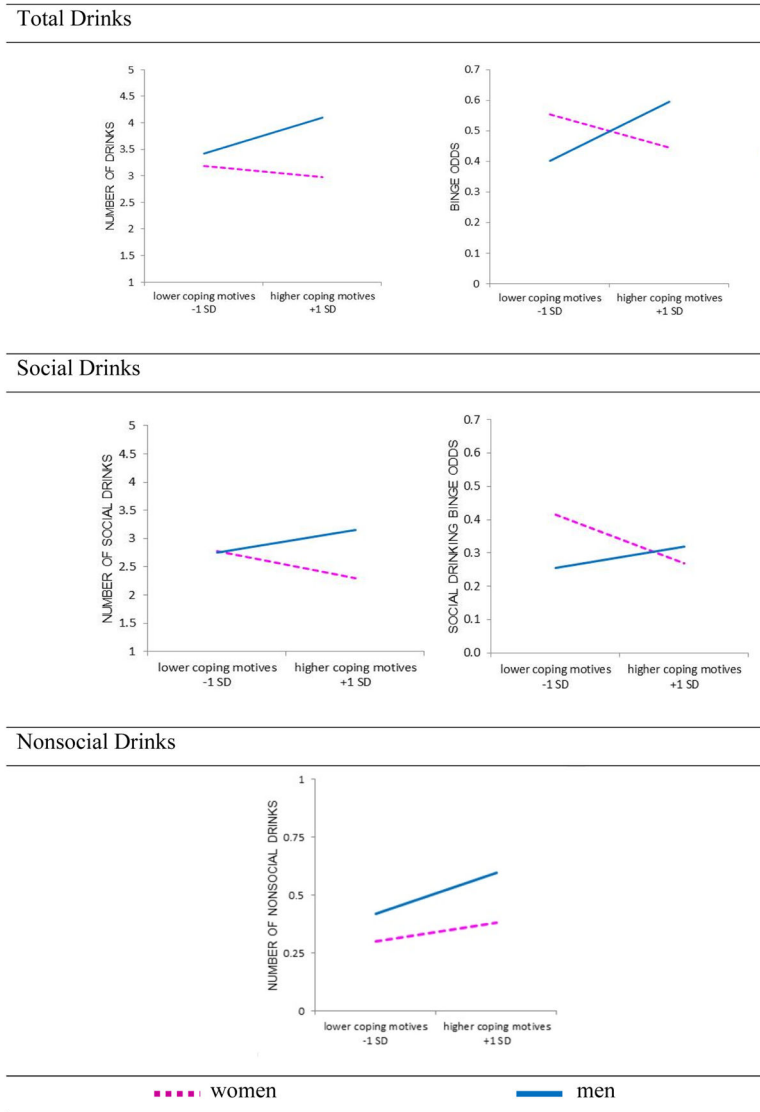S1 … to make party or gathering more fun

S2 … to improve party or gathering

Figure 1.
Confirmatory factor analyses for episode-specific drinking motives. CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root mean square error of approximation; CI = confidence interval.

Figure 2.
Interaction of episode-specific coping motives (within-person) × gender in predicting drinking outcomes.

Table 1

Predicting Total Number of Drinks Consumed at the Episode-specific (ES) Level

Predictor	Total Number of Drinks				Number of Social Drinks				Number of Nonsocial Drinks			
	Intercept Only and Individual Main Effects Models[a]		Final Model		Intercept Only and Individual Main Effects Models[a]		Final Model		Intercept Only and Individual Main Effects Models[a]		Final Model	
	b	SE	b	SE	b	SE	b	SE	b	SE	b	SE
Intercept	1.28**	0.02	0.80**	0.06	1.08**	0.03	0.47**	0.06	−0.96**	0.07	−1.37**	0.11
Within-person effects												
ES social motives[b]	0.20**	0.01	0.14**	0.01	0.24**	0.01	0.18**	0.01	0.03	0.02		
ES enhancement motives[b]	0.20**	0.01	0.08**	0.02	0.24**	0.01	0.10**	0.02	0.05*	0.02		
ES coping motives[b]	0.05**	0.01	−0.02*f	0.01	0.03**	0.01	−0.06**g	0.01	0.09**	0.01	0.07**h	0.01
Weekend[c]	0.31**	0.03	0.17**	0.03	0.41**	0.03	0.23**	0.03	−0.04	0.06		
Between-person effects												
Gender[d]	0.27**	0.05	0.20**	0.05	0.22**	0.05	0.15*	0.05	0.55**	0.15	0.39*	0.14
Age[e]	−0.04*	0.02			−0.04*	0.02			−0.06	0.04		
Mean ES social motives	0.19*	0.02	0.10**	0.03	0.21**	0.02	0.18**	0.03	−0.04	0.07		
Mean ES enhancement motives	0.16*	0.02			0.18**	0.02			0.02	0.07		
Mean ES coping motives	0.06*	0.01	0.03*	0.01	0.02	0.01			0.22**	0.03	0.15**	0.04
Global social motives[e]	0.01*	0.01			0.01*	0.01			0.02	0.01		
Global enhancement motives[e]	0.02**	0.01	0.01*	0.005	0.02*	0.01			0.04*	0.01		
Global coping motives[e]	0.02*	0.01			0.00	0.01			0.08**	0.01	0.05*	0.02
Interactions												
ES coping motives[b] × Gender[d]			0.08**	0.01			0.11**	0.02			0.04†	0.02

†
p = .05,

*
p < .05,

**
p < .0001.

[a] Each main effect, including the intercept, was tested individually, except for ES motives, for which the within-person effect was tested with the between-person effect.

[b]Person-mean centered.

[c]0 = weeknight, 1 = weekend.

[d]0 = female, 1 = male.

[e]Grand-mean centered.

[f]Conditional effect; $b = 0.02^*$ without interaction term.

[g]Conditional effect; $b = -0.01$ without interaction term.

[h]Conditional effect; $b = 0.08^{**}$ without interaction term.

Table 2

Predicting Heavy Drinking Episodes at the Episode-specific (ES) Level

Predictor	Odds of Heavy Drinking Episode[a]				Odds of Social Heavy Drinking Episode[a]				Odds of Nonsocial Heavy Drinking Episode[a]			
	Intercept Only and Individual Main Effects Models[b]		Final Model		Intercept Only and Individual Main Effects Models[b]		Final Model		Intercept Only and Individual Main Effects Models[b]		Final Model	
	b	SE	b	SE	b	SE	b	SE	b	SE	b	SE
Intercept	−0.55**	0.02	−1.60**	0.18	−0.89**	0.07	−2.19**	0.19	−3.21**	0.13	−3.58**	0.17
Within-person effects												
ES social motives[c]	0.60**	0.04	0.45**	0.06	0.68**	0.05	0.52**	0.06	0.18*	0.08		
ES enhancement motives[c]	0.61**	0.05	0.25*	0.07	0.63**	0.06	0.26*	0.08	0.20†	0.10		
ES coping motives[c]	0.10*	0.03	−0.078g	0.05	0.07*	0.03	−0.14*h	0.06	0.14*	0.04	0.14*	0.04
Weekend[d]	0.86**	0.11	0.49**	0.12	1.03*	0.11	0.63**	0.13	−0.15	0.23		
Between-person effects												
Gender[e]	0.14	0.13	−0.01	0.15	−0.00	0.14	−0.16	0.17	0.06	0.26		
Age[f]	−0.12*	0.04			−0.12*	0.04			−0.15†	0.08	−0.19*	0.08
Mean ES social motives	0.49**	0.07	0.34**	0.08	0.50**	0.07	0.41**	0.08	0.22	0.13		
Mean ES enhancement motives	0.41**	0.07			0.44**	0.07			0.28*	0.13		
Mean ES coping motives	0.11*	0.03			0.03	0.03			0.22**	0.05	0.17*	0.06
Global social motives[f]	0.03*	0.01	0.03*	0.01	0.03*	0.01			0.05*	0.02		
Global enhancement motives[f]	0.05**	0.01			0.05*	0.01			0.05*	0.02		
Global coping motives[f]	0.03	0.01			0.01	0.02			0.09*	0.03	0.07*	0.03
Interactions												
ES coping motives[c] × Gender[e]			0.20*	0.07			0.21*	0.08				

† p = .05,

* p < .05,

** p < .0001.

[a] Heavy drinking episode was defined as 4+ drinks for women and 5+ drinks for men (NIAAA, 2004).

[b] Each main effect, including the intercept, was tested individually, except for ES motives, for which the within-person effect was tested with the between-person effect.

[c] Person-mean centered.

[d] 0 = weeknight, 1 = weekend.

[e] 0 = female, 1 = male.

[f] Grand-mean centered.

[g] Conditional effect; $b = 0.15$ without interaction term.

[h] Conditional effect; $b = -0.04$ without interaction term.