

Daily Stress and Alcohol Consumption: Modeling Between-Person and Within-Person Ethnic Variation in Coping Behavior*

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ABSTRACT. Objective: Using a daily diary approach, the current study evaluated the relationship between coping and alcohol consumption using a large, multiethnic sample. The primary goals of this study were to (a) identify coping strategies that are either protective or risk factors for alcohol consumption and (b) model between-ethnic and within-ethnic group variation for these relations. **Method:** College students ($N = 365$, 69.0% female) were recruited via flyers, course/club presentations, and university seminars. Participants completed Internet-based daily diaries over the course of 5 days and reported specifically on a target stressful event, how they coped with the stressful event, and the amount of alcohol consumed on a daily level. **Results:** Use of more avoidance-oriented coping strategies (minimization of stressor, emotional rumination) and social support were significantly associated with more alcohol

consumption. Ethnicity, however, did moderate some coping–alcohol associations. Use of religious coping was associated with less alcohol consumption and minimization of the stressor was associated with more alcohol consumption in African Americans; use of social support was associated with more alcohol consumption in Asian Americans; and use of problem-focused coping was associated with less alcohol consumption in Whites. **Conclusions:** Three maladaptive or risky coping strategies with respect to alcohol consumption were identified using an ecologically valid methodology. However, ethnic-specific variation of these risky (and protective) coping factors was identified. The findings highlight the importance of considering both between-ethnic and within-ethnic group variation with respect to the stress/coping and alcohol consumption. (*J. Stud. Alcohol Drugs*, 72, 125-134, 2011)

COLLEGE STUDENTS CONSUME larger quantities of alcohol relative to peer groups that do not attend college (Substance Abuse and Mental Health Services Administration, 2006). The consequences of this drinking includes decrements in general psychological health (Hingson et al., 2002), increases in risky sexual behaviors (Cooper et al., 2003), and poor academic performance (Hingson et al., 2005) to name a few. Because of the deleterious effect that alcohol consumption can have, it is important to identify the reasons behind consumption (Task Force of the National Advisory Council on Alcohol Abuse and Alcoholism, 2002). One aim of the current study was to document how college students cope with stress on a daily level and whether the coping strategies used in response to a stressful event are associated with more or less alcohol consumption. Using a daily diary approach, the current study was primarily focused on predicting daily alcohol use by exploiting within-person variability of coping variables. This aim presupposes that maladaptive coping strategies not only make one more

susceptible to alcohol consumption but also that adaptive coping strategies make one more resistant to alcohol consumption. The second aim of the current study was to evaluate the coping–alcohol link with a large, multi-ethnic college sample. Not only are *daily* drinking rates virtually unknown for ethnic minority individuals, the between-ethnic group differences in the relationship between coping and alcohol consumption are also unknown.

The Motivational Model of Alcohol Use (Cox and Klinger, 1988) and the Stress Vulnerability Model (Cooper et al., 1988, 1992) are both based on the assumption that individuals drink because of specific motivations that they have in this regard. These motivations primarily include (a) drinking to experience a particular (positive) affective state and (b) drinking to cope, as a reaction to a negative emotional state that one wants to escape from (Cooper et al., 2008) or remove (Greeley and Oei, 1999). Recent theorizing suggests that these motivations are the proximal causes of alcohol consumption (Cooper et al., 2008), and recent findings have shown that these personal motivators are predictive of alcohol use in college students (LaBrie et al., 2007). Coping motives, however, are typically operationalized as traits rather than states (Mohr et al., 2010) and, thus, are only weakly related to alcohol variables (Armeli et al., 2005). Similarly, general coping traits (or styles) are also only weakly related to alcohol outcomes (Armeli et al., 2000; Park et al., 2004a).

These weak relations, perhaps, are a function of the methodology employed to examine the predictive ability of

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coping (motives) and alcohol outcomes. For instance, Sobell and Sobell (1992) assessed alcohol use and found that despite adequate measure of average drinking levels using Timeline Followback (TLFB), individuals vary significantly in their ability to recall alcohol consumption; thus, recall biases might be present. Moreover, studies (e.g., Carney et al., 1998; Searles et al., 2000, 2002) have shown that methods such as TLFB consistently result in underreporting of alcohol consumption relative to daily assessment methods. This suggests that there is less measurement error in assessing alcohol consumption using daily assessments relative to assessment methods such as TLFB, for the simple reason that the recollection window is smaller in the former method.

Similarly, trait or dispositional reports of coping cognitions/behaviors correlate weakly with daily reports of coping cognitions/behaviors (Todd et al., 2004). Significant within-person variation in coping variables, however, has been found at the within-person (e.g., daily) level (e.g., Collins and Muraven, 2007) in ecological momentary assessment/daily diary (EMA/DD) studies and is predictive of less alcohol consumption when problem-focused coping is used (e.g., Park et al., 2004a) and more alcohol consumption when self-blame is used (e.g., Muraven et al., 2005). This is hardly surprising given that the stress–alcohol link is a dynamic, unfolding process that is probably best captured not by dispositional operationalizations of substantive predictors and alcohol consumption but, rather, by a more in situ method such as EMA/DD.

Although the trait–state operationalization of coping and structure of coping taxonomies is certainly contentious (e.g., Skinner et al., 2003), multilevel factor analysis of EMA/DD has been used to model both within-person (state) and between-person (trait) components of coping variables (Roesch et al., in press). Intraclass correlation coefficients suggested that the majority of coping strategies had significantly more variability at the state rather than trait levels, and thus within-person associations are more apt to have stronger associations with daily outcomes such as alcohol consumption. For example, more daily use of emotional rumination as a coping strategy was associated with higher levels of daily negative affect and lower levels of positive affect; more daily use of problem-focused coping with regard to a target stressful event, however, was associated with higher levels of daily positive affect.

A glaring weakness of this literature with respect to alcohol consumption is the virtual absence of studies that have evaluated the relationship between coping strategies (or motives) and alcohol consumption in ethnic minority groups, although some research has emerged (e.g., Boyd et al., 2007; Cooper et al., 2008; Liu and Iwamoto, 2007; Menagi et al., 2008; but see Neff, 1997). Interestingly, lower drinking rates in ethnic minority (relative to White) adolescents and young adults have generally been found (e.g., Nonnemaker et al., 2003; Paschall et al., 2005; Siebert et al., 2003). Researchers

have suggested that these lower rates of alcohol consumption are largely a function of (a) ethnic minority parents (relative to White parents) exhibiting stricter disapproval of substance use (e.g., Peterson et al., 1994) and (b) an emphasis on abstinence in religious settings (e.g., Wallace et al., 2003). This is consistent with some research that shows that use of religious coping is associated with less alcohol consumption (Brody et al. 1996; Brook et al., 1998; Menagi et al., 2008). However, other researchers suggest that the increased intensity (stress) and demands of academic life and new peer relations, coupled with the relative absence of a supportive, familiar environment, can result in increased alcohol and drug use (Hingson et al., 2002), particularly for ethnic minority group members. Studies have revealed that college students who experience higher levels of stress are more prone to use increased amounts of alcohol (Colder and Chassin, 1993; McCreary and Sadava, 2000; Perkins, 1999). Moreover, other researchers have found that the drinking-to-cope motive is greater in ethnic minority individuals (African Americans; Cooper et al., 2008), and that this motive is associated with more alcohol use (Bradizza et al., 1999). Traditional avoidant coping strategies such as escape, denial, and (lower) emotional control have also been associated with alcohol use in minority samples (Boyd et al., 2007; Liu and Iwamoto, 2007). Clearly, inconsistencies exist in the alcohol literature in this regard. Mean level differences in alcohol consumption rates indicate that ethnic minority group members consume less alcohol than Whites. However, when the association between alcohol consumption and variables such as stress and coping (including coping motives) is considered, a subset of ethnic minority group members appear to be at risk.

Current study

The proposed research attempted to address many of the limitations found in the adolescent and young adult stress and coping literature (Compas et al., 2001) as it pertains to alcohol consumption. First, a distinction needs to be made between conceptually defining coping as something that someone *typically* thinks and does (i.e., a trait or style) from what he or she actually thinks or does (i.e., a state [or “process” as Ayers et al., 1998, refer to it]). Thus, this study evaluated the stress and coping process by using daily diary methodology to evaluate in situ stressors, coping strategies, and alcohol consumption. Second, the relationship between stress, coping, and alcohol consumption must be studied in ethnic minority groups. Although there are a handful of EMA/DD studies assessing daily stress and alcohol use among college students (Armeli et al., 2005, 2006, 2008; Grant et al., 2009; Hussong, 2007; Mohr et al., 2005; Park et al., 2004b), the type of sample used in these studies has been overwhelmingly White (e.g., 90% and greater White in all the studies cited), with similar percentages of White

participants for EMA/DD studies that have used assessing community samples (Armeli et al., 2000, 2007; Carney et al., 2000; Collins and Muraven, 2007). Third, past studies have typically employed cross-sectional designs and focused exclusively on interethnic mean comparisons, rather than on intraethnic variation for individuals within specific ethnic or cultural groups at the daily level. The relations between these variables were assessed *within* and *between* specific ethnic groups (including Whites). It was hypothesized that use of traditional approach-oriented coping strategies (e.g., problem-focused coping) and religious coping would be associated with less alcohol consumption; conversely, use of traditional avoidance-oriented coping strategies (e.g., minimization of stressor) would be associated with more alcohol consumption. Because of the scarcity of studies evaluating how ethnicity might moderate the coping–alcohol consumption association, no specific hypotheses are proffered.

Method

Participants

Participants were college students recruited from a large southwestern university. Three hundred sixty-five participants completed all target measures (described later). There were more female than male participants (69.0% vs. 31.0%), and their ages ranged from 17 to 25 years ($M = 20.1$, $SD = 2.10$). This multiethnic sample was composed of Whites (37.8%), Asian Americans (31.2%), Hispanics/Latinos/Latinas (20.8%), and African Americans (10.1%). Student breakdown by classification was 34.2% freshmen, 18.4% sophomore, 20.3% junior, and 27.1% senior. However, the majority of the students were in either their first or second year at the university (76.7%). The sample also represented a cross section of majors at the university, with larger percentages of business (24.0%) and psychology (15.9%) majors.

Daily diary

Internet-based daily diaries were approximately one page in length and required approximately 5 minutes to complete. Participants were first asked to describe the most stressful or bothersome event that had occurred to them in the current day, using an open-ended format on 5 consecutive days. These events were later classified based on the type of stressful event (e.g., academic, social). The participants also rated how stressful they perceived the situation to be, ranging from 1 (*very slightly stressful*) to 5 (*extremely stressful*).

Coping was assessed with 14 specific coping strategies using a 4-point rating scale (1 = *not at all* to 4 = *a lot*). Participants were asked to report on the extent to which they used any of the specific strategies after the stressful event they had just described. These items were taken from Brief COPE (Carver, 1997), the Children's Coping Strate-

gies Checklist, and the How I Coped Under Pressure Scale (Ayers and Sandler, 2000) and the Responses to Stress Questionnaire (Connor-Smith et al., 2000). The strategies were selected to represent relatively distinct methods of coping. Each coping strategy was measured using two items, as has been done in previous daily diary/experience sampling methodology studies (e.g., Hox and Kleiboer, 2007; Peters et al., 2000; Porter and Stone, 1996; Stone and Neale, 1984). The 14 strategies included cognitive decision making (thought about what I need to know to solve the problem; thought about which things are best to do to handle the problem), direct problem solving (did something to solve the problem; did something to make things better), seeking understanding (thought about why it happened; tried to figure out why things like this happen), positive cognitive restructuring (tried to think about or notice only the good things in life; remind myself that things could be worse), expressing feelings (cried to myself; let my feelings out), humor (laughed about the situation; tried to find humor in the situation), religious coping (sought God's help; prayed about it), physical release of emotions (went and exercised; went and played sports), distracting actions (watched television and/or listened to music; played a video game or hobby), avoidant actions (tried to stay away from things that made me upset; tried to stay away from the problem), cognitive avoidance (tried to put it out of my mind; wished that things were better), problem-focused support (figured out what I could do by talking to my family; figured out what I could do by talking to my friends), emotion-focused support (talked to my family about how I was feeling; talked to my friends about how I was feeling), and acceptance (learned to live with it; just accepted the fact that this is the way it is).

A recent multilevel factor analysis (Roesch et al., in press), however, identified four factors at the within-person (daily) level: (a) social support (mean $\alpha = .77$, composed of problem-focused and emotion-focused support), (b) problem-focused coping (mean $\alpha = .80$, composed of direct problem solving and cognitive decision making), (c) minimization of stressor (mean $\alpha = .75$, composed of avoidant actions, distracting actions, acceptance, positive cognitive restructuring), and (d) emotional rumination (mean $\alpha = .70$, composed of expressing feelings and seeking understanding). Although religious coping did not load on a target factor, it is included in the current analyses because of the relevance of this variable to ethnic minority samples (e.g., Menagi et al., 2008).

The total number of standard drinks consumed per day was calculated from daily reports of the number of drinks consumed using the categories of beer, wine, distilled spirits, and other. The scale was modeled after the measure employed by Armeli et al. (2006). Before initiating the daily reports, participants were familiarized with the concept of a standard drink and instructed about the volumes of different beverages and their equivalents to a standard drink. Students were instructed to consider one alcoholic beverage as one

12-oz. beer, 4-oz. glass of wine, or 1-oz. glass of distilled spirits (these instructions were posted on the daily questionnaire for participants' convenience).

Procedure

Participants were recruited via flyers, course/club presentations, and university seminars. Once an individual agreed to participate, he or she received instructions (via email) on how to complete the Internet-based daily diary page over the course of 5 days. Participants were given a username and password (that they could change) to access the secured Web site in order to complete the diary page. These procedures are consistent with recent Internet-based daily diary studies (Armeli et al., 2005; Nezlek, 2005; Park et al., 2004a, 2004b). Participants were allowed to begin the daily diary assessment page on any weekday that they contacted the researchers and consented to participate. All participants reported on at least 1 weekend day (Friday or Saturday). There was not a fixed window for time on a given assessment day. Knowing that alcohol consumption would likely occur late in the evening or early in the morning, the assessment of alcohol consumption for a given day covered the current day up until the end of the day (as defined by the participant). *End of the day* in the context of this study, again, did refer to the early morning hours in many cases. The date and time of each diary entry was assessed by this approach; thus, monitoring of compliance was increased (reporting time: $M_{\text{overall}} = 10:13$ P.M., $SD = 77$ minutes; $M_{\text{weekday}} = 10:05$ P.M., $SD = 72$ minutes; $M_{\text{weekend}} = 11:02$ P.M., $SD = 91$ minutes). Participants received \$25 for participating in the study.

Results

Descriptive statistics

There were a total of 1,760 observations (diary pages completed) for the 365 participants, with an average of 4.82 observations per participant. Of the stressful events reported, 28.4% were related to academics (i.e., homework, tests) on average across days, with smaller percentages of stressful events reported on social relationships with peers (20.7%) or family (17.5%), financial concerns (7.1%), and work-related concerns (6.8%). The mean perceived stress of each described stressful event was 3.57 ($SD = 1.08$). The sample primarily used problem-focused coping ($M = 2.63$, $SD = 0.84$), with lesser use of minimization of stress ($M = 1.99$, $SD = 0.63$), emotional rumination ($M = 1.93$, $SD = 0.76$), social support ($M = 1.88$, $SD = 0.82$), and religious coping ($M = 1.58$, $SD = 0.96$). Of the 1,760 observations, participants reported drinking on 322 of those days (18.3% of observed days), with the number of average drinks on those days being 3.73 ($SD = 3.26$). The intraclass correlation coefficient (ICC) for the alcohol variable was .13. Because the repeated

measures observations are nested within individuals, the ICC represents the similarity of these observations within individuals (i.e., reflects the statistical independence of the observations). The correlated nature of these observations needs to be accounted for in the analysis. Ignoring this correlation underestimates standard error terms and can result in biased parameter estimates (Kaplan et al., 2009).

Multilevel regression models

Because of the nested structure of the data, multilevel models were tested using Hierarchical Linear Modeling (HLM) 6.06 (Raudenbush et al., 2005). Particularly, random-intercept models were specified to account for the correlated nature of the data structure. Moreover, a Poisson sampling model was used for all analyses because the number of drinks per day is a count variable and positively skewed ($M = 0.67$, $SD = 1.99$). Because the standard deviation for this variable was significantly larger than the mean, a log-link function with an overdispersion parameter was specified.

Preliminary bivariate analyses were conducted to identify significant covariates for use in the target multiple predictor model. Categorical variables were dummy-coded for these analyses (i.e., type of stressful event [academic reference group], day of the week [weekday reference group], gender [male reference group]). As shown in Table 1, perceived stress, stressful events involving peers, work, other stressors (relative to academic stressors), and weekend (vs. weekday) were all related to alcohol consumption on a daily level. At the individual level, both gender and age were significantly associated with alcohol consumption, with men and older individuals drinking more.

Similar bivariate analyses were conducted for ethnicity and each coping variable. Three dummy-coded predictor variables comparing each ethnic minority group to Whites

TABLE 1. Regression coefficients (standard errors) and event rate ratios [95% confidence intervals (CIs)] predicting alcohol consumption from bivariate multilevel models

Variable	<i>B</i> (<i>SE</i>)	<i>p</i>	Event rate [95% CI] ^a
Time ^b	0.01 (0.03)	.871	1.00 [0.94-1.07]
Perceived stress	-0.10 (0.05)	.036	0.91 [0.83-0.99]
Type of stressful event ^c			
Financial	0.07 (0.26)	.807	1.07 [0.64-1.78]
Peer	0.91 (0.15)	<.001	2.48 [1.84-3.34]
Family	0.45 (0.24)	.061	1.57 [1.98-2.52]
Work	0.65 (0.21)	.003	1.91 [1.26-2.90]
Other	0.64 (0.14)	<.001	1.89 [1.43-2.51]
Weekend, vs. weekday	1.23 (0.11)	<.001	3.42 [2.77-4.22]
Gender	-0.44 (0.14)	.004	0.64 [0.48-0.86]
Age	0.08 (0.03)	.013	1.08 [1.02-1.15]

^aEvent rates are interpreted as the following: For every 1-unit increase in the predictor/covariate, drinking increases by a factor of the value of the event rate; ^btime was coded to reflect day of assessment (Day 1 was coded 0, Day 2 was coded 1, Day 3 was coded 2, etc.); ^cacademic stressful events serve as the reference group.

TABLE 2. Regression coefficients (standard errors) and event rate ratios [95% confidence intervals (CIs)] predicting alcohol consumption from coping and ethnicity in bivariate multilevel regression models

Variable	<i>B</i> (<i>SE</i>)	<i>p</i>	Event rate [95% CI]
Ethnicity ^a			
African American	-0.87 (0.29)	.004	0.42 [0.24-0.74]
Hispanic/Latino	-0.51 (0.21)	.018	0.60 [0.40-.89]
Asian American	-0.58 (0.19)	.003	0.56 [0.39-0.82]
Coping			
Daily social support	0.14 (0.05)	.010	1.15 [1.04-1.28]
Daily problem-focused coping	-0.11 (0.05)	.048	0.89 [0.80-0.98]
Daily minimization of stressor	0.18 (0.08)	.033	1.19 [1.02-1.40]
Daily emotional rumination	0.32 (0.06)	<.01	1.38 [1.23-1.56]
Daily religious coping	-0.19 (0.10)	.013	0.83 [0.72-0.96]
Personal-level social support	0.14 (0.15)	.167	1.15 [0.94-1.39]
Personal-level problem-focused coping	0.13 (0.17)	.453	1.14 [0.81-1.59]
Personal-level minimization of stressor	-0.10 (0.18)	.587	0.91 [0.66-1.24]
Personal-level emotional rumination	-0.13 (0.16)	.413	0.87 [0.63-1.21]
Personal-level religious coping	-0.56 (0.11)	<.01	0.57 [0.46-0.71]

^aWhite serves as the reference group.

were evaluated. As shown in Table 2, alcohol consumption was significantly lower in each ethnic minority group relative to Whites. For the coping analyses, all coping variables were group-mean (or person-mean) centered. In addition, mean-level (or aggregate) coping variables were created and simultaneously entered into the Level 2 intercept equation to reintroduce between-individual variance back into the model (see Raudenbush and Bryk, 2002 for a full exposition of centering). Of primary interest, however, is the within-person (daily) association between coping and alcohol consumption. As shown in Table 2, all five coping variables were significantly associated with alcohol consumption. More use of minimization of the stressor, social support, and emotional rumination were all significantly associated with more

alcohol consumption. Conversely, more use of religious and problem-focused coping was associated with less alcohol consumption.

Next, a main effects model was tested to determine if ethnic and daily coping associations with alcohol were maintained after controlling for statistically significant covariates identified previously (perceived stress, type of stressful event, day of the week, gender, age). All variables were entered simultaneously. Statistically significant ethnic differences remained in this multilevel model, with ethnic minority group members reporting lower alcohol consumption rates (African Americans, event rate [ER] = 0.44, 95% CI [0.24-0.83], $p = .011$; Hispanic/Latinos/Latinas, ER = 0.61 [0.38-0.96], $p = .009$; Asian Americans, ER = 0.57

TABLE 3. Ethnicity \times Coping regression coefficients (standard errors) and event rate ratios [95% confidence intervals (CIs)] predicting alcohol consumption

Variable	<i>B</i> (<i>SE</i>)	<i>p</i>	Event rate [95% CI]
Social Support \times			
African American ^a	-0.17 (0.24)	.471	0.84 [0.52-1.35]
Hispanic/Latino/Latina	-0.33 (0.20)	.102	0.72 [0.49-1.07]
Asian American	0.50 (0.18)	.007	1.66 [1.16-2.38]
Problem-Focused Coping \times			
African American	0.11 (0.25)	.457	1.12 [0.69-1.81]
Hispanic/Latino/Latina	-0.19 (0.17)	.254	0.82 [0.59-1.15]
Asian American	0.49 (0.23)	.033	1.63 [1.04-2.55]
Minimization of Stressor \times			
African American	1.36 (0.36)	<.001	3.91 [1.92-7.96]
Hispanic/Latino/Latina	0.25 (0.21)	.223	1.29 [0.86-1.93]
Asian American	-0.41 (0.37)	.276	0.67 [0.32-1.38]
Emotional Rumination \times			
African American	-0.92 (0.25)	.001	0.40 [0.24-0.65]
Hispanic/Latino/Latina	-0.82 (0.25)	.002	0.44 [0.27-0.73]
Asian American	-0.22 (0.18)	.241	0.81 [0.56-1.16]
Religious Coping \times			
African American	-0.78 (0.17)	<.001	0.46 [0.33-0.64]
Hispanic/Latino/Latina	-0.24 (0.17)	.163	0.78 [0.56-1.10]
Asian American	0.34 (0.23)	.139	1.40 [0.90-2.19]

Notes: The coping-alcohol consumption associations presented are within-person relations.

^aWhite serves as the reference group for all ethnic comparisons.

[0.38-0.87], $p = .008$). In addition, three of the five daily coping variables remained significantly associated with alcohol consumption (minimization of stressor, $ER = 1.16$ [1.02-1.31], $p = .021$; social support, $ER = 1.12$ [1.03-1.23], $p = .009$; and emotional rumination, $ER = 1.15$ [1.04-1.28], $p = .009$). The associations between religious coping ($ER = 0.93$ [0.82-1.05], $p = .211$) and problem-focused coping ($ER = 0.99$ [0.85-1.16], $p = .934$) with alcohol consumption became statistically nonsignificant.

Finally, a model testing whether ethnicity moderated the coping-alcohol consumption association was evaluated controlling for all statistically significant covariates. Statistical information for the Ethnicity \times Coping interaction terms are shown in Table 3.

Three statistically significant interactions were found for African Americans (vs. Whites): minimization of stressor, emotional rumination, and religious coping. Probing these interactions found that the simple slope relating minimization of stressor to alcohol consumption was statistically significant and positive for African Americans ($ER = 5.87$ [3.89-11.06], $p < .001$) and for Whites ($ER = 1.50$ [1.11-2.03], $p = .009$). For the simple slope relating emotional rumination to alcohol consumption, there was a statistically significant and negative association for African Americans ($ER = 0.66$ [0.43-0.99], $p = .049$) and a statistically significant and positive association for Whites ($ER = 1.66$ [1.25-2.20], $p = .001$). Although the simple slope for this relationship for Hispanics/Latinos/Latinas differed significantly from the slope for Whites, the simple slope was not statistically significant ($ER = 0.73$ [0.48-1.12], $p = .155$). Finally, for the simple slope relating religious coping to alcohol consumption, there was a significant and negative association for African Americans ($ER = 0.46$ [0.37-0.57], $p < .001$) but no significant association for Whites ($ER = 1.00$ [0.78-1.29], $p = .995$).

Two statistically significant interactions were found for Asian Americans (vs. Whites): social support and problem-focused coping. Probing these interactions found that the simple slope relating social support to alcohol consumption was statistically significant and positive for Asian Americans ($ER = 1.54$ [1.13-2.10], $p = .007$) but not for Whites ($ER = 0.93$ [0.73-1.18], $p = .540$). For the simple slope relating problem-focused coping to alcohol consumption, there was a statistically significant and negative association for Whites ($ER = 0.76$ [0.64-0.92], $p = .005$) but not for Asian Americans ($ER = 1.24$ [0.82-1.89], $p = .309$).

Discussion

Using daily diary methodology, the current study found significant associations between coping dimensions and alcohol use after controlling for statistically significant covariates (e.g., type of stressor). In the current study, those individuals who used more emotional rumination and minimization of

the stressor on a given day tended to engage in more alcohol use during the same day. The minimization of stress factor is conceptually similar to what Skinner et al. (2003) identified as avoidance. However, the minimization factor differs in an important way from a more *traditional* avoidance dimension; the minimization factor is a blend of some avoidance coping with positive cognitive restructuring. Rather than avoidance, this state factor could be conceptualized as accommodative coping or secondary control with an emphasis on attention redeployment (Skinner and Wellborn, 1994; see also Steele et al. [1986], attention-allocation model). That this factor was associated with more alcohol use is consistent with the self-awareness model (Hull, 1981), which suggests that some individuals regulate alcohol consumption as a distraction in times of stress.

The emotional rumination factor was a blend of expressing feelings and seeking understanding. This conceptual meaning of this factor is consistent with Skinner et al.'s (2003) conceptualization, which includes intrusive thoughts, negative thinking, and anxiety amplification. Use of seeking understanding in isolation can be an adaptive coping strategy as it is generally defined as making meaning out of a stressful event. When covarying with expressing feelings, however, this factor appears to represent fearful, self-blame coping responses. This is consistent with past research (e.g., Baer, 2002) that has found that stress- or anxiety-based drinking is associated with higher drinking rates, and with the limit violation effect of Collins and Muraven (2007), which identifies self-blame as a risk factor for increased drinking. That both the minimization of stressor factor and the emotional rumination factor were associated with increased alcohol use is also consistent with the finding that the drinking-to-cope motive is associated with avoidant coping (Cooper et al., 1988, 1992; but see Park et al., 2004a).

The social support factor was also associated with increased alcohol use. Although social support is not consistently found to be adaptive or maladaptive in the coping literature (Compas et al., 2001; Skinner et al., 2003), social camaraderie does have stronger relations with alcohol use relative to tension-reducing coping strategies (LaBrie et al., 2007). Baer (2002) has suggested that peers have the strongest influence on drinking in college students. Moreover, the social context is a primary component of Cooper's (1994) model of drinking motivation, in which drinking is motivated by an external response to enhance social situations. Consistent with this line of reasoning, studies have shown that more than 50% of the reasons that college students gave for drinking involved social interaction (e.g., Kairouz et al., 2002). Moreover, this suggestion is consistent with a recent daily diary study (DeHart et al., 2009) that showed that individuals with high self-esteem drank more to enhance interpersonal experiences rather than to alleviate stress.

Although there has been a significant amount of research concerning stress and alcohol use in college students, there

is little research available that tests this relationship in ethnic minority college students (Broman, 2005; Cooper, 2002; Dowdall and Wechsler, 2002). It has been suggested, however, that ethnic minority college students (relative to White students) may be more susceptible to alcohol use because they are likely to experience more, and more severe, stressors in the college environment (e.g., Williams et al., 1999). Using daily diary methodology, the current study found that alcohol consumption rates were significantly lower in each ethnic minority group relative to the White groups, even after controlling for statistically significant covariates (e.g., type of stressful event). This finding is consistent with recent research that found that ethnic minority parents are more likely (a) to be stricter with respect to alcohol consumption and (b) to emphasize abstinence because of religious convictions (e.g., Peterson et al., 1994, Wallace et al., 2003).

Some of these first-order effects of ethnic differences and coping differences in alcohol consumption were qualified by Ethnic \times Coping interactions. Ethnic differences in the coping-alcohol consumption relationship allow one not only to make between-ethnic group comparisons, with Whites serving as the reference group, but they also acknowledge and model the heterogeneity *within* ethnic groups (McCrae, 2001; Sue et al., 1998). The latter importantly identifies coping strategies that are particularly risky or protective for specific ethnic groups, if significant variability exists for a given coping strategy within an ethnic group.

The most dramatic differences between ethnic groups are realized from the comparison between African Americans and Whites. African Americans who used more religious coping than they normally would on a daily level engaged in less alcohol consumption. This is consistent with the notion that African American adolescents who are exposed to abstinence norms engage in less alcohol consumption (Wallace et al., 2003). Grant et al. (2000) have also noted that religion plays a protective role for African Americans, and this coping strategy is very salient in times of stress. No association was found between religious coping and alcohol consumption in Whites. Strong positive associations were found between minimization of the stressor and alcohol consumption for both African Americans and Whites, although the relationship was significantly stronger for African Americans. As discussed previously, this coping factor emphasizes attention redeployment and distractions when stressors are encountered. Consistent with past research (e.g., Tolan et al., 2002), use of coping strategies that distance oneself from the problem is associated with substance use and increased symptomatology (Tolan et al., 2002). Interestingly, use of emotional rumination was associated with less alcohol consumption in African Americans; this coping strategy was maladaptive (i.e., associated with more alcohol consumption) for Whites, as it was in the overall sample (see above). Why might this typically maladaptive coping strategy be adaptive for some African Americans in the short term? Some African

Americans in particular face many stressors that are uncontrollable. For these individuals, it is not uncommon to find that some types of avoidance or passive coping methods are adaptive (Gonzales and Kim, 1997; Gonzales et al., 2001) if they are used in the short term, such as everyday hassles (Lazarus, 1983; Stone et al., 1995). For example, wishful thinking (a coping strategy similar to emotional rumination) was associated with resiliency in African Americans (Tolan et al., 2002). In this case, a strategy such as emotional rumination might represent a tacit acknowledgment that a problem exists (cf. minimization of stressor) but that some preliminary venting/understanding is needed before a more problem-focused strategy is employed.

For Asian Americans, a significant and positive association between social support and alcohol consumption was found (relative to no association for Whites). Asian Americans typically have a stronger collectivistic orientation than do Whites; therefore, the increased alcohol consumption might simply reflect social camaraderie because the social group is salient in times of stress (Liu and Iwamoto, 2007). Related to this finding, a statistically significant and negative association was found between problem-focused coping and alcohol consumption but only for Whites (and not relative to Asian Americans). One could argue that this is a function of Whites who are more individualistic in cultural orientation. This coping strategy would serve as a protective factor for alcohol consumption in that it emphasizes finding an active (adaptive) way to eliminate or minimize the impact of the stressor.

The primary purpose of the current study was to identify coping strategies that were associated with increased/decreased alcohol consumption and whether these associations differed between and/or within ethnic groups. Because of the fundamental nature of the research questions, many limitations can be identified. First, the number of assessment periods and use of end-of-the-day reports are questionable. More assessment periods would have resulted in more reliable assessments of coping and alcohol consumption. With respect to the end-of-the-day reports, some research has found that this assessment method is susceptible to recency and saliency heuristic biases (e.g., Hedges et al., 1985; Stone et al., 2007). Second, the prediction of alcohol consumption could differ as a function of other state variables such as stressor type and perceived stressfulness of the stressor. Lee-Baggeley et al. (2005), for example, recently reported that individuals used more avoidance-oriented coping strategies (e.g., withdrawal, self-blame) when encountering marital conflict but used more approach-oriented coping strategies (e.g., relationship-focused) when encountering child misbehavior. These stress variables were controlled for in the current analyses, but future research should evaluate how the coping-alcohol association is moderated by these (and other) contextual features of the stressful situation. Third, the measures used are self-report, and thus the data do not overcome

this potential source of bias. However, as noted by Belli et al. (2007) and Chan (2009), self-reports are necessary to assess self-referential perceptions (e.g., how one has coped) but clearly could be supplemented with other measures (e.g., peer reports). Fourth, the current study evaluated same-day associations between coping variables and alcohol consumption; thus, causal statements about the directionality of these relationships are tenuous. And fifth, researchers could disagree with the composition and labeling of the coping factors. There has been a general lack of consensus in coping categories/dimensions, as noted by Skinner et al. (2003). Related to this, the factor structure of coping measures is typically unstable (Perrez, 2001; Schwarzer and Schwarzer, 1996), thus the factor structure derived here, arguably, might not generalize to other populations, methodological designs, and coping measures.

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