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Acculturative stress as a moderator of the effect of drinking motives on alcohol use and problems among young adults

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Abstract

Background—Research has demonstrated a strong relationship between drinking motives and alcohol use among young adult populations. Further, there is substantial evidence of the association between psychosocial stressors and greater alcohol consumption. In the present study, we examined whether acculturative stress would moderate the relationship between major drinking motives and alcohol use behaviors and alcohol-related problems, and whether this relationship differs by racial/ethnic group.

Method—Six hundred diverse undergraduate students (Mean age = 21.50, SD = 2.46; 82.8% female; 40.2% White/Caucasian) completed a series of measures, including demographic information, alcohol use/alcohol problems, and acculturative stress.

Results—Findings showed varying patterns in the moderating effect of acculturative stress on the relationship between drinking motives and alcohol consumption and alcohol-related problems, particularly for self-identified Hispanic, Black, and Asian students. Stronger drinking motives were associated with greater alcohol consumption and alcohol-related problems, and this relationship was stronger among Asian and Hispanic students who reported higher levels of acculturative stress. For Black students, greater acculturative stress was observed to weaken the relationship between coping, enhancement, and conformity motives and alcohol drinking frequency.

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Human Subjects

This study was approved by the institutional review board.

Conflict of Interest

All authors declare that they have no conflicts of interest.

Contributors

The first author conceptualized the study, conducted analyses, and supported the overall paper. The second, third, and fourth authors conducted literature searches and supported overall manuscript development.

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Conclusions—Results are discussed in terms of incorporating acculturative stress in the development of tailored alcohol use interventions for vulnerable young adults, such as certain ethnic minority and immigrant groups. Clinical implications include screening for acculturative stress in primary care and counseling centers and early intervention programs to identify young adults who may be at-risk for or currently experiencing alcohol problems.

Keywords

drinking motives; acculturative stress; alcohol use; alcohol problems; ethnic-racial differences

1. Introduction

Alcohol abuse is recognized as a major public health concern and a serious risk behavior among young adults in the United States (Bacio, Lau, & Mays, 2013; White & Hingson, 2014), associated with a range of adverse outcomes including alcohol poisoning, drunk driving, unsafe sexual practices, and academic disengagement (Townshend, Kambouropoulos, Griffin, Hunt, & Milani, 2014; U.S. Department of Health and Human Services, 2000; White & Hingson, 2014). Despite being a target of intervention, the persistence of problematic young adult drinking highlights the importance of this issue (Tanner-Smith & Lipsey, 2015). For instance, in 2013, the prevalence of binge drinking (five or more drinking in one sitting on at least one occasion in the past month) and driving under the influence among young adults was 37.9% and approximately 20%, respectively; estimates that remained relatively unchanged from the previous year (Substance Abuse and Mental Health Services Administration [SAMHSA], 2012).

Young adults who are already vulnerable due to stress related to developmental and life role transitions (Schwartz, 2016; Magolda & Taylor, 2015) and who may lack positive coping skills. Such individuals may turn to maladaptive coping strategies, including alcohol use (Corbin, Farmer, & Nolen-Hoekesma, 2013), especially within the context of increased peer normalization and approval of alcohol consumption (Byrd, K. M., 2016). The literature provides growing support for the connections between the emerging adulthood developmental transition and risky behaviors, as well as the ensuing implications for academic success (Borsari, Murphy, & Barnett, 2007; Read, Wood, Davidoff, McLacken, & Campbell, 2002; Schulenberg & Maggs, 2002). However, there remains a paucity of research on the impact of alcohol use among young adults who are at increased due to specific social stresses related to acculturation and adaptation, particularly within ethnic minority groups (Ehlers, Gilder, Criado, & Caetano, 2009).

1.1 Acculturative stress

Acculturation is a process by which an ethnic minority individual or group (with values, beliefs, and practices from their area of origin) experiences changes in their cultural patterns as a consequence of contact and interaction with the ethnic majority (Berry, 2003). This process is at times wrought with stress due to conflicting or incompatible cultural systems, which may lead an individual to utilize various strategies in an attempt to cope (Crockett, Iturbide, Torres Stone, McGinley, & Raffaelli, & Carlo, 2007). Acculturative stress is described as the impact of psychological adjustment to a new culture, generally observed in

immigrant and ethnic minority communities (Mena, Padilla, & Maldonado, 1987). Based on hypothesized stressors associated with acculturating or “adapting” within a new country or culture, acculturative stress has been found to be associated with myriad negative health outcomes, including increased risk for mental health problems and substance abuse among adolescents and young adults (Walker, Wingate, Obasi, & Joiner, 2008).

During young adulthood, because of the additional stressors associated with increased autonomy, responsibility, and role transitions, experiencing acculturative stress may particularly increase risk for maladjustment, engaging in negative coping behaviors, and lower levels of active coping (Driscoll & Torres, 2013; Gil, Wagner, & Vega, 2000; Tafoya, 2011). Previous research has identified different approaches to coping with stressful events and that certain coping strategies were associated with either more or less alcohol consumption among ethnically-diverse young adults (Aldridge-Gerry, Roesch, Villodas, McCabe, Leung, & Da Costa, 2011). Further, Ehlers and colleagues (2009) identified that elevations in acculturative stress were associated with alcohol dependence and other mental health diagnoses among a sample of Mexican-American young adults. The present study aims to extend the literature in examining how young adults’ experiences of acculturative stress and motives for alcohol consumption may relate to actual alcohol use behavior.

1.2 Drinking motives

Cooper’s seminal four-factor model of alcohol drinking motives has found consistent evidentiary support for the association between these motives and alcohol use behavior (Cooper, 1994). These motives are defined as: social (anticipating favorable social outcomes, such as having fun at a party); conformity (avoiding social rejection or gaining acceptance peers); coping (alleviating negative affect, such as to forget one’s problems); and enhancement (increasing positive affect or experiencing a pleasant feeling) motives (Cooper, 1994; MacLean & Lecci, 2000). Further, research has provided a framework that conceptualizes these drinking motives as strong factors in alcohol consumption (e.g., Piasecki, Cooper, Wood, Sher, Shiffman, & Heath, 2014; Wahesh, Lewis, Wyrick, & Ackerman, 2015), even remaining relatively invariant during the transition from adolescence to young adulthood (Anderson, Briggs, & White, 2013).

Not surprisingly, there is a plethora of evidence that drinking motives are strongly associated with alcohol behaviors among young adult populations (Foster & Neighbors, 2013; Kuntsche, Knibbe, Gmel, & Engels, 2005; Mohr et al., 2005). Research indicates that among young adult college students, enhancement and social motives are the most frequently endorsed, and that these motives are often linked with heavier alcohol consumption (Armeli, Conner, Cullum, & Tennen, 2010; Cadigan, Martens, & Herman, 2015) as compared to other motives. While conformity and coping motives are less frequently endorsed, they are consistently and more strongly linked with alcohol-related problems compared with enhancement and social motives (Kuntsche et al., 2005; Neighbors, Lee, Lewis, Fossos, & Larimer, 2007). Research suggests that enhancement drinking motives in particular mediate the relationship between psychosocial antecedents (e.g., impulsivity-sensation seeking, negative affect) and drinking outcomes among young adult college students (Read, Wood, Kahler, Maddock, & Palfai, 2003). More recently, Dumas and Midgett (2015) found that

while there were no differences in drinking motives among White and ethnic minority college athletes; White athletes reported greater alcohol use whereas, ethnic minority athletes reported higher levels of alcohol-related problems. Furthermore, ethnic minority athletes who endorsed higher levels of coping and conformity motives reported greater alcohol-related problems.

1.3 Current study

Given growing evidence that the relationship between drinking motives and alcohol use/problems varies among ethnic/racial groups (e.g., Koyama & Belli, 2011), we aimed to examine acculturative stress as a potential moderator that may influence alcohol-related behavior or problems for diverse young adults based on their drinking motives. Ethnic identity and acculturation have been linked to heavy alcohol use among young adults (e.g., Zamboanga, Raffaelli, & Horton, 2006); however, to our knowledge the moderating influence of acculturative stress on the relationship between drinking motives and alcohol use and alcohol-related problems has yet to be examined. We aimed to first examine and confirm previous findings on the relationship between drinking motives and alcohol use within our sample. Previously, race and ethnicity have been viewed as biological rather than social constructs and utilized as explanatory variables in examining group differences (Committee on Pediatric Research, 2000). Given previous literature examining acculturation and various health outcomes, including substance use (Schwartz et al., 2011), the present study examined these relationships separately by racial/ethnic group. We also aimed to further the literature by examining the influence of acculturative stress on this relationship between drinking motives and alcohol behavior. Our research hypotheses were three-fold:

1. We hypothesized that drinking motives would be associated with greater frequency and quantity of alcohol consumption and alcohol-related problems, particularly among individuals reporting higher levels of acculturative stress compared to those reporting lower levels of acculturative stress.
2. Based on previous literature (e.g., Walker, Wingate, Obasi, & Joiner, 2008), we hypothesized that the moderating influence of acculturative stress would be significant among ethnic minority participants and less so among their White peers.
3. Finally, we hypothesized that acculturative stress would differentially influence the relationship between certain drinking motives and alcohol behavior, particularly alcohol-related problems, and that these moderating relationships would differ across ethnic/racial groups.

2. Method

2.1 Participants and procedure

As part of a larger study described previously (Foster, Neighbors, & Pai, 2015), undergraduate students were recruited from a psychology department via in-class recruitment and flyers placed around the university campus to participate in a study approved by the Institutional Review Board (IRB). Participants were 445 students ranging in age from 18–29 years (Mean age = 21.62, SD = 2.57, 82.7% female). The age range of the

current sample was decided based on previous research with college students, which indicated that the developmental period considered young or emerging adulthood can be extended to include individuals through their twenties who are still completing their undergraduate education (Arnett, 2016; Galambos, Turner, & Tilton-Weaver, 2005). Participants completed a web survey and received extra course credit as remuneration for participation. The study sample was comprised of the following ethnic/racial groups: White/Caucasian (40.2%), Hispanic (26.8%), Black/African American (18.3%), Asian (22%), and Multi-Ethnic/Other (19.5%). Approximately half of participants (51.2%) were living with their parents, while 13.2% were living in residence halls/dorms, 1.7% were living in a fraternity or sorority house, and 34% were living in off-campus housing. Participants reported their class status as follows: 11.5% freshmen, 25.5% sophomore, 35.8% junior, and 26.7% senior. The majority (86.8%) reported being full-time students (12+ credits).

2.2 Measures

2.2.1 Demographics—Participants reported demographic information such as age, sex, living situation, student status, ethnic/racial background, and year in school.

2.2.2 Alcohol consumption—The Daily Drinking Questionnaire (DDQ; Collins, Parks, & Marlatt, 1985; Kivlahan, Marlatt, Fromme, Coppel, & Williams., 1990) is a 4-item tool that asks participants to estimate the standard number of alcoholic beverages that they consumed on every day of a typical week (Monday–Sunday) within the last 90 days (three months). For the purposes of these analyses, we utilized one item assessing for estimated alcohol consumption frequency (“On average, during the last three months, how often have you consumed alcohol?”) The response scale ranged from 0 to 11 (0 = *Never*, 1 = *Less than once per month*, 2 = *Once a month*, 3 = *Two times a month*, 4 = *Three times a month*, 5 = *Once a week*, 6 = *Twice a week*, 7 = *Three times a week*, 8 = *Four times a week*, 9 = *Five times a week*, 10 = *Six times a week*, 11 = *Every day*). We utilized a second item as a measure of estimated alcohol consumption quantity (“During the last three months, when you have consumed alcohol, how many drinks on average did you typically consume on a given occasion?”). The response scale ranged from 0 to 25.

2.2.3 Alcohol-related problems—The Rutgers Alcohol Problem Index (RAPI; White & Labouvie, 1989) is a 25-item measure that assesses alcohol-related negative consequences experienced in the last three months. Responses range from “Never” (0) to “10 times or more” (5). All items are endorsed based on how many times each problem occurs while drinking, such as “felt that you had a problem with alcohol”, “went to work or school high or drunk”, or “tried to cut down or quit drinking.” Total summed scores for the RAPI ranged from 0 to 125 (White & Labouvie, 1989; Cronbach’s $\alpha = .96$).

2.2.4 Drinking motives—The Drinking Motives Questionnaire-Revised (DMQR; Cooper, 1994) is a measure of motives for alcohol consumption where participants rate twenty reasons why individuals might be motivated to drink on a 5-point scale ranging from 1 (*Never/Almost Never*) to 5 (*Almost Always/Always*). The measure yields four sub-scales that reflect motives for drinking including social (e.g., “Because it helps you enjoy a party”; $\alpha = .93$), coping (e.g., “To forget your worries”; $\alpha = .89$), enhancement (e.g., “Because you

like the feeling”; $\alpha = .88$), and conformity (e.g., “Because your friends pressure you to drink”; Cronbach’s $\alpha = .87$) motives.

2.2.5 Acculturative stress—The Social, Attitudinal, Familial, and Environmental Acculturative Stress Scale (Mena, Padilla, & Maldonado, 1987) is a 24-item measure of potential statements regarding negative experiences related to acculturation, such as “people look down upon me if I practice customs of my culture” or “I have more barriers to overcome than most people.” Participants rate on a 5-point scale ranging from 1 (not very stressful) to 5 (extremely stressful) and the higher the sum the greater the level of acculturative stress (Cronbach’s $\alpha = .95$).

2.3 Statistical analyses

Data were initially cleaned to address issues of missing values and assess for dispersion and assumptions of normality. As there was only one missing value, mean imputation was used. The dependent variables were not normally distributed and were overdispersed. Transformation did not sufficiently address issues with skewness for the dependent variables. Generalized linear modeling using a Poisson distribution was identified as an appropriate analytic approach for the data (Neal & Simons, 2007). Poisson regression was employed for each dependent variable (drinking frequency, drinking quantity, and alcohol-related problems). Models were constructed by first entering age and sex (male = 0 and female = 1), followed by the independent variables (drinking motive and acculturative stress), and finally, the two-way interactions (acculturative stress $\times$ drinking motive). In other words, for each outcome, each model was run with acculturative stress and one drinking motive to examine both main and interaction effects (i.e., Acculturative Stress $\times$ Social Drinking Motives; Acculturative Stress $\times$ Coping Drinking Motives; Acculturative Stress $\times$ Conformity Drinking Motives; Acculturative Stress $\times$ Enhancement Drinking Motives). Each model was run independently for four self-identified major ethnic/racial groups: Non-Hispanic white ($n = 165$; 82.4% female), Black ($n = 109$; 87.2% female), Hispanic ($n = 174$; 83.3% female), and Asian ($n = 132$; 81.1% female). In total, forty-eight models were run. Post-hoc analyses were conducted using chi-square tests and contingency tables to further evaluate and describe the observed significant interaction models. Specifically, variables were dichotomized using a median-split method and entered into a three-way cross-tabulation comparing the percentage of participants with high/low levels of drinking motives and acculturative stress within both high and low levels of the dependent variable. For these analyses, only significant chi-square tests indicate a relationship that can be generalized from the sample to population. When cells contained less than 5 counts, Fisher’s exact test was used (Routledge, 2005). The results are presented in percentages of observed counts (i.e., participants) of the high/low levels of the variables and one-sided exact significant p-values are reported. Statistical analyses were conducted using SPSS 23.0 (IBM SPSS Statistics, Armonk, NY).

3. Results

3.1 Descriptives

Spearman's rho correlations were obtained to examine relationships between predictor and criterion variables for the total sample. Age (range = 18–29) and sex were included as covariates. Drinking frequency, drinking quantity, and alcohol-related problems were positively correlated with each other. Motives subscales (social, coping, enhancement, and conformity) were positively correlated with each other and with all drinking outcomes. Acculturative stress was positively correlated with coping and conformity motives and alcohol problems. There were no significant associations of acculturative stress with drinking quantity or drinking frequency. Age was negatively correlated with acculturative stress and positively associated with social and enhancement drinking motives. Specifically, younger age was associated with greater acculturative stress and older age was associated with enhancement and socially motivated alcohol consumption. Sex was negatively associated with drinking frequency suggesting that, within this sample, males drank more frequently. Means, standard deviations, and correlations for all of the variables in the sample are presented in Table 1. Tables 2–5 present Poisson regression models for all outcome variables for each ethnic/racial group.

3.2 Poisson regression models

3.2.1 Drinking frequency—There were significant main effects for sex only for Asian participants, such that males reported greater drinking frequency. Further, this effect was observed in the models for coping and conformity drinking motives. Older age predicted greater drinking frequency among non-Hispanic white, Hispanic, and Asian participants across all models. There was a significant main effect for all drinking motives for Black, Hispanic, and Asian participants. For non-Hispanic white students, there was a significant main effect for social and enhancement motives. Among Asian participants, there was a significant main effect for acculturative stress in the model accounting for enhancement drinking motive. All main effects indicated that greater levels of drinking motives predicted greater drinking frequency. Significant interactions emerged only among Black students in the models for coping, enhancement, and conformity drinking motives; for instance, more acculturative stress was associated with less frequent drinking for this subgroup when taken in account with coping motives. In other words, the positive association between alcohol consumption for coping, enhancement, and conformity purposes and drinking frequency was weaker among those reporting more acculturative stress. In post-hoc analyses, among Black young adults who reported higher levels of acculturative stress, the greatest number of observed counts (i.e., participants) was for those who reported less frequent alcohol use. Further, these observations were accounted for by lower reported levels of conformity (39.1%), coping (40.6%), and enhancement (36.2%) motives.

3.2.2 Drinking quantity—There was a significant effect for age across all drinking motives for Hispanic participants; specifically, older age predicted greater alcohol consumption during a drinking occasion. Among non-Hispanic white participants, only social and enhancement motives were significant for main effects. For Hispanic and Asian participants, main effects were significant for social, coping, and enhancement motives only;

whereas, Black participants had significant main effects for all drinking motives. There were no significant interaction effects.

3.2.3 Alcohol-related problems—Sex significantly predicted alcohol-related problems for Asian students, such that males reported more alcohol-related problems than females. There was a significant main effect for social, coping, and enhancement motives for non-Hispanic white participants; for coping, enhancement, and conformity motives for Black and Asian participants; and for coping motives only for Hispanic participants. There was also a significant main effect for acculturative stress across all models for Asian participants. For Black participants, there was a significant main effect for acculturative stress in the model accounting for coping drinking motives. There was a significant inverse main effect for acculturative stress in the model accounting for conformity drinking motives for non-Hispanic white students; specifically, less acculturative stress predicted greater drinking problems.

Interactions emerged between acculturative stress and each of the four motives for Asian participants. Specifically, the relationship between all drinking motives and alcohol-related problems was stronger among those reporting higher levels of acculturative stress. In post-hoc analyses, among Asian young adults who reported high levels of acculturative stress and greater alcohol-related problems, the observed counts indicated that this relationship was most accounted for by higher endorsed levels of social (60.0%), coping (55.0%), enhancement (60.0%), and conformity (57.5%) motives. The chi-square analyses for the interaction between high acculturative stress and high conformity motives for alcohol-related problems was statistically significant, $X^2(1, N = 40) = 5.12, p < 0.05$. For Hispanic students, there was a significant interaction effect only for the model considering conformity motives, such that the positive relationship between conformity motives and alcohol-related problems was stronger among those who endorsed greater acculturative stress. For post-hoc analysis, the greatest observed counts were among those who endorsed both high acculturative stress and high conformity motives (38.3%). Conversely, for non-Hispanic white young adults, less acculturative stress was associated with greater alcohol-related problems among those who endorsed lower levels of conformity drinking motives. This was supported by post-hoc analysis which found that the greatest observed counts were among those who endorsed both lower levels of acculturative stress and lower levels of conformity drinking motives (36.8%). Further, this interaction was more accounted for by conformity motives and was found to be statistically significant, $X^2(1, N = 76) = 10.30, p < 0.00$.

4. Discussion

Young adults are particularly at risk for problematic alcohol use given vulnerabilities related to life transition, adjustment experiences, peer influences, and increased academic stress (Read, Wood, Davidoff, McLacken, & Campbell, 2002; Schulenberg & Maggs, 2002; White & Hingson, 2014). The findings of the present study are three-fold. First, we note that a single drinking outcome variable was insufficient to measure and account for the various ways acculturative stress may impact the relationship between four major drinking motives (coping, social, enhancement, and conformity) and young adults' alcohol use behavior and functioning. Second, the results provide further support for the significant relationship

between those major drinking motives and alcohol use frequency, alcohol use quantity, and alcohol-related problems; though our hypotheses were supporting in that these relationships varied across ethnic/racial group. Lastly, we highlight the importance of considering the moderating effect of acculturative stress on the relationship between drinking motives and alcohol use outcomes by ethnic/racial group. Beyond considering variations in outcomes between non-Hispanic white and ethnic minority groups, there is also a need to consider the nuances between various ethnic/racial groups and how acculturative may differential impact their alcohol behavior based on their drinking motive.

As hypothesized, drinking motives were positively associated with greater drinking frequency, drinking quantity, and alcohol-related problems, which is in line with previous literature (Foster & Neighbors, 2013; Piasecki, Cooper, Wood, Sher, Shiffman, & Heath, 2014; Wahesh, Lewis, Wyrick, & Ackerman, 2015). Of note, sex was significantly associated with drinking frequency and alcohol-related problems for Asian young adults only, such that males reported drinking alcohol more frequency and experiencing more problems related to alcohol (e.g., Missed a day (or part of a day) of school or work; Had a fight, argument or bad feeling with a friend). For Asian young adults, social, coping, and enhancement motives were associated with greater frequency and quantity of alcohol use. In addition, acculturative stress emerged as a main effect within models with alcohol-related problems as the outcome. For non-Hispanic white young adults, less acculturative stress was significantly associated with greater alcohol-related problems but only in the model accounting for conformity motives. Enhancement and social motives only predicted greater alcohol frequency and quantity consumption, while enhancement, social, and coping motives predicted greater alcohol-related problems.

For Black young adults, there was a moderating effect of acculturative stress for drinking frequency but not for drinking quantity or alcohol-related problems. Specifically, individuals who reported experiencing more acculturative stress and who endorsed greater coping, enhancement, or conformity motives also reported drinking alcohol less frequently compared to those who reported greater acculturative stress. In other words, contrary to what might be expected, acculturative stress did not identify these young adults as being likely to drink more alcohol more frequently. It may be that those who are less acculturated are also less likely to participate in social activities (e.g., parties) where alcohol could be involved (Zamboanga, Raffaelli, & Horton, 2006), and that there were other stressors (not examined in this study) that may have accounted for alcohol use frequency. For instance, Zamboanga and colleagues (2006) identified that higher levels of ethnic identity were associated with greater frequency of heavy alcohol use particularly among Mexican-American male college students. Increased exposure to peer drinking norms, which is related to higher levels of acculturation (Hahm, Lahiff, & Guterman, 2004), also has been linked to greater alcohol behaviors among young adults (Talbot, Wilkinson, Moore, & Usdan, 2014; Zamboanga, Raffaelli, & Horton, 2006). Young adults who are more acculturated to mainstream culture are likely to not endorse as much acculturative stress compared to their less acculturated counterparts (Lucas, Driscoll, & Voell, 2012; Wilton & Constantine, 2003). Higher levels of acculturation are associated with greater alcohol consumption, which may be related to normalized alcohol use among emerging adults in the U.S., particularly for the purposes of coping (Iwamoto, Kaya, Grivel, & Clinton, 2016). However, conformity has previously been

shown to be associated with decreased alcohol use; thus, this finding among Hispanic young adults warrants future investigation (Neighbors, Lee, Lewis, Fossos, & Larimer, 2007). Among these individuals, drinking for the purposes of coping or “fitting in” with others may be mechanisms for generally managing stress, and not necessarily stress related to acculturation.

In terms of alcohol-related problems, there was more variability across ethnic/racial groups and for different drinking motives. Studies have previously demonstrated differential predictive relationships between psychological variables, such as affect lability, perceived social norms, and alcohol use behaviors (i.e., frequency of consumption) compared to alcohol-related problems (Lejuez, Magidson, Mitchell, Sinha, Stevens, & De Wit, 2010; Simons, 2003). For Asian young adults, regardless of motivations for alcohol use, experiencing more acculturation-related stress strengthened the relationship between motives and alcohol-related problems. It is possible that young adult students who reported higher acculturative stress may also be more likely to report alcohol-related problems due to their level of distress, or cultural values that are sensitive to the impact of problematic drinking on one’s personal and academic functioning (e.g., Bacio, Lau, & Mays, 2013). This finding was applicable across all drinking motive models and thus provides some evidentiary support that Asian young adults may experience greater vulnerability or risk for alcohol-related problems, especially if they are experiencing greater acculturative stress (Hendershot, Dillworth, Neighbors, & George, 2008).

For Hispanic young adults, higher reported acculturative stress strengthened the relationship between conformity drinking motives and alcohol-related problems. In other words, stronger conformity drinking motives were associated with more reported problems, and that this relationship was greater among those who reported experiencing higher levels of acculturative stress compared to lower levels of acculturative stress. These young adults may have been engaging in problematic alcohol use for the purposes of conforming with their peers, which is one means of trying to acculturate or “fit in” in a new setting (Borsari, Murphy, & Barnett, 2007). Finally, contrary to our initial hypotheses, there was a significant interaction between acculturative stress and conformity motives for alcohol-related problems among non-Hispanic white young adults; specifically, lower levels of acculturative stress was associated with greater problems. Post-hoc analyses identified that this interaction was best accounted for by greater conformity motives, which is contrary to previous research that has found that conformity motives were not associated with alcohol-related problems for White young adults (Dumas & Midgett, 2015). This may indicate an area for future exploration in identifying whether conformity motives may lead to alcohol-related problems for some non-Hispanic white young adults in the presence of another unknown factor or stressor.

The results of the present study provide some support for the need to tailor alcohol drinking interventions among ethnically/racially diverse young adult population to consider acculturative stress as a marker for increased risk of alcohol-related problems (e.g., Zamboanga, Raffaelli, & Horton, 2006). Further, it is also important to consider the nuanced interplay between diverse young adults’ motives for drinking and culturally-related drinking as it may influence alcohol use behavior and related problems. This study broadens the

current literature by highlighting a potential factor (i.e., acculturative stress) associated with alcohol consumption and alcohol-related problems. Still, it is important to note that findings did not indicate that greater acculturative stress is a precursor to greater alcohol use or alcohol use problems across all ethnic/racial student groups, providing further support for research suggesting the development of culturally relevant intervention and prevention programs (Galvan & Caetano, 2003). As such, additional work is needed to examine the risk associated with acculturative stress with regard to alcohol use and associated problems in the young adult population. This was particularly evident for Asian and Hispanic groups who experience greater acculturation-related adjustment issues. Clinical implications of the present findings include the potential utilization of reported acculturative stress, as well as reasons or motives for alcohol use, in interventions and treatment programs to identify young adults who may be at-risk for or currently experiencing alcohol problems.

4.1 Limitations and future directions

There were limitations to the current study that should be considered when interpreting results. Our sample comprised undergraduate volunteer participants, and was drawn from a psychology pool in a southwestern university and thus generalizability of these results to other populations, including non-college populations, is limited. In addition, the majority of the sample was female (82.7%), which was not representative of the overall student population, and may limit generalizability to males. Extant literature also suggests examining ethnic/racial subgroups as studies have found nuances in alcohol use within specific sub-groups. For instance, Iwamoto and colleagues (2012) found that risk of binge drinking and experiencing alcohol-related problems were higher among certain Asian ethnic groups (e.g., Japanese, Multi-Asian) compared to others in a sample of U.S.-born Asian American young adult undergraduate students. While ethnic identity information was not available in the present data set, it remains an area for future study in order to better understanding the influence of acculturative stress on alcohol use among ethnically/racially diverse young adult populations (e.g., Zamboanga, Raffaelli, & Horton, 2006). Data on immigration status, generational status, or primary language use was not collected, limiting additional analyses of acculturation as it pertains to foreign-born students or students in multigenerational immigrant households, or allow for comparison among generational status groups. Future research should aim to incorporate additional measures of acculturative stress which may “tap” into other important, related constructs, in addition to well-supported markers of acculturation status (e.g., Cabassa, 2003; Kang, 2006).

Finally, our data were cross-sectional in nature; thus, no causal inferences can be made. Future studies should employ longitudinal designs to evaluate patterns of influence between acculturative stress, drinking motives, and alcohol use over time. Future work might also include examinations of potential health consequences and morbidity due to alcohol consumption among individuals experiencing acculturative stress. The present study represents an important step in elucidating the impact of acculturation-based sources of stress on problematic alcohol behaviors and consequences among young adults who are already at-risk for maladaptive behaviors during a challenging transition period in their lives.

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Highlights

- We examined acculturative stress (AS) and alcohol outcomes among college students.
- Drinking motives (DM) were associated with elevated alcohol use and problems.
- Alcohol problems were greater for Asian and Hispanic students reporting higher AS.
- Coping and conformity DM predicted alcohol use for Black students reporting low AS.
- Greater AS weakened the relationship between coping and conformity DM and drinking in Black students.

Table 1

Means, standard deviations, and correlations among variables.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Age	–									
2. Sex	0.00	–								
3. Acculturative Stress	–0.08	–0.04	–							
4. Social Drinking Motives	0.17 ***	–0.07	–0.04	–						
5. Coping Drinking Motives	0.14 **	0.00	0.04	0.75 ***	–					
6. Enhancement Drinking Motives	0.19 ***	–0.05	–0.02	0.85 ***	0.76 ***	–				
7. Conformity Drinking Motives	0.09	–0.08	0.14 **	0.54 ***	0.53 ***	0.47 ***	–			
8. Alcohol-Related Problems	0.11 *	–0.05	0.11 *	0.53 ***	0.56 ***	0.57 ***	0.37 ***	–		
9. Drinking Frequency	0.27 ***	–0.04	–0.12 **	0.59 ***	0.50 ***	0.62 ***	0.24 ***	0.63 ***	–	
10. Drinking Quantity	0.14 **	–0.06	0.01	0.59 ***	0.53 ***	0.60 ***	0.30 ***	0.66 ***	0.77 ***	–
Mean	21.62	0.83	41.87	11.43	8.23	9.62	6.96	29.07	2.89	2.36
Standard Deviation	2.57	0.38	26.94	5.58	4.25	4.94	3.33	8.90	2.67	3.27

Note. N = 445

p .001.

**
p .01.

*
p .05.

Significant correlations in bold.

Generalized linear model analysis for alcohol consumption frequency, quantity, and self-reported alcohol drinking problems based on acculturative stress and drinking motives among non-Hispanic white young adults.

Table 2

Criterion	Predictor	B	S.E.	p-value	Wald χ^2	CI (95%)
Drinking Frequency	Sex	-0.29	0.52	0.58	0.31	-1.30–0.73
	Age	0.18	0.08	0.02	5.54	0.03–0.33
	Acculturative Stress (AS)	0.00	0.02	0.95	0.01	-0.42–0.05
	Social Drinking Motive (SDM)	0.55	0.18	0.00	9.55	0.20–0.90
	AS*SDM	-0.00	0.00	0.53	0.40	-0.00–0.00
	Sex	-0.10	0.55	0.86	0.03	-1.18–0.99
	Age	0.21	0.08	0.01	6.54	0.05–0.37
	AS	-0.02	0.02	0.30	1.07	-0.07–0.02
	Coping Drinking Motives (CDM)	0.16	0.10	0.13	2.35	-0.04–0.35
	AS*CDM	0.00	0.00	0.87	0.03	-0.00–0.01
Drinking Quantity	Sex	-0.39	0.50	0.44	0.59	-1.37–0.60
	Age	0.20	0.07	0.01	7.58	0.06–0.35
	AS	-0.01	0.02	0.60	0.28	-0.05–0.03
	Enhancement Drinking Motives (EDM)	0.28	0.07	0.00	16.70	0.14–0.41
	AS*EDM	0.00	0.00	0.82	0.05	-0.00–0.00
	Sex	-0.32	0.57	0.58	0.31	-1.44–0.80
	Age	0.22	0.08	0.01	6.65	0.05–0.38
	AS	-0.03	0.02	0.19	1.73	-0.08–0.02
	Conformity Drinking Motives (ODM)	0.02	0.13	0.86	0.03	-0.23–0.27
	AS * ODM	0.00	0.00	0.60	0.28	-0.00–0.01
Drinking Quantity	Sex	-0.27	0.61	0.66	0.20	-1.46–0.92
	Age	-0.01	0.09	0.94	0.01	-0.18–0.17
	AS	0.01	0.03	0.64	0.22	-0.04–0.06
	SDM	0.16	0.08	0.04	4.43	0.01–0.32
	AS*SDM	0.00	0.00	0.95	0.00	-0.00–0.00

Criterion	Predictor	B	S.E.	p-value	Wald χ^2	CI (95%)
	Sex	-0.10	0.62	0.87	0.03	-1.32-1.11
	Age	0.01	0.09	0.90	0.02	-0.17-0.19
	AS	-0.01	0.03	0.71	0.14	-0.06-0.04
	CDM	0.11	0.11	0.36	0.85	-0.12-0.33
	AS*CDM	0.00	0.00	0.57	0.32	-0.00-0.01
	Sex	-0.34	0.60	0.57	0.32	-1.52-0.84
	Age	0.01	0.08	0.92	0.01	-0.17-0.18
	AS	0.02	0.02	0.51	0.43	-0.03-0.06
	EDM	0.21	0.08	0.01	6.47	0.05-0.37
	AS*EDM	-0.00	0.00	0.73	0.12	-0.01-0.00
	Sex	-0.30	0.64	0.64	0.22	-1.54-0.95
	Age	0.01	0.09	0.90	0.02	-0.17-0.20
	AS	0.02	0.03	0.57	0.32	-0.04-0.07
	ODM	0.09	0.14	0.52	0.42	-0.19-0.37
	AS*ODM	-0.00	0.00	0.69	0.16	-0.01-0.01
	Sex	0.02	1.38	0.99	0.00	-2.69-2.72
	Age	-0.00	0.21	0.99	0.00	-0.40-0.40
	AS	0.09	0.06	0.11	2.57	-0.02-0.21
	SDM	0.55	0.18	0.00	9.55	0.20-0.90
	AS*SDM	-0.00	0.01	0.36	0.84	-0.01-0.00
Alcohol-Related Problems	Sex	0.74	1.34	0.58	0.31	-1.88-3.36
	Age	0.37	0.20	0.85	0.04	-0.35-0.42
	AS	0.01	0.05	0.93	0.01	-0.10-0.11
	CDM	0.66	0.25	0.01	7.26	0.18-1.14
	AS*CDM	0.00	0.01	0.73	0.12	-0.01-0.01
	Sex	-0.15	1.37	0.91	0.01	-2.84-2.54
	Age	0.05	0.20	0.80	0.06	-0.35-0.45
	AS	0.05	0.05	0.39	0.75	-0.06-0.15
	EDM	0.51	0.19	0.01	7.42	0.14-0.87

Criterion	Predictor	B	S.E.	p-value	Wald χ^2	CI (95%)
	AS*EDM	-0.00	0.01	0.86	0.03	-0.01-0.01
	Sex	-0.55	1.37	0.69	0.16	-3.22-2.13
	Age	0.07	0.20	0.72	0.13	-0.32-0.47
	AS	-0.11	0.06	0.04	4.19	-0.22-0.01
	ODM	0.09	0.31	0.78	0.08	-0.51-0.69
	AS*ODM	0.02	0.01	0.01	6.06	0.00-0.03

Note. N = 165 Significant statistics in bold.

Generalized linear model analyses for alcohol consumption frequency, quantity, and self-reported alcohol drinking problems based on acculturative stress and drinking motives among Hispanic young adults.

Table 3

Criterion	Predictor	B	S.E.	p-value	Wald's χ^2	CI (95%)
Drinking Frequency	Sex	-0.01	0.12	0.92	0.01	-0.24-0.22
	Age	0.05	0.02	0.01	7.87	0.02-0.09
	Acculturative Stress (AS)	0.00	0.00	0.80	0.06	-0.01-0.01
	Social Drinking Motive (SDM)	0.05	0.01	0.00	16.68	0.03-0.07
	AS*SDM	0.00	0.00	0.64	0.22	-0.00-0.00
	Sex	0.00	0.12	0.99	0.00	-0.24-0.23
	Age	0.06	0.02	0.00	8.46	0.02-0.09
	AS	0.00	0.00	0.93	0.01	-0.01-0.01
	Coping Drinking Motives (CDM)	0.05	0.01	0.00	13.84	0.03-0.08
	AS*CDM	0.00	0.00	0.65	0.21	-0.00-0.00
Drinking Quantity	Sex	-0.05	0.12	0.70	0.15	-0.28-0.19
	Age	0.06	0.02	0.00	8.56	0.02-0.09
	AS	0.00	0.00	0.98	0.00	-0.01-0.01
	Enhancement Drinking Motives (EDM)	0.06	0.01	0.00	14.34	0.03-0.08
	AS*EDM	-5.15	0.00	0.87	0.03	-0.00-0.00
	Sex	-0.05	0.12	0.70	0.15	-0.28-0.19
	Age	0.06	0.02	0.00	8.89	0.02-0.09
	AS	0.00	0.00	0.63	0.23	-0.01-0.01
	Conformity Drinking Motives (ODM)	0.05	0.02	0.05	3.93	0.00-0.10
	AS * ODM	0.00	0.00	0.38	0.78	-0.00-0.00
Drinking Quantity	Sex	-0.19	0.14	0.17	1.92	-0.47-0.08
	Age	0.07	0.02	0.00	10.57	0.03-0.11
	AS	0.01	0.00	0.12	2.41	-0.00-0.02
	SDM	0.05	0.02	0.00	12.66	0.02-0.08
	AS*SDM	-3.42	0.00	0.91	0.01	-0.00-0.00

Criterion	Predictor	B	S.E.	p-value	Wald's χ^2	CI (95%)
	Sex	-0.18	0.14	0.20	1.63	-0.45-0.10
	Age	0.07	0.02	0.00	11.88	0.03-0.11
	AS	0.00	0.00	0.45	0.58	-0.00-0.01
	CDM	0.04	0.02	0.04	4.06	0.00-0.07
	AS*CDM	0.00	0.00	0.38	0.79	0.00-0.00
	Sex	-0.22	0.14	0.11	2.54	-0.50-0.05
	Age	0.07	0.02	0.00	11.58	0.03-0.11
	AS	0.01	0.00	0.19	1.75	-0.00-0.01
	EDM	0.05	0.02	0.00	8.48	0.02-0.08
	AS*EDM	6.99	0.00	0.83	0.04	-0.00-0.00
	Sex	-0.22	0.14	0.12	2.38	-0.49-0.06
	Age	0.07	0.02	0.00	11.99	0.03-0.11
	AS	0.00	0.00	0.29	1.11	-0.00-0.01
	ODM	0.04	0.03	0.13	2.32	-0.01-0.09
	AS*ODM	0.00	0.00	0.77	0.09	-0.00-0.00
	Sex	-0.04	0.04	0.33	0.96	-0.11-0.04
	Age	0.01	0.01	0.27	1.23	-0.01-0.02
	AS	0.00	0.00	0.06	3.61	-7.11-0.01
	SDM	0.01	0.00	0.03	4.68	0.00-0.02
	AS*SDM	-2.41	9.14	0.79	0.07	0.00-0.00
Alcohol-Related Problems	Sex	-0.03	0.04	0.48	0.50	-0.10-0.05
	Age	0.01	0.01	0.18	1.80	-0.00-0.02
	AS	0.00	0.00	0.65	0.20	-0.00-0.00
	CDM	0.01	0.01	0.03	4.66	0.00-0.02
	AS*CDM	0.00	0.00	0.18	1.80	-6.49-0.00
	Sex	-0.04	0.04	0.26	1.28	-0.12-0.03
	Age	0.01	0.01	0.17	1.85	-0.00-0.02
	AS	0.00	0.00	0.42	0.67	-0.00-0.00
	EDM	0.01	0.01	0.34	0.91	-0.01-0.02

Criterion	Predictor	B	S.E.	p-value	Wald's χ^2	CI (95%)
	AS*EDM	0.00	0.00	0.34	0.92	0.00–0.00
	Sex	–0.04	0.04	0.36	0.85	–0.11–0.04
	Age	0.01	0.01	0.15	2.08	–0.00–0.02
	AS	–0.00	0.00	0.45	0.58	–0.00–0.00
	ODM	0.00	0.01	0.85	0.04	–0.02–0.02
	AS*ODM	0.00	0.00	0.02	5.58	–5.76–0.00

Note. N = 174 Significant statistics in bold.

Generalized linear model analysis for alcohol consumption frequency, quantity, and self-reported alcohol drinking problems based on acculturative stress and drinking motives among Black young adults.

Table 4

Criterion	Predictor	B	S.E.	p-value	Wald's χ^2	CI (95%)
Drinking Frequency	Sex	-0.22	0.53	0.67	0.18	-1.25-0.81
	Age	0.09	0.07	0.19	1.72	-0.04-0.22
	Acculturative Stress (AS)	0.01	0.01	0.40	0.70	-0.02-0.04
	Social Drinking Motive (SDM)	0.40	0.07	0.00	32.20	0.26-0.54
	AS*SDM	-0.00	0.00	0.03	4.88	-0.01-0.00
	Sex	-0.05	0.56	0.94	0.01	-1.14-1.05
	Age	0.09	0.07	0.20	1.62	-0.05-0.23
	AS	0.03	0.01	0.06	3.56	-0.00-0.05
	Coping Drinking Motives (CDM)	0.59	0.10	0.00	33.58	0.39-0.79
	AS*CDM	-0.01	0.00	0.00	13.86	-0.01-0.00
Drinking Quantity	Sex	0.43	0.53	0.41	0.67	-0.60-1.46
	Age	0.09	0.07	0.19	1.72	-0.04-0.22
	AS	0.01	0.01	0.45	0.56	-0.02-0.04
	Enhancement Drinking Motives (EDM)	0.41	0.07	0.00	31.37	0.27-0.56
	AS*EDM	-0.00	0.00	0.04	4.21	-0.01-0.00
	Sex	-0.43	0.63	0.50	0.45	-1.67-0.81
	Age	0.08	0.08	0.33	0.96	-0.08-0.23
	AS	0.05	0.02	0.02	5.63	0.01-0.09
	Conformity Drinking Motives (ODM)	0.91	0.21	0.00	18.23	0.49-1.32
	AS * ODM	-0.01	0.00	0.00	9.61	-0.02-0.00
Drinking Quantity	Sex	-0.05	1.02	0.96	0.00	-2.05-1.94
	Age	-0.12	0.13	0.37	0.81	-0.37-0.14
	AS	-0.00	0.03	0.79	0.07	-0.06-0.05
	SDM	0.23	0.14	0.09	2.94	-0.03-0.50
	AS*SDM	0.00	0.00	0.39	0.74	-0.00-0.01

Criterion	Predictor	B	S.E.	p-value	Wald's χ^2	CI (95%)
	Sex	0.16	1.06	0.88	0.02	-1.92-2.24
	Age	-0.12	0.13	0.39	0.74	-0.38-0.15
	AS	0.40	0.03	0.13	2.30	-0.01-0.09
	CDM	0.54	0.19	0.01	7.87	0.16-0.92
	AS*CDM	-0.00	0.00	0.19	1.76	-0.01-0.00
	Sex	0.72	1.02	0.48	0.50	-1.27-2.71
	Age	-0.09	0.13	0.48	0.50	-0.35-0.16
	AS	-0.01	0.03	0.79	0.07	-0.06-0.05
	EDM	0.23	0.14	0.11	2.62	-0.05-0.51
	AS*EDM	0.00	0.00	0.35	0.86	-0.00-0.01
	Sex	-0.37	1.12	0.74	0.11	-2.57-1.82
	Age	-0.13	0.14	0.33	0.94	-0.40-0.14
	AS	0.07	0.04	0.09	2.91	-0.01-0.14
	ODM	0.90	0.38	0.02	5.74	0.16-1.64
	AS*ODM	-0.01	0.01	0.18	1.81	-0.02-0.00
	Sex	-1.31	2.19	0.55	0.36	-5.60-2.99
	Age	-0.39	0.28	0.16	1.97	-0.93-0.15
	AS	0.04	0.06	0.53	0.40	-0.07-0.15
	SDM	0.05	0.29	0.08	3.00	-0.07-1.07
	AS*SDM	0.00	0.01	0.84	0.04	-0.01-0.01
Alcohol-Related Problems	Sex	-1.01	2.17	0.62	0.25	-5.34-3.17
	Age	-0.38	0.27	0.16	1.99	-0.92-0.15
	AS	0.10	0.05	0.05	3.85	4.32-0.21
	CDM	1.17	0.39	0.00	8.87	0.40-1.95
	AS*CDM	-0.01	0.01	0.13	2.25	-0.02-0.00
	Sex	0.13	2.03	0.95	0.00	-3.84-4.11
	Age	-0.33	0.26	0.20	1.67	-0.84-0.17
	AS	0.01	0.05	0.91	0.01	-0.10-0.11
	EDM	0.58	0.28	0.04	4.20	0.03-1.14
	AS*EDM					

Criterion	Predictor	B	S.E.	p-value	Wald's χ^2	CI (95%)
	AS*EDM	0.00	0.01	0.41	0.68	-0.01-0.01
	Sex	-2.49	1.89	0.19	1.74	-6.19-1.21
	Age	-0.41	0.23	0.08	3.12	-0.86-0.04
	AS	-0.03	0.07	0.70	0.10	-0.15-0.10
	ODM	1.23	0.63	0.05	3.78	-0.01-2.47
	AS*ODM	0.01	0.01	0.29	1.13	-0.01-0.03

Note. N = 109 Significant statistics in bold.

Generalized linear model analysis for alcohol consumption frequency, quantity, and self-reported alcohol drinking problems based on acculturative stress and drinking motives among Asian young adults.

Table 5

Criterion	Predictor	B	S.E.	p-value	Wald's χ^2	CI (95%)
Drinking Frequency	Sex	0.64	0.39	0.10	2.65	-0.13-1.41
	Age	0.15	0.07	0.03	4.93	0.02-0.29
	Acculturative Stress (AS)	0.02	0.01	0.12	2.43	-0.00-0.04
	Social Drinking Motive (SDM)	0.21	0.06	0.00	14.07	0.10-0.31
	AS*SDM	-0.00	0.00	0.34	0.92	-0.00-0.00
	Sex	0.86	0.41	0.03	4.48	0.06-1.66
	Age	0.18	0.07	0.01	6.22	0.04-0.32
	AS	0.02	0.01	0.06	3.59	-0.00-0.05
	Coping Drinking Motives (CDM)	0.29	0.08	0.00	12.11	0.13-0.45
	AS*CDM	-0.00	0.00	0.12	2.44	-0.01-0.00
Drinking Quantity	Sex	0.70	0.39	0.07	3.20	-0.07-1.47
	Age	0.14	0.07	0.05	3.94	0.00-0.28
	AS	0.02	0.01	0.05	3.77	0.00-0.05
	Enhancement Drinking Motives (EDM)	0.29	0.07	0.00	16.34	0.15-0.44
	AS*EDM	-0.00	0.00	0.12	2.39	-0.00-0.00
	Sex	0.89	0.43	0.04	4.21	0.04-1.74
	Age	0.21	0.08	0.01	7.56	0.06-0.36
	AS	0.01	0.01	0.47	0.53	-0.02-0.03
	Conformity Drinking Motives (ODM)	0.11	0.11	0.30	1.06	-0.10-0.32
	AS * ODM	0.00	0.00	0.85	0.04	-0.00-0.00
Drinking Quantity	Sex	0.50	0.68	0.47	0.53	-0.84-1.83
	Age	0.04	0.12	0.72	0.13	-0.19-0.28
	AS	0.01	0.02	0.61	0.26	-0.03-0.05
	SDM	0.20	0.10	0.03	4.61	0.02-0.39
	AS*SDM	0.00	0.00	0.95	0.00	0.00-0.00

Criterion	Predictor	B	S.E.	p-value	Wald's χ^2	CI (95%)
	Sex	0.80	0.68	0.24	1.36	-0.54–2.13
	Age	0.07	0.12	0.57	0.33	-0.17–0.30
	AS	0.02	0.02	0.26	1.27	-0.02–0.06
	CDM	0.35	0.14	0.01	6.36	0.08–0.63
	AS*CDM	-0.00	0.00	0.35	0.89	-0.01–0.00
	Sex	0.61	0.68	0.37	0.80	-0.73–1.95
	Age	0.03	0.12	0.81	0.06	-0.21–0.27
	AS	0.02	0.02	0.34	0.92	-0.02–0.06
	EDM	0.31	0.13	0.01	6.13	0.07–0.56
	AS*EDM	-0.00	0.00	0.49	0.48	-0.01–0.00
	Sex	0.83	0.72	0.24	1.38	-0.55–2.21
	Age	0.11	0.12	0.39	0.76	-0.14–0.35
	AS	0.01	0.02	0.81	0.06	-0.04–0.05
	ODM	0.13	0.17	0.44	0.60	-0.20–0.47
	AS*ODM	0.00	0.00	0.93	0.01	-0.01–0.01
	Sex	2.86	2.11	0.18	1.83	-1.28–7.00
	Age	-0.35	0.37	0.34	0.90	-1.08–0.38
	AS	-0.14	0.06	0.02	5.27	-0.26–0.02
	SDM	-0.42	0.29	0.15	2.05	-1.00–0.16
	AS*SDM	0.02	0.01	0.00	17.35	0.01–0.03
Alcohol-Related Problems	Sex	2.47	1.71	0.15	2.09	-0.88–5.81
	Age	-0.44	0.30	0.14	2.18	-1.03–0.15
	AS	-0.24	0.05	0.00	22.90	-0.34–0.14
	CDM	-0.83	0.35	0.02	5.55	-1.51–0.14
	AS*CDM	0.04	0.01	0.00	48.57	0.03–0.05
	Sex	1.91	1.73	0.27	1.21	-1.49–5.31
	Age	-0.49	0.31	0.11	2.50	-1.09–0.12
	AS	-0.24	0.05	0.00	22.01	-0.34–0.14
	EDM	-0.72	0.32	0.02	5.01	-1.35–0.09

Criterion	Predictor	B	S.E.	p-value	Wald's χ^2	CI (95%)
	AS*EDM	0.04	0.01	0.00	47.75	0.03–0.05
	Sex	3.25	1.68	0.05	3.74	–0.04–6.54
	Age	–0.30	0.30	0.31	1.04	–0.88–0.28
	AS	–0.26	0.05	0.00	26.68	–0.35–0.16
	ODM	–1.06	0.41	0.01	6.69	–1.86–0.26
	AS*ODM	0.04	0.01	0.00	48.87	0.03–0.05

Note. N = 132 Significant statistics in bold.