



Published in final edited form as:

*Addict Behav.* 2020 September ; 108: 106442. doi:10.1016/j.addbeh.2020.106442.

## Alcohol Use Severity among Hispanic Emerging Adults: Examining the Roles of Bicultural Self-efficacy and Acculturation

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### Abstract

**Objective:** This study aimed to (1) examine respective associations of acculturation orientations (e.g., U.S. orientation and Hispanic orientation) and domains (e.g., social groundedness and role repertoire) of bicultural self-efficacy, the perceived confidence to function effectively within the receiving culture and the heritage culture, with alcohol use severity among Hispanic emerging adults. This study also aimed to (2) examine potential moderating factors of respective associations among acculturation orientations and bicultural self-efficacy with alcohol use severity.

**Method:** 200 Hispanic emerging adults from Arizona ( $n=99$ ) and Florida ( $n=101$ ) completed a cross-sectional survey. Inclusion criteria were being ages 18–25, self-identify as Hispanic or Latina/o, and currently living in Maricopa County or Miami-Dade County. Data were analyzed using hierarchical multiple regression and moderation analyses.

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#### Contributors

Miguel Ángel Cano conceptualized the study, conducted statistical analyses, and led writing efforts of the first draft of the manuscript. Mariana Sánchez assisted with the conceptualization the study. Daisy Ramírez-Ortiz assisted with data collection and creating tables. Zoran Bursac assisted with data analyses. The remaining authors contributed to the literature review, revising portions of the manuscript, and reviewing the entire manuscript.

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Author Disclosures: All authors declare that they have no conflicts of interest and do not have any financial disclosures to report.

**Results:** Findings indicate that neither of the acculturation orientations nor role repertoire had main effects with alcohol use severity. However, higher social groundedness was associated with lower alcohol use severity. Moderation analyses indicate that the interaction between the U.S. orientation and study site and the interaction between the Hispanic orientation and social groundedness were statistically significant in relation to alcohol use severity.

**Conclusions:** Considering that the U.S. orientation was associated with alcohol use severity only in Arizona highlights the need for multisite studies on acculturation. Our findings demonstrate that other sociocultural processes such as acculturation can impact bicultural self-efficacy; and that the association between bicultural self-efficacy and alcohol merits further investigation. However, more thorough assessments of bicultural self-efficacy are needed to better understand its effects on alcohol.

### Keywords

alcohol; biculturalism; enculturation; Latino; young adults

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The fields of developmental psychology and epidemiology indicate that *emerging adulthood* (ages 18–25 years) is a period in which people tend to drink most heavily in comparison to adolescents and older adults (Sussman & Arnett, 2014; Substance Abuse and Mental Health Services Administration [SAMHSA], 2018). For instance, in the United States (U.S.), emerging adults report the highest prevalence of all age groups in terms of current alcohol use (56.3%), binge drinking (36.9%), heavy drinking (9.6%), and alcohol use disorder (10.7%; SAMHSA, 2018). Compared to other racial/ethnic groups, Hispanic (inclusive of Latinos, Latinas, and Latinx) emerging adults had the second-highest prevalence of current alcohol use (50.1%), binge drinking (32.9%), and heavy drinking (8.0%), and the third-highest prevalence of alcohol use disorder (10.7%; SAMHSA, 2018). Furthermore, compared to other racial/ethnic groups, Hispanics are more likely to experience alcohol-related disparities such as higher rates of injury, chronic liver disease, and legal problems related to driving under the influence of alcohol (National Institute on Alcohol Abuse and Alcoholism [NIAAA], 2013; Sy et al., 2017; Vaeth, Wang-Schweig, & Caetano, 2017).

From a public health perspective, identifying and understanding potentially modifiable sociocultural determinants of alcohol use among Hispanic emerging adults is increasingly important in preventing the development of alcohol use disorder and in reducing alcohol-related disparities (Ver Ploeg & Perrin, 2004; Zemore et al., 2018). One sociocultural factor that has been previously studied with alcohol use is *acculturation*, broadly this is a “process of cultural and psychological change that takes place as a result of contact between two or more cultural groups and their individual members (Berry, 2005, p .698).” Another sociocultural factor that may merit investigation with alcohol use is *bicultural self-efficacy*, the perceived ability and confidence to function effectively both within the receiving culture and the heritage culture (David, Okazaki, & Saw, 2009; LaFromboise, Coleman, & Gerton, 1993). Accordingly, the first aim of this study was to examine associations of acculturation orientations and domains of bicultural self-efficacy with alcohol use severity among Hispanic emerging adults. The second aim was to examine the extent to which acculturation orientations moderate associations between domains of bicultural self-efficacy and alcohol use severity.

## Acculturation

Beyond the general definition of acculturation, it should be noted that acculturation has been conceptualized as a unidimensional process in which assimilation to the receiving culture (e.g., U.S. orientation) is inevitable for immigrants and ethnic minorities and ultimately results in the loss of the heritage culture (e.g., Hispanic orientation; Gordon, 1964). However, in more contemporary literature acculturation is conceptualized as an orthogonal bidimensional process whereby individuals (a) acquire the practices, values, and identity associated with the receiving culture (e.g., U.S. orientation), and (b) maintain the practices, values, and identity associated with the heritage culture (e.g., Hispanic orientation; Berry, 2017; Schwartz, Unger, Zamboanga, & Szapocznik, 2010). It should be noted that maintenance of the heritage culture is also referred to as enculturation (Castillo & Caver, 2009; Schwartz et al., 2010). Further, it has also been proposed that these processes—adoption of the receiving culture and maintenance of the heritage culture—unfold independently over time; therefore, acculturation orientations can be measured separately (Berry, 2017; Schwartz et al., 2010).

One factor that may impact acculturation among Hispanics living in the U.S. is the community of settlement—the reason being that respective communities of settlement have diverse characteristics such as attitudes toward Hispanics, sociopolitical history, ethnic density, public policies, and available resources (Cano et al., 2015). In addition, respective communities of settlement may also have a distinct context of reception—the social expectations of how immigrants and racial/ethnic minorities should interact with and acculturate toward the receiving culture (Schwartz et al., 2010; Schwartz, Unger, et al., 2014).

For some context, we briefly describe some characteristics of Maricopa County, Arizona, and Miami-Dade County, Florida which are the two communities of settlement included in the present study. In Maricopa County, approximately 31% of the population is Hispanic, 8.5% of the population is composed of immigrants from Latin America, 20% of adults report speaking Spanish at home, and 88.7% of Hispanics are of Mexican heritage (U.S. Census Bureau, 2017a, 2017b). Maricopa County has been described as a community where Hispanics often experience ethnic discrimination, hostility, and civil violations because of their real or perceived immigration status (American Civil Liberties Union of Arizona, 2019). On the other hand, in Miami-Dade County, approximately 69% of the population is Hispanic, 50% of the population is composed of immigrants from Latin America, 67% of adults report speaking Spanish at home, and 53.6% of Hispanics are of Cuban heritage (U.S. Census Bureau, 2017b, 2017c). An example that demonstrates the cultural and economic interconnectedness between Miami-Dade County and Latin America is that Miami is often referred to as the “Gateway of the Americas” (National Tour Association, 2004).

## Acculturation and Alcohol

Some scholars have proposed that acculturation can play a key role in understanding racial/ethnic health disparities and merits investigation in alcohol research among racial/ethnic minorities living in the U.S. (Zemore et al., 2018). Not surprisingly, acculturation may be the

cultural construct that has been studied the most in alcohol research among Hispanics. However, a meta-analysis on acculturation and alcohol use outcomes among Hispanics found that most studies have relied on unidimensional measures of acculturation (Lui & Zamboanga, 2018). Most of the studies with Hispanics that have used unidimensional measures of acculturation find that a higher U.S. orientation was associated with more alcohol use—especially among women (Alvarez, Fietze, Ramos, Field, & Zárata, 2017; Blanco et al., 2013; Lui & Zamboanga, 2018; Vaeth, Caetano, Rodriguez, 2012). An explanation for the association between a higher U.S. orientation and alcohol use is that Hispanics, particularly women, may adopt more liberal attitudes toward alcohol consumption with higher adherence to the U.S. culture (Pinedo, Zemoré, Cherpitel, & Caetano, 2017).

Overall, alcohol studies among Hispanics that have conceptualized and measured acculturation as a bidimensional process have produced mixed findings. For instance, some studies that have used bidimensional measures of acculturation have found that a higher U.S. orientation is associated with more alcohol use while a higher Hispanic orientation is associated with less alcohol use (Des Rosiers, Schwartz, Zamboanga, Ham, & Huang, 2013; Martinez, Schwartz, Thier, & McClure, 2018; Sánchez, 2015). However, other studies have found that a higher U.S. orientation is associated with less alcohol use, and multiple studies have found that none of the acculturation orientations have significant associations with alcohol use outcomes (Cano, 2016; Lee, Almeida, Colby, Tavares, & Rohsenow, 2016; Montoya, Wittenburg, & Martinez, 2016; Schwartz et al., 2011).

In sum, the link between acculturation and alcohol use among Hispanics is not well understood (Vaeth et al., 2012). This association is complex and researchers have not established conclusive findings in part because studies have operationalized acculturation differently, used various measures of acculturation, and have examined acculturation with distinct alcohol use outcomes such as drinking status, quantity, frequency, and alcohol use severity (Zamboanga, Tomaso, Kondo, & Schwartz, 2014; Lui & Zamboanga, 2018). However, as this field of research moves forward, continuing to use unidimensional measures of acculturation in alcohol research is problematic because it eliminates the possibility to investigate the association between the Hispanic orientation and alcohol use outcomes.

## Beyond Acculturation: Understanding Bicultural Self-efficacy

Self-efficacy, the perceived confidence to perform a desired action, is a key construct in theories of health behavior and behavior modification—including alcohol use behavior (Bandura, 1982; Kadden & Litt, 2011). Thus, one construct that may be relevant to research on sociocultural determinants of health behavior among Hispanics is bicultural self-efficacy which encompasses multiple domains of functioning such as social groundedness and role repertoire. *Social groundedness* represents the level of confidence an individual has in establishing social networks in both cultural groups (David et al., 2009). It is hypothesized that the ability to establish and maintain social networks in both cultures improves a person's capacity to cope with the demands of living in a bicultural context (LaFromboise et al., 1993). *Role repertoire* refers to one's level of confidence in using or learning culturally

appropriate behaviors in relation to both cultural groups (David et al., 2009). It is hypothesized that a greater range of role repertoire facilitates positive interactions and reduces conflict, with both cultural groups (LaFromboise et al., 1993).

To our knowledge, no prior study has examined the association between bicultural self-efficacy and alcohol use or any other health behavior. However, researchers have suggested that higher levels of bicultural self-efficacy may help ethnic minorities, including Hispanics, enhance their coping resources and in turn experience lower sociocultural stressors (e.g., minority stress, ethnic discrimination) and better mental health (Carrera & Wei, 2014; Wei et al., 2010). Presently, most studies on bicultural self-efficacy have used multiethnic samples to examine its association with indicators of mental health. These studies have found that higher levels of social groundedness and role repertoire, as well as a composite score of bicultural self-efficacy, were associated with lower depressive symptoms and better psychological well-being (Broustovetskaia, 2015; David et al., 2009; Wei et al., 2010). However, a study that only included Hispanic college students found that higher social groundedness was associated with lower depressive symptoms, while the association between role repertoire and depressive symptoms was not statistically significant (Carrera & Wei, 2014).

Not surprisingly, both acculturation orientations are positively associated with a higher composite score of bicultural self-efficacy and with respective subscales (Carrera & Wei, 2014; David et al., 2009); however, no prior study has examined *if* and *how* acculturation orientations interact with bicultural self-efficacy. It should be noted that despite the similarities between acculturation and bicultural self-efficacy these two constructs are distinct (David et al., 2009). Having bicultural self-efficacy is more than simply reporting high degrees of adherence to both the receiving and heritage cultures—which has been referred to as a bicultural acculturation strategy (Berry, 2017; David et al., 2009). For instance, it may be the case that an individual reports high linguistic U.S. and Hispanic orientations but does not believe that he or she can communicate effectively with a respective cultural group. It has also been suggested that bicultural self-efficacy serves as a better indicator of cultural adaptation than acculturation because bicultural self-efficacy assesses individuals' perceived competence/mastery of skills to effectively engage in interactions with people of different cultures (Basilio et al., 2014; Torres, 2013). By contrast, acculturation orientations typically focus on language and cultural practices, and thus, do not assess an individuals' perceived competence to meet the expectations of different cultures (Basilio et al., 2014; Torres, 2013).

Examining interactions between acculturation and bicultural self-efficacy would not only deepen our understanding of bicultural self-efficacy, but it would also advance our understanding of substance use behavior among ethnic minorities. According to the *cultural context model*, interactions between cultural constructs (e.g., acculturation and bicultural self-efficacy) should be examined in relation to substance use behavior because conditional effects may elucidate that the effect of a cultural variable on substance use is influenced by different levels of another cultural variable (Castro & Alarcón, 2002). Further, Berry (1997) proposed a conceptual framework of acculturation and adaptation. Some key components of this framework are that acculturation can act as a moderator that influences distinct forms of

adaptation. One type of adaptation in this framework is sociocultural adaptation, operationalized as a person's "fit" within their new receiving culture and ability to respond to the demands of the social environment. This framework also proposed that individuals who develop a higher degree of sociocultural adaptation are more likely to experience better psychological adaptation (e.g., psychological and behavioral well-being; Berry, 1997). Building on this framework, we propose that acculturation will function as a moderator between indicators of sociocultural adaptation (e.g., bicultural self-efficacy domains) and an indicator of psychological adaptation (e.g., alcohol use).

## Present Study

Based on the review of the existing literature, the following hypotheses were proposed. *Hypothesis one*, regarding acculturation, a higher U.S. orientation will be associated with higher alcohol use severity and a higher Hispanic orientation will be associated with lower alcohol use severity. Post hoc analyses will be conducted to examine if gender and community of settlement (e.g., Arizona vs. Florida) moderate respective associations between acculturation orientations and alcohol use severity. *Hypothesis two*, higher levels of each respective domain of bicultural self-efficacy (e.g., social groundedness and role repertoire) will be associated with lower alcohol use severity. Acculturation orientations will be tested as moderators in each respective association between bicultural self-efficacy domains and alcohol use severity. However, given the scarcity of literature on bicultural self-efficacy, specific hypotheses regarding potential moderating effects were not advanced. Lastly, a post hoc analysis will be conducted to examine if the community of settlement moderates each respective association between domains of bicultural self-efficacy and alcohol use severity.

## Methods

### Procedure and Participants

The present analyses used data from a cross-sectional study with a sample of 200 participants from the *Project on Health among Emerging Adult Latinos* (Project HEAL). A quota sampling design was used to enroll participants in Maricopa County, Arizona and Miami-Dade County, Florida. The target quota for Arizona was 100 participants and within Arizona we aimed to enroll 15 non-college student women, 15 non-college student men, 35 college student women, and 35 college student men. The same target quotas were applied in Florida. Prospective participants were recruited (1) in-person by distributing flyers, (2) posting flyers with tear-off tabs, (3) social media, and (4) by emailing an announcement that described the study aims and procedures to organizations and individuals who may have had access to the target sample. It should be noted that at each respective study site most participants who were not current college students were recruited in-person by research personnel with experience in recruiting Hispanic participants for research studies.

Prospective participants interested in the study contacted coordinators of Project HEAL and they were screened to determine whether they were eligible to enroll in the study. Inclusion criteria for participants included being ages 18 to 25, self-identify as Hispanic or Latina/o, able to read English, and currently living in Maricopa County, Arizona or Miami-Dade

County, Florida. Exclusion criteria were currently being pregnant or breastfeeding. Participants provided informed consent to participate in the study by using an electronic informed consent form. Data were collected between August 2018 and February 2019 via a confidential online survey using Qualtrics. The survey took approximately 50 minutes to complete and participants were compensated with a \$30 electronic Amazon gift card. This study was approved by the Florida International University Institutional Review Board.

## Measures

**Demographic Variables.**—The following sociodemographic variables were included: age, gender, (0 = male, 1 = female), study site (0 = Florida, 1 = Arizona), partner status (0 = single, 1 = has a partner), nativity (0 = immigrant, 1 = non-immigrant), Hispanic heritage group (0 = other Hispanic heritage, 1 = Mexican heritage), student status (0 = current college student, 1 = non-college student), employment status (0 = unemployed, 1 = employed), and financial strain (1 = has more money than needed, 2 = just enough money for needs, 3 = not enough money to meet needs). Existing literature suggests that these sociodemographic variables are linked with alcohol use behavior (Alegría et al., 2007; SAMHSA, 2018); thus, we included them in the regression analyses to control for potential confounding effects.

**Acculturation.**—Two linguistic acculturation orientations were measured using the Brief Acculturation Rating Scale for Mexican Americans-II (Brief ARSMA-II; Bauman, 2005). The four-item Anglo orientation subscale of the Brief ARSMA-II was used to measure the U.S. orientation. A sample item of this subscale is, “I enjoy English language movies.” The six-item Hispanic orientation subscale of the Brief ARSMA-II was used to measure the Hispanic orientation. A sample item of this subscale is, “I enjoy speaking Spanish.” Both subscales use a five-point Likert-type scale (1 = *not at all*, 5 = *extremely often or almost always*). Higher mean scores indicate higher levels of U.S. orientation and Hispanic orientation, respectively. Cronbach’s alpha reliability coefficients for the Anglo orientation subscale and Hispanic orientation subscale in this study were ( $\alpha = .79$ ) and ( $\alpha = .91$ ), respectively.

**Bicultural Self-efficacy.**—The Bicultural Self-efficacy Scale measures six domains of perceived bicultural self-efficacy, social groundedness, role repertoire, communication ability, positive attitudes, cultural knowledge, and bicultural beliefs (David et al., 2009); however, due to time limitations the present study only measured two domains—social groundedness and role repertoire. The social groundedness subscale consists of seven self-report items and a sample item is, “I have an extensive network of mainstream Americans as well as an extensive network of people from the same heritage culture as myself.” The role repertoire subscale consists of three self-report items and a sample item is, “I am confident that I can learn new aspects of both the mainstream American culture and my heritage culture.” Both subscales use a nine-point Likert-type scale (1 = *strongly disagree*, 9 = *strongly agree*). Higher sum scores indicate higher levels of bicultural self-efficacy for each respective subscale. Cronbach’s reliability coefficients for social groundedness and role repertoire in this study were ( $\alpha = .92$ ) and ( $\alpha = .77$ ), respectively.

**Alcohol Use Severity.**—Self-reported alcohol use severity was measured using the Alcohol Use Disorder Identification Test (AUDIT; Babor, Higgins-Biddle, Saunders, & Monteiro, 2001), which consists of 10 self-report items with varied response choices on a Likert-type scale ranging from zero to four. Summed scores range from zero to 40 with higher scores indicating higher alcohol use severity. A sample item is “Has a relative or friend or a doctor or another health worker been concerned about your drinking or suggested you cut down?” Cronbach’s reliability coefficient for the AUDIT was ( $\alpha = .90$ ).

### Statistical Analysis Plan

All analyses were performed with SPSS v25. Descriptive statistics including means, standard deviations were generated for all continuous variables and frequencies and proportions were generated for all categorical variables. Univariate comparisons of the mentioned variables by study site were carried out with the chi-square test for categorical variables, and a *t*-test for continuous variables. Bivariate correlations between study variables were assessed using a Pearson correlation coefficient.

Main effects of the predictor variables on alcohol use severity were estimated using hierarchical multiple regression (HMR). Predictor variables were entered into the HMR model in a specified order so that each predictor contributed to the explanatory variance of the outcome variable (i.e., alcohol use severity) after controlling for the variance explained by the previous variables (Cohen, Cohen, West, & Aiken, 2003). Predictor variables were grouped and entered into the HMR model in the following order: (1) demographic variables were entered in the first block, (2) acculturation orientations were entered in the second block, and (3) domains of bicultural self-efficacy were entered in the third and final block to determine the extent to which they uniquely predicted alcohol use severity above and beyond the other predictors.

Using PROCESS v3.2 for SPSS (Hayes, 2017), moderation analyses were conducted with 50,000 bootstraps to examine the extent to which potential moderating variables influenced the direction and/or strength of respective associations with alcohol use severity. PROCESS tested moderation by (1) performing a multiple regression to replicate the variance explained by all the predictor variables included in the HMR model, (2) estimating interaction terms between focal predictors (e.g., acculturation orientations) and moderating variables (e.g., study site), and (3) estimating conditional effects for each respective interaction term in relation to alcohol use severity. All moderation analyses controlled for all variables in the HMR model that were not included in respective interaction terms.

## Results

### Descriptive Analyses

The mean participant age was 21.30 ( $SD = 2.09$ ) and approximately half the sample was composed of women ( $n = 102, 51.0\%$ ) and participants from Arizona ( $n = 99, 49.5\%$ ). Approximately one-third of participants were immigrants ( $n = 60, 30.0\%$ ) and non-college students ( $n = 61, 30.5\%$ ). Regarding Hispanic heritage groups, participants identified as Mexican ( $n = 88, 44.0\%$ ), Cuban ( $n = 33, 16.5\%$ ), Colombian ( $n = 24, 12.0\%$ ), non-



Colombian South American ( $n = 21$ , 12.5%), Central American ( $n = 20$ , 10.0%), Puerto Rican ( $n = 9$ , 4.5%), and Dominican ( $n = 4$ , 2.0%). With regard to language, seven participants (3.5%) reported that they did not speak Spanish. Lastly, some participants reported being non-drinkers ( $n = 49$ , 24.5%) and based on an AUDIT total score of eight points or higher, some participants met criteria for hazardous alcohol use ( $n = 45$ , 22.5%). Frequencies, proportions, means, and standard deviations for all study variables are presented by study site in Table 1. Bivariate correlations for all study variables are presented in Table 2.

### Hierarchical Multiple Regression

Table 3 presents the regression coefficients from the HMR model. Results indicate that 19.3% of the variance of alcohol use severity was explained by all predictor variables entered into the HMR model. The first predictor block included demographic variables and explained 14.1% of variability in alcohol use severity,  $R^2 = 14.1$ ,  $F(9, 190) = 3.29$ ,  $p = .001$ . The second block added the two acculturation orientations which explained 2.5% of variability in alcohol use severity  $R^2 = 2.5$ ,  $F(2, 188) = 2.78$ ,  $p > .05$ . The third and final block added the social groundedness and role repertoire domains of bicultural self-efficacy, which explained 2.7% of the variability in alcohol use severity  $R^2 = 2.7$ ,  $F(2, 186) = 3.10$ ,  $p < .05$ . Standardized coefficients from the final regression model indicate that age ( $\beta = .17$ ,  $p = .03$ ), study site ( $\beta = .39$ ,  $p = .004$ ), and the social groundedness domain of bicultural self-efficacy ( $\beta = -.19$ ,  $p = .02$ ) had statistically significant associations with alcohol use severity.

### Moderation Analyses

Moderation analyses conducted to test hypothesis one indicated that the study site moderated the association between U.S. orientation and alcohol use severity ( $\beta = -.36$ ,  $p = .03$ ). This moderation effect added 2.1% to the variance explained by the HMR model. Conditional effects indicate that higher U.S. orientation was associated with lower levels of alcohol use severity among participants in Arizona ( $\beta = -.36$ ,  $p = .001$ ); however, no statistically significant association was found among participants in Florida ( $\beta = -.01$ ,  $p > .05$ ). This moderating effect is depicted in Figure 1. Study site did not moderate the association between the Hispanic orientation and alcohol use severity and gender did not moderate respective associations between acculturation orientations and alcohol use severity.

Moderation analyses conducted to test hypothesis two indicated that Hispanic orientation moderated the association between the social groundedness domain of bicultural self-efficacy and alcohol use severity ( $\beta = .17$ ,  $p = .01$ ). This moderation effect added 2.8% to the variance explained by the HMR model. Conditional effects indicate that, across participants, increases in social groundedness were associated with the steepest decline in alcohol use severity ( $\beta = -.39$ ,  $p < .001$ ) at low levels of Hispanic orientation (1 *SD* below the mean). A similar but weaker conditional effect ( $\beta = -.16$ ,  $p = .04$ ) was found at mean levels of Hispanic orientation. The conditional effect of social groundedness on alcohol use severity was not significant at high levels of Hispanic orientation (1 *SD* above the mean). This moderating effect is depicted in Figure 2. The interaction between social groundedness and the U.S. orientation was not statistically significant, nor were any of the interactions between

acculturation orientations and the role repertoire domain of bicultural self-efficacy. Lastly, study site did not moderate respective associations between domains of bicultural self-efficacy and alcohol use severity.

## Discussion

### Acculturation and Alcohol: What Did We Learn?

Although most studies on acculturation among Hispanics find that a higher U.S. orientation is linked with higher alcohol use—our null findings on the main effects of acculturation orientations are not entirely unexpected. Our null findings are consistent with other studies that specifically examined alcohol use severity among Hispanic emerging adults and used bidimensional measures of acculturation (Cano, 2016; Schwartz et al., 2011). Findings from a meta-analysis may offer an explanation for our null findings, Lui and Zamboanga (2018) found that acculturation is a strong predictor of drinking status, but may exert a relatively small effect on alcohol use severity. The acculturation measure used in our study, the Brief ARSMA-II, may have also been a factor. A study that used two acculturation measures, the original ARSMA-II and the Bicultural Involvement Questionnaire-Short Version (BIQ-S), found that none of the ARSMA-II subscale scores were associated with risk of alcohol use; however, the Hispanic orientation subscale score of the BIQ-S was associated with risk of alcohol use (Martinez et al., 2018). Again, it should be noted that the present study used the Brief ARSMA-II, not the original ARSMA-II. However, these two measures are highly correlated; thus, indicating concurrent validity (Bauman, 2005).

One of our moderation analysis indicated that gender did not moderate the association between acculturation orientations and alcohol use severity. One explanation for this null finding is that historically, men have reported higher rates for various alcohol use outcomes compared to women, but those differences are narrowing—particularly among emerging adults (Delker, Brown, & Hasin, 2016). In addition, it has been suggested that attitudes toward alcohol may now be very similar between male and female Hispanic emerging adults, and thus, acculturation may not have the same pronounced effect on drinking attitudes and alcohol use outcomes among Hispanic women (Montoya et al., 2016). Some post-hoc analyses of our data indicate that there were no statistically significant differences by gender in relation to acculturation orientations or alcohol use severity which may lend some support to this potential explanation.

Another moderation analysis indicated that the study site functioned as a moderator between higher levels of U.S. orientation and alcohol use severity. On average, participants in Florida had a lower level of alcohol use severity than participants in Arizona; however, the conditional effect for Florida was not statistically significant because the rate of change in alcohol use severity across participants was low. By contrast, participants in Arizona had the steepest decline in alcohol use severity as levels of U.S. orientation increased across participants. The association we found between the U.S. orientation and alcohol use is the same found in another study that used the ARSMA-II with Hispanic emerging adults living in Texas (Montoya et al., 2016). The social environment in Maricopa County, Arizona likely played a role in the moderating effect that was found in our study. While Maricopa County has been characterized as a community that discriminates against Hispanics, Torres (2012)

suggested that a higher U.S. orientation may facilitate Hispanics' ability to communicate effectively in English to help them counteract the effects of negative interactions such as ethnic discrimination. To some degree, the idea presented by Torres (2012) has some empirical support because one study found that a higher U.S. orientation was associated with lower perceived ethnic discrimination (Cano et al., 2015). To date, few studies on acculturation and alcohol have examined the social environment. Our findings highlight the notion that context matters, and thus more multisite studies are needed to examine the extent to which communities of settlement may influence associations between acculturation and alcohol use outcomes.

### **Bicultural Self-efficacy and Alcohol**

It is possible that higher social groundedness was associated with lower alcohol use severity because it is acting as a coping resource against sociocultural stressors (e.g., ethnic discrimination) that are linked with more alcohol use (Carrera & Wei, 2014; Cano et al., 2015; Wei et al., 2010). For example, one study found that higher social groundedness mitigated the effects of ethnic discrimination/minority stress on depressive symptoms (Chao, Mallinckrodt, & Wei, 2012; Wei et al., 2010). A question that merits investigation in future studies is whether social groundedness (and other domains of bicultural self-efficacy) function as protective factors that mitigate the effects of sociocultural stressors on alcohol use outcomes. Higher levels of social groundedness may also facilitate the ability to develop wider social networks that enhance social support (Lubben, 1988). This may be important because according to the *Stress Buffering Model*, higher levels of social support can help an individual cope with stressors more effectively; thus, mitigating the effect of stress on maladaptive outcomes such as substance use (Cohen, 2004). For instance, a study with Hispanic immigrants found that higher levels of social support mitigated the effect of immigration stress in relation to alcohol use severity (Cano et al., 2017).

In the current study, the role repertoire domain of bicultural self-efficacy was not associated with alcohol use severity. Given the limited research on bicultural self-efficacy, particularly on specific domains of bicultural self-efficacy, it is difficult to develop explanations for our null findings that are based on existing literature. However, researchers have suggested that respective domains of bicultural self-efficacy develop at varying rates and some domains might not fully develop until bicultural self-efficacy is achieved in other domains (LaFromboise et al., 1993). Thus, it may be the case that bicultural self-efficacy in the role repertoire domain has not reached an optimal level to function as a protective factor against alcohol use severity. LaFromboise and colleagues (1993) also suggest that some domains of bicultural self-efficacy may be more important than others in relation to distinct indicators of psychosocial adjustment. A study that lends support to this explanation found that out of six bicultural self-efficacy domains, only the social groundedness and cultural knowledge domains were associated with lower depressive symptoms (Wei et al., 2014). Lastly, the psychometric properties of the role repertoire subscale may have been a factor. Although the role repertoire subscale had adequate internal consistency in our sample the initial validation study reported suboptimal internal consistency and another study found low internal consistency which raises concern about the psychometric properties of this subscale (Wei et al., 2010).

A moderation analysis indicated that the Hispanic orientation moderated the association between social groundedness and alcohol use severity. Although the conditional effect of social groundedness on alcohol use severity was most favorable at high levels of Hispanic orientation, the slope of this condition was not statistically significant because the rate of change in alcohol use severity observed across participants was low. By contrast, the worst condition was at low levels of Hispanic orientation; however, the slope for this conditional effect was statistically significant because it had the steepest decline in alcohol use severity as levels of social groundedness increased across participants. A plausible explanation for this finding is that social groundedness may help individuals counteract adverse effects associated with a low Hispanic orientation. For instance, some studies have found that a low Hispanic orientation is associated with higher perceived marginalization from the family which in turn may increase levels of alcohol use severity (Cano et al., 2015, Cano, 2016).

Moderation analyses also indicated that acculturation orientations did not moderate the association between the role repertoire domain of bicultural self-efficacy and alcohol use severity. Again, these null findings may stem from the psychometric properties of the role repertoire subscale or it may be the case that the role repertoire domain does not have a direct association with alcohol use severity—future studies with longitudinal data should consider testing if role repertoire is associated with alcohol use outcomes indirectly. Also, study site did not moderate respective associations between bicultural self-efficacy domains and alcohol use severity. It may be the case that the perceived context of reception of each respective community of settlement may be a more salient factor, rather than objective differences by study site, that function as a moderating factor (Schwartz, Zamboanga, et al., 2014). However, this does not mean that communities of settlement do not impact bicultural self-efficacy because one notable difference was that social groundedness was significantly higher in Florida than in Arizona. As research on this topic advances, researchers should consider including measures of perceived context of reception and using longitudinal study designs with larger immigrant samples to examine if bicultural self-efficacy increases over-time as a function of distinct communities of settlement.

### Limitations

The following limitations should be considered when interpreting the findings of this study. First, the present study utilized self-report measures that are susceptible to participant misrepresentation and error. Second, our assessment of acculturation was limited to linguistic acculturation and only two domains of bicultural self-efficacy were examined out of a possible six. Third, due to the cross-sectional design, the causal or directional ordering of associations found cannot be inferred. Lastly, generalizability may be limited due to the non-probability sampling technique that was utilized in the current study. Namely, most participants were current college students and U.S.-born. Also, the sample size adequacy limited the ability to examine subgroup variations attributable to different Hispanic heritage groups. Future studies should attempt to recruit more diverse samples that are more representative of the broader Hispanic population living in the U.S. because key variables in our study such as acculturation have been found to have different effects on alcohol use among distinct Hispanic subgroups (Blanco et al., 2013; Caetano, Ramisetty-Mikler, & Rodriguez, 2009).

## Conclusion

Despite these limitations, the present study highlights that distinct communities of settlement can modify associations between specific acculturation orientations and substance use behavior. This finding underscores the need for more multisite studies on acculturation and alcohol use. Bicultural self-efficacy is a novel construct in alcohol research and our findings suggest that this construct is relevant in alcohol research with Hispanic populations. However, our findings need to be replicated and more studies are needed with more diverse Hispanic samples (e.g., ages, nativity) and inclusion of other bicultural self-efficacy domains. Based on the interaction we found between acculturation and bicultural self-efficacy—future studies should continue to examine how other sociocultural processes may influence bicultural self-efficacy in relation to substance use behavior.

## Acknowledgments:

Preparation of this article was supported by the National Institute on Alcohol Abuse and Alcoholism [K01 AA025992] and the National Institute on Minority Health and Health Disparities [U54 MD002266, U54 MD012393, K01 MD013770]. The content is solely the responsibility of the authors and does not necessarily represent the official view of the National Institutes of Health. The authors would like to acknowledge Carlos Estrada and Irma Beatriz Vega de Luna for their work in recruiting participants.

Role of funding sources

Covered time and effort to work on the article.

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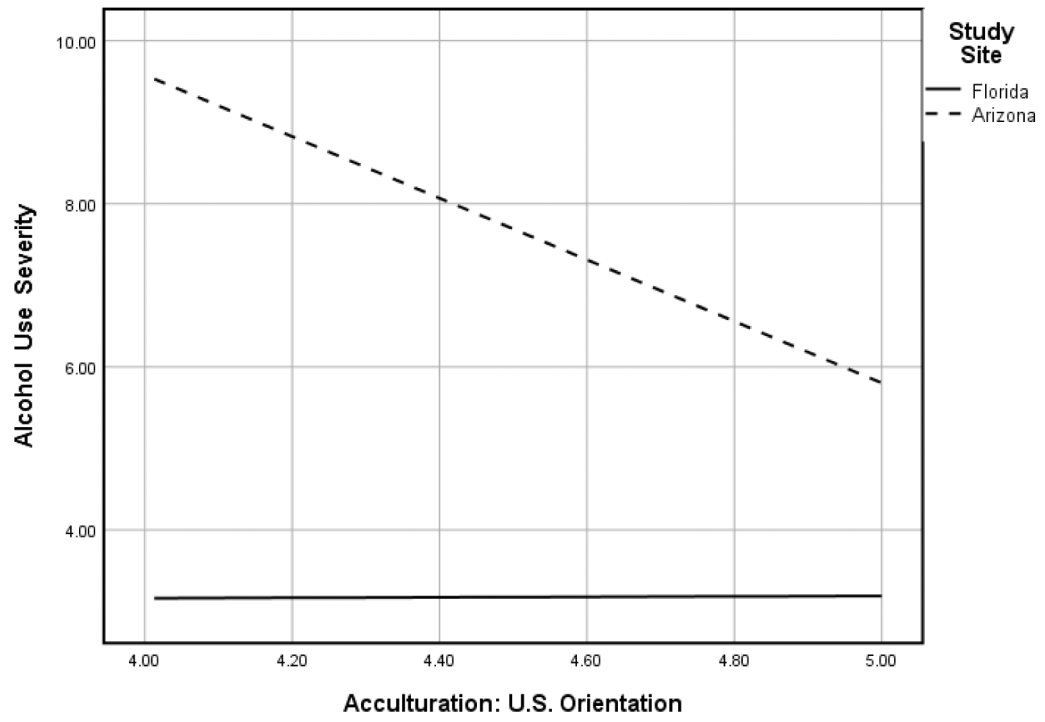
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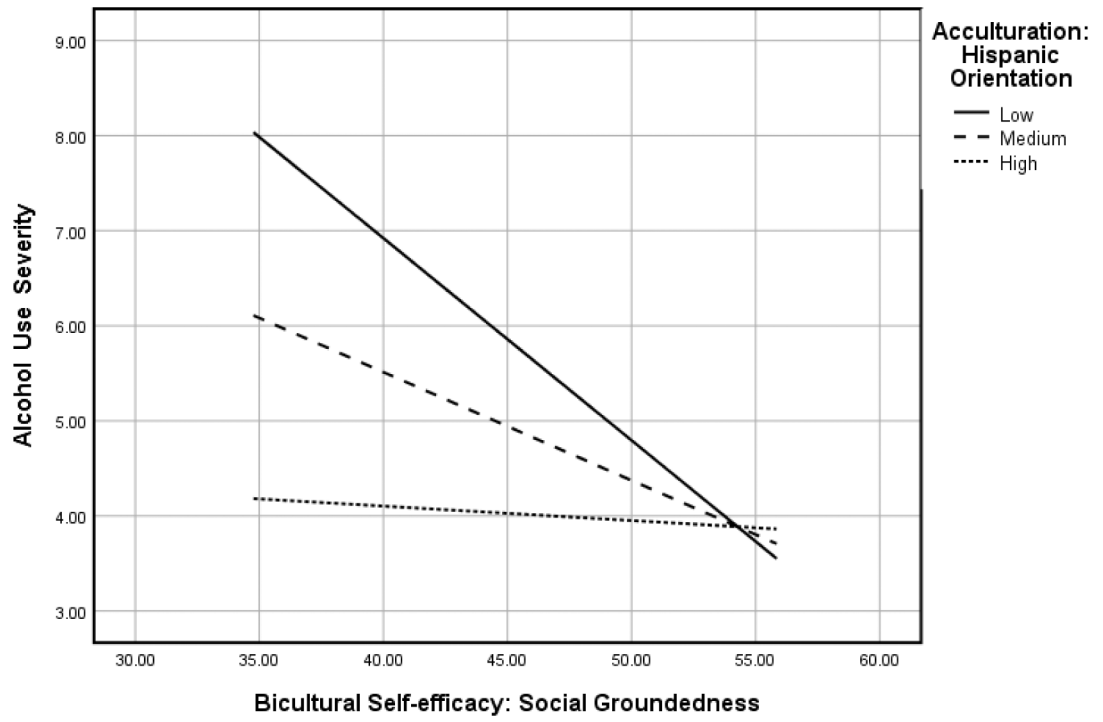


### Highlights

- Neither acculturation orientation nor the role repertoire domain of bicultural self-efficacy had a main effect with alcohol use severity.
- Higher levels of the social groundedness domain of bicultural self-efficacy were associated with lower alcohol use severity.
- Study site moderated the association between the U.S. orientation and alcohol use severity.
- The Hispanic orientation moderated the association between social groundedness and alcohol use severity.



**Figure 1.** Two-way interaction with study site moderating the association between U.S. orientation and alcohol use severity.



**Figure 2.** Two-way interaction with Hispanic orientation moderating the association between the social groundedness domain of bicultural self-efficacy and alcohol use severity.

**Table 1**

Descriptive Statistics for Study Variables (n = 200)

Variable	Arizona 99 (49.5)	Florida 101 (50.5)	
	<i>n</i> (%)	<i>n</i> (%)	$\chi^2$
Gender			.50
Female	53 (53.5)	49 (48.5)	
Male	46 (46.5)	52 (51.5)	
Partner Status			1.05
Single	67 (67.7)	75 (74.3)	
Has Partner	32 (32.3)	26 (25.7)	
Nativity			23.48 **
Immigrant	14 (14.1)	46 (45.5)	
Non-immigrant	85 (85.9)	55 (54.5)	
Hispanic Heritage			146.21 **
Mexican	86 (86.9)	2 (2.0)	
Other Hispanic Heritage	13 (13.1)	99 (98.0)	
Student Status			.06
Current College Student	68 (68.7)	71 (70.3)	
Non-College Student	31 (31.3)	30 (29.7)	
Employment Status			31.43 **
Employed	94 (94.9)	63 (62.4)	
Unemployed	5 (5.1)	38 (37.6)	
	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>t</i> -value
Age	21.67 (1.91)	20.94 (2.20)	-2.49 *
Financial Strain	2.34 (.61)	2.26 (.58)	-1.03
Hispanic Orientation	3.23 (.99)	3.45 (3.45)	1.56
U.S. Orientation	4.72 (.44)	4.44 (.64)	-3.62 **
Social Groundedness	42.98 (11.38)	47.58 (9.15)	3.14 *
Role Repertoire	21.20 (4.07)	21.33 (3.85)	.23
Alcohol Use Severity	6.85 (6.48)	3.19 (4.84)	-4.52 **

\*  $p < .05$ ,\*\*  $p < .01$

Table 2

Bivariate Correlations for Study Variables (n = 200)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Age	-													
2. Gender	-.05	-												
3. Study Site	.17*	.05	-											
4. Partner Status	.24**	.01	.07	-										
5. Nativity	.08	.14*	.34**	-.01	-									
6. Hispanic Heritage	.23**	.02	.86**	.06	.32**	-								
7. Student Status	.30**	-.01	.02	.01	-.11	.01	-							
8. Employment Status	.27**	.05	.40**	.09	.16*	.37**	.24**	-						
9. Financial Strain	-.02	.10	.07	.03	.02	.06	-.19**	.02	-					
10. Hispanic Orientation	.02	.09	-.11	-.14*	-.27**	-.10	.28**	.02	-.15*	-				
11. U.S. Orientation	.02	.07	.25**	.07	.30**	.23**	-.29**	.01	.12	-.50**	-			
12. Social Groundedness	.05	-.16*	-.22**	-.15	-.07	-.17*	.16*	-.06	-.12	.09	-.01	-		
13. Role Repertoire	.11	-.08	-.02	.03	.14	.02	-.14*	.14*	-.02	-.06	.24**	.44**	-	
14. Alcohol Use Severity	.16*	-.05	.31**	-.01	.12	.23**	-.03	.21**	.10	-.13	.02	-.22**	-.07	-

\*  $p < .05$ ,

\*\*  $p < .01$

**Table 3**  
 Hierarchical Multiple Regression Model Predicting Alcohol Use Severity (n = 200)

Variable	Model 1		Model 2		Model 3	
	b	SE	b	SE	b	SE
<i>Block 1</i>						
Age	.42	.22	.15*	.47	.22	.16*
Gender	-.81	.82	-.07	-.50	.82	-.04
Study Site	4.86	1.60	4.1**	5.16	1.59	4.3***
Partner Status	-.95	.92	-.07	-1.16	.92	-.09
Nativity	.08	.96	.01	-.04	.98	-.00
Hispanic Heritage	-2.33	1.59	-.19	-2.32	1.57	-.19
Student Status	-1.11	.97	-.09	-1.45	1.03	-.11
Employment Status	1.54	1.12	.11	1.51	1.11	.10
Financial Strain	.75	.70	.08	.64	.70	.06
<i>Block 2</i>						
Hispanic Orientation			-.97	.49	-.16*	-.90
U.S. Orientation			-1.74	.89	-.16*	-1.47
<i>Block 3</i>						
Social Groundedness					-.11	.05
Role Repertoire					.07	.12

Note: b = unstandardized coefficient, SE = standard error,  $\beta$  = standardized coefficient,

\* p .05,

\*\* p .01,

\*\*\* .001

R<sup>2</sup> = 14.1 for Block 1, R<sup>2</sup> change = 2.5 for Block 2, R<sup>2</sup> change = 2.7 for Block 3.