A Cultural and Social Cognitive Model of Differences in Acculturation Orientations, Alcohol Expectancies, and Alcohol-Related Risk Behaviors Among Hispanic College Students

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Objectives: The present study used a cultural and social cognitive conceptual framework to investigate whether alcohol expectancies and valuations would mediate the associations between specific acculturation orientations and alcohol-related risk behaviors. Design: The sample comprised 1,527 Hispanic students attending colleges and universities in diverse regions of the United States. Respondents completed self-report measures of Hispanic and American cultural practices; alcohol expectancies and valuations; and self-reported frequency of hazardous alcohol use, binge drinking, sexual activity under the influence of alcohol, driving under the influence of alcohol, and riding with a drunk driver. Latent class analysis was used to classify participants into acculturation orientations. Results: Results indicated that acculturation orientations were differentially associated with alcohol-related risk outcomes, with separated bicultural and low bicultural orientations inversely related to all of the alcohol-related risk behaviors except for riding with a drunk driver. Negative expectancy valuations were positively associated with endorsement of binge drinking and drunk driving and negative expectancies were negatively associated with binge drinking, drunk driving, and riding with a drunk driver. With the exception of sexual activity under the influence of alcohol, the associations between acculturation orientations and alcohol-related risk behaviors were partially mediated by positive alcohol expectancies. Conclusions: Our findings provided relevant data that are informative for preventing alcohol and related risk behaviors among Hispanic college students. © 2012 Wiley Periodicals, Inc. J. Clin. Psychol. 69:319–340, 2013.

Keywords: acculturation; alcohol expectancies; alcohol-related problems; hazardous alcohol use; Hispanic college students

National surveys have suggested that heavy alcohol use and negative drinking consequences are prevalent among college students (e.g., Hingson, Heeren, Winter, & Wechsler, 2005). The availability of alcohol, the concentration of same-age peers, and the relative absence of adult supervision in college settings make for the “perfect storm” that can increase college students’ risk for heavy and problematic drinking. These risk factors are common among traditionally aged college students, however, there are additional factors that could exacerbate problem drinking in the college context.

Specific ethnic groups, such as Hispanics, are especially vulnerable to alcohol-related problems (Chartier & Caetano, 2010). Hispanic college students have the second highest rates of alcohol consumption compared with their White counterparts (Johnston, O’Malley, Bachman, & Schulenberg, 2009). However, as a group, Hispanics are more likely to experience negative alcohol-related consequences (Mulia, Ye, Greenfield, & Zemore, 2009). Alcohol use among Hispanics is associated with faster escalation to maladaptive short-term and long-term

*This research was supported by Grant DA025694 from the National Institute on Drug Abuse.
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health outcomes such as alcohol-related traffic fatalities (Caetano, Ramisetty-Mikler, Wallisch, McGrath, & Spence, 2008) and alcohol use disorders (Chartier & Caetano, 2010).

Alcohol-related consequences are a serious public health concern; however, few studies have examined factors associated with alcohol-related risk outcomes in Hispanic college students (e.g., Bourdeau, Saltz, Bersamin, & Grube, 2007). Considering the elevated risk for negative alcohol-related consequences among Hispanics, such as progression to alcohol use disorders (Dawson et al., 2005), it is essential to examine how Hispanic college-attending emerging adults may be at incrementally higher risk for participation in alcohol-related risk behaviors. In fact, Arnett (2000) has suggested that emerging adulthood is a distinct period of the lifespan—one characterized by increased freedom and exploration. Research among emerging-adult college students has suggested that the increased involvement in alcohol-related risk behaviors (Goldman, Greenbaum, Darkes, Brandon, & Del Boca, 2011) may be partly explained by the identity explorations (Arnett, 2000) associated with emerging adulthood. Consistent with the conceptualization of emerging adulthood as a period of increased identity exploration, the study of cultural identity processes, such as acculturation, among Hispanic college students provides a unique opportunity to identify (a) heterogeneity in acculturation among Hispanic college students and (b) how within-group variations in acculturation are associated with involvement in alcohol-related risk behaviors.

By definition, acculturation is a multidimensional process that includes the identifications, values, and practices that change through contact with a new culture or that are shaped through growing up in an immigrant family (Berry, 1997; Lopez-Class, Castro, & Ramirez, 2011; Schwartz, Unger, Zamboanga, & Szapocznik, 2010). Such a notion of acculturation considers the heritage and receiving cultures separately (Berry, 1997). Within this conceptualization, specific acculturation orientations represent permutations of Hispanic and American cultural practices (Schwartz & Zamboanga, 2008). Schwartz and Zamboanga demonstrated that heterogeneity in acculturation orientations among Hispanic emerging adults was related to a number of cultural variables such as acculturative stress, collectivist values, familism, and discrimination.

Among many ethnic minority and immigrant groups, such as Hispanics, acculturation has been associated with whether or not—and to what extent—individuals engage in alcohol use and related risk behaviors (e.g., binge drinking, drunk driving, sex while under the influence of alcohol; Caetano, Ramisetty-Mikler, & Rodriguez 2008; Maldonado-Molina, Jennings, & Prado, 2011; Zamboanga, Raffaelli, & Horton, 2006). Although such research has been informative in identifying associations between acculturation and alcohol-related risk outcomes, many of these studies have adopted a unidimensional approach to acculturation—and reliance on unidimensional approaches may have led to the inconsistencies found in the acculturation/alcohol-related risk behavior literature. Another important knowledge gap that remains is the understanding of mechanisms by which the acculturation orientation/alcohol-related risk behaviors associations occur. Therefore, variables that have been shown to explain the relationship between more distal processes and alcohol-related risk behaviors should be included as potential mediators of the link between acculturation and alcohol-related risk behaviors.

To that effect, much work using college student samples has focused on the extent to which alcohol-related cognitions, such as alcohol expectancies (i.e., a person’s anticipated beliefs about the effects of alcohol consumption and their evaluations of those effects), can increase or inhibit the likelihood of drinking (Gaher & Simmons, 2007). Alcohol expectancies have been shown to explain the mechanism by which distal processes such as family history of alcoholism predict alcohol-related risk behaviors. The purpose of the present study was to build on this social cognitive framework for alcohol use and on the empirical literature linking acculturation with alcohol-related risk behaviors. In doing so, we also sought to extend Schwartz and Zamboanga (2008) by empirically deriving acculturation orientation categories from measures of Hispanic and American cultural practices, using these categories to examine how heterogeneity in acculturation is associated with alcohol-related risk behaviors, both directly and indirectly through alcohol expectancies and their valuations. To increase generalizability, we utilized a sample of Hispanic emerging adults attending 30 colleges and universities around the United States.
Acculturation and Alcohol Use and Related Problems

The last decade of research has vastly expanded our understanding of acculturation. An extensive landscape of theoretical and empirical work has demonstrated that acculturation is an important area of study (Schwartz et al., 2010) and is related to a number of outcomes, including alcohol use (Wagner, Ritt-Olson, Soto, Rodriguez, Baezconde-Garbanati, & Unger, 2008). As aforementioned, some studies have operationalized acculturation as a unidimensional process whereby individuals are deemed “acculturated” when they replace the practices and values of their heritage culture with those embraced by the receiving society (e.g., Ramirez, Crano, Quist, Burgoon, Alvaro, & Grandpre, 2004). For example, Hispanic individuals would become “Americanized” or “acculturated” by adopting cultural practices and behaviors associated with the United States while discarding those associated with their heritage cultures. Indeed, many health studies have used either unidimensional measurement scales or demographic proxies (e.g., language spoken at home, place of birth, number of years in the United States) that imply a unidimensional view of acculturation (e.g., Allen, Elliott, Fugligni, Morales., Hambarsoomian, & Schuster, 2008).

However, scholars in cultural psychology have recommended bidimensional approaches, where heritage and receiving cultural practices are considered separately. Bidimensional approaches allow for the possibility of biculturalism, where individuals both embrace the receiving culture and retain their heritage culture. Schwartz and colleagues (2010) have reviewed literature suggesting that certain orientations to acculturation may be associated differently with a number of health outcomes, including alcohol and drug use. Consequently, studies examining how acculturation is related to psychosocial and health outcomes should utilize bidimensional models of acculturation. Following Berry’s definition (1997; Berry & Sam, 2010), we use the term “acculturation” to subsume both American culture acquisition and heritage culture retention.

Recent literature reviews suggest that acculturation is in fact heterogeneous and that individuals may employ different acculturation orientations depending on the receiving context in which they live (Lopez-Class et al., 2011). For example, Hispanic adolescents who live in highly Hispanic areas may be more likely to retain Hispanic cultural practices compared with Hispanic adolescents residing in more monocultural American contexts (Schwartz, Pantin, Sullivan, Prado, & Szapocznik, 2006; Schwartz, Zamboanga, & Jarvis, 2007). However, regardless of context, a bicultural approach—where one strongly endorses both Hispanic and American cultural practices—appears to be associated with the lowest levels of risk behavior for both adolescents and emerging adults (Coatsworth, Maldonado-Molina, Pantin, & Szapocznik, 2005).

Alcohol Expectancies and Valuations

An important line of research that evolved from cognitive-affective and social learning conceptualizations of alcohol use has identified alcohol expectancies and valuations as predictors and correlates of alcohol-related risk behaviors. Alcohol expectancies have been defined as cognitive representations or anticipated beliefs about the effects of alcohol use, based on relations between the physiological effects of alcohol and an individual’s learning history (Goldman, Reich, & Darkses, 2006). Valuations have been defined as one’s beliefs about the desirability (good or bad) of a particular expected outcome associated with drinking (Fromme, Stroot, & Kaplan, 1993). Generally speaking, positive expectations about the effects of alcohol use (e.g., disinhibition, increased sexual prowess) and favorable evaluations of these expectancies are positively associated with consumption (Fromme et al., 1993; Ham, Stewart, Norton, & Hope, 2005). Conversely, studies have found that negative expectations about the effects of alcohol use (e.g., feeling sick, cognitive impairment) can decrease or even inhibit use (Thush & Wiers, 2007).

An increasing number of researchers have directed their investigations toward understanding the mechanisms through which alcohol expectancies may play a role in promoting a range of alcohol-related health-risk behaviors. In general, these studies have used college samples and have found that expectancies were a significant predictor of not only involvement in alcohol use but also alcohol-related problems (Hatzenbuehler, Corbin, & Fromme, 2011). Although positive expectancies have been identified as a more powerful predictor of drinking outcomes,
negative expectancies have also been shown to correlate with drinking outcomes. However, the literature has been inconsistent regarding the direction of the associations between negative expectancies and alcohol-related outcomes, with some studies finding positive associations (e.g., Neighbors, Lee, Lewis, Forros, & Larimer, 2007), others finding negative associations (e.g., Kuntsche, Knibbe, Gmel, & Engels, 2005), and others finding no relationship (e.g., Bot, Engels, & Knibbe, 2005).

Alcohol expectancy *valuations*, whether or not specific alcohol expectancies are labeled as “good” or “bad,” are also predictive of involvement in alcohol use. Research with college students in general has suggested that expectancy valuations may explain variability in alcohol use and related outcomes beyond that explained by positive and negative expectancies (Ham & Hope, 2005; Zamboanga & Ham, 2008). Consequently, in the current study we modeled positive and negative expectancies, along with their valuations, to construct a comprehensive model regarding the link between acculturation orientations and the ways in which they are related to alcohol-related risk behaviors among Hispanic college students.

The associations between expectancies and alcohol use have been demonstrated in a number of ethnic groups (e.g., Chartier, Hesselbrook, & Hesselbrook, 2009), including Hispanic college students (Zamboanga, 2005). Additionally, some work with college students in general has also focused on links between alcohol expectancies and indices of risky alcohol use such as pregaming (drinking before going to a social event; Zamboanga, Schwartz, Ham, Borsari, & Van Tyne, 2010), involvement in drinking games (Zamboanga, Bean, Pietras, & Pabon, 2005), binge drinking (Balodis, Potenza, & Olmstead, 2009), and drunk driving (LaBrie, Kenney, Mirza, & Lac, 2011). However, the mediating role of alcohol expectancies and valuations in the association between acculturation orientations and alcohol-related risk behaviors (e.g., drunk driving and alcohol-related sexual activity) has not been empirically examined. Acculturation processes can play an important role in determining Hispanics’ vulnerability to health risks (e.g., Alegría et al., 2007; Schwartz, Weiskirch, et al., 2011), and, as a result, it is essential to integrate cultural and social cognitive mechanisms to provide a more comprehensive portrayal of vulnerability to alcohol-related risks among Hispanic college students.

As part of such an integrative model of alcohol-related risk among Hispanic college students, it is important to examine the culturally based predictors of alcohol expectancies and expectancy valuations. Expectancies and valuations might not only serve as social cognitive mechanisms that directly predict alcohol use and related behaviors, but also mediate the associations between acculturation and alcohol-related risks. “More assimilated” Hispanics may be more likely to consume alcohol and to engage in alcohol-related risk behavior compared with their “less assimilated” counterparts (Epstein, Doyle, & Botvin, 2003). It is also likely that more assimilated individuals may hold more favorable expectancies because they have largely relinquished their cultural heritage, whereas individuals who have maintained their heritage might be less likely to endorse positive alcohol expectancies. The interplay between Hispanic and American cultural practices may predict the type of expectancies Hispanic college students endorse. For example, Hispanic students who endorse a separated-bicultural acculturation orientation may endorse characteristics associated with emerging adulthood, such as being self-focused and indulgent, to a lower extent compared with individuals endorsing other acculturation orientations. Consequently, such individuals may endorse less favorable alcohol expectancies that would in turn protect them against engagement in alcohol-related risk behaviors.

On the other hand, Hispanic students who endorse an assimilated acculturation orientation would be more likely to endorse self-focused and hedonistic characteristics that are typical for college students in an American context. The types of expectancies (i.e., positive and negative) that individuals endorse have been shown to be closely related to the social and cultural context in which they evolve (Goldman, Reich, & Darkes, 2006). The study of alcohol expectancies as known mediators of distal factors such as acculturation orientations might elucidate how acculturation orientations are related to alcohol-related risk behaviors among Hispanic college students. The examination of acculturation and alcohol expectancies together may provide a
more comprehensive explanatory framework for understanding alcohol-related risks behaviors among Hispanic college students.

**Acculturation, Alcohol Expectancies, and Alcohol-Related Risk Behaviors**

The literature on alcohol use and related negative outcomes among Hispanics has included acculturation (see Zemore, 2007, for a review), as well as alcohol expectancies (Marín, 1996; Mills & Caetano, 2010), as predictors. In general, studies focusing on the role of acculturation in alcohol use behaviors have found that “assimilation” (i.e., orientation toward American cultural practices and away from Hispanic cultural practices) is positively predictive of alcohol use (e.g., Caetano, Ramisetty-Mikler, Wallisch, et al., 2008; Resor & Cooper, 2010). In terms of alcohol expectancies, compared with other ethnic groups, individuals of Hispanic heritage also report greater levels of positive alcohol expectancies. Individuals with an acculturation orientation toward American cultural practices (i.e., assimilated) are more likely to endorse positive expectancies and the endorsement of positive expectancies is more consistently a predictor of higher levels of involvement in alcohol-related behaviors (Marín, 1996; Mills & Caetano, 2010).

**The Present Study**

The present study was designed to evaluate simultaneously the mediating role of four important social cognitive variables (positive alcohol expectancies, negative alcohol expectancies, positive alcohol expectancy valuations, and negative alcohol expectancy valuations) in the association between acculturation orientations and alcohol-related risk behaviors in a sample of Hispanic college students. The hypothesized model (see Figure 1) is based on a blend of cultural (e.g., Lopez-Class et al., 2011) and social cognitive perspectives (e.g., Goldman, Reich, & Darkes, 2006) to test our main hypothesis that acculturation orientations are indirectly associated (through alcohol expectancies and valuations) with alcohol-related problems in Hispanic college students.

To achieve this goal, first, we attempted to replicate the acculturation clusters derived by Schwartz and Zamboanga (2008). These authors used indices of Hispanic and American cultural practices (Berry, 1997) to empirically extract different acculturation orientations in a sample of Hispanic students attending a large urban public university, and to evaluate whether differences in endorsement patterns of cultural identity indices would differ across these classes. Indices of cultural identity included cultural values and identifications such as collectivism, individualism,

![Figure 1](image)

Figure 1. Conceptual model of hypothesized relationships.
ethnic and U.S. identity, independence, interdependence, and familism, and six acculturation classes emerged: (a) an “Undifferentiated” class characterized by low scores on American and Hispanic cultural practices; (b) an “Assimilated” class characterized by high endorsement of American cultural practices and low endorsement of Hispanic cultural practices; (c) a “Full Bicultural” class defined by the highest scores on both Hispanic and American cultural practices; (d) a “Partial-Bicultural” class characterized by moderate scores on both Hispanic and American cultural practices; (e) an “American-oriented bicultural” class characterized by high levels of American cultural practices and moderate levels of Hispanic cultural practices; and (f) a “Separated” class characterized by high scores on Hispanic cultural practices and low scores on American cultural practices.

Given that Schwartz and Zamboanga (2008) used a sample from a single urban university, it remains to be determined whether similar acculturation orientations would emerge in a diverse sample of Hispanic emerging adults attending a number of colleges around the United States, including both schools located in urban areas and schools located in college towns. Based on this prior research (Schwartz & Zamboanga, 2008) and on acculturation theory (e.g., Berry, 1997), we anticipated that latent-class procedures conducted on heritage and American cultural practices would yield classes representing three of Berry’s four cultural orientations: biculturalism (retaining both heritage and receiving culture); separation (retaining the heritage culture and rejecting the receiving culture); and assimilation (rejecting the heritage culture and acquiring the receiving culture). We expected that multiple forms of biculturalism would emerge, with a “high biculturalism” cluster characterized by stronger endorsement of both heritage and receiving cultural practices compared with a “low biculturalism” cluster (Benet-Martínez & Haritatos, 2005).

Second, on the basis of the research reviewed above, we also hypothesized that acculturation orientations would directly predict alcohol-related risk behaviors. We hypothesized that acculturation orientation class would predict involvement in alcohol-related risk outcomes, such that classes that are more oriented toward heritage culture would be associated with lower levels of involvement in alcohol-related risk outcomes. Given that alcohol expectancies (Jones, Corbin, & Fromme, 2001) and acculturation orientations (Lopez-Classet al., 2011) are both, at least in part, the results of prior social and cultural experiences, we expected that acculturation orientations would be associated with alcohol expectancies and valuations. Furthermore, consistent with the finding that being “less acculturated” (i.e., orientations other than assimilation) is associated with lower levels of drinking (Zemore, 2007), we also expected that acculturation classes oriented toward heritage culture would be associated with less positive, and more negative, alcohol expectancies. In turn, we expected that positive expectancies would be most likely to promote drinking and alcohol-related risk outcomes.

Last, we examined whether the hypothesized model fit equivalently by gender and across university settings. Research using Hispanics in general has reported gender differences in alcohol use (e.g., Zamboanga, Raffaelli, & Horton, 2006). Consequently, an auxiliary goal of the current study was to explore between-group differences by testing whether the model we posited in Figure 1 fits equivalently for male and female Hispanic students. Using a unidimensional characterization of acculturation, many studies found that “less acculturated” Hispanic men do not differ significantly in their mean-level of alcohol use compared with their “more acculturated” counterparts. On the other hand, “more acculturated” Hispanic women tend to report higher levels of drinking compared with those who are less acculturated (e.g., Pearson, Dube, Nelson, & Caetano, 2009). In light of these prior findings using unidimensional acculturation models, it is important to evaluate whether the proposed model (based on a bidimensional model of acculturation) operates differently for college-attending Hispanic men and women.

Moreover, the type of living environments have been found to be associated with alcohol use and related risk behaviors among college students (e.g., Labrie et al., 2011; e.g., LaBrie, Kenney, Tehniat, & Lac, 2011; Zamboanga, Olthuis, Horton, McCollum, Lee, & Shaw, 2009). For example, living arrangements often associated with college towns, such as dormitories and fraternity/sorority houses, tend to be associated with drinking and related problems (e.g., Labrie et al., 2011). Such findings raise the question whether university setting (i.e., college town versus
urban/suburban) may also contribute to differences in the links between acculturation and alcohol-related risk related outcomes. Consequently, we also evaluated the consistency of the hypothesized model between college towns and urban/suburban settings).

**Method**

**Sample and Procedures**

For the present analyses, we used data from the Multi-Site University Study of Identity and Culture (MUSIC), a national research collaborative that involved data collection from 30 colleges and universities in the United States (Schwartz, Waterman, et al., 2011). The present sample comprises all participants identifying as Hispanic or Latino and who were in the traditional college age range (18-25 years). The present sample comprises 1,527 undergraduate students (76% women, 24% men; mean participant age = 20.35 years, standard deviation [SD] = 3.88). With regard to nativity, 77% of participants were born in the United States, and 23% reported being born in another country. The most prominent countries of familial origin were Mexico (19%), Cuba (17%), Colombia (6%), the Dominican Republic (3%), Peru (3%), Puerto Rico (2%), Nicaragua (2%), Venezuela (2%) and El Salvador (2%).

An additional 8.5% of participants reported being of mixed Hispanic ancestry, where the mother was born in one Hispanic country and the father was born in a different Hispanic country. Two percent reported mixed Hispanic/non-Hispanic ancestry, where one parent was born in a Hispanic country and the other parent was born in the United States or in a non-Hispanic country. In terms of socioeconomic status, 28% of participants reported annual family incomes below $30,000, 26% between $30,000-$50,000, 26% between $50,000-$100,000, and 17% above $100,000. The remaining 3% of participants did not report their annual family income.

**Measures**

**Acculturation orientations.** The Stephenson (2000) Multigroup Acculturation Scale was used to create the acculturation orientation categories. This instrument includes two subscales: heritage cultural practices (17 items; e.g., “I think in my heritage language”) and American cultural practices (15 items; e.g., “I think in English”). All items were responded to using a 5-point scale, ranging from 1 (strongly disagree) to 5 (strongly agree). In the current data set, Cronbach’s estimates were .91 for heritage cultural practices and .85 for American cultural practices.

**Alcohol expectancies.** Alcohol expectancies were measured using the Brief Comprehensive Effects of Alcohol Scale (BCEO; Ham et al., 2005). The BCEOA is a 15-item version that measures positive and negative expectancies and their valuations. The positive expectancies subscale includes items that assess positive effects of alcohol such as “I would act sociable,” whereas the negative expectancies subscale measures anticipated negative effects associated with alcohol use, e.g., “I would be clumsy.” The BCEOA also asks participants to indicate how desirable or how undesirable they consider each positive or negative outcome expectancy to be. The positive and negative drinking expectancy items are rated on a 4-point scale, ranging from 1 (disagree) to 4 (agree), and the valuation items are rated on a 5-point scale, ranging from 1 (bad) to 5 (good). In the present sample, Cronbach’s α estimates were .81 for positive expectancies; .72 for negative expectancies; .88 for positive valuations and .81 for negative valuations.

**Alcohol-Related Risk Behaviors**

Alcohol-related risk behaviors included hazardous alcohol use (e.g., drinking accompanied by negative consequence such as missing school of work, relationship problems), binge drinking, drunk driving, riding with a drunk driver, and sex under the influence of alcohol. Hazardous alcohol use was measured using the Alcohol Use Disorders Identification Test (AUDIT; Saunders, Aasland, Babor, De La Puente, & Grant, 1993). The AUDIT assesses frequency and quantity
of drinking in the past year, as well as a number of negative consequences that individuals experienced as a result of their drinking in the past year. The total AUDIT score ($\alpha = .87$ in the present study) was derived by taking the sum of the 10 items. The first AUDIT item measures the frequency of alcohol use in the past year, with response options of (0) never, (1) monthly or less, (2) 2-4 times a month, (3) 2 to 3 times a week, (5) 4+ times a week. The subsequent questions measures problematic alcohol use and negative consequences associated with alcohol use (e.g., how often during the last year have you found that you were not able to stop drinking once you had started?).

Responses to these remaining items were provided on a 5-point scale, where the scale anchors varied as a function of item content. Binge drinking was measured by asking participants how many times during the 30 days prior to assessment they had consumed four or more drinks (for women) or five or more drinks (for men) on a single occasion (cf. Othuis, Zamboanga, Ham, & Van Tyne, 2011; Wechsler, Dowdall, Davenport, & Rimm, 1995). Drunk driving, riding with a drunk driver, and sex under the influence of alcohol were measured by asking participants how many times in the 30 days prior to assessment they had engaged in each of these behaviors. Each of these items was answered using a 5-point scale: 0 (never), 1 (once or twice), 2 (3-5 times), 3 (6-10 times), or 4 (11 or more times).

**Data Analytic Plan**

Analyses for the current study were conducted in four steps. Preliminary analyses were conducted on the first step to obtain the frequency of alcohol-related risk behaviors in this sample of Hispanic college students and to evaluate the need to control for the nesting of students within data collection sites. To provide the frequency of involvement in alcohol-related risk behaviors, we created a dichotomous variable for each of these behaviors, where (0) represented no involvement and (1) represented any involvement in the behavior in question. The hazardous alcohol use variable was also dichotomized. Consistent with empirical evidence regarding the validity of the AUDIT as a measure of hazardous alcohol use among college students, we used a standard cut-point of 6 (Reinert & Allen, 2007). Participants with a composite score of 6 or higher were coded as (1) representing involvement in hazardous drinking. Participants not meeting this criterion were assigned a score of 0. Also in the first step, as an internal validation, we used latent class analysis to ascertain whether the same acculturation dimensions reported by Schwartz and Zamboanga (2008), using a different dataset, would emerge in the present multisite sample of Hispanic college students.

In the second step, we estimated Model 1, in which acculturation dimensions were used to directly predict alcohol-related risk behaviors. In the third step, we estimated Model 2 to test the primary hypothesis that alcohol expectancies and their valuations would mediate the relationship between acculturation dimensions and alcohol-related risks behaviors. In the current study, with the exception of hazardous alcohol use, which was modeled as a continuous variable, each of the alcohol-related risk variables was characterized by at least 75% zero responses. In such cases, zero-inflated Poisson (ZIP) modeling (Atkins & Gallop, 2007) should be used to model the zeroes separately from the nonzero count data so that associations within the nonzero data can emerge. In a ZIP model, the count variable is split into two parts: (a) a dichotomous (endorsement) indicator representing whether the participant engaged in the behavior in question during the 30 days prior to assessment, and (b) a count (frequency) indicator representing how often participants reported involvement in the behavior during that same time span. The count portion of the ZIP model can be used to distinguish experimentation from chronic engagement in a given behavior (Schwartz, Waterman, et al., 2011).

In a ZIP model, the unstandardized regression coefficient for the dichotomous portion is interpreted as an odds ratio (OR), and the count portion is interpreted as an incidence rate ratio (IRR). Both ratios are derived by taking the exponential (inverse natural logarithm) of the unstandardized regression coefficient. To evaluate mediation, we used the joint significance test advanced by MacKinnon (2008; MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). This approach to mediation analysis creates a 95% confidence interval around the product of the two unstandardized paths that contain the mediating pathway. If this product does not include zero,
then partial mediation is assumed at $p < .05$. The joint significance test has been shown to have more statistical power and accurate Type I error rates compared with other tests of mediation. The mediation analyses were conducted using the PRODCLIN software (Fritz & MacKinnon, 2007).

In the final step of analysis, we conducted invariance testing across gender and university setting, to examine the consistency of the hypothesized model. Of the 1527 students who participated in the study, 1174 students (77%) self-identified as alcohol drinkers. Of these 1174 drinkers, 64% were younger than 21 years of age, and 36% were 21 years of age or older. Given reported differences by age (i.e., legal versus underage drinkers) regarding alcohol use among college students (e.g., Zamboanga et al., 2010), we created a dichotomous variable to represent whether the student was below (younger than 21) or above (21 or older) the legal drinking age. This dichotomized age variable was then entered into the model as a covariate by including it as an additional predictor of each mediating and outcome variable.

Results

Preliminary Analyses

Intraclass correlations. Given that the data were collected from 30 different colleges and universities, we evaluated the magnitude of the intraclass correlations (ICC) prior to model testing. The ICC indicates the percentage of variance in a given outcome variable that is attributable to between-site differences (Raudenbush & Bryk, 2002). Generally, ICC values of .05 or greater are considered indicative that site-level differences should be controlled in analysis. Three of the ICC estimates—hazardous drinking (.07), positive expectancy valuations (.05), and drunk driving (.11)—met this criterion. Consequently, to adjust standard errors for the nesting of participants within university sites, we used the sandwich estimator (Kauerman & Carroll, 2001). This adjustment was done using the TYPE = COMPLEX command in Mplus (Muthén & Muthén, 2007). The use of the sandwich estimator is recommended when the objective is to account for nesting without predicting between-site variability. Robust maximum likelihood estimation was used to account for missingness and to control for non-normality.

Descriptive statistics. The frequencies of past month involvement in alcohol-related risk behaviors, including hazardous drinking, binge drinking, sex under the influence of alcohol, driving under the influence of alcohol, and riding with a drunk driver, are presented in Table 1. The prevalence of past year alcohol use, as assessed using the first item of the AUDIT, was 77%. The frequencies of past-month involvement in alcohol-related risk behaviors were lower than those for national samples of college students (Hingson et al., 2009). Hazardous drinking was the most common risk behavior—26% of the sample was classified as past-year hazardous drinkers based on their AUDIT scores.

Creation of acculturation orientation classes. To place participants into acculturation orientation classes, we used latent class analysis. Following classification, we validated the acculturation orientation classes to document significant between-class differences in endorsement

| Table 1 |
|-----------------|-----------------|
| Prevalence of Alcohol Use and Alcohol Risk Behaviors (Last 30 Days) | N (%) |
| Alcohol use | 1174 (77%) |
| Binge drinking | 254 (17%) |
| Sex while drinking | 250 (16%) |
| Drunk driving | 246 (16%) |
| Riding w/drunk driver | 890 (18%) |
| Hazardous drinking | 402 (26%) |
patterns of the clustering variables, as an internal validation of the class solution. The class solution that we extracted was extremely similar to the solution reported by Schwartz and Zamboanga (2008), with the exception of the undifferentiated class, which did not emerge in the present sample. Specifically, LCA results suggested the presence of five empirically distinct acculturation dimensions: separated bicultural ($n = 219$), separated ($n = 76$), assimilated ($n = 401$), high bicultural ($n = 526$), and low bicultural ($n = 169$). Compared with one-class to six-class solution, the five-class solution provided the best model fit with smallest Bayesian information criterion (22031.5) and Akaike information criterion (22116.5). The Vuong-Lo-Mendel-Rubin likelihood ratio value for the five-class solution, compared with a four-class solution, was 53.02, $p < .01$. The entropy value ($E = .75$) suggested that the five-class solution was reliable and stable. Classification accuracy rates for all five classes were above .70.

**Model 1: Direct Associations Between Acculturation Dimensions and Alcohol-Related Risk Behaviors**

In Model 1, we tested the direct relationship between acculturation classes and alcohol-related risk outcomes (hazardous drinking, binge drinking, sex under the influence of alcohol, drunk driving, and riding with a drunk driver). The acculturation classes were entered into the model using dummy-coded variables for separation, separated biculturalism, high biculturalism, and low biculturalism. The assimilated acculturation class was used as the reference category. Compared with the assimilated class, the three variants of biculturalism—separated bicultural, low bicultural and high bicultural—were differentially associated with alcohol-related risk behaviors. Separated biculturalism was negatively related to frequency of binge drinking ($IRR = 0.55$, $95\% CI = 0.34$ to $0.89$, $p = .02$) and low biculturalism was negatively linked with prevalence of binge drinking ($OR = 0.36$, $95\% CI = 0.13$ to $1.01$, $p = .05$). A parallel association for the separated bicultural class with prevalence of binge drinking approached significance ($OR = 0.50$, $95\% CI = 0.23$ to $1.08$, $p = .08$).

An inverse relationship was also observed between the low bicultural class and the frequency of sex while under the influence of alcohol ($IRR = 0.63$, $95\% CI = 0.44$ to $0.92$, $p = .02$). Compared with the assimilated class, separated biculturalism was negatively associated with the prevalence of drunk driving ($OR = 0.40$, $95\% CI = 0.19$ to $0.86$, $p = .02$), but positively associated with the frequency ($IRR = 1.59$, $95\% CI = 1.12$ to $2.25$, $p < .01$) of drunk driving. Low biculturalism was positively related to the frequency of riding with a drunk driver ($IRR = 1.62$, $95\% CI = 1.21$ to $2.17$, $p < .001$), whereas the negative relationship between high biculturalism and the prevalence of riding with a drunk driver approached significance ($OR = 0.59$, $95\% CI = 0.32$ to $1.08$, $p = .09$). Both separated biculturalism $\beta = -.11$, $p < .01$, and high biculturalism, $\beta = -.09$, $p < .05$, were negatively related to hazardous drinking.

**Model 2: Indirect Effects of Alcohol Expectancies and Valuations in the Association Between Acculturation Dimensions and Alcohol-Related Risk Outcomes**

The third step of analysis was to test the proposed cultural and social cognitive model (Figure 1) for the mediating role of alcohol expectancies and valuations in the association between acculturation orientations and alcohol-related risk behaviors among Hispanic college students. Results evaluating our hypothesized model indicated that acculturation orientations were significantly associated with positive alcohol expectancies (Figure 2). Compared with individuals in the Assimilated class, individuals in the other five classes reported fewer positive expectancies: Separated Bicultural, $\beta = -.40$, $p < .001$; Separated, $\beta = -.23$, $p < .01$; High Bicultural, $\beta = -.20$, $p < .001$; and Low Bicultural, $\beta = -.26$, $p < .01$. On the other hand, compared with participants in the assimilated class, individuals in the Separated Bicultural, $\beta = -.29$, $p < .001$, and High Bicultural, $\beta = -.13$, $p < .01$, classes endorsed fewer positive expectancy valuations. The acculturation classes were not related to negative alcohol expectancies or to negative expectancy valuations.
Alcohol Expectancies and Valuations as Predictors of Alcohol-Related Risk Behaviors

Odds ratios (ORs) for prevalence of alcohol-related risk behaviors are shown in Table 2 and Incidence rate ratios (IRRs) for frequency of alcohol-related risk behaviors are reported in Table 3. Positive alcohol expectancies were positively associated with the prevalence of binge drinking, sex under the influence of alcohol, and riding with a drunk driver (Table 2). Similarly, positive alcohol expectancies were positively associated with hazardous alcohol use ($\beta = .30, p < .001$) and with negative expectancy valuations ($\beta = .16, p < .001$). In terms of prevalence of alcohol-related risk behaviors, a negative relationship was observed between negative alcohol expectancies and prevalence of binge drinking, drunk driving, and riding with a drunk driver. Negative expectancy valuations were positively associated with the prevalence of binge drinking and drunk driving (Table 2). In terms of frequency of alcohol-related risk behaviors, negative alcohol expectancies were positively associated with the frequency of drunk driving and approached significance as positive correlates of the frequency of binge drinking and sex under the influence of alcohol (Table 3).

In terms of age effects, older Hispanic college students were less likely than younger students to report involvement in sexual activity under the influence of alcohol. Age group did not significantly predict positive expectancies and valuations.

Alcohol Expectancies and Expectancy Valuations as Mediators of the Association Between Acculturation Orientations and Alcohol-Related Risk Outcomes

We next tested whether alcohol expectancies and their valuations mediated the relationship between acculturation orientations and alcohol-related risk outcomes. Our results indicate that only positive alcohol expectancies partially mediated the relationship between acculturation orientations and alcohol-related risk behaviors (Figure 2). Results of these mediation tests are presented in Table 4. The current findings support our hypothesis with regard to positive expectancies as partial mediators of the relationship between acculturation and alcohol-related risk behaviors. With the Assimilated class used as the reference group, positive expectancies partially mediated the associations between acculturation classes and prevalence of binge drinking, drunk driving, and riding with a drunk driver (see Table 4), except for the association between Separated Biculturalism and drunk driving, in which the mediating effect of positive alcohol
### Table 2

**Association of Alcohol Expectancies and Valuations With Alcohol-Related Risk Behaviors**

<table>
<thead>
<tr>
<th>Alcohol-related risk behaviors</th>
<th>Positive expectations OR (95% CI)</th>
<th>Negative expectancies OR (95% CI)</th>
<th>Positive valuations OR (95% CI)</th>
<th>Negative valuations OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Binge drinking</td>
<td>3.48 (1.90 to 6.38) ***</td>
<td>0.69 (0.49 to 0.99) *</td>
<td>1.35 (0.87 to 2.10)</td>
<td>1.75 (1.01 to 3.00) *</td>
</tr>
<tr>
<td>Sex while drinking</td>
<td>1.56 (0.75 to 3.27)</td>
<td>0.77 (0.57 to 1.05)</td>
<td>1.90 (0.80 to 4.52)</td>
<td>0.83 (0.52 to 1.30)</td>
</tr>
<tr>
<td>Drunk driving</td>
<td>1.96 (1.01 to 3.27)</td>
<td>0.66 (0.44 to 0.99) *</td>
<td>1.20 (0.73 to 1.80)</td>
<td>1.78 (1.26 to 2.53) ***</td>
</tr>
<tr>
<td>Riding w/drunk driver</td>
<td>2.37 (1.71 to 3.27) ***</td>
<td>0.69 (0.57 to 0.84) ***</td>
<td>1.10 (0.63 to 1.94)</td>
<td>0.99 (0.57 to 1.72)</td>
</tr>
</tbody>
</table>

OR = odds ratio; CI = confidence interval.

*p < .05; **p < .01; ***p < .001.
### Table 3

**Association of Alcohol Expectancies and Valuations With the Frequency of Alcohol-Related Risks Behaviors**

<table>
<thead>
<tr>
<th>Alcohol-related risk behaviors</th>
<th>Positive expectancies</th>
<th>Negative expectancies</th>
<th>Positive valuations</th>
<th>Negative valuations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Binge drinking</td>
<td>1.09 (0.81 to 1.45)</td>
<td>1.19 (1.00 to 1.42)</td>
<td>1.01 (0.76 to 1.34)</td>
<td>1.75 (0.89 to 1.18)</td>
</tr>
<tr>
<td>Sex while drinking</td>
<td>1.21 (0.81 to 1.81)</td>
<td>1.18 (0.96 to 1.44)</td>
<td>0.88 (0.58 to 1.36)</td>
<td>1.14 (0.92 to 1.41)</td>
</tr>
<tr>
<td>Drunk driving</td>
<td>1.15 (0.79 to 1.68)</td>
<td>1.29 (1.03 to 1.61)</td>
<td>0.91 (0.68 to 1.21)</td>
<td>1.00 (0.86 to 1.18)</td>
</tr>
<tr>
<td>Riding w/drunk driver</td>
<td>0.97 (0.71 to 1.31)</td>
<td>1.24 (0.97 to 1.57)</td>
<td>1.09 (0.77 to 1.54)</td>
<td>1.12 (0.81 to 1.55)</td>
</tr>
</tbody>
</table>

**IRR** = Incident Rates Ratio; **CI** = Confidence Intervals

*p < .1; *p < .05.*
Table 4
*Mediated Effects of Positive Expectancies in the Association Between Acculturation Orientations and Alcohol-Related Risk Behavior*

<table>
<thead>
<tr>
<th>Alcohol-related risk behaviors (outcome variables)</th>
<th>Separated</th>
<th>Separated bicultural</th>
<th>High bicultural</th>
<th>Low bicultural</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes/No - OR (95% CI)</td>
<td>Yes/No - OR (95% CI)</td>
<td>Yes/No - OR (95% CI)</td>
<td>Yes/No - OR (95% CI)</td>
</tr>
<tr>
<td>Binge drinking</td>
<td>Yes/No</td>
<td>0.61 (0.41 to 0.83)**</td>
<td>0.75 (0.53 to 0.99)*</td>
<td>0.78 (0.64 to 0.91)**</td>
</tr>
<tr>
<td></td>
<td>Count</td>
<td>0.97 (0.85 to 1.09)</td>
<td>0.98 (0.90 to 1.05)</td>
<td>0.98 (0.92 to 1.04)</td>
</tr>
<tr>
<td>Drunk driving</td>
<td>Yes/No</td>
<td>0.76 (0.54 to 1.00)*</td>
<td>0.86 (0.65 to 1.01)$</td>
<td>0.87 (0.73 to 1.00)*</td>
</tr>
<tr>
<td></td>
<td>Count</td>
<td>0.94 (0.80 to 1.10)</td>
<td>0.97 (0.86 to 1.06)</td>
<td>0.97 (0.89 to 1.05)</td>
</tr>
<tr>
<td>Riding w/drunk driver</td>
<td>Yes/No</td>
<td>0.71 (0.56 to 0.87)**</td>
<td>0.82 (0.65 to 0.99)*</td>
<td>0.84 (0.74 to 0.93)**</td>
</tr>
<tr>
<td></td>
<td>Count</td>
<td>1.01 (0.89 to 1.15)</td>
<td>1.01 (0.93 to 1.10)</td>
<td>1.01 (0.94 to 1.07)</td>
</tr>
<tr>
<td>Sex while drinking</td>
<td>Yes/No</td>
<td>0.83 (0.59 to 1.12)</td>
<td>0.90 (0.70 to 1.07)</td>
<td>0.91 (0.77 to 1.06)</td>
</tr>
<tr>
<td></td>
<td>Count</td>
<td>0.93 (0.77 to 1.09)</td>
<td>0.96 (0.84 to 1.05)</td>
<td>0.96 (0.88 to 1.04)</td>
</tr>
</tbody>
</table>

OR = odds ratio; CI = confidence interval.

$p < .1; * p < .05; ** p < .01; *** p < .001.$
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expectancies approached significance. With the assimilated class again used as the reference group, results indicated that positive expectancies partially mediated the association between the acculturation classes and hazardous drinking: Separation, point estimate = −.615, 95% CI = −1.01 to −.276, *p* < .001; Separated biculturalism, point estimate = −.357, 95% CI = −1.01 to −.276, *p* < .05; High biculturalism, point estimate = −.309, 95% CI = −.508 to −.137, *p* < .001; and Low biculturalism, point estimate = −.394, 95% CI = −.714 to −.110, *p* < .01. The hypothesis that negative expectancies, positive valuations, and negative valuations would mediate the relationship between acculturation orientations and alcohol-related risk outcomes were not supported.

**Equivalence Across Gender and College/University Setting**

As the final step of analysis, we examined the consistency of the hypothesized model across male (*n* = 266) and female (*n* = 855) students, as well as across urban/suburban (*n* = 694) and college town (*n* = 423) settings. For each invariance test, we estimated two models: an unconstrained model with all paths free to vary by gender or setting, and a constrained model with all paths constrained equally across gender or setting. The difference between the two log-likelihood values was adjusted according to the non-normality corrections used by the robust maximum likelihood estimator (Muthén & Muthén, 2011), and this adjusted difference was interpreted as a chi-square difference value. For gender, the model comparison was not statistically significant (Δχ²(65) = 58.95, *p* = .70), suggesting that the model fit equivalently for male and female Hispanic college students. Similarly, the model comparison across settings was not statistically significant (Δχ²(65) = 69.55, *p* = .56), suggesting that the model fit equivalently between college towns and urban/suburban locations.

**Discussion**

The primary purpose of the present study was to evaluate the mediating role of alcohol expectancies and expectancy valuations in the associations of acculturation orientations with alcohol-related risk behaviors in a sample of Hispanic college students from diverse regions of the United States. In addition, two auxiliary aims were pursued to achieve this goal: (a) the replication of the cluster solution obtained by Schwartz and Zamboanga (2008) and (b) the testing for invariance of the hypothesized model by gender and across university settings. The present results suggest three main conclusions.

First, we were able to replicate and extend the class solution reported by Schwartz and Zamboanga (2008) in a sample of Hispanic college students from 30 colleges and universities around the United States. Second, our findings also indicated that heterogeneity in approaches to acculturation was differentially associated with alcohol-related risk behaviors. Third, our primary hypothesis was partially supported by the finding that positive alcohol expectancies played a mediating role in the association of acculturation orientations with alcohol-related problems. This finding highlights that positive alcohol expectancies as relevant targets for prevention and intervention aimed at reducing alcohol use and related problems on college campuses. Fourth, the posited model appeared to operate equivalently across gender and across university settings.

**Replication and Validation of Acculturation Orientations in a Hispanic College Sample**

In the present study, we replicated and extended the acculturation class solution reported by Schwartz and Zamboanga (2008) in two ways. First, we found a highly similar cluster solution in a different sample; and second, we found that these classes are differentially associated with alcohol expectancies and expectancy valuations, and with alcohol-related risk behaviors. This pattern of findings is consistent with prior evidence that acculturation must be conceptualized as a multidimensional process, and that heterogeneity in acculturation is important for understanding involvement in alcohol-related risk outcomes.

Second, as has been reported in many samples of adolescents and emerging adults within many different receiving contexts (e.g., Chia & Costigan, 2006; Matsunaga, Hecht, Elek, & Ndiaye,
many of the Hispanic emerging adults in the present sample were placed into a class associated with biculturalism. Exposure to the heritage culture in the home, and to American culture through their college peers, media, and other external influences increases the likelihood that young people from immigrant families will endorse both their heritage and receiving cultural streams. However, as has been speculated and documented in other studies (e.g., Benet-Martínez & Haritatos, 2005; Rudmin, 2003), there appear to be multiple types of biculturalism. In the present sample, three variants of biculturalism emerged: a separated version, where Hispanic orientations were elevated; a “low” version, where both Hispanic and American cultural streams were endorsed moderately; and a “high” version, where both Hispanic and American cultural streams were endorsed strongly.

Heterogeneity in Acculturation Orientations and Association With Alcohol-Related Risk Behaviors

Our findings indicate that, relative to assimilation, separated biculturalism was negatively associated with all of the alcohol-related risk behaviors measured in this study. The only exception was frequency of drunk driving, where separated bicultural participants engaged in greater degrees of drunk driving compared with assimilated participants. This finding suggests that separated bicultural Hispanic college students are comparatively unlikely to report driving under the influence of alcohol, but when they do, they are likely to drive drunk more often compared with Hispanic college students who are assimilated. A similar pattern emerged in the association between low biculturalism and riding with a drunk driver: endorsement of riding with drunk drivers was lower in the low bicultural class, but for those low-bicultural participants who did report riding with a drunk driver, they tended to do so more often compared with assimilated participants. Among the other two acculturation classes, low biculturalism was negatively related to endorsement of binge drinking and alcohol-related sexual activity, whereas high biculturalism was negatively related only to hazardous drinking.

Taken together, these findings suggest that “biculturalism” is not a single entity that protects against all alcohol-related risk behaviors. Rather, different types of biculturalism were linked with different risky behaviors. The fact that each type of bicultural orientation was inversely related to the endorsement of at least one alcohol-related risk behavior is consistent with research suggesting that, for Hispanics, retention of one’s heritage culture is negatively related to health-risk outcomes (e.g., Szaflarski, Cubbins, & Ying, 2010). However, the positive associations with frequency of drunk driving (for separated biculturalism) and with frequency of riding with a drunk driver (for low biculturalism) suggest that retention of Hispanic cultural practices may, in some cases, no longer be protective against the severity of the behavior once it has been initiated. However, the high bicultural class, which is characterized by high endorsement of both Hispanic and American cultural practices, appeared to be protective against alcohol-related negative consequences (i.e., hazardous drinking).

Mediation of Positive Alcohol Expectancies in the Association between Acculturation Orientations and Alcohol-Related Risk Outcomes

The present results lend support to the proposition that alcohol expectancies may mediate the relationship between acculturation orientations and alcohol-related risk behavior outcomes. Specifically, positive, but not negative, alcohol expectancies mediated the relationship between acculturation orientations and alcohol-related problems. Positive expectancies partially mediated the relationships of both the low and high variants of biculturalism with hazardous drinking, binge drinking, drunk driving, and riding with a drunk driver, and they partially mediated the associations of the separated variant of biculturalism with hazardous drinking, binge drinking, and riding with a drunk driver. Positive expectancies also partially mediated the inverse association between separation and hazardous drinking, binge drinking, drunk driving, and riding with a drunk driver. It appears that heritage-culture retention, which is absent in the assimilated class, may help to protect against positive alcohol-related beliefs. Curiously, however, the acculturation
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classes were not associated with negative alcohol expectancies, suggesting that “aversive” effects of alcohol may be perceived similarly regardless of one’s degree of heritage culture retention.

As has been documented in previous research (Jones et al., 2001; Labrie et al., 2011), in the current study we found that alcohol expectancies served as strong correlates of several alcohol-related risk behaviors among Hispanic college students. Moreover, we found that these associations generalized across male and female college students and across types of college settings, suggesting that the link between expectancies and behavior is not moderated by gender or whether the university is located in a college town or a suburban/urban area. Further, negative alcohol expectancies also appeared to serve as risk factors for a number of alcohol-related risk behaviors, suggesting that beliefs that alcohol is harmful or induces undesirable mood states is nonetheless associated with drunk driving, riding with impaired drivers, and sex under the influence of alcohol. The fact that specific alcohol-related beliefs are labeled by researchers as “negative” does not necessarily indicate that students will perceive these outcomes as sufficiently aversive to prevent them from drinking alcohol and engaging in risky behaviors linked with alcohol consumption. Surprisingly, however, expectancy valuations were not significantly related to the risky behaviors we studied. Labeling a specific alcohol-related outcome as “good” or “bad” may not influence the likelihood that, or extent to which, an individual will drink heavily, drive while drunk, ride with an impaired driver, or engage in sexual activity under the influence of alcohol. For Hispanic college students, alcohol expectancies therefore appear to be closely related to drinking behaviors, whereas alcohol expectancy valuations do not (Zamboanga, 2005).

Clinical Implications of the Current Findings

As found in previous studies, the current findings suggest that alcohol expectancies represent a common pathway (e.g., Darkes, Greenbaum, & Goldman, 2004) through which more distal variables, including acculturation orientations, may influence alcohol use and related risk behaviors. In light of the prevalence of alcohol problems and associated risks among Hispanic college students, and among emerging adults in general (Corbin, Iwamoto, & Fromme, 2011), intervening to modify positive alcohol expectancies among Hispanic college students (particularly those with an assimilated acculturation orientation who may be more responsive to positive alcohol expectancy challenges) is essential as a way of preventing or decreasing participation in alcohol-related risk behaviors.

Such interventions may be promising given that expectancies can be challenged and modified (e.g., Jones et al., 2001; Weirs & Rummeling, 2004). The current results affirm the role of alcohol expectancies as key processes that can be targeted effectively as a strategy for reducing alcohol-related problems among Hispanics on college campuses. Encouraging heritage culture retention (Kulis, Nieri, Yabiku, Stromwall, & Marsiglia, 2007) may also represent an important (but perhaps more distal) way to prevent alcohol-related risk behaviors among Hispanic college students. The increased freedom and exploration that characterize emerging adulthood may be utilized more prudently among those who retain Hispanic culture, which emphasizes behaviors and practices that facilitate family relations and interdependence.

Moreover, college counseling programs may systematically include, as part of their alcohol-related risk prevention efforts, sessions that discuss heritage cultural practices with Hispanic students. In particular, given the power of language as a transmitter of cultural knowledge, Hispanic students who have stopped speaking Spanish (or who may have never learned it) may be encouraged to reacquaint themselves with the language and to use it to reconnect with their cultural heritage, as well as with family members who may be more comfortable in Spanish than in English. Such heritage cultural retention may decrease positive alcohol expectancies, which in turn may lower the likelihood of hazardous drinking, drunk driving, riding with a drunk driver, and sex under the influence of alcohol.

Second, the finding that the pattern of results generalized across gender and college setting suggests that similar cultural and social cognitive mechanisms are likely associated with alcohol-related risk taking in male and female Hispanic college students, and regardless of whether they go away to college or stay home and commute to school. The present findings are therefore
relevant for college educational and intervention programs that address alcohol use, in Hispanic students, across university settings and for students of both genders.

Third, the application of a model that integrates person-centered Latent Class Analysis (LCA) and variable-centered Structural Equation Modeling (SEM) analytic techniques to data analysis (e.g., Muthén & Muthén, 2007) allowed us to take into account unobserved heterogeneity in acculturation patterns and allowed us to model this heterogeneity as a predictor of alcohol-related risks through alcohol expectancies and expectancy valuations. Moreover, risk behaviors were modeled in their natural metrics (e.g., normal, zero-inflated Poisson) rather than attempting to transform or rescale them to meet the assumptions of more commonly used analyses. This analytic approach allowed us to most validly examine the structural relations between cultural and social cognitive risk/protective factors that may influence alcohol use and related risk outcomes.

Last, the findings reported here both build upon and expand the current literature on acculturation, alcohol expectancies, and health-risk behaviors among Hispanics college students. First, as previously noted, especially in relation to health outcomes, acculturation has often been studied as a unidimensional process whereby receiving culture acquisition and heritage culture retention are cast as opposing ends of a continuum (Abraido-Lanza, Armbrister, Florez, & Aguirre, 2006; Hunt, Schneider, & Comer, 2004). The present results suggest that bidimensional models of acculturation may hold greater explanatory power because they examine orientations toward one’s heritage separately from orientations toward the receiving culture (e.g., Szapocznik et al., 1980). The identification of distinct acculturation orientations in the present study allows for exploration of the interplay between Hispanic and American cultural practices—most of which would be indistinguishable from one another within unidimensional models of acculturation—and may be differentially linked with alcohol-related risks.

Study Limitations

The present results should be interpreted in light of these important limitations. Perhaps the most important limitation is the use of a cross-sectional design. Although this design permitted us to map the associations among the study constructs, it does not permit inferences regarding causal or directional effects. Longitudinal measurement of heterogeneity in acculturation would yield information about individual differences, as well as the mechanisms underlying the relations among acculturation orientations, alcohol expectancies, and alcohol-related risk behaviors (Matsumaga et al., 2010). In addition, alcohol use and alcohol-related risk behaviors should be examined over the college years as a function of acculturation.

Second, the acculturation orientations were empirically derived using cultural practices. Because acculturation is a multidimensional process that includes identifications and values as well as practices (Schwartz et al., 2010), it is possible that a different set of orientations may have emerged if all three components were considered. Third, the present findings were based on participants’ self-reports. Therefore, the results may be confounded by the effects of social desirability—individuals may overreport or underreport risk behavior participation for any number of reasons. The use of collateral reports, daily diary studies, or other methods that do not rely on recall of past risk taking behavior may be important for future research.

Additionally, all variables were measured using reports from a single informant (i.e., the student her/himself), and this shared method variability may artificially increase the correlations among constructs (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Future studies should also examine involvement in illicit drug use, given findings suggesting that the construct expectancy (i.e., an individual belief about the anticipated outcomes associated with future experiences) and expectancy valuations apply to substances other than alcohol (e.g., Lundahl & Lukas, 2007) have been shown to play a role in treatment outcomes (Witkiewitz & Marlatt, 2004).

Conclusions

Despite these limitations, the present findings have demonstrated the utility of a cultural and social cognitive perspective for examining links among acculturation orientations, alcohol ex-
Alcohol Expectancies, Acculturation, and Alcohol-Related Risk Behaviors

pectancies and expectancy valuations, and alcohol-related risk behaviors in a national sample of Hispanic college students. Our results have replicated and validated acculturation orientation categories and have documented both direct and indirect relationships of acculturation orientations to alcohol-related risk behaviors. Specifically, the indirect associations of acculturation with alcohol-related risk behaviors through positive alcohol expectancies have brought together two disparate literatures in the service of creating a larger understanding of the mechanisms through which Hispanic college students may come to engage in risky behaviors associated with alcohol use. Our model not only sheds light on the cultural underpinnings of Hispanic health disparities in alcohol-related consequences, but it also provides avenues for intervention. We hope that the model will find use in college counseling centers and other clinical settings that provide services to Hispanic students.

References


