The Relation between Stress and Alcohol Use among Hispanic Adolescents

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Abstract

We explored the relation between eight domains of Hispanic stress and alcohol use and frequency of use in a sample of Hispanic adolescents between 11 and 19 years old (*N* = 901). Independent *t*-tests were used to compare means of domains of Hispanic stress between adolescents who reported alcohol use and those who reported no use. In addition, multinomial logistic regression was used to examine whether domains of Hispanic stress were related to alcohol use and whether the relation differed by gender and age. Multiple imputation was used to address missing data. In the analytic sample, 75.8% (*n* = 683) reported no use and 24.2% (*n* = 218) reported alcohol use during the previous 30 days. Higher mean Hispanic stress scores were observed among youths who reported alcohol use during the previous 30 days in five domains: acculturation gap, community and gang violence, family economic, discrimination, and family and drug-related stress. Increased community and gang violence, family and drug, and acculturative gap stress were found to be associated with some alcohol use categories beyond the effect of other domains. Few differences in the association between Hispanic stress and alcohol use by gender and age were observed. Study findings indicate that family and drug-related, community and gang violence, and acculturative gap stress domains are salient factors related to alcohol use among Hispanic adolescents, and their implications for prevention science are discussed.

Keywords

cultural stress; Hispanic; adolescents; alcohol use

More than one quarter of Hispanic adolescents in the United States report using alcohol during the previous 30 days (Pemberton, Colliver, Robbins, & Gfroerer, 2008; Substance Abuse and Mental Health Services Administration [SAMHSA], 2010). Compared to their

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non-Hispanic White counterparts, Hispanic adolescents report higher rates of binge and heavy drinking (Kanny, Liu, Brewer, & Lu, 2013; King & Vidourek, 2010). The health consequences of alcohol consumption, especially during adolescence, are numerous. Adolescents who engage in drinking have a higher prevalence of involvement in criminal activity, abuse of other substances, and depression (Hill et al., 2010) and report poorer academic outcomes and more frequent risky sexual behavior (Miller, Naimi, Brewer, & Everett Jones, 2007). Adolescent alcohol use has been linked to poor cognitive functioning, lower mood states (Townshend & Duka, 2005), and poor decision-making, particularly among individuals who begin drinking at an early age (Goudriaan, Grekin, & Sher, 2007). Understanding the underlying cultural mechanisms that may contribute to alcohol use or promote abstinence patterns in this population is a public health priority (Little, 2000; Longabaugh, 2007).

Stress and Substance Use among Hispanic Adolescents

Researchers commonly suggest that a stress-illness model (Lazarus & Folkman, 1978) explains behavioral health disparities among minority groups (Edwards & Romero, 2008; Williams & Mohammed, 2009). Among Hispanics, stressors include those associated with cultural adaptation (e.g., acculturation) and minority status (e.g., discrimination, immigration; Córdova & Cervantes, 2010). More than two decades of research with Hispanic adults has found a relatively consistent association between these unique Hispanic stressors and alcohol use (Amaro, Whitaker, Coffman, & Heeren, 1990; Caetano & Clark, 2003; Okamoto, Ritt-Olson, Soto, Baezconde-Garbanati, & Unger, 2009; Vega, Sribney, & Achara-Abrahams, 2003).

Few studies have examined these stressors and alcohol use among Hispanic adolescents (Delva et al., 2005) and have reported inconsistent findings. Some researchers found no association between acculturation and alcohol use (Elder et al., 2000), whereas others have reported positive (Brindis, Wolfe, McCarter, Ball, & Starbuck-Morales, 1995; Caetano, Ramisetty-Mikler, Caetano Vaeth, & Harris, 2007; Polednak, 1997) or negative (Nielsen & Ford, 2001) associations. This may be due to the complex nature of stress among Hispanic youths. For example, Gil, Wagner, and Vega (2000) found that acculturative stress is related to alcohol use among adolescent Hispanic boys, but is affected by additional factors such as the deterioration of Hispanic family values, attitudes, and behaviors. Research including measures of family stress (Driscoll, Biggs, Brindis, & Yankah, 2001), parental warmth, and language spoken at home (Mogro-Wilson, 2008) has shown these factors also to be relevant to understanding alcohol use among Hispanic adolescents (Prado & Pantin, 2011). Furthermore, although many Hispanic families emigrate from rural areas (Suárez-Orozco & Suárez-Orozco, 2001), they tend to reside in more geographically concentrated and urban areas once arriving in the United States (U.S. Census Bureau, 2007). Higher-density households and living arrangements found in Hispanic-dominant urban neighborhoods with fewer socioeconomic advantages also influence family and individual stress levels (Cervantes, Córdova, Fisher, & Kilp, 2008), which may influence alcohol use patterns. It is clear that stress experiences associated with alcohol use among Hispanic adolescents are multifaceted and not well understood.

Recently, Cervantes and colleagues (Cervantes, Fisher, Córdova, & Napper, 2012; Cervantes, Goldbach, & Padilla, 2012) developed a measure to identify and assess the impact of different stress experiences among Hispanic youths. The Hispanic Stress Inventory-Adolescent Version (HSI-A) was constructed in a two-part process: (a) focus groups to identify stressful experiences and (b) a national validation study using exploratory factor analysis with 992 Hispanic adolescents in four metropolitan U.S. cities. The item analysis revealed eight unique domains of Hispanic stress: acculturation gap, culture and educational, immigration, community and gang violence, family and drug-related, family-related immigration stress, discrimination, and family economic stress. Some domains were closely associated with processes related directly to being a Hispanic in the United States (e.g., immigration stress, acculturation), whereas others reflected stressful experiences common to the neighborhoods in which Hispanics live related to socioeconomic disadvantage (Evans & Kim, 2007). For example, although the domain of community and gang violence stress includes items such as being stereotyped as being in a gang, it also includes living in a dangerous neighborhood and seeing drive-by shootings. In the family and drug-related stress domain, items include having too little contact with parents and having family members who sell drugs.

Researchers have examined the HSI-A in relation to depression (Cervantes, Berger Cardoso, & Goldbach, 2015), suicidal ideation (Cervantes, Goldbach, Varela, & Santisteban, 2014), and risky substance use behaviors (Berger Cardoso, Goldbach, Cervantes, & Swank, 2014; Cervantes, Goldbach, & Santos, 2011). To date, however, no studies have used a comprehensive measure of Hispanic stress to explore alcohol use in a sample of Hispanic adolescents. The present study filled a gap in the literature by examining: (a) how the eight domains of stress, as measured by the HSI-A, differ among adolescents who used alcohol versus those who did not use alcohol during the previous 30 days; and (b) the relation between each domain of Hispanic stress and the relative risk of alcohol use during the previous 30 days after controlling for covariates and the other stress domains. Additionally, exploratory analysis examined whether age and gender moderate the relation between stress domains and alcohol use. We hypothesized that higher scores in Hispanic stress domains will be associated with alcohol use and that community and family stressors will be associated with a higher degree of use during the previous 30 days. Additionally, national trends (e.g., Centers for Disease Control and Prevention, 2014; Chassin, Pitts, & Prost, 2002) suggest older youths and boys report more binge drinking. However, to our knowledge no studies have examined whether certain stressors affect alcohol use differently by gender or as youths advance through adolescence. As such, we explored whether age and gender moderated the effects of stress domains on alcohol use among Hispanic adolescents.

Methods

Sample

Data for the current study were drawn from a sample of 1,119 Hispanic adolescents between 11 and 19 years old from four urban U.S. cities: Los Angeles, Miami, El Paso, and Lawrence (a suburb of Boston). Adolescents were initially recruited from middle and high school settings to participate in a study designed to validate the HSI-A. Classroom rosters

were separated by grade level and SPSS software was used to randomly select classrooms in each school to participate in the study. Only schools that reported that at least 50% of their student body was Hispanic were eligible to participate in the original study. Although socioeconomic status was not collected directly from participants, at all school sites more than 50% of youths qualified for free or reduced-price lunches.

Of the 1,119 participants, 901 provided complete information on alcohol use, HSI-A variables, and other covariates including gender, age, parental nativity, and dominant language. Participants in the sample came from diverse Hispanic backgrounds: 47.0% (n = 406) Mexican, 13.3% (n = 117) Cuban, 13% (n = 115) Dominican, 9.5% (n = 84) mixed, 7.7% (n = 68) Puerto Rican, 5.1% (n = 45) Central American, 4.0% (n = 35) South American, and 1.5% (n = 18) other. Approximately 2% (n = 18) had missing data on origin. Nearly half of the sample was from Los Angeles (n = 443, 44.7%), followed by Lawrence (n = 253, 25.5%), Miami (n = 207, 20.8%), and El Paso (n = 89. 9.0%).

To address the first research question by comparing the mean difference of HSI-A domains between alcohol users and nonusers, we performed the analysis based on the 901 participants with complete information. Regarding the second and third research questions, analyses were conducted with the sample with complete data (n = 901) and using multiple (20) imputed datasets with the full sample (N = 1,119). We describe a series of sensitivity analyses in the data analysis section designed to address potential biases related to missing data.

Measures

Survey instruments were administered to youths in their preferred language (English or Spanish) using paper-and-pencil booklets. The primary independent variable of interest was the HSI-A; the dependent variable was alcohol use, and if present, the extent of alcohol use disclosed by each adolescent.

Hispanic stress—The construct of Hispanic stress was measured using the HSI-A, a 71-item measure that assesses exposure to and appraisal of life stressors related to minority status. The HSI-A is a validated measure of stress among Hispanic adolescents and has strong overall internal consistency reliability for appraisal ratings (α = .92; see Cervantes, Fisher, et al., 2012 for more information about scale psychometrics). Previous factor analytic research has identified eight unique domains (subscales) of Hispanic stress: family economic (12 items), culture and educational (14 items), acculturation gap (12 items), immigration (7 items), discrimination (6 items), family immigration (7 items), community and gang violence-related (8 items), and family and drug-related (5 items) stress (see Cervantes, Fisher, et al., 2012).

Some of the stress domains capture concepts exclusively related to being Hispanic. For example, acculturative gap ("Parents want me to maintain customs and traditions," "Expected to be like parent to siblings"), culture and educational ("Teachers think I am cheating when I am speaking in Spanish," "School ignored cultural history"), discrimination ("Students said racist things," "Pointed at and called me names"), immigration ("Left close friends in home country," "Separated from some family members"), and family immigration

("Family afraid of getting caught by immigration officials," "Family had problems with immigration papers") relate specifically to Hispanic youths. The remaining domains, family economic ("Parents could not get a good job," "Not enough money for everyone in the family"), community and gang violence ("I have a lot of pressure to be involved in gangs," "Saw weapons at school"), and family and drug stress ("Family members had a drug problem," "Hard to speak with family"), capture social stressors that are often experienced by Hispanics and other minority groups in the United States. Participants were asked whether they had experienced a specific stressor, and if so, to appraise the degree to which the stressor affected them. Responses were based on a 5-point Likert scale: 1 = *not at all worried or tense, 2 = a little worried or tense*, 3 = *moderately worried or tense*, 4 = *very worried or tense, 5 = extremely worried or tense*. Higher scores on the stress subscales indicate more stressful experiences.[1] Mean values for the eight domains of Hispanic stress were centered for multivariate analysis.

Alcohol use and frequency of alcohol use—Two single-item questions from the Government Performance and Results Act's participant outcome measures (SAMHSA, 2003) were used to assess alcohol use and frequency of alcohol use. The act features a set of required federal reporting guidelines used to collect performance outcome data on all substance abuse prevention and treatment programs funded through SAMHSA. Relying on these measurement standards, alcohol use was assessed by adolescent self-report to a single question: "In the past 30 days, did you use alcohol?" A dichotomous indicator of alcohol use was created (0 = *no use*, 1 = *use*). Similarly, frequency of alcohol use was assessed using a follow-up question: "In the past 30 days, how many times did you use alcohol?" To capture differences in alcohol risk behavior, a three-level ordinal variable was constructed to indicate no alcohol use (*0 times*), low use (*1–3 times*) and heavy use (*4 or more times*) during the previous 30 days (Cervantes et al., 2015). The cutoff points were chosen based on an assumption that youths who drink fewer than 4 times per month (i.e., 1 to 3 times) are likely drinking on average less than once per week. We suspect that adolescents reporting drinking 4 or more times per month are more likely drinking with consistency (that is, about once per week). We considered including alcohol frequency as a continuous variable, yet the frequency of alcohol use was skewed to the lower response categories. In line with previous work by Berger Cardoso, Goldbach, and Cervantes (2015), we used the aforementioned cutoffs. Although these cutoffs provide some insight into drinking patterns, a validated measure of binge or heavy drinking would have likely provided a more accurate assessment of use in the sample.

Covariates—We controlled for four demographic variables related to alcohol use and frequency among adolescents (Wade, Lariscy, & Hummer, 2013; Warner et al., 2006; Weiss & Tillman, 2009). Adolescent age was included as a continuous variable and centered for the analysis testing the moderation effects of age on alcohol use. Gender was a dichotomous variable (male or female) and was included as both a control and interaction variable. Other

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[1]The Hispanic stress items were asked in a two-part question. First, participants were asked if they experienced a specific stressor. If participants answered affirmatively, they were asked to appraise the stress experience on a scale of 1–5. The measure was constructed by combining negative responses with scores of 1 (not at all worried or tense) to maintain sample size. This was the coding process by which the measure was tested and validated.

categorical variables included parental nativity (0 = *both parents born in the United States*, 1 = *one or both parents born outside the United States*) and dominant language (1 = *English*, 2 = *Spanish*, 3 = *other*). Two dummy variables for dominant language were created (the reference was other) and controlled for in the analyses to minimize confounding factors when examining the relation between Hispanic stress and alcohol use and frequency of alcohol use in this population.

Data Analysis

We examined descriptive differences in age, gender, parental nativity, dominant language, and Hispanic stress domains between adolescents who reported alcohol use and those who did not report use during the previous 30 days. In addition, effect sizes (Cohen's *d*) for the standardized mean differences in the eight stress domains were calculated. To provide estimates of bivariate associations, we calculated Pearson correlations between the eight stress domains and alcohol use frequency. Further, we conducted multiple multinomial logistic regression models to examine the effect of each stress domain on alcohol use frequency with contrast between 1–3 times and no use, 4 or more times and no use, and 4 or more times and 1–3 times, while adjusting for the other domains. The models were also adjusted for gender, age, parental nativity, and dominant language. We employed likelihood ratio tests to compare the nested multinomial logistic regression models that included a block of interaction variables versus models without interaction variables. We tested the moderation effect of gender (male vs. female) and age (centered on mean) on the relation between stress domains and alcohol use frequencies. Statistically significant interactions terms indicated a possible moderation effect, though the decision to test these indicators was made a posteriori.

To address potential biases related to missing data, we conducted sensitivity analyses using multiple imputation. Multivariate imputation using fully conditional specification methods was employed to generate 20 datasets with complete information for all HSI-A measures and covariates. Model estimates from these 20 imputed datasets were combined to obtain a final set of parameter estimates. Fully conditional specification methods are commonly used to impute missing values for both continuous and categorical variables in a dataset with an arbitrary missing pattern (Graham, Olchowski, & Gilreath, 2007; Rubin, 1987; Schafer, 1997; Schafer & Olsen, 1998), which was the case in this study (appendix of arbitrary missing pattern available on request). Because results based on imputed and nonimputed data did not differ substantially, we present only results based on imputed data. All analyses were conducted using SAS version 9.3.

Results

Descriptive Statistics and Bivariate Associations

During the previous 30 days, 75.8% (*n* = 683) of the sample reported no use and 24.2% (*n* = 218) reported alcohol use. Among adolescents who reported using alcohol, 64.2% (*n* = 111) reported using alcohol 1 to 3 times and 35.8% (*n* = 63) reported using alcohol 4 or more times. The proportion of adolescents who reported alcohol use were similar for male (22.0%) and female participants (25.9%), $\chi^2(1) = 1.80$, $p = .18$. Alcohol varied significantly

by age, $t(899) = -6.34$, $p < .001$; adolescents who reported using alcohol during the previous 30 days had a mean age of 15.54, compared to a mean age of 14.66 for youths who had not used alcohol during that period. Differences in alcohol use were found based on adolescents' primary language, $\chi^2(2) = 7.43$, $p = .02$. Alcohol use was estimated to be the highest among adolescents whose primary language was English (28.8%), compared to those whose primary language was Spanish (18.5%) or other (3.3%). The bivariate association between alcohol use and parental nativity was not statistically significant ($p = .257$).

Six of the eight domains of stress were associated with increased alcohol use frequency during the previous 30 days ($r = .07$ to $.18$, $p < .05$). The immigration stress and family immigration stress subscales were not associated with alcohol use frequency. As expected, the eight domains of stress were correlated with one another ($r = .11$ to $.48$, $p < .05$), with the exception of community and gang violence and immigration stress ($r = .06$, $p > .05$). Tables are available on request.

Results of several independent t-tests showing differences in the eight domains of Hispanic stress by alcohol use are also presented in Table 1. Significant differences in stress were observed for five of the eight domains. Significant mean differences between adolescents who used alcohol and those who did not were observed for acculturation gap (1.52 vs. 1.29, respectively), community and gang violence (1.32 vs. 1.17), family economic (1.32 vs. 1.21), discrimination (1.20 vs. 1.12), and family and drug-related (1.46 vs. 1.20) stress subscales. Higher mean scores were observed among youths who reported alcohol use during the previous 30 days compared to participants who reported no use. We examined the effect sizes of these differences, using Cohen's d calculations, and found the greatest effect sizes in the family and drug-related (.53), acculturative gap (.44), and community and gang violence (.39) subscales. Much smaller effect sizes were observed in the family economic (.24) and discrimination (.18) subscales.

Multinomial Logistic Regression

Multinomial logistic regressions were conducted to examine the relation between domains of Hispanic stress and alcohol use, adjusting for the effects of age, gender, dominant language, and parental nativity. Finding presented in Table 2 show that when adjusting for one another, only a few of the eight domains of Hispanic stress were associated with increased risk of alcohol use during the previous 30 days. Compared to those with lower community and gang violence stress, youths with higher stress in this domain had significantly greater relative risk (RR) of drinking 1 to 3 times (RR = 1.85, 95% CI = 1.08, 3.17) or 4 or more times (RR = 3.15, 95% CI = 1.69, 5.90) than not drinking at all during the previous 30 days. Additionally, adolescents with higher family and drug-related stress had a greater risk of drinking 1 to 3 times (RR = 2.06, 95% CI = 1.37, 3.09) compared to not drinking at all. However, increased family and drug-related stress was associated with lower risk of drinking 4 or more times (RR = 0.50, 95% CI = 0.27, 0.90) than drinking 1 to 3 times. Higher acculturative gap stress was associated with greater risk of drinking 4 or more times (RR = 2.39, 95% CI = 1.40, 4.09) than those who reported not drinking. No other stress domains were significantly associated with increased risk of alcohol use during the previous 30 days. These findings suggest that after adjusting for other stress domains,

acculturation gap, community and gang violence, and family and drug-related stressors were important factors associated with alcohol use beyond the other domains of Hispanic stress included in the model. Finally, results indicated neither gender nor age moderated the relation between Hispanic stress and alcohol use frequencies ($p > .05$).

Discussion

Our study is one of the first to use a standardized multi-domain measure of Hispanic stress to understand alcohol use among Hispanic adolescents in the United States. The HSI-A measures eight domains of stress developed specifically for Hispanic adolescents to provide a better understanding of how these experiences may be related to alcohol use. Most adolescents in the sample who reported drinking in the last 30 days reported lower use; 64.2% ($n = 111$) reported using alcohol 1 to 3 times and 35.8% ($n = 63$) reported using alcohol 4 or more times during the previous 30 days. Youths in our study reported lower use of alcohol than in national samples. Whereas 24.2% ($n = 218$) of our sample reported alcohol use during the previous 30 days, 34.9% of high school youths nationally and 37.5% of Hispanic high school youths nationally report alcohol consumption during the prior month (Kann et al., 2014). However, it should be noted, the highest proportion of alcohol use is in older youth in 11th (39.2%) and 12th (46.8%) grade. Lower alcohol use was reported in 10th (30.9%) and 9th graders (24.4%). The lower rates of use in our sample may be due to the inclusion of younger adolescents in our sample (i.e., 12- and 13-year-olds), as the mean age in our sample was 14.87(CDC, 2014). The alcohol use in our sample is closer to national proportions of use in younger youth.

Our analysis found evidence of a significant relation between Hispanic stress and adolescent alcohol use. Compared to those who did not drink, adolescents who reported using alcohol had significantly higher scores on family economic, culture and educational, acculturative gap, discrimination, community and gang violence, and family and drug-related stress subscales. Moderate effect sizes were observed between alcohol use and family and drug-related, acculturative gap, and community and gang violence stress, with small effect sizes found between alcohol use and family economic and discrimination stress. Our multivariate analyses also found community and gang violence, acculturative gap, and family and drug-related stress to be associated with alcohol use patterns beyond the influence of other cultural stressors; thus, we focused our discussion on these three significant correlates of alcohol use.

Community and Gang Violence Stress

In our study, community and gang violence stress was associated with both moderate and high levels of drinking. General population studies have explored neighborhood effects on adolescent drinking (Chuang, Ennett, Bauman, & Foshee, 2005). For example, living in environments with lower socioeconomic status is associated with increased peer drinking and adolescent alcohol use. The lower socioeconomic circumstances found in many predominately Hispanic neighborhoods have been associated with greater exposure to gangs, drug abuse, and discrimination (Cervantes et al., 2008). This neighborhood disadvantage has been associated with a lack of social and economic resources and opportunity (Sampson,

Raudenbush, & Earls, 1997). Further, exposure to neighborhood crime and perceptions of crime and violence are associated with alcohol and substance use (Boardman, Greenberg, Vining, & Weimer, 2001; Duncan, Duncan, Strycker, & Chaumeton, 2002).

Given the association between community gang stress and alcohol use in our sample, the effect of the neighborhood context on Hispanic youth alcohol use should be examined further in future research. For example, our findings align with previous research indicating a strong correlation among economic circumstances, crime, alcohol and substance use, and negative health outcomes (Galea & Vlahov, 2002; Glaeser, Sacerdote, & Scheinkman, 1996), and minority groups are disproportionately affected in large part due to long histories of oppression and segregation that put them at higher risk of poverty (Galea & Vlahov, 2002). Structural approaches addressing these social conditions may help in alleviating the stress response (Dickerson & Kemeny, 2004) and reducing alcohol use among Hispanic adolescents.

Acculturative Gap

Higher acculturative stress was associated with a greater risk of drinking 4 or more times compared to those that reported no alcohol use during the previous 30 days. A commonly explored risk factor for alcohol use among Hispanics is acculturative stress. The experience of immigration is stressful (Thomas, 1995) and studies have reported an association between alcohol use and acculturation processes among adults (Johnson, 1996). However, findings have been inconsistent regarding the relation between acculturative stress and alcohol use during adolescence, with studies finding both positive and negative associations (Cabassa, 2003; Rogler, Cortes, & Malgady, 1991; Vega, Alderete, Kolody, & Aguilar-Gaxiola, 1998). Some studies have indicated that lower acculturation is associated with alcohol use among Hispanic boys but not girls (Epstein, Griffin, & Botvin, 2000).

The inconsistent findings of these previous studies may be due to the complex nature of acculturation for adolescents and the challenge of measuring acculturative stress—a complex and multidimensional process. For example, acculturation during adolescence is more interactive with the family; the stress of acculturating at a different pace than parents may cause parent– adolescent conflict (Patterson, Reid, & Dishion, 1992; Szapocznik & Williams, 2000). When parents and adolescents acculturate at a difference pace (i.e., acculturative gap or differential acculturation), this can increase family conflict and decrease family cohesion (Hwang & Wood, 2009; Szapocznik & Williams, 2000). Differential acculturation has been associated with increased mental health problems (Vega, Khoury, Zimmerman, Gil, & Warheit, 1995) and alcohol use among Hispanic adolescents (e.g., Martinez & Eddy, 2005; Santisteban, Muir-Malcolm, Mitrani, & Szapocznik, 2002), and our study further supports its status as a salient mechanism related to alcohol use in this population.

Family and drug-Related Stress

Similar to the salient finding of acculturative gap stress, the current study found that another family-related construct (family and drug-related stress) was associated with a greater risk of drinking 1 to 3 times compared to not drinking at all. However, increased family and drug-

related stress was associated with a lower risk of drinking 4 or more times than drinking 1 to 3 times. Finding an association between these constructs was not unexpected; the population literature has suggested that youths are more likely to use alcohol when their families have norms that promote drinking (Song, Smiler, Wagoner, & Wolfson, 2012). However, given the importance of *familismo*, which stresses the centrality of family and adherence to familial values and norms (Galanti, 2003), the use of substances by parents may be especially relevant to Hispanic adolescent substance use.

Although we hypothesized (and found) an effect of family and drug-related stress on alcohol use, findings by level of alcohol use were unexpected. Contrary to our initial hypothesis, family and drug-related stress was lower among adolescents who reported drinking 4 or more times during the previous 30 days as compared to those who reported drinking 1 to 3 times. It is possible that this finding is an anomaly and may be better understood if we had a measure of consumption (e.g., binge drinking), rather than only being able to report on incidence. There is some research showing that Hispanic's are less likely to drink. However when they do drink, binge use is more common (SAMHSA, 2010; Borges, et al., 2006). We were unable to explore this in the present dataset but acknowledge that future research could shed light on this contradictory finding. Nevertheless, our study indicates that youths reporting family and drug-related stress are engaging in low to moderate alcohol use and any alcohol use in adolescence is associated with heavier use later in life (Stueve & O'Donnell, 2005). This underscores again the importance of family in the context of Hispanic adolescent drinking.

Gender and Age Effects

The most recent Youth Risk Behavior Survey (Kann et al., 2014) found no differences by males and females in alcohol consumption during the previous 30 days nationally (35.5% vs. 34.4%, respectively). Some previous research, however, has suggested that the relation between stress and alcohol use may be different for boys and girls (Epstein, Botvin, & Diaz, 2000; Oshri et al., 2014). For Hispanic adolescents, less is known about the relation among stress, gender, and alcohol use. We explored whether different Hispanic stressors might be more or less salient to boys and girls in the context of alcohol use. In our sample, no gender differences were found between HSI-A stressors and alcohol use. This suggests that these stressors have a similar effect on drinking patterns among youths regardless of gender.

Likewise, age is often a significant predictor of alcohol use during adolescence, with older youths reporting drinking more frequently (Johnston, O'Malley, Miech, Bachman, & Schulenberg, 2014). Given the documented association between age and alcohol use in the literature, we explored whether the relation of stress to alcohol use in Hispanic adolescents was moderated by age. Consistent with previous research, age was related to alcohol use, with a significantly higher mean age in the group that reported alcohol use during the previous 30 days. However, our analyses found that age did not moderate the relation between stress and alcohol use; in other words, the association between stress domains and alcohol use was not different for younger versus older youths. Thus, we found that despite developmental changes as youths grow older, the stressors associated with alcohol use do not seem to become more or less relevant to alcohol use based on age.

Limitations and Conclusions

Despite its strengths, the current study is not without limitations. Issues associated with sampling, measurement, and research design should be noted and considered in both the interpretation of our findings and the development of future research. Although the sample was large, schools were not randomly selected. It is possible that youths who engage in high-risk alcohol use are less likely to attend school and were therefore underrepresented in this sample. Additionally, only about one third of students nationally are eligible for free or reduced-price lunches (National Center for Education Statistics, 2005), whereas more than 50% of students at all study sites in the current sample were eligible (suggesting lower socioeconomic status). Thus, we may not be fully representing the experience of Hispanic adolescents nationally. Additionally, alcohol use is typically assessed by national agencies such as SAMHSA in the same fashion as this study, but additional measures of binge drinking may have revealed differences in both frequency and intensity of drinking. Although drinking more than 4 times during a month was suggestive of using alcohol at least once a week, which is problematic given that the sample is underage (Chou & Pickering, 1992), we could not determine if some youths in our sample drank once per week during the course of a month or four times in a row during a single weekend. Understanding differences among usual, episodic, and binge-drinking patterns may elucidate differences by stress domain. As with all cross-sectional data, determinations of causality were not possible. Although theory and previous research have suggested that Hispanic stressors cause adolescent substance use, at least in part, they may also have the opposite effect; adolescents experiencing distress related to their drinking patterns may be more likely to report these types of stressors. Thus, longitudinal designs are needed to investigate the direction of these effects.

Despite these limitations, our study lends support to the need for research on both the community context and families. Further, in our study, domains related to the family (acculturative gap and family and drug-related stress) and community and gang violence had the strongest effect sizes compared to all other domains. Previous literature has supported the importance of family to Hispanic youth development (Prado & Pantin, 2011) and the relation between family conflict and alcohol use patterns among Hispanic youths specifically; this may indicate the importance of including family variables in studies of substance use. These findings also have some application to intervention research. Several interventions have highlighted the role of family-based prevention of adolescent substance use (e.g., Cervantes & Goldbach, 2012; Schwartz et al., 2013). Although our study found these domains to be the strongest correlates of alcohol use, nearly all (six of eight) of the domains were associated with drinking at the bivariate level. Thus, we would caution that interventions should address a diverse set of Hispanic stressors and further research should explore the most salient predictors of change in alcohol use. Although more research is needed, particularly longitudinal and experimental studies, the relation between these eight domains of Hispanic stress and alcohol use among adolescents provides a basis for identifying mechanisms of change that are unique to this high-need population.

Acknowledgments

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Table 1

Mean HSI-A Stress Domain Scores Stratified by the Total Sample and Alcohol Use during the Previous 30 Days among Hispanic Adolescents

	Total Sample	Alcohol	No Alcohol		
	M (SD)	M (SD)	M (SD)	d	t
HSI-A stress domains[a]					
Family economic	1.24 (0.46)	1.32 (0.54)	1.21 (0.44)	.24	−2.81 (312.4)**
Culture and educational	1.09 (0.26)	1.12 (0.29)	1.08 (0.27)	.16	−1.95 (323.7)
Acculturative gap	1.35 (0.52)	1.52 (0.61)	1.29 (0.47)	.44	−4.97 (302.9)***
Immigration	1.17 (0.48)	1.13 (0.42)	1.19 (0.49)	.13	1.75 (421.3)
Discrimination	1.14 (0.39)	1.20 (0.47)	1.12 (0.36)	.18	−2.01 (299.4)*
Family immigration	1.19 (0.45)	1.23 (0.52)	1.18 (0.42)	.10	−1.29 (899.0)
Community and gang violence	1.20 (0.39)	1.32 (0.51)	1.17 (0.34)	.39	−4.13 (280.1)***
Family and drug	1.26 (0.50)	1.46 (0.63)	1.20 (0.44)	.53	−5.68 (287.4)***

[a]HSI-A = Hispanic Stress Inventory-Adolescent Version. Values range from 1–5.

Table 2

Relative Risks and 95% Confidence Intervals for Alcohol Use Frequency during the Previous 30 Days[a]

	1–3 Times vs. None		4+ Times vs. None		4+ Times vs. 1–3 Times	
	RR	95% CI	RR	95% CI	RR	95% CI
Family economic	0.94	0.57, 1.53	0.74	0.40, 1.37	0.79	0.40, 1.57
Culture and educational	0.56	0.19, 1.69	0.54	0.19, 1.52	0.96	0.25, 3.64
Acculturation gap	1.49	0.93, 2.37	**2.39**	1.40, 4.09	1.61	0.86, 2.99
Immigration	0.87	0.54, 1.40	0.46	0.20, 1.06	0.54	0.21, 1.33
Discrimination	0.96	0.56, 1.64	1.30	0.78, 2.17	1.35	0.70, 2.59
Family immigration	0.74	0.43, 1.28	1.26	0.72, 2.21	1.71	0.84, 3.47
Community and gang violence	**1.85**	1.08, 3.17	**3.15**	1.69, 5.90	1.71	0.83, 3.50
Family and drug	**2.06**	1.37, 3.09	1.02	1.02, 1.77	**0.50**	0.27, 0.90

[a] All models were adjusted for each domain of Hispanic stress, age, gender, dominant language, and parental nativity. Coefficients in bold are significant at $p < .05$.