



Published in final edited form as:

Psychol Addict Behav. 2004 June ; 18(2): 135–142. doi:10.1037/0893-164X.18.2.135.

Binge Drinking Among Latino Youth: Role of Acculturation-Related Variables

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Abstract

This research examined the relationship between acculturation-related variables and binge drinking behavior among nationally representative samples of Mexican American, Cuban American, and Puerto Rican youth. It explored the relationship between length of residence in the United States, type of language spoken in the home (Spanish vs. English) and binge drinking in each of these subgroups. Results suggest that Latino youths with no prior history of alcohol consumption remain largely unaffected by these acculturation-related variables. Youth with a previous history of alcohol consumption experience greater likelihood of binge drinking as a function of the acculturation-related variables, but the relationships are complex.

The alcohol consumption behavior of Latino youth is an important area of inquiry. Latino youth report elevated levels of heavy drinking behavior (Johnson, O'Malley, & Bachman, 2002). Costs associated with underage drinking are over \$52 billion per year (Levy, Miller, & Cox, 1999). The progression of substance use in Latino youth is believed to begin with alcohol, followed by other illicit substances (Warheit, Vega, Khoury, Gil, & Elfenbein, 1996). In addition, Latino youth may be more prone to alcohol use because for many, it is a culturally accepted behavior (Arredondo, Weddige, Justice, & Fitz, 1987; R. M. Gil & Vasquez, 1996; Rebach, 1992).

Research suggests that *acculturation*, or the process by which minorities adjust to a majority culture, is related to a number of health-related difficulties experienced by Latinos (Barnes, 1979). Alcohol consumption is one such outcome that has been found to be associated with acculturation-related concepts (Caetano, 1989; Gilbert & Cervantes, 1986; Johnson, Gruenewald, Treno, & Taff, 1998). Despite the increasing attention that acculturation has received for understanding the health-related behavior of Latinos, there is disagreement about how acculturation influences Latino health outcomes. Studies on acculturation and alcohol use report different relationships between the two variables. For example, some studies suggest that more acculturated Latinos drink less frequently and in smaller amounts relative to their less acculturated peers (Oetting, 1993). Other studies suggest that increased rates of Latino

adolescent alcohol consumption result from prolonged exposure to mainstream U.S. culture (Balcazar, Peterson, & Cobas, 1996; A. G. Gil, Wagner, & Vega, 2000; Lovato et al., 1994; Vega, Gil, & Zimmerman, 1993). Still other studies suggest a curvilinear relationship: For adult Latino men, U.S. (as contrasted with foreign) nativity and moderate levels of acculturation are associated with higher levels of binge drinking (Caetano & Clark, 2003). Finally, some studies suggest that there is no direct relationship between acculturation and alcohol use and that other social psychological variables (e.g., social class) account for differences in the alcohol consumption behavior of Latinos (Barrett, Joe, & Simpson, 1991).

Theoretical frameworks that focus on acculturation and alcohol use rely predominately on the notion of *acculturation strain* (Vega & Gil, 1999; Vega, Zimmerman, Gil, Warheit, & Apospori, 1993). Acculturation strain theory emphasizes the importance of stressful situations related to adaptation to a host culture. The development of problem behaviors, such as binge drinking, is a result of stress-inducing factors that increase an individual's vulnerability to problem behaviors. For example, recent immigrants to the United States may experience difficulties related to language barriers and deficient financial resources. In contrast, Latinos residing within the United States for longer periods of time may be likely to experience greater levels of racial and ethnic discrimination and may occupy low social status within the host culture (LaFramboise, Coleman, & Gerton, 1993). The cumulative effects of these stress-inducing factors are thought to lead to the development of problem behaviors. This is particularly true when the stress associated with the acculturative process is not buffered by personal resources (A. G. Gil et al., 2000; Vega, Zimmerman, et al., 1993). It is within the context of high levels of stress, coupled with few personal resources, that problems with adaptation to American culture are thought to be most likely to occur.

In the present research we examined the relationship between acculturation-related variables and binge drinking behavior among nationally representative samples of Mexican American, Cuban American, and Puerto Rican youth. Few studies have examined binge drinking behaviors in middle school and high school Latino youth, and that is the focus of the present investigation. To be sure, studies have examined Latino drinking habits in adult populations and with alcohol use more generally, but it is unknown whether perspectives derived from this literature apply to binge drinking in Latino adolescents. In addition, few studies have explored Latino subgroup differences in binge drinking, such as differential binge drinking in Cuban Americans, Puerto Ricans, and Mexican Americans (Collins, 1992). The present study addresses these gaps in the literature.

Acculturation concepts and binge drinking are important to consider for both immigrant and nonimmigrant youth in the United States. Latino youth, representing different minority cultures, are faced with the difficult task of having to accommodate both the cultural milieu of mainstream America as well as the native cultural traditions of the country in which they grew up (for the case of youth whose parents immigrated to the United States after their birth) or in which their parents or grandparents resided (for the case of youth who were born in the United States). Even if an adolescent was born in the United States, he or she is confronted with issues of accommodating multiple sets of cultural values and influences as conveyed by the broader social, familial, neighborhood, and regional contexts in which he or she resides. Thus, acculturation-based variables are potentially important for describing the binge drinking behavior of Latino youth.

Two acculturation-related variables are of central interest in the present study. The first is the amount of time that the adolescent has resided in the United States. Some Latino youth are born in the United States (or have lived most of their lives in the United States), whereas others have immigrated to the United States. Both types of youth must adjust to the host, majority culture, but in somewhat different ways. Immigrants often must overcome language barriers

and other stressors associated with moving to a new country. By contrast, those who have lived in the United States most of their lives probably face increased exposure to discrimination because of more extensive contacts with the majority culture. The length of time that the adolescent has lived in the United States serves as a rough indicator of the extent of exposure to the majority U.S. culture. The second variable of interest is the primary language spoken in the home: Spanish or English. This variable is a rough indicator of acceptance or embracement of the host culture. Although many researchers have used this variable as a proxy for acculturation per se, we do not equate it with acculturation. Acculturation as a complex process that is not captured by such simple proxies (Nguyen, Meese, & Stollak, 1999). Despite this, the language spoken in the home is an important variable because it reflects one aspect of embracing the host culture, namely, adopting its language in a personal, private setting (the home). It seems reasonable to assume that families that report Spanish as the primary language spoken in the home probably are less likely to have embraced the host culture in some respects as compared to their Latino English-speaking counterparts. Both of these acculturation-related variables (length of residency in the United States and language spoken in the home) have an extensive history in the social science literature as being relevant to acculturation-based theories (Nguyen et al., 1999). Both are theoretically important in their own right. They have been found to predict important health outcomes and hence are of conceptual interest (Negy & Woods, 1992; Strait, 1999).

Previous acculturation research using these two variables typically has relied on one or the other as indicators of acculturation or has adopted a strategy that uses a composite score that collapses across these two dimensions. Such approaches obscure the potential unique contributions of the two constructs. Past research also has evaluated the influence of these variables as main effects and has failed to examine potential interaction effects between them. By contrast, we examine the relationship of acculturation to binge drinking behavior within the context of both main effect and interactive models. Our research moves beyond the previously documented studies of the relationship between acculturation-related variables and binge drinking in a number of important ways. First, most prior attempts to understand the relationship between acculturation-related variables and adolescent binge drinking have relied on Latino convenience samples. In the present research we used nationally representative samples of Mexican American, Puerto Rican, and Cuban American youth. Second, most research related to Latino youth either focuses on one specific Latino subgroup or fails to distinguish among Latino subgroups. Our approach is to examine the relationship between acculturation-related variables and binge drinking while allowing for possible subgroup differences through the use of interaction terms in our statistical models. Third, whereas studies of binge drinking have tended to focus on college populations, we examined binge drinking tendencies in younger populations, namely, middle school and high school aged youth. This is particularly important for the design of prevention-oriented interventions.

As noted, several competing acculturation binge drinking hypotheses have been suggested in the literature. Some studies suggest that greater levels of acculturation are associated with a decreased likelihood of alcohol consumption problems; others suggest that greater levels of acculturation are associated with a greater likelihood of problems with alcohol consumption; still others suggest that no association exists between these two variables; and others suggest a curvilinear acculturation–binge drinking association, with moderate levels of acculturation resulting in the least amount of problem drinking. It is possible to generate theoretical accounts for these different patterns of data, but the fact is that the state of current research on Latino middle school and high school youth and binge drinking is so sparse that we simply do not have any sense of what form the relevant function will take. By isolating the function for different Latino subgroups as represented by a national sample of middle school and high school aged youth, the present study will facilitate the direction that future research should pursue for understanding the mechanisms responsible for the relationship between

acculturation-related variables and binge drinking in adolescents. As will be seen, the patterning of data is complex but interpretable within the general framework of acculturation stress theory.

Method

Respondents and Design

The data for this study come from the National Longitudinal Study of Adolescent Health (also called *Add Health*). Add Health is a school-based study with a sample of more than 20,000 adolescents in Grades 7 through 12. A total of 2,035 Latino youth (1,284 Mexican American, 335 Cuban American, and 416 Puerto Rican) were included in our analyses. The sampling frame of Add Health was based on a national random sample of 80 high schools stratified by ethnic proportions, size, geographic region, and school type. A self-administered questionnaire was given in schools from September 1994 through April 1995 during a class period. More than 90,000 adolescents completed the questionnaire. A stratified (gender \times grade) random sample of 12,105 adolescents was selected from all students who completed the in-school questionnaire and those who did not but who were listed on the schools' rosters. This sample is referred to as the *core sample*. In addition, African Americans from well-educated families, Chinese adolescents, Cuban American adolescents, and Puerto Rican adolescents were oversampled. Adolescents in Grades 7 through 11 were interviewed in their homes twice, with a 1-year interval between assessments. A parent, usually the resident mother, also completed a survey on topics similar to those of the adolescent survey.

Procedure

The Wave I interviews occurred between April and December 1995, and the Wave II interviews occurred during those same months in 1996. Of those respondents who were sought for a Wave II interview, 90% were successfully reinterviewed. (The sampling weights developed by Add Health sampling statisticians and used in the data analysis were adjusted for nonresponse.) The interviews lasted 1 to 2 hr. Responses were recorded on laptop computers. The interviewer read the questions and entered the respondent's data for those sections of the questionnaire deemed as less sensitive. The responses to more sensitive questions were entered directly into the computer by the respondent in conjunction with prerecorded questions administered via earphones. Diverse topics were covered in the interviews, including health status, health facility use, nutrition, peer networks, decision-making processes, family composition and dynamics, educational aspirations and expectations, employment experience, the ordering of events in the formation of romantic partnerships, substance use, and criminal activities. The current research is based on a subsample of Latino youth who completed both Waves I and II.

Measures

Latino ethnicity—Adolescent respondents indicated their ethnic identity through the use of multiple questions. First, youths were asked if they were of Hispanic or Latino origin. An affirmative answer was followed by the question "What is your Hispanic or Latino background?" Adolescents were included in the current research only if they responded "yes" to the first item and self-identified as being solely Mexican, Puerto Rican, or Cuban in the second item.

Acculturation-related variables—The length of time that the adolescent had resided in the United States was assessed by asking adolescents if they were born in the United States and, if not, by asking the date they had moved to the United States. Responses to these items were used in conjunction with questions about chronological age to quantify the numbers of years the adolescent had lived in the United States. For language spoken in the home, adolescents were asked, "What language is usually spoken in your home?"

Binge drinking—Add Health included several measures of alcohol consumption. Two items were used as part of the present study. The first indicator focused on whether adolescents had ever experimented with alcohol, as follows: “Have you had a drink of beer, wine, or liquor more than 2 or 3 times in your life?” This was answered as either “yes” or “no.” This item has been used in hundreds of past studies to indicate past experimentation with alcohol. The second item was asked only of individuals who responded affirmatively to the first question. Adolescents were asked to indicate on how many days they had drunk five or more drinks in a row during the past 12 months. This was answered on a 7-point scale with demarcations of 1 = never, 2 = one or two days in the past 12 months, 3 = once a month or less (3–12 times in the past year), 4 = two or three days a month, 5 = one or two days a week, 6 = three to five days a week, 7 = every day or almost every day. This was the primary measure of binge drinking. The “five or more drinks” category is a standard for binge drinking that was dominant in 1995, the time when the Add Health survey was conducted. Some researchers now use different criteria for males and females to accommodate body mass and metabolic differences. This was not commonplace in 1995, and doing so is controversial even today. Despite these issues, our measure has an extensive history and is a reasonable indicator of binge drinking tendencies.

Demographic measures—Demographic measures included grade, gender, religion, religiosity, maternal education, and family structure. For religion, adolescents were asked two items about religious affiliation and religiosity. Responses to the affiliation question were categorized into four groups: (a) Catholic, (b) Protestant, (c) Jewish, and (d) other. Religiosity was scored from 1 to 4 in response to rating scale question “How important is religion to you?”, with higher scores reflecting greater levels of religiosity. Maternal education was assessed by asking the mother of the adolescent, “How far did you go in school?” (1 = eighth grade or less; 2 = more than eighth grade but did not graduate from high school; 3 = high school graduate; 4 = completed a GED; 5 = went to business, trade or vocational school after high school; 6 = went to college, but did not graduate; 7 = graduated from a college or university; 8 = professional training beyond a 4-year college or university). Family structure was measured using two items, one about whether a mother figure resided in the home and the second about the presence of a father figure in the home.

Analytic Strategy

Analyses used logistic and multiple regression based methods. Add Health used a stratified cluster sampling design in which schools were sampled from the Quality of Education Database (www.qeddata.com). Student-level sampling weights were calculated for both waves of the design (Tourangeau & Shin, 1998). The use of sampling weights in complex model evaluation is controversial (e.g., Lohr & Liu, 1994; Winship & Radbill, 1994). The weights, in conjunction with the statistical methods we used, adjust for clustering effects due to the sample being school based as well as nonrepresentativeness due to oversampling and nonresponse. If the variables under study are not affected by these factors, then the weighted estimates yield higher standard errors than unweighted analyses, which is less desirable. We conducted both weighted and unweighted analyses and note discrepancies in conclusions across the two forms of analysis. The results presented are from the weighted analyses, which were conducted using SUDAAN and the robust estimation strategy developed by Binder (1983) as an extension of generalized estimating equations estimation (Liang & Zeger, 1986).

We conducted two sets of analyses. The first focused on whether an individual had ever engaged in binge drinking during the past 12 months and was scored dichotomously (1 = yes, 0 = no). The second focused only on those individuals who had engaged in binge drinking in the past 12 months and evaluated predictors of the frequency of binge drinking among binge drinkers. We used this strategy in light of evidence that the factors that influence the initiation

of binge drinking may be distinct from those that predict the frequency of binge drinking once binge drinking has been started (Quinlan, Jaccard, & Blanton, 2002).

Results

Descriptive Analyses

Descriptive statistics for the three Latino subgroups on the outcome variables, the acculturation-related variables, and selected demographic variables are presented in Table 1. In terms of alcohol use and binge drinking, there was a tendency for Cuban Americans to be less likely to engage in binge drinking than either Puerto Ricans or Mexican Americans. However, the statistical significance of the difference between the Cuban American sample and the other two groups varied depending on whether the analysis was done with weighted or unweighted data. None of the groups differed substantially in the frequency of binge drinking among adolescents who already had a history of alcohol consumption (means not shown in Table 1).

In terms of acculturation indices, Puerto Ricans were more likely to have been born in and lived longer in the continental United States than Mexican American or Cuban American youth. Similarly, Puerto Ricans were more likely than Mexican Americans and Cuban Americans to speak English in the home. These results suggest a confounding between Latino ethnicity and acculturation and raise the possibility that prior research on acculturation and alcohol use that has ignored Latino ethnicity is open to alternative explanations.

In terms of demographic variables, Puerto Ricans reported higher levels of maternal education relative to Mexican Americans. Puerto Ricans also were most likely to live in a single-parent household. Ethnic differences in whether a family was receiving public assistance were not statistically significant (see Table 1).

Acculturation-Related Variables and Binge Drinking

We pursued analyses with two different outcomes. The first outcome was whether the adolescent engaged in binge drinking between the waves of assessment. The second outcome focused only on those adolescents who had engaged in binge drinking and examined the frequency with which they binge drank.

For the first outcome, we examined the relationship between the acculturation-related variables and whether an adolescent engaged in binge drinking between waves using logistic regression. Our initial analyses included the primary language spoken in the home and length of time residing within the United States as the primary predictors. Whether the adolescent was born in the United States was excluded because of its high correlation with the length of time residing in the United States ($r = .71, p < .05$). The analysis also included past alcohol consumption (a dichotomous variable reflecting whether the adolescent had had a drink more than two or three times in his or her life) as a covariate. Models with more comprehensive sets of covariates are discussed later. Model diagnostics suggested several interaction effects among the predictors, and these were formally modeled with product terms using the strategies discussed in Jaccard (2001). In addition, diagnostics suggested that the number of years living in the United States was nonlinearly related to the log odds of whether an adolescent had engaged in binge drinking between waves. The equations therefore included a squared polynomial term for this predictor.

When formally modeled, the analyses revealed a three-way interaction effect among language spoken, years of exposure to U.S. culture, and whether an adolescent had ever consumed alcohol. Table 2 presents the relevant logistic coefficients for the model with the three-way interaction terms. The -2 normalized log likelihood for the model with the three-way interaction terms (1,562.8) was statistically significantly smaller than the -2 normalized log

likelihood for the model omitting the three-way interaction terms (1,576.3; model difference = 13.5 with 2 degrees of freedom, $p < .01$). Both the curvilinear and interactive effects are reflected in Figure 1, which plots the predicted odds of having engaged in binge drinking between waves as a function of time of exposure and primary language spoken within the home for two groups of adolescents: (a) those indicating that they had consumed more than two drinks in their lifetime versus (b) those with no previous alcohol consumption history.

There are several notable trends in the curves. The first trend is that neither acculturation-related variable is of much relevance for predicting binge drinking across waves for youth who had never experimented with alcohol; rather, the acculturation-related variables become relevant only for adolescents who already had some experience with alcohol. For Latino adolescents who are relatively new to the United States and experienced with alcohol, there was a larger likelihood of binge drinking for youth from Spanish-speaking homes as opposed to English-speaking homes. This difference tends to dissipate with greater levels of exposure to U.S. culture. At around 12 years of exposure, both the Spanish-speaking and English-speaking youth show an upswing in the predicted odds of binge drinking, with adolescents from English-speaking homes eventually showing higher predicted odds of binge drinking than those from Spanish-speaking homes. Several additional interaction terms were included in the model to determine if the relational forms depicted in Figure 1 varied as a function of Latino subgroup, grade, and gender. No statistically significant group differences were detected.

Acculturation-Related Variables and Frequency of Binge Drinking

For youth who reported having engaged in binge drinking, we conducted a similar set of analyses to evaluate the relationship between the acculturation-related variables and the frequency of binge drinking using ordinary least squares regression. Again, model diagnostics suggested a nonlinear relationship between the length of time an adolescent resided within the country and the frequency of his or her binge drinking. Included in the model was a squared polynomial exposure predictor. Results indicated that mean levels of binge drinking increased in a nonlinear fashion as youths resided within the United States for longer periods of time. For example, the predicted mean binge drinking at 2 years of residence within the United States was 2.57, 2.50 for 6 years, 3.17 for 13 years, and 4.0 for 17 years of residence in the United States. The language variable was not significantly related to the frequency of binge drinking. In addition, no interaction effect was detected between the two acculturation-related variables. We conducted additional analyses to determine whether the observed relationships varied as a function of Latino subgroup, grade, alcohol consumption history, and gender. No statistically significant differences were detected.

Demographic Confounds

The acculturation-related trends in Figure 1 are potentially confounded with other demographic variables. To examine this possibility, we entered a number of theoretically plausible demographic variables that could serve as confounds into the models. Included in the analyses were Latino subgroup (Puerto Rican, Mexican American, and Cuban American), grade, gender, religion, religiosity, maternal education, family income, and family structure (one- vs. two-parent family). We examined the three-way interaction in the logistic analysis for statistical significance when each of the demographic variables was introduced into the model one at a time. ² No significant change in the basic curvature or the significance of the acculturation-based interaction was detected. The same also was true when all the demographic covariates were simultaneously entered into the equation. We also evaluated whether the three-way interaction remained statistically significant when interactions were modeled between the demographic variables and the lower order interaction terms. In all cases, the fundamental dynamics remained unchanged. Our analyses suggest that the basic trend for the acculturation-related variables in Figure 1 is robust across a wide range of demographic covariates.

The observed relationship between time living in the United States and the frequency of binge drinking also is potentially confounded with demographic variables. To explore this possibility, we reran the OLS regression analyses including as covariates Latino subgroup (Puerto Rican, Mexican American, and Cuban American), grade, gender, religion, maternal education, family income, and family structure (one- vs. two-parent families). We examined the coefficients representing the polynomial exposure predictor for statistical significance when the demographic variables were introduced into the model one at a time as well as simultaneously. No significant change in the basic curvature or the significance of the acculturation effect was detected. We also evaluated whether the acculturation-based effects remained statistically significant when product terms between the polynomial exposure term, alcohol consumption history, and the demographic variables were included in the equation (e.g., Ethnicity \times Exposure \times Alcohol Consumption History interaction). In all cases, the fundamental dynamics remain unchanged. Our analyses suggest that the effects of the acculturation-based variables are robust across a wide range of covariates.

Piecewise Analyses

We also examined the curve in Figure 1 using piecewise regression methods. We used this strategy because of the complex dynamics operating between the acculturation indices, chronological age, Latino subgroup, and whether the adolescents reported consuming more than two drinks in their lifetime. Our initial focus was on the part of the curve representing adolescents who had resided in the United States for 11 years or less ($N = 283$). The vast majority of these youths were immigrants, so place of birth essentially was constant for them. Most of these youth were Mexican American or Cuban American (65% Mexican American, 29% Cuban American, 6% Puerto Rican). Adolescent age was not significantly associated with the length of time the adolescent had resided within the United States ($r = .16, p < .01$), suggesting that years of exposure to U.S. culture and chronological age were not confounded for this group of adolescents. The data in Figure 1 suggest that adolescents from this section of the curve who indicated that they had consumed more than two drinks in their lifetime and that the primary language spoken in the home was Spanish should be at greatest risk for binge drinking between waves. We replicated this using a logistic analysis targeting just adolescents who had lived in the United States for 11 or fewer years.

The second part of the piecewise analysis was restricted to those adolescents residing within the United States 12 or more years ($N = 1,752$). Most of these youth were born within the United States (88%). Sixty-three percent were Puerto Rican, 23% were Mexican American, and 15% were Cuban American. A logistic regression analysis restricted to just adolescents residing in the United States for 12 or more years also replicated the acculturation dynamics of the curves shown in Figure 1. Both English- and Spanish-speaking youth with a history of alcohol consumption were similar in that both groups experienced greater probability of binge drinking with increasing number of years residing in the United States. Piecewise regressions were not pursued for the OLS regression analyses on the frequency of binge drinking outcome, because the sample sizes were deemed too small for those individuals residing in the United States 11 years or less.

Discussion

Given the increasing numbers of Latinos within the United States, and the elevated rates of binge drinking, it is important to understand factors that influence Latino binge drinking behavior. Social scientists have suggested that acculturation to the U.S. majority culture increases vulnerability for alcohol misuse. Ambiguity exists in terms of how acculturation is related to the binge drinking behavior of Latino youth, particularly diverse Latino youths. In the present study we used a nationally representative sample of Latino youths in Grades 7

through 11 to explore the relationship between indices of acculturation and binge drinking. Our results suggest a link between acculturation-related variables and the likelihood of engaging in binge drinking, but in a complex way.

First, the acculturation-based variables we studied were not significantly associated with the likelihood of binge drinking for youths with no prior history of alcohol consumption (two or more alcoholic drinks consumed in lifetime). Latino adolescents with no history of previous alcohol use seemed to be largely unaffected by either greater exposure to U.S. culture or a significant transition to adoption of U.S. culture as reflected by language use. This result is of interest in that most previous studies of acculturation and adolescent binge drinking have failed to adequately examine potential differences in the effect of acculturation-based variables as a function of differences in previous alcohol consumption history. Our results suggest that, in the area of binge drinking, acculturation-based dynamics (at least as reflected by our two variables) are not strong influences of risk behavior for individuals who have shown no inclination toward that risk behavior in the past.

In contrast, our acculturation-based variables do appear to be relevant for Latino youth who have a previous history of experimentation with alcohol. The dynamics differ for recent immigrants as opposed to those who have lived in the United States most of their lives. For recent immigrants, adolescents from Spanish-speaking homes were more likely to exhibit binge drinking than those from English-speaking homes. This trend reversed itself, with those from English-speaking homes being more likely to engage in binge drinking than those from Spanish-speaking homes, for Latino adolescents who were either born in the United States or who had lived most of their lives in the United States. These results can be interpreted in terms of acculturation stress theory. The higher rates of binge drinking in youth from Spanish-speaking families who have recently immigrated to the United States may be due to the initial stresses and strains of adapting to a new host culture. If the adolescent had not yet experimented with alcohol, then binge drinking did not seem to serve as a coping mechanism for dealing with the stress, but if the adolescent already had crossed the threshold and experimented with alcohol, then binge drinking may have been an outlet for stress reduction.

For Latino youth who had lived most of their lives in the United States and who had experimented with alcohol in the past, the fundamental dynamics were such that the predicted odds of binge drinking increased as the adolescents became older. However, there was a tendency for the Latino youth from English-speaking homes to show a higher probability of binge drinking than those from Spanish-speaking homes. Whereas recent arrivals may be affected primarily by difficulties related to language obstacles and the burden of a new host culture, Latino youths residing here for greater periods of time are more vulnerable to the stressors associated with racial discrimination and a growing consciousness that many of their future aspirations are influenced by membership in an ethnic minority group. Those who are from English-speaking homes may have greater contact with the host culture, as reflected by their linguistic orientations, and thus be more likely to experience the stress and strains associated with discrimination. Again, if the adolescent has already experimented with alcohol, he or she may then be oriented toward dealing with the stress by means of binge drinking.

Our results also suggest that there are no significant differences in binge drinking related consumption behaviors among varying Latino adolescent subgroups, although there was some evidence of a lowered tendency in Cuban Americans. To the extent that Cuban American youth do differ in their binge drinking tendencies from other Latino youth, it may be important to take into account ethnic subgroup differences within the broader Latino culture when trying to understand binge drinking dynamics. However, the ways in which our two primary acculturation-related variables seemed to influence behavior did not vary appreciably across Latino subgroups, suggesting that the dynamics that we observed may be quite general.

The present research documents important trends in acculturation-related variables and binge drinking behavior in Latino youth and sets a direction for future research on this topic. Simple theoretical explanations of our data are not easily offered, but the results can be explained in terms of general acculturation stress theory. In an insightful analysis, Caetano, Clark, and Tam (1998) distinguished between acculturative stress and minority stress: *Acculturative stress* results from adapting to the beliefs and values of the dominant culture; *minority stress* results from encounters with racism. As noted above, our results can be explained if one assumes that time of residence in the United States affects minority stress and that language spoken in the home is reflective of variables or orientations that affect acculturative stress. A promising direction for future research is to develop more refined conceptions and measures of acculturative stress and minority stress and to test the mediating and moderating influences that these variables have on more traditional acculturated-related variables (such as the ones we investigated) and binge drinking behavior.

As with all investigations, the present study should be interpreted within the context of its limitations. The binge drinking index relied on self-reports and may be subject to some degree of measurement error. Add Health study respondents were not required to report their alcohol-related behavior directly to an interviewer. These questions were self-administered, using audio computer-assisted self-interviewing technology. Respondents also were assured confidentiality in regard to their responses. These techniques are used routinely to reduce any potential reporting bias. Second, the place of birth measure was unclear for Puerto Rican youth. The item did not distinguish between the continental United States versus the “island” of Puerto Rico. We suspect that individuals made this distinction (island vs. mainland) when asked this question, and ancillary data suggest this to be the case. For example, the percentage of Puerto Rican youths who reported being born in the United States is comparable to national data related to Puerto Rican youths residing within the United States (National Center for Health Statistics, 2002) that made the explicit distinction between *island* and *mainland*. Despite these weaknesses, we believe the present research provides insights to help better understand the binge drinking behavior of Latino youth.

Acknowledgments

This research is based on data from the Add Health project, a program project designed by Richard Udry (principal investigator) and Peter Bearman and funded by Grant P01-HD31921 from the National Institute of Child Health and Human Development to the Carolina Population Center, University of North Carolina at Chapel Hill, with cooperative funding participation by the National Cancer Institute; the National Institute of Alcohol Abuse and Alcoholism; the National Institute on Deafness and Other Communication Disorders; the National Institute of Drug Abuse; the National Institute of General Medical Sciences; the National Institute of Mental Health; the National Institute of Nursing Research; the Office of AIDS Research, National Institutes of Health (NIH); the Office of Behavior and Social Science Research, NIH; the Office of the Director, NIH; the Office of Research on Women’s Health, NIH; the Office of Population Affairs, U.S. Department of Health and Human Service (DHHS); the National Center for Health Statistics, Centers for Disease Control and Prevention, DHHS; the Office of Minority Health, Centers for Disease Control and Prevention, DHHS; the Office of Minority Health, Office of Public Health and Science, DHHS; the Office of the Assistant Secretary for Planning and Evaluation, DHHS; and the National Science Foundation. The analyses reported in this study were funded by Grant RO3 MH1632 to Vincent Guilamo-Ramos from the Office of AIDS Research, National Institute of Mental Health.

References

- Arredondo R, Weddige RL, Justice CL, Fitz J. Alcoholism in Mexican Americans: Interventions and treatment. *Hospital and Community Psychiatry* 1987;38:180–183. [PubMed: 3557343]
- Balcasar H, Peterson G, Cobas JA. Acculturation and health-related risk behaviors among Mexican-American pregnant youth. *American Journal of Health Behavior* 1996;20:425–433.
- Barnes GE. Solvent abuse: A review. *International Journal of Addictions* 1979;14:1–26.
- Barrett ME, Joe GW, Simpson DD. Acculturation influences on inhalant use. *Hispanic Journal of Behavioral Sciences* 1991;3:276–296.

- Binder DA. On the variances of asymptotically normal estimators from complex surveys. *International Statistical Review* 1983;51:279–292.
- Caetano, R. Drinking patterns and alcohol problems in a national sample of United States Hispanics. In: Spiegler, D.; Tate, D.; Aitken, S.; Christian, C., editors. *Alcohol use among U.S. ethnic minorities*. Rockville, MD: U.S. Department of Health and Human Services, National Institute on Alcohol Abuse and Alcoholism; 1989. (National Institute on Alcohol Abuse and Alcoholism Research Monograph No. 18, DHHS Publication No. ADM 89–1435).
- Caetano, R.; Clark, CL. Acculturation, alcohol consumption, smoking, and drug use among Hispanics. In: Chun, KM.; Organista, PB.; Marín, G., editors. *Acculturation: Advances in theory, measurement, and applied research*. Washington, DC: American Psychological Association; 2003. p. 223–239.
- Caetano R, Clark CL, Tam T. Alcohol consumption among racial/ethnic minorities: Theory and research. *Alcohol Health & Research World* 1998;22:233–238. [PubMed: 15706749]
- Collins RL. Methodological issues in conducting substance abuse research on ethnic minority populations. *Drugs & Society* 1992;6:59–77.
- Gil AG, Wagner EF, Vega WA. Acculturation, familism, and alcohol use among Latino adolescent males: Longitudinal relations. *Journal of Community Psychology* 2000;28:443–458.
- Gil, RM.; Vasquez, CI., editors. *The Maria paradox*. New York: Putnam; 1996.
- Gilbert MJ, Cervantes RC. Patterns and practices of alcohol use among Mexican Americans: A comprehensive review. *Hispanic Journal of Behavioral Sciences* 1986;8:1–60.
- Jaccard, J. *Interaction effects in logistic regression*. Newbury Park, CA: Sage; 2001.
- Johnson FW, Gruenewald PJ, Treno AJ, Taff GA. Drinking over the life course within gender and ethnic groups: A hyperparametric analysis. *Journal of Studies on Alcohol* 1998;59:568–580. [PubMed: 9718110]
- Johnson, LD.; O'Malley, PM.; Bachman, JG., editors. *Monitoring the Future national survey results on drug use, 1975–2001*. Bethesda, MD: National Institute on Drug Abuse; 2002. (NIH Publication No. 02-5106).
- LaFramboise T, Coleman HLK, Gerton J. Psychological impact of biculturalism: Evidence and theory. *Psychological Bulletin* 1993;114:395–412. [PubMed: 8272463]
- Levy, DT.; Miller, TR.; Cox, KC. *Costs of underage drinking*. Rockville, MD: Pacific Institute for Research and Evaluation; 1999.
- Liang K-Y, Zeger SL. Longitudinal data analysis using generalized linear models. *Biometrika* 1986;73:13–22.
- Lohr SL, Liu J. A comparison of weighted and unweighted analyses in the National Crime Victimization Survey. *Journal of Quantitative Criminology* 1994;10:343–360.
- Lovato CY, Litrownik AJ, Elden JP, Campbell NR, Ayala GX, Sylvia DJ. Cigarette and alcohol use among migrant Hispanic adolescents. *Family and Community Health* 1994;16:18–31.
- National Center for Health Statistics. *Vital statistics of the United States, 1999: Volume I. Natality*. 2002. Retrieved December 10, 2002, from <http://www.cdc.gov/nchs/datawh/statab/unpubd/natality/natab99.htm>
- Negy C, Woods D. The importance of acculturation in understanding research with Hispanic-Americans. *Hispanic Journal of Behavioral Sciences* 1992;14:224–247.
- Nguyen HH, Meese LA, Stollak GE. Toward a more complex understanding of acculturation and adjustment. *Journal of Cross Cultural Psychology* 1999;30:5–27.
- Oetting ER. Orthogonal cultural identification: Theoretical links between cultural identification and substance use. *NIDA Research Monographs* 1993;130:32–56.
- Quinlan, S.; Jaccard, J.; Blanton, H. *A decision theoretic and prototype conceptualization of possible selves: Implications for the prediction of risk behavior*. State University of New York: University at Albany; 2002. Unpublished manuscript
- Rebach, H., editor. *Alcohol and drug use among American minorities*. New York: Haworth; 1992.
- Strait SC. Drug use among Hispanic youth: Examining common and unique contributing factors. *Hispanic Journal of Behavioral Sciences* 1999;21:89–103.
- Tourangeau, R.; Shin, HC. *The National Longitudinal Study of Adolescent Health: Grand sample weights*. Chapel Hill: Carolina Population Center, University of North Carolina; 1998.

- Vega WA, Gil AG. A model for explaining drug use behavior among Hispanic adolescents. *Drugs & Society* 1999;14:57–74.
- Vega WA, Gil AG, Zimmerman RS. Patterns of drug use among Cuban-American, African-American, and White non-Hispanic boys. *American Journal of Public Health* 1993;83:257–259. [PubMed: 8427335]
- Vega, WA.; Zimmerman, R.; Gil, A.; Warheit, GJ.; Apospori, E., editors. NIDA Research Monographs. Vol. 130. 1993. Acculturation strain theory: Its application in explaining drug use behavior among Cuban and other Hispanic youth; p. 144-166.
- Warheit GJ, Vega WA, Khoury EL, Gil AG, Elfenbein PR. A comparative analysis of cigarette, alcohol, and illicit drug use among an ethnically diverse sample of Hispanic, African American, and non-Hispanic White adolescents. *Journal of Drug Issues* 1996;26:901–922.
- Winship C, Radbill L. Sampling weights and regression analysis. *Sociological Methods and Research* 1994;23:230–257.

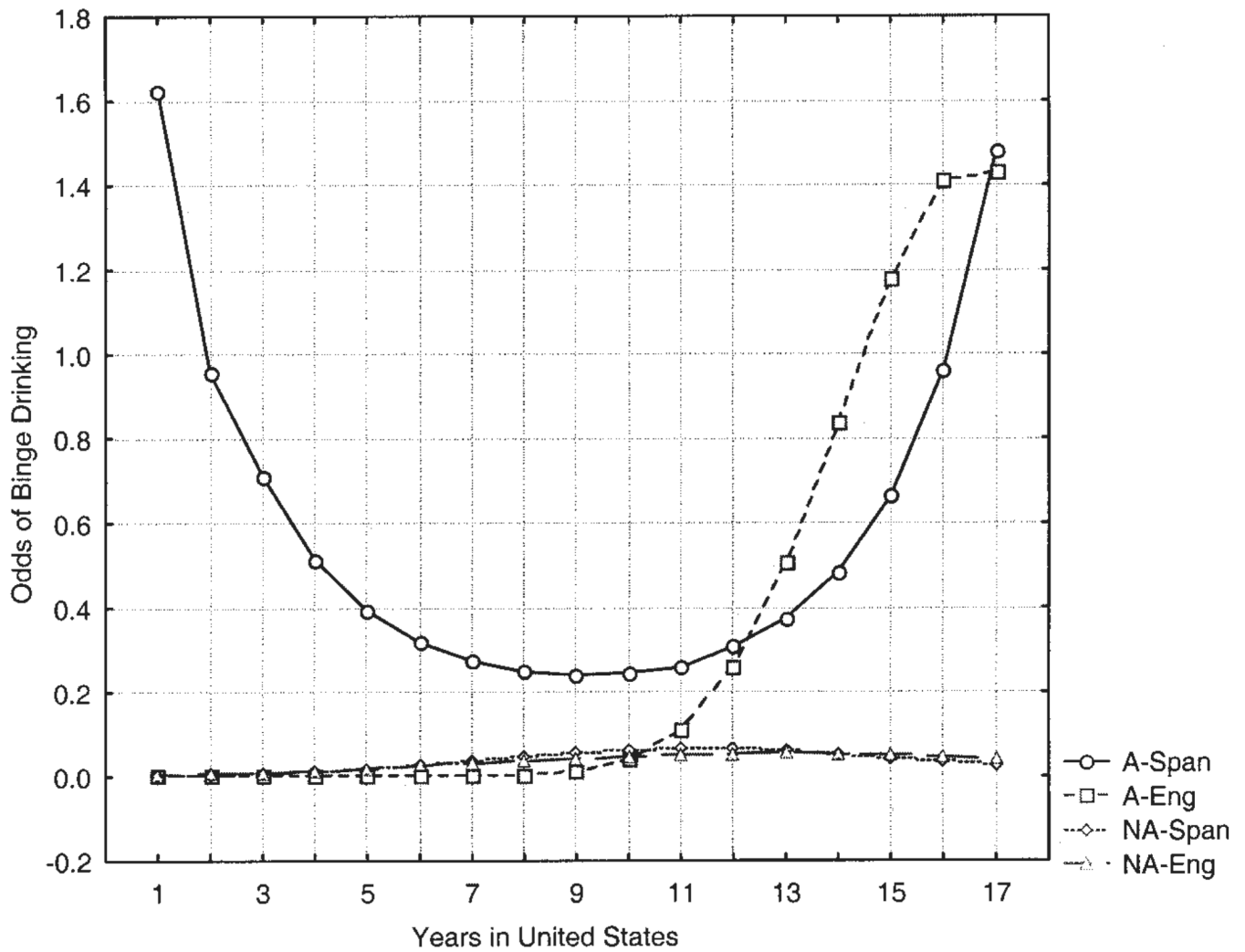


Figure 1. Predicted odds of binge drinking between waves as a function of the Alcohol Consumption Status × Time Residing Within the United States × Primary Language Spoken in the Home interaction. A = previous history of alcohol consumption; NA = no previous history of alcohol consumption; Span = Spanish; Eng = English.

Table 1

Descriptive Statistics for the Sample Based on Weighted Analyses

| Variable | Mexican Americans | Puerto Ricans | Cuban Americans |
|--|--------------------|--------------------|--------------------|
| <i>N</i> | 1,284 | 416 | 335 |
| Percentage ever consumed alcohol at Wave 1 | 57 _{a,1} | 54 _{a,1} | 46 _{a,1} |
| Percentage binge drank at Wave 1 | 28 _{a,1} | 26 _{a,1} | 18 _a |
| Percentage binge drank between waves | 33 _{a,1} | 25 _{a,1} | 15 _a |
| Frequency of binge drinking at Wave 1 | 3.4 _a | 3.1 _a | 3.1 _a |
| Frequency of binge drinking between waves | 3.5 _{a,1} | 4.0 _{a,1} | 2.6 |
| Percentage who speak English in the home | 54 | 80 | 33 |
| Mean years lived in United States | 13.2 _a | 14.5 | 12.6 _a |
| Mean maternal education | 2.6 _b | 3.3 _a | 3.1 _{a,b} |
| Percentage living in a single-parent home | 28 _a | 51 | 35 _a |
| Percentage receiving public assistance | 17 _a | 24 _{a,1} | 24 _{a,1} |

Note. Groups with a common Arabic subscript within a row are not statistically significantly different from each other in the weighted analyses ($p < .05$). Groups with a common numerical subscript within a row are not statistically significantly different from each other in the unweighted analyses ($p < .05$).

Table 2

Logistic Coefficients for Prediction of Binge Drinking Between Waves From the Alcohol Use \times Language Spoken in the Home \times Number of Years Lived in United States Interaction

| Model term | Coefficient | SE | p | Exponent | 95% CI |
|---------------------------------------|-------------|-------|------|----------|-------------|
| Language (L) | 1.45 | 0.380 | <.01 | 4.28 | 2.01, 9.10 |
| Exposure (E) | -0.159 | 0.322 | .624 | 0.854 | 0.45, 1.62 |
| E ² | -0.031 | 0.030 | .311 | 0.970 | 0.91, 1.03 |
| Ever Drink (ED) | 2.199 | 0.400 | <.01 | 9.01 | 4.07, 19.96 |
| L \times E | 0.121 | 0.381 | .752 | 1.13 | 0.53, 2.40 |
| L \times E ² | 0.014 | 0.032 | .674 | 1.01 | 0.95, 1.08 |
| E \times ED | 0.444 | 0.318 | .167 | 1.56 | 0.83, 2.93 |
| E ² \times ED | 0.060 | 0.030 | .052 | 1.06 | 0.99, 1.13 |
| L \times ED | -0.907 | 0.552 | .104 | 0.40 | 0.13, 1.21 |
| E \times ED \times L | 0.019 | 0.424 | .045 | 1.02 | 0.44, 2.37 |
| E ² \times ED \times L | -0.125 | 0.040 | .964 | 0.88 | 0.81, 0.96 |
| Intercept | -2.924 | 0.296 | | | |

Note. $N = 1,544$; -2^* normalized log likelihood for model = 1,562.8; model approximate chi-square is 335.1, $p < .01$. L is a dummy variable scored 1 = English spoken in home, 0 = Spanish spoken in home; E is the number of years the adolescent reported living in the United States, mean centered; ED is a dummy variable scored 1 = 2 or more drinks consumed in life, 0 = less than 2 drinks consumed in life; exponent = exponent of the logistic coefficient; 95% CI = 95% confidence interval for exponent of the logistic coefficient.