PERCEIVED BARRIERS TO OPPORTUNITY AND THEIR RELATION TO SUBSTANCE USE AMONG LATINO IMMIGRANT MEN

India J. Ornelas[Postdoctoral Fellow],
University of Washington and Fred Hutchinson Cancer Research Center

Eugenia Eng[Professor], and
Department of Health Behavior and Health Education, University of North Carolina at Chapel Hill

Krista M. Perreira[Associate Professor]
Department of Public Policy, University of North Carolina at Chapel Hill

Abstract

Theory and empirical evidence suggest that perceived barriers to opportunity, such as discrimination, can lead to the adoption of unhealthy behaviors. The study assessed the relationship between perceived racial/ethnic, language and legal status barriers to opportunity and substance use among Latino immigrant men in North Carolina. Logistic regression was used to test for the association between perceived barriers and odds of binge drinking in the past 30 days and cigarette smoking. In both crude and adjusted models, perceived language barriers (OR = 3.05, 95% CI: 1.78 – 5.25) and legal status barriers (OR = 2.25, 95% CI: 1.26 – 4.01) were associated with increased odds of having engaged in binge drinking. Perceived barriers to opportunity were not significantly associated with cigarette smoking. Further research is needed to better understand the effect of language and legal status barriers on health among Latino immigrants.

Keywords

Alcohol; Tobacco; Latino; Immigrant

Introduction

Substance use is a serious health concern among Latino immigrant men whose rates of alcohol and tobacco use put them at increased risk for injury, violence, infectious and chronic diseases (American Cancer Society, 2005, 2006; Mokdad et al., 2004; U.S. Department of Health and Human Services, 1998). Research shows that although immigrants have lower levels of alcohol and tobacco use than those born in the United States (US), their rates often increase with length of residence due to the stressors associated with adaptation to life in the US (Abraido-Lanza et al., 2005; Finch et al., 2003; Otero-Sabogal et al., 1995; Vega & Amaro, 1994; Wilkinson et al., 2005). Immigrants' perceptions about their barriers to opportunity in the US can lead to the adoption of unhealthy behaviors (Finch, et al., 2003; A. J. Romero et al., 2007). Yet despite the growing research in this area, no studies have assessed the relationship between perceived barriers to opportunity and substance use among Latino immigrants.

Race, Language and Legal Status as Barriers to Opportunity for Latino Immigrants

Although immigrants often arrive in US with expectations of social mobility, they soon observe how their opportunities for success are limited by their race/ethnicity, language barriers and their perceived legal status (Telles & Ortiz, 2008). Some of these limitations are due to discrimination based on these factors, while others are simply challenges associated with being an immigrant. Limited research has explored Latino immigrants' perceptions of potential barriers to opportunity.

Studies suggest that perceived racial/ethnic discrimination is common among Latinos living in the US. According to the National Survey of Latinos (NSOL), a nationally representative telephone survey conducted by the Pew Hispanic Center, 82% of Latinos felt racial discrimination was a problem that prevents them from succeeding in America (Pew Hispanic Center, 2006). In addition, over 30% reported that they had been personally discriminated against or had someone close to them discriminated against in the last five years because of their racial or ethnic background (Pew Hispanic Center, 2006). Similar rates were observed in the National Latino and Asian American Study (NLAAS), in which 30% of Latinos reported everyday discrimination.

Latino immigrants may be particularly vulnerable to racial/ethnic discrimination. In the NSOL, Latinos who were not U.S. citizens were more likely to think that discrimination was a major problem than Latinos who were citizens (Pew Hispanic Center & Kaiser Family Foundation, 2002, 2004). A study of U.S. and foreign-born Mexican Americans in Fresno County, California also found that those born in Mexico or who claimed Mexico as a primary residence were more likely to report perceived discrimination than native residents of the US (Finch et al., 2000). Findings from a recent survey of Latino immigrants living in the U.S. South found that 68% perceived racial discrimination on a regular basis and over two-thirds reported being made to feel unwelcome in their community (Bauer, 2009).

Evidence suggests that Latinos also perceive language barriers as limiting their opportunity for success (Araujo & Borrell, 2006). Language barriers are a common and frequent stressor among Latino immigrants, and many perceive their use of Spanish as a source of discrimination (Kim-Goodwin & Bechtel, 2004). The NSOL found that among those who reported being discriminated against, more Latinos felt the main reason for their experience was the language they speak (35%) than either physical appearance alone (24%), or both language and physical appearance (20%) (Pew Hispanic Center & Kaiser Family Foundation, 2002). In 2007, the NSOL reported that 46% of all Latinos surveyed felt that language skills were the biggest cause of discrimination against Latinos, followed by immigration status (22%) and skin color (11%). Latino participants in the 2001 California Health Interview Survey also cited language or accent among the most common reasons for discrimination (Trivedi & Ayanian, 2006). In addition to discrimination, language barriers can limit immigrants' economic and social opportunities, and their access to health care.

Latino immigrants' actual or perceived legal status can also impact their opportunities for success in the US. Because Latino physical features have been racialized to be associated with being "foreign" or having undocumented legal status (Marrow, 2009; Viruell-Fuentes, 2007), many Latinos experience discrimination based on legal status regardless of other whether they are documented or not. Those that are undocumented are more vulnerable to economic and occupational hardship and exploitation (Sladkova, 2007).

Barriers to Opportunity, Stress and Substance Use

Barriers to opportunity related to racial/ethnicity, language and legal status are increasingly receiving attention as social determinants of health. Public health researchers have developed conceptual models for understanding how social determinants of health influence

health outcomes (Clark et al., 2002; Gallo et al., 2009; H. Myers et al., 2003; Schulz & Northridge, 2004). These models suggest that both real and perceived barriers to social mobility can increase levels of stress in an individual which then influences their health behaviors. Many draw on stress and coping theory, which suggests that individuals employ coping responses to manage stressful situations (Lazarus & Folkman, 1984; H. Myers, et al., 2003). Substance use can be an avoidant coping strategy that is used to distance, distract and minimize problems.

Along with theory, there is substantial empirical evidence that substance use, such as tobacco and alcohol, is a common response to social stress (Aneshensel & Phelan, 1999). Stressful situations often induce substance use, because of expectations that the activity will relieve stress (Sayette, 2000; Wills & Shiffman, 1985). In fact, alcohol and tobacco's anticipated stress-relieving properties are often the reason individuals continue to use substances despite their harmful effects (Sayette, 1999). Substance use is seen as an effective mechanism for coping with life stress because it can both minimize negative mood and maximize positive mood (Wills & Shiffman, 1985).

Given that alcohol and tobacco are used to relieve stress, immigrants may drink and smoke to try to alleviate the pressures related to their adjustment to the US, including perceived barriers to opportunity (Abraido-Lanza et al., 2006; Fernander et al., 2007; Finch, et al., 2003; Finch & Vega, 2003; Garcia & Gondolf, 2004; Kassel et al., 2003; A. Romero & Roberts, 1998). Studies among African Americans have shown that perceived racial discrimination is associated with both increased alcohol use and cigarette smoking (Bianchi et al., 2004; Edwards & Romero, 2008; Farley et al., 2005; Finch, et al., 2003; Landrine et al., 2006). However, only a few studies have assessed this relationship among Latinos in the US. Finch et al. found that among Mexican labor migrants in California, perceived racial and ethnic discrimination at work was significantly related to alcohol abuse in the past year (Finch, et al., 2003). In a study with a combined student and community racial/ethnic minority sample that included Latinos, racial and ethnic discrimination was significantly associated with increased odds of being a current smoker (Landrine, et al., 2006).

Present Study

The aim of our study was to assess whether Latino immigrant men who perceived their race/ethnicity, language and legal status as barriers to opportunity were more likely to binge drink and smoke cigarettes. Our study focused on men in North Carolina, a state with one of the fastest growing Latino immigrant populations in the US and which is representative of a new trend of immigrant settlement in the South (Durand et al., 2005; Kandel & Parrado, 2006; Kochkar et al., 2005). As a result of the rapid growth in the Latino population in the late 1990s, racial relations became strained in some parts of the state (Love, 2000). Workplace raids by the U.S. Immigration and Customs Enforcement (ICE) have also increased markedly in the last decade further promoting fear and social isolation among Latino immigrants (Capps et al., 2007). While, ethnographic studies of other new immigrant destinations in the South have noted anti-immigrant sentiment and racial and ethnic discrimination towards Latino immigrants, to our knowledge no other studies have documented perceptions of social mobility and their impact on substance use in this vulnerable population (Kandel & Parrado, 2005; Marrow, 2009; Perreira et al., 2006).

Methods

Data Source and Study Population

The data for this study come from the Men as Navigators (MAN) for Health and *Hombres Manteniendo Bienestar y Relaciones Saludables* (HoMBReS) studies, which evaluated a lay

health advisor intervention targeting Latino men in central North Carolina. A non-probability purposive sampling strategy was used to recruit men to participate in the intervention and comparison groups. The project coordinator recruited 21 lay health advisors (LHA) to participate in the intervention from an existing soccer league operated by and for Latino immigrant men. In Latin America, soccer is a popular sport and Latin American men who move to the US bring their love of soccer with them. In North Carolina, Latino soccer leagues are an important social network for men who get together for games (*cascaritas*) on the weekends (Cuadros, 2006). At the time of the study, 1800 Latino men participated in the league (Eng et al., 2009). Each LHA played with a different team and recruited up to 12 men from his team with whom he would share health information. Comparison group men were recruited by the HoMBReS project coordinator from Latino soccer teams in a neighboring community in the same county. To be eligible for participation in the parent study, the men had to: (1) self-identify as Latino or Hispanic; (2) be a member of a Hispanic soccer league in North Carolina; (3) be 18 years of age or older; (4) be literate in Spanish or English; and, (5) provide informed consent. Although eligibility was not limited to foreign-born Latinos, almost all men recruited for the study were born outside of the U.S. and we excluded the two cases that were US born. In addition, 73% indicated that they had immigrated within the past 10 years. As a result, the study focuses exclusively on foreign-born (i.e. first-generation immigrant) Latino men.

Data Collection and Measures

For this study, we used baseline data collected from 291 Latino immigrant men between the summers of 2005 and 2006. The baseline survey contained measures of health behaviors, perceived racism, and demographic characteristics. Prior to data collection, the survey was pilot-tested with community advisory group members and modified before the survey was translated into Spanish using standard procedures (Brislin, 1970). All men chose to complete the self-administered surveys in Spanish, which took approximately 30 minutes. Although the men filled out the questionnaire on their own, project coordinators or lay health advisors read each question and response option aloud to the group and answered any questions. Surveys were sealed in an envelope by the respondents before they were given to project staff in order to protect their confidentiality. The study was approved by the Institutional Review Board at the University of North Carolina at Chapel Hill. Participants were read and given a copy of the consent brochure which they signed if they agreed to participate.

Substance Use—Participants were asked to report the number of times they had binge drank (had five or more drinks on one occasion) in the past 30 days. An indicator variable was created for those that binge drank at least one time in the past 30 days. Participants were asked if they currently smoked daily, occasionally or not at all. An indicator variable was created for those that reported current daily or occasional smoking. Language for both items were taken from the Spanish version of the Centers for Disease Control and Prevention Behavioral Risk Factor Surveillance System questionnaire (Centers for Disease Control and Prevention, 2003).

Perceived Barriers to Opportunity—Participants were asked "In what ways, if any, do you differ from those with the greatest opportunity for success in this country?" and were allowed to choose responses from a list of social factors that included race, ethnicity, language and legal status. The question was developed by project staff to assess ways in which the men felt their social mobility was limited by social factors, and as a proxy for potential sources of discrimination. Based on their responses, we created three dichotomous variables to indicate barriers to opportunity on the basis of (1) race or ethnicity, (2) language, and (3) legal status.

Sociodemographic Characteristics—Respondents were asked several questions about their sociodemographic characteristics. Age was reported in years and recoded into the following groups based on the distribution of the sample: 18 to 24, 25 to 29, 30 to 34, and 35 and older. The marital status of those who were single, divorced or widowed was coded as "single," and those that were married (living with or without their family) or single but living with a partner were coded as "married or living as married." Household size was measured as the number of people living in the respondents' home, including themselves. Level of education was measured as the number of years of education the respondent had completed and was recoded into, those with a those with less than a high school education, and those with a high school education, general equivalency degree (GED) or more education. Respondents were asked their total income before taxes in the past year and response options included ten categories ranging from less than $10,000 to more than $58,000. The income variable was recoded into five categories based on the distribution of responses.

Nativity and Acculturation—Respondents were asked to report the country in which they were born. Responses were grouped into those from Mexico and those from other countries. Length of residence in the US was measured as the number of months the respondent had lived in the US. This was converted into years for the analysis. Level of acculturation was measured with a ten-item scale based on a previously published media-based acculturation scale (Ramirez et al., 1986). The scale included questions related to language preferences and the amount of contact with Latino and non-Latino persons, and was altered to provide response options for both Latino and Anglo preferences (Marin & Gamba, 1996). For example one item in the scale read, "In general, what language(s) do you read and speak?" with the following response options: only Spanish (1), more Spanish than English (2), both languages equally (3), more English than Spanish (4), and only English (5). Responses for the ten items were averaged with total acculturation scores ranging from 1 – 5, and higher scores indicating increased levels acculturation. The estimated reliability of the scale in our sample is $\alpha = .92$.

Data Analysis

Descriptive statistics were used to describe the study sample and the patterns of perceived barriers and substance use. Sixteen cases were dropped from the analyses due to missing data on several sociodemographic characteristics and/or substance use. We tested for significant associations between sociodemographic characteristics and substance use using chi-square tests and logistic regression. Logistic regression models were used to estimate the crude odds of binge drinking and cigarette smoking for each type of barrier. Adjusted models contained only those sociodemographic characteristics that were significantly associated with both perceived barriers and the health outcome.

Because some of the data were clustered (men recruited by the same LHA), intra-class correlation coefficients were computed to assess the amount of variability within and between clusters. The intra-class correlation coefficients (ICC) were estimated using the formula specified by Cohen et al., with the mean square error between and within the cluster calculated for dichotomous outcomes (Cohen et al., 2003). The ICC was .16 for binge drinking and .21 for cigarette smoking. To account for the correlation within clusters, all models were calculated using the SAS Version 9.1 procedures for generalized estimating equations (GEE) with an independent correlation structure. Models were estimated using a variable to specify the cluster of the participant, as well as the logit link function and binomial distribution, using robust standard errors. Statistical tests were considered significant at an alpha level of .05.

Results

The sociodemographic characteristics of the total study sample, those who had engaged in binge drinking in the past month, and cigarette smokers are presented in Table 1. The average age was 29.4. Most men were married, had less than a high school education or GED, were low income and from Mexico. Income was modestly correlated with age (r = . 12, p = .05) and education (r = .17, p = .003). Age was negatively correlated with racial/ ethnic barriers (r = −.13, p =.02). Age (r = .14, p = .01), being married (r = .13, p = .02), and income (r = −.14, p = .01) were significantly correlated with language barriers. Income (r = −.22, p < .001) was negatively correlated with legal status barriers. Acculturation had a moderate positive correlation with income (r = .28, p <.001) and education (r = .42, p < . 001). Time in the U.S. was moderately correlated with acculturation (r = .265, p <.001) and negatively correlated with perceptions of legal status barriers (r = −.14, p = .02).

Among the study sample, 44% of the men had engaged in binge drinking in the past month and 36% were cigarette smokers. Among the smokers, most smoked less than one cigarette per day (72%). Younger age (OR=1.02, CI: 1.01 – 1.02) and lower income were significantly associated with increased odds of binge drinking. Lower income (OR=1.04, CI: 1.02 – 1.08), having less than a high school education or GED (OR=2.40, CI: 1.40 – 4.10) and having lower levels of acculturation (OR=1.42, CI: 1.01 – 2.01) were associated with increased odds of cigarette smoking.

We estimated logistic regression models using GEE to test the association between perceived barriers and substance use. Separate models were calculated for racial/ethnic, language and legal status barriers. Table 2 shows crude odds ratios for binge drinking and cigarette smoking in separate models for each type of barrier. Language barriers and legal status barriers were both associated with increased odds of binge drinking. None of the perceived barrier variables were associated with cigarette smoking (daily or occasional) in the crude models. Adjusting for age, income, and acculturation made no difference in the association between barriers to opportunity and cigarette smoking; therefore, adjusted models are not presented.

Fully adjusted models of the odds of binge drinking are presented in Table 3. Models 2 and 3 show that language barriers and legal status barriers continued to be associated with at least a two-fold increase in the odds of binge drinking after adjusting for age, income and acculturation. In the full model, language barriers remained significant even after controlling for racial/ethnic and legal status barriers.

Discussion

Perceived Barriers to Opportunity and Substance Use

The purpose of the study was to assess the relationship between perceived barriers to opportunity and substance use among Latino immigrant men. The study builds upon previous research in two ways. First, the sample reflected an understudied population, recently immigrated Latino men living in rural North Carolina. Second, our novel measure of perceived barriers to opportunity allowed us to examine three potential sources of discrimination, race/ethnicity, language and legal status.

There was a strong and consistent relationship between Latino men's perceptions of language and legal status barriers and their binge drinking. While both the crude and adjusted odds ratios for racial/ethnic barriers and binge drinking were in the expected direction, they were not as significantly associated with an increased odds of binge drinking. The strength of the associations observed for language and legal status barriers was similar

to previous studies of perceived racial discrimination and alcohol use among African Americans but stronger than the association found in a previous study among Latinos (Borrell et al., 2007; Finch, et al., 2003; Martin et al., 2003).

Results for the full model showed that perceived language barriers remained significant even after controlling for perceived legal status barriers, racial/ethnic barriers and covariates. A recent study examining racial and language discrimination among Asian American immigrants found similar results (Yoo et al., 2009). In the study, language discrimination was significantly associated with an increased number of chronic conditions, such as high blood pressure, diabetes and cancer, after controlling for sociodemographic covariates and racial discrimination (Yoo, et al., 2009).

The results from our study and the Yoo (2009) study suggest that language barriers, specifically discrimination based language, may be a particularly health-damaging for immigrant populations. Language barriers may be a more salient stressor for recently immigrated Latino men, who need to speak English to access social and economic resources (Viruell-Fuentes, 2007). Alternatively, discrimination based on race/ethnicity may become more of a threat to health with increased length of time in the U.S., as immigrant men become more aware of their identity as a racial/ethnic minority. Previous research among immigrants has found that that the relationship between racial/ethnic discrimination and poor health is stronger for those that have lived in the U.S. longer (Gee et al., 2006). Although there was no association between racial/ethnic barriers and length of residence in the US in our study, legal status barriers were associated with having a shorter length of residence in the U.S. These findings may also reflect the fact that perceived barriers change with length of residence. Future studies should assess the health effects of different perceived barriers longitudinally, to better understand their effect on health changes over time.

Our findings also indicate that heavy alcohol use is an important health issue for Latino immigrant men. In our study, rates of binge drinking (44%) were twice as high as rates previously reported among Latinos in North Carolina (North Carolina Center for Health Statistics, 2005). Rates in our study were also higher than those observed in previous studies among Latino immigrants. In a study of Mexican immigrants living in rural eastern North Carolina, 12% of the sample engaged in binge drinking on at least one day in the past month (Loury & Kulbok, 2007). While a separate study of recent Latino immigrant farmworkers in eastern North Carolina, found that 27% reported frequent binge drinking (two or more times per month) (Grzywacz et al., 2007). One possible explanation for the high rates of alcohol use in this sample is the influence of peers in their social network (R. Myers et al., 2009). For example, the men may have participated in celebratory or social drinking after soccer games. Trends of alcohol use should be monitored in new immigrant communities to identify populations at risk for substance abuse.

In contrast to our findings for binge drinking, perceived barriers were not associated with cigarette smoking in our study. One possible explanation is that our sample size may not have been large enough to detect a significant association. Alternatively, the men in our sample may have used tobacco more as recreation than as a way to cope with stress, and therefore were unlikely to initiate or increase tobacco use in response to perceived barriers. The percentage of cigarette smokers in our sample (36%) was higher than rates reported in previous studies of Latinos in North Carolina which similarly measured both daily and occasional smokers (Loury & Kulbok, 2007; North Carolina Center for Health Statistics, 2006). However, most of the men in our study were light smokers with most smokers consuming less than one cigarette per day. Patterns of light smoking among Latino men have been observed in previous studies; further research is needed to understand the

relationship between smoking and stress in this population (Fagan et al., 2009; Reitzel et al., 2009; Trinidad et al., 2009).

Limitations

The findings must be interpreted in light of several study limitations. Because the data were cross-sectional, we were unable to draw causal inferences about the associations between perceived barriers and binge drinking. However, we can infer that the observed significant associations were in the expected direction based on theory and the wording of the questions. While our measures of perceived barriers did not state a specific time frame, our measure of binge drinking was restricted to the past 30 days. Therefore, it is likely that their assessment of perceived barriers included experiences preceding binge drinking within the past month.

The homogeneity within the sample prevented us from fully assessing the impact of several sociodemographic characteristics on perceived barriers and substance use. The men in our study were similar in terms of their generation status, their income, language use and acculturation. While we were unable to detect differences based on these characteristics, this also reduced the potential threat of bias due to confounding on these factors. Theory and previous studies suggest that these factors and other sociodemographic characteristics may moderate the relationship between perceived discrimination and health (Clark et al., 1999; Lee & Ferraro, 2009; Paradies, 2006; Yoo, et al., 2009). Further research is needed to fully understand how the relationship between perceived barriers and binge drinking varies by sociodemographic and cultural characteristics.

Because the men in our sample were recruited from soccer leagues our findings may not be generalizable to foreign-born Latino men who are not active in soccer leagues. Latino men who do not participate in soccer leagues may differ from those in soccer leagues in both observed and unobserved ways. The social nature of the soccer league may promote alcohol use; however, Latino men may relieve stress through playing soccer, which may help reduce alcohol use.

There were also limitations due the measurement of the study variables. Our measure of binge drinking did not specify a time period in which the five drinks were consumed, therefore participants may have considered consuming five drinks over the course of an afternoon at a weekend party to be the same as drinking five drinks in a row alone at a bar. Consequently, our measure could overestimate episodes of excessive drinking. All of the data were based on self-report, which is subject to recall and social desirability bias. We attempted to reduce social desirability bias by using bilingual, bicultural staff and the lay health advisors themselves to administer the survey. Using lay health advisors for data collection may have had both positive and negative consequences on social desirability and response veracity.

Conclusion

Despite these limitations, the study represents an important contribution to research on race/ethnicity, language, and legal status as social determinants of health-damaging behaviors, such as substance use, among Latino immigrant men. To mitigate the negative health effects from binge drinking, public health officials could work to ensure that culturally competent Spanish language alcohol abuse prevention and treatment services are made available to Latino immigrant men. Given the prevalence of perceived barriers observed in our study, providers may need to conduct outreach to these populations to overcome their fear and mistrust. As was the case in the parent study, a potentially effective way to reach Latino immigrant men is through existing community structures, such as Latino soccer leagues

(Eng, et al., 2009; Rhodes et al., 2007). In addition to community outreach, programs and policies that reduce discrimination in health care and public health institutions may also improve health in Latino immigrant communities. For example, health organizations could provide anti-racism training to staff and assure that Spanish-speaking and undocumented immigrant clients have equal access to services.

This study was one of the first to document the effect of perceived barriers, particularly due to language and legal status, on binge drinking among Latino immigrant men living in the US South. Future research should continue to explore the health impact of perceived barriers, including different forms of discrimination among Latinos, as well as the impact of perceived barriers on other health behaviors and outcomes. Once these relationships are better understood, public health practitioners should look towards developing interventions that reduce the negative health effects of perceived barriers among Latino immigrants.

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Table 1

Selected Sample Characteristics by Substance Use (n = 275)

	Total Sample (n=275)[a]		Binge Drinking (n=120)[a]		Cigarette Smoking (n=97)[a]	
	Number/ Mean	Percent/ S.D.	Number/ Mean	Percent/ S.D.	Number/ Mean	Percent/ S.D.
Age (years)[b]						
18 – 24	79	29.4%	37	30.8%	33	34.0%
25 – 29	76	28.2%	38	31.7%	30	30.9%
30 – 34	52	19.3%	27	22.5%	16	16.5%
35+	62	23.1%	18	15.0%	18	18.6%
Marital Status						
Single	90	33.3%	38	32.5%	32	33.0%
Married or living as married	180	66.7%	79	67.5%	65	67.0%
Education[c]						
Less than High School/GED	169	62.4%	74	62.7%	74	74.7%
High School/GED or greater	102	37.6%	44	37.3%	25	25.3%
Income[bc]						
Less than $10,000	45	17.2%	24	20.3%	19	20.0%
$10,000 – $16,000	71	27.1%	36	30.5%	28	29.5%
$16,001 – $22,000	61	23.3%	25	21.2%	26	27.4%
$22,001 – $28,000	43	16.4%	19	16.1%	13	13.7%
$28,001 or more	42	16.0%	14	11.9%	9	9.5%
Country of Birth						
Mexico	191	69.4%	88	74.2%	72	74.3%
Other country	76	27.6%	31	25.8%	25	25.7%
Years in the U.S. (range 0 – 54)	8.0	(6.9)	7.4	(4.7)	7.7	(6.1)
Acculturation (range 1 – 5)	1.8	(0.7)	1.8	(0.7)	1.7	(0.7)
Racial/ethnic barriers	92	33.5%	46	38.3%	33	33.3%
Language barriers[b]	162	58.9%	87	72.6%	57	57.6%
Legal status barriers[b]	143	52.0%	75	62.5%	53	53.5%

[a] Numbers do not sum to total n in some categories, due to missing values

[b] Significantly associated with binge drinking

[c] Significantly associated with cigarette smoking

Table 2

Crude Odds Ratios for Binge Drinking and Cigarette Smoking (n=275)

	Binge Drinking		Cigarette Smoking	
	OR	95% CI	OR	95% CI
Racial/ethnic barriers	1.47	(0.89 – 2.45)	0.99	(0.56 – 1.76)
Language barriers	2.80	(1.64 – 4.80) ***	0.92	(0.58 – 1.45)
Legal status barriers	2.13	(1.23 – 3.67) **	1.10	(0.72 – 1.67)

**
p ≤ .01,

***
p ≤ .001

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Table 3

Adjusted Odds Ratios for Binge Drinking (n=275)

	Model 1		Model 2		Model 3		Full Model	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Intercept	0.90	(0.41 – 2.00)	0.44	(0.17 – 1.16)	0.68	(0.28 – 1.68)	0.41	(0.15 – 1.15)
Age group[a]								
18 – 24	1.90	(0.95 – 3.78)	2.69	(1.29 – 5.60) **	2.27	(1.10 – 4.70) *	2.75	(1.35 – 5.64) **
25 – 29	2.53	(1.31 – 4.87) **	3.19	(1.60 – 6.36) ***	3.07	(1.59 – 5.91) ***	3.45	(1.74 – 6.85) ***
30 – 34	2.59	(1.09 – 6.13) *	3.02	(1.28 – 7.09) **	2.81	(1.15 – 6.82) *	3.07	(1.28 – 7.33) *
Income[b]								
Less than $10,000	2.11	(0.75 – 5.98)	1.83	(0.62 – 5.42)	1.81	(0.63 – 5.18)	1.69	(0.57 – 5.01)
$10,000 – $16,000	1.64	(0.60 – 4.48)	1.32	(0.47 – 3.73)	1.23	(0.45 – 3.37)	1.13	(0.40 – 3.18)
$16,001 – $22,000	1.21	(0.48 – 3.07)	1.12	(0.42 – 2.97)	1.04	(0.41 – 2.65)	1.00	(0.37 – 2.76)
$22,001 – $28,000	1.53	(0.54 – 4.33)	1.38	(0.49 – 3.92)	1.41	(0.49 – 4.11)	1.32	(0.45 – 3.88)
Acculturation	0.88	(0.60 – 1.29)	0.97	(0.66 – 1.44)	0.88	(0.61 – 1.28)	0.92	(0.61 – 1.40)
Racial/Ethnic Barriers	1.55	(0.88 – 2.72)					1.06	(0.60 – 1.86)
Language Barriers			3.05	(1.78 – 5.25) ***			2.55	(1.43 – 4.55) **
Legal Status Barriers					2.25	(1.26 – 4.01) **	1.60	(0.85 – 3.02)

[a]Reference group is 35 years and older

[b]Reference group is more than $28,000

*
p ≤.05,

**
p ≤ .01,

***
p ≤.001