Social Stressors and Alcohol Use among Immigrant Sexual and Gender Minority Latinos in a Non-Traditional Settlement State

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Abstract

We sought to quantify the association of social stressors with alcohol use among immigrant sexual and gender minority Latinos in North Carolina (n = 190). We modeled any drinking in past year using logistic regression and heavy episodic drinking in past 30 days using Poisson regression. Despite a large proportion of abstainers, there were indications of hazardous drinking. Among current drinkers, 63% reported at least one heavy drinking episode in past 30 days. Ethnic discrimination increased, and social support decreased, odds of any drinking in past year. Social support moderated the associations of English use and ethnic discrimination with heavy episodic drinking.

Introduction

Since 1990, the US Latino population has grown rapidly and is now the largest racial/ethnic minority group (Census Bureau, 2011; Ennis, Rios-Vargas, & Albert, 2011). Despite its size, the health status and needs of Latinos are poorly understood due to gaps in national databases, the heterogeneity of immigrant populations, a history of limited funding for Latino research, and relatively few researchers focusing on Latinos (Dovidio, Gluszek, John, Ditlmann, & Lagunes, 2010; North Carolina Institute of Medicine, 2003; Organista, 2007; Rhodes et al., 2007). Additionally, some Latinos may be reluctant to participate in epidemiologic studies because of their immigration status or perceived discrimination. Even less is known about sexual and gender minority Latinos, a sub-group that includes gay- and

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bisexually-identified men, men who have sex with men (MSM) who do not self-identify as gay or bisexual, and gender variant or transgender individuals. Sexual and gender minority Latinos are often considered a hidden and hard-to-reach population as no population-based sampling frame can be elaborated and for some their potentially stigmatizing characteristics may inhibit recruitment for research studies (Shedlin, Decena, Mangadu, & Martinez, 2011; Zea, Reisen, & Diaz, 2003).

While some immigrant Latino men abstain from or consume little alcohol, recent research suggests that a sizeable proportion engages in heavy weekly or heavy episodic drinking (Worby & Organista, 2007). In addition, Latino men's drinking patterns may differ from other racial/ethnic groups. In their review of alcohol use among US racial/ethnic minorities, Galvan and Caetano (Galvan & Caetano, 2003) found that a greater proportion of Latino men abstained from alcohol than their non-Latino White peers (35% vs. 26%); however, a greater proportion of Latino men reported frequent heavy drinking than non-Latino Black or White men (18% versus 15% and 12%, respectively). The same study found that from 1984 to 1995 the proportion of Latino men who reported three or more alcohol-related problems, such as driving while intoxicated, increased from 9% to 16% while the proportions of non-Latino White and Black men reporting alcohol-related problems decreased.

It has been suggested that some Latino men may consume alcohol as a way to cope with the psychological strain associated with their minority status (Laureano & Poliandro, 1991; Neff, 1986). Qualitative research in North Carolina identified alcohol use as a possible coping reaction to migration-related stress (Rhodes et al., 2009). Additionally, some Latino men may use heavy drinking as a strategy to circumvent cultural constraints that otherwise prevent expression of some emotions, such as anger, frustration, or loss (Perez, 2000).

Much of the knowledge about Latinos' alcohol use has been based on samples drawn from traditional Latino communities (e.g., California, Texas, Florida, and New York) or national samples that mask regional variations; however, non-traditional settlement states have received increasing attention. Recent research in North Carolina found high levels of binge drinking among Latino men (Grzywacz, Quandt, Isom, & Arcury, 2007; Kim-Godwin & Fox, 2009), which was associated with Spanish language use and inversely associated with age and social support (Loury, Jesse, & Wu, 2011; Ornelas, Eng, & Perreira, 2011). These findings suggest a pattern of prevalent risky drinking that is driven by social stressors. As these studies presumed heterosexuality, however, they may not reflect alcohol use among sexual and gender minority Latinos in North Carolina.

High levels of alcohol consumption and alcohol-related problems have also been reported for gays and lesbians, often exceeding those found among their heterosexual peers (Drabble, Midanik, & Trocki, 2005; Hughes, 2005; McKirnan & Peterson, 1989a; Stall et al., 2001; Stall & Wiley, 1988). Proposed explanations for the observed disparities have frequently focused on the greater experiences of stigma and discrimination due to minority sexual orientation or internalized negative attitudes about their sexuality (Cabaj, 1996; DiPlacido, 1998; McKirnan & Peterson, 1989b; Meyer, 2003). In other words, gays and lesbians experience stress as a result of their minority sexuality and may turn to alcohol or drugs to cope (Hatzenbuehler, 2009). Although sexual orientation has received far less attention than

other types of social stressors, there is increasing support in diverse but predominantly White samples for the proposed association of gay-related stressors with alcohol use (Bux, 1996; Hamilton & Mahalik, 2009; McDermott, Roen, & Scourfield, 2008). Similar to the literature on drinking among Latino men, however, the findings are based on only a small number of studies that have explicitly tested such relationships.

To date, very few studies have examined social stressors and alcohol consumption under the joint conditions of Latino ethnicity and minority sexual orientation or gender identity. Nevertheless, a small body of literature has emerged. One of the earliest reports found that immigrant Mexican men who have sex with men (MSM) consumed alcohol at higher levels than their heterosexual immigrant Mexican peers (Tori, 1989) and showed higher levels of stress, which may be attributed to their sexual minority status. Extending these findings, other researchers found that internalized homosexual stigma was positively associated with amount of alcohol consumed (Bruce, Ramirez-Valles, & Campell, 2008) and with sex under the influence of drugs or alcohol (Ramirez-Valles, Kuhns, Campbell, & Diaz, 2010) among gay and bisexual Latino men and transgender Latino individuals in Chicago and San Francisco. To our knowledge, no other studies have measured stressors and alcohol use among sexual and gender minority Latinos.

Social support may serve as a compensatory factor. There is substantial evidence of its beneficial effects for a wide variety of health outcomes (Gottlieb & Bergen, 2010; Heaney & Israel, 2008), and the field of public health now recognizes social support as an important determinant of health, particularly as it may interact with other social characteristics such as socio-economic position and social integration (Grundy & Sloggett, 2003; Stansfeld, 2006; Weyers et al., 2008). Social support may buffer some of the disadvantages faced by sexual and gender minority Latinos; however, research to-date has largely been restricted to HIV-related topics (Carlos et al., 2010; Fekete et al., 2009; Wohl et al., 2010; Zea, Reisen, Poppen, Bianchi, & Echeverry, 2005). This reflects the preponderance of research on sexual behavior and relatively scant attention to the relationship between social support and other risky behaviors, including substance use, among this sub-group of Latinos.

In this study, we sought to build upon the limited extant literature about alcohol use among immigrant sexual and gender minority Latinos. Drawing upon theory and empirical evidence, we derived a conceptual model to guide the study. The Transactional Model of Stress and Coping (Lazarus & Folkman, 1984) provided the basic structure, focusing on drinking as an active, avoidant coping response to stressors. We drew upon various Minority Stress Models (Clark, Anderson, Clark, & Williams, 1999; Harrell, 2000; Meyer, 1995, 2003) to identify specific sources of stress for the study population, including experiences of discrimination and internalized homonegativity, i.e. internalized negative attitudes about same-sex sexuality. A concurrent qualitative study suggested additional stressors. In individual interviews, age at migration and English language use were identified as key stressors among immigrant sexual and gender minority Latinos in North Carolina (manuscript in preparation). Social Support Theory provided a complementary mechanism to explain the hypothesized association of social stressors with drinking. Based on the Stress Buffering hypothesis (Cohen & Wills, 1985; Ganster & Victor, 1988), we expected that social support would weaken any association between social stressors and alcohol use. Our

primary aim was to quantify the association of select social stressors with alcohol use among immigrant sexual and gender minority Latinos in North Carolina, a non-traditional settlement state that has experienced recent, rapid growth of its Latino population (Griffith, 2005; Kochlar, Suro, & Tafoya, 2005). Additionally, we tested whether social support moderated any relationship between social stressors and alcohol use among this sub-group of Latinos.

Methods

Sample

Data for this study came from an investigation of HIV risk and protective factors among immigrant sexual and gender minority Latinos in North Carolina. A community-based participatory research (CBPR) partnership guided the parent study and included representatives from public health departments, AIDS service organizations, universities, the local Latino community (including immigrant sexual and gender minority Latinos), and community-based organizations serving the Latino community. The parent study used respondent-driven sampling (RDS) to recruit participants. RDS is an extension of chain-referral methods that enables researchers to sample populations when no sampling frame can be established (Heckathorn DD, 1997; Magnani, Sabin, Saidel, & Heckathorn, 2005; Ramirez-Valles, Heckathorn, Vazquez, Diaz, & Campbell, 2005). Initially, the CBPR partnership identified eight seeds, participants chosen to represent the diversity of the local sexual minority Latino community (e.g. by level of "outness" about their sexual orientation, country of origin, gender identity, and HIV status). Nine additional seeds were enrolled during data collection to expedite recruitment in accordance with standard RDS procedures, for a total of 17 seeds. All participants were born outside the US, self-identified as Latino, were age 18 or older, and provided informed consent. Each seed completed a psychosocial and behavioral assessment (described below), received instruction on the study's recruitment protocol and eligibility criteria, and recruited up to three additional participants from his social network. Each subsequent participant completed an assessment, received instruction on the study's recruitment protocol and eligibility criteria, and recruited up to three new participants from his social network. Recruitment waves continued until the target sample size (n = 190) was met. All participants were compensated for completing their own assessment ($50) and for each referral that also completed an assessment ($20), a dual incentive process that is a hallmark of RDS methods. The Institutional Review Board (IRB) at Wake Forest University School of Medicine approved the parent study; the Public Health-Nursing IRB at the University of North Carolina at Chapel Hill approved this secondary analysis.

Measures

The parent study's CBPR partnership developed a comprehensive psychosocial and behavioral assessment, using established Spanish-language measures whenever possible and adapting established English-language measures or developing new measures when necessary. Following a committee approach, which is an increasingly preferred translation method (Behling & Law, 2000; Census Advisory Committees, 2004), a group of individuals with complementary skills was convened to translate the English items into Spanish. The

group included professional translators (including native Spanish speakers from Mexico and Central America), a translation reviewer, content specialists, and a questionnaire design expert. Multiple group members made independent translations of the assessment, and the full committee met to discuss and reconcile the various versions. The CBPR partnership, which included native Spanish speakers, reviewed and approved the final Spanish translation.

Although the parent study focused on HIV-specific outcomes (e.g., condom use, HIV testing), data were available to investigate alcohol use. Current drinking status was assessed by a single item about any alcohol use in the past year (coded 0 = none; 1 = any). Current drinkers were asked to select the most common reason for drinking from a list of seven options (1 = enhance sex; 2 = bored/for fun; 3 = lose inhibitions; 4 = lonely/depressed; 5 = physical pain; 6 = other; 7 = don't know) and to report the number of heavy episodic drinking episodes in the past 30 days, defined as five or more drinks on a single occasion.

Among migration related stressors, language use was measured by the language sub-scale of the *Short Acculturation Scale for Hispanics* (Marin, Sabogal, Marin, Otero-Sabogal, & Perez-Stable, 1987). Five items assessed participants' language use in a variety of situations, such as "what language(s) do you usually speak with your friends?" Participants responded on a five-point bipolar scale (coded 1 = exclusively Spanish to 5 = exclusively English; α = 0.92). Because a majority (59%) of participants spoke exclusively Spanish or more Spanish than English, we modeled language use in terms of English acquisition, with exclusive Spanish speakers serving as the referent group. Participants also reported the number of years they lived in the US, which we used as a proxy for duration of cultural contact. We calculated age at migration by subtracting participants' self-reported years in the US from self-reported age at time of interview, then created a dichotomous indicator for migration as an adult, (coded 0 = migration at age < 18 years; 1 = migration at age ≥ 18 years).

The parent study assessed ethnic discrimination by adapting the *Detroit Area Study Discrimination Questionnaire* (Williams, Yu, Jackson, & Anderson, 1997). Ten items presented examples of discrimination (e.g. "you were treated with less courtesy than others") and participants reported the frequency of each event (coded 1 = never to 4 = very frequently; α = 0.95). We created binary indicators for each type of discrimination (coded 0 = none; 1 = any) and summed them to create a count variable (range 0-10). The parent study assessed sexual orientation discrimination by adapting a previously used scale of social discrimination and HIV risk among Latino gay men (Díaz & Ayala, 2001). Five statements described inter-personal harassment due to sexual orientation (e.g. "you had to pretend to be straight in order to be accepted") and participants reported the frequency of each event (coded 1 = never to 4 = always; α = 0.75). As with the measure for ethnic discrimination, we created binary indicators for each type of sexual orientation discrimination and summed them to create a count variable (range 0-5).

The parent study assessed internalized negative attitudes about gay men and MSM using the *Reactions to Homosexuality Scale* (Ross & Rosser, 1996). Although the items performed well in a confirmatory factor analysis (λs = 0.76 to 0.86), we found a three-factor structure rather the four-factors identified by the scale's developers. Based on the factor structure we

identified, we used a subset of items to assess: (1) social comfort about gay men and MSM (6-items; e.g. "social situations with gay men make me feel uncomfortable;" $\alpha = 0.86$); (2) internalized negative stereotypes about gay men (4 items; e.g. "it would be harder in life to be a homosexual man;" $\alpha = 0.82$); and (3) personal comfort and acceptance of sexual orientation (5 items; e.g. "I am comfortable about people finding out I am gay;" $\alpha = 0.74$).[1] All internalized negative attitude items were coded 1 = strongly disagree to 7 = strongly agree.

A single item asked participants how many other immigrant sexual and gender minority Latinos they knew. This count variable was originally included as a means to understand the RDS sampling process; however, it also served as a measure of participants' social ties. In addition, the availability of social support, which is one of the benefits of connections to others, was measured using an adaptation of the *Index of Sojourner Social Support* (Ong & Ward, 2005). The items assessed the availability of other people for supportive functions relevant to adults living outside their country of origin (e.g. "Listen and talk with you whenever you feel lonely or depressed"; coded 0 = no one would do this to 4 = many would do this. Although an 18-item scale, we used 11 items based on our confirmatory factor analysis (Gilbert & Rhodes, 2012). The reduced set had excellent internal consistency reliability ($\alpha = 0.96$); however, we failed to replicate the original two-factor structure (socio-emotional and instrumental support). The high factor loadings (λs 0.87) indicated that the ISSS was a very good measure of a single latent construct, which we labeled general social support based on characteristics of the indicators.

Data Collection

Three native Spanish-speaking males drawn from the local Latino community were trained in issues salient to research with sexual minorities and within Latino communities. The training also refined their interview and elicitation skills (e.g., how to respond to participant queries and what to do if a respondent was confused by a question). They conducted interviews from March to December 2008. The parent study chose face-to-face interviews, which took 45-90 minutes to complete, rather than other methods, such as audio computer assisted self-interview, based on formative data and feedback from CBPR partnership members suggesting that participants would be more likely to engage with a well-trained interviewer who could establish rapport and trust. This approach was believed to be more culturally congruent given that some Latinos value *personalismo*, a cultural characteristic that stresses the importance of warm and friendly interactions and interpersonal engagement (Marsiglia & Kulis, 2009).

Analysis

We hypothesized that migration as an adult, ethnic discrimination, sexual orientation discrimination, and internalized negative stereotypes about gay and bisexual men would be positively associated with alcohol use because they would exacerbate stress. Conversely, we hypothesized that English use, social comfort with gay and bisexual men, and personal

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[1]A recent revision of the *Reactions to Homosexuality Scale* produced an instrument that has a three-factor structure similar to the one we identified in these data (Smolenski et al., 2010).

comfort with one's own sexuality would be negatively associated with alcohol use because they would reduce stress. We calculated means and standard deviations or counts and proportions to describe the sample, and then performed bivariate tests of association with each hypothesized predictor. We used logistic regression to model the dichotomous outcome (any drinking in past year vs. none). Although small sample sizes may produce biased estimates, we met the generally accepted rule-of-thumb by having at least 10 events (i.e., current drinkers) per parameter estimated (Hosmer & Lemeshow, 2000). We used Poisson regression to model of the count outcome (number of heavy episodic drinking episodes in past 30 days) among participants who reported drinking in the past year, which included a scale parameter to account for over-dispersion of the variable. In preliminary tests, we compared the Poisson model against zero-inflated and negative binomial models, neither of which fit the data better than the Poisson model with scale parameter. Each hypothesized predictor was tested individually for moderation by social support, which was centered at the grand mean to facilitate interpretation of interactions. We followed procedures suggested by Hosmer and Lemeshow (2000), retaining all variables that had bivariate associations at $p < 0.25$ for construction of multiple variable models. Preliminary multiple variable models were fit, then each variable was assessed in a backwards elimination process in which we constrained its effect to zero and performed a likelihood ratio test. We removed variables when their inclusion did not significantly improve model fit. To better understand interactions, we graphed simple slopes for each conditional effect at one standard deviation above and below the grand mean of social support. We calculated the regions of significance, threshold values of the moderator below or above which the interaction was significant, for each interaction using an online utility (www.quantpsy.org/interact/mlr2.htm).

Because the data were obtained via RDS methods, which violated the assumption of independent observations, we accounted for the sampling strategy by using individual post-hoc sampling weights calculated with the RDS Analysis Tool v5.6 (RDS Incorporated, Ithaca NY). These sampling weights allowed adjustment for participants' different social network sizes (i.e. different numbers of potential recruits) and homophily within recruitment dyads (i.e. the tendency of recruiters to recruit others similar to themselves), thereby minimizing the bias introduced by the sampling method. Although there is currently no consensus on appropriate regression modeling of RDS data (Johnston, Malekinejad, Kendall, Iuppa, & Rutherford, 2008), sampling weights are an increasingly utilized approach (Carballo-Dieguez, Balan, Dolezal, & Mello, 2012; Garfein et al., 2009; Jenness et al., 2011; Schneider, Michaels, & Bouris, 2012; Song et al., 2012; Townsend et al., 2010; Wayal et al., 2011).Among raw variables, the average level of missing data was 2% (range 0-14%); only two variables exceeded 10% missing observations: years in US (14% missing) and one item of the ethnic discrimination scale (12% missing). To maximize statistical power, we imputed missing values for independent variables using SAS PROC MI, performed independent analyses with each imputed dataset, and combined results to obtain parameter estimates using SAS PROC MIANALYZE. Because traditional goodness-of-fit statistics are not available in multiple imputation, we used the COMBCHI macro (www.ssc.upenn.edu/~allison/#macros) to combine likelihood ratio chi-square statistics from each imputed data set, allowing us to test the overall null hypothesis that all coefficients in the final models

equaled zero. All statistical tests were performed using SAS v9.3 (SAS Institute, Cary NC), were two-tailed, and used the critical alpha of 0.05.

Results

Sample Characteristics

One hundred ninety immigrant sexual and gender minority Latinos completed a comprehensive psychosocial and behavioral assessment. Participants were young (M = 25.5, SD = 5.4 years, range 18-48 years) and had resided in the US approximately ten years (M = 9.7, SD = 5.3 years, range 0.3-25.8 years). Most participants were originally from Mexico (81%), self-identified as gay (79%), had earned a high school diploma or GED (69%), and had migrated as adults (63%). A minority of participants (17%) self-identified as transgender. Ninety-one percent of participants were employed year-round and 83% of all participants earned less than $30,000 annually. The sample included approximately equivalent proportions of single persons (48%) and persons in a dating relationship (46%).

Drinking Status

Approximately half of participants (53%) reported no alcohol consumption in the past year. Among current drinkers (n = 90), the most frequently endorsed reasons for drinking included boredom/for fun (42%), an undefined reason (29%), and to enhance sex (14%). Regressing drinking status (any versus none) on social stressors, social support, and demographics, we identified three predictors and two control variables that met the inclusion criterion for the multiple variable model (Table 1). In the final model, each additional type of ethnic discrimination was associated with 23% higher odds of being a current drinker (adjusted odds ratio [aOR] 1.23; 95% confidence interval [CI] 1.09, 1.39; p-value < 0.001) and each incremental increase in social support score was associated with 51% lower odds of being a current drinker (aOR 0.49; 95% CI 0.28, 0.86; p-value = 0.01). No interactions with social support met the model building inclusion criterion.

Heavy Episodic Drinking

Among current drinkers, over half (63%) reported at least one heavy episodic drinking episode in the past 30 days (range 1-15). Considering abstainers, the overall prevalence of heavy episodic drinking in the sample was 30%. Regressing the number of episodes on social stressors, social support, and demographics, we identified three predictors, two interactions with social support, and one control variable that met the inclusion criterion for the multiple variable model (Table 2). Being in a relationship was associated with 54% reduction in the count of heavy drinking episodes (adjusted incident rate ratio [aIRR] 0.54; 95% CI 0.32, 0.92). In contrast, social support was positively associated with heavy episodic drinking; however, as social support interacted with English use and ethnic discrimination, it must be interpreted as a conditional effect. In other words, the effect of social support was linked to the level of the two other variables.

To better understand the interactions, we calculated simple intercepts and simple slopes (Figures 1 and 2). When social support was one standard deviation below the grand mean, the expected log-count of heavy drinking episodes increased with higher levels of English

use and more types of ethnic discrimination. In contrast, when social support was one standard deviation above the grand mean, the expected log-count decreased with increasing levels of both variables. Calculating regions of significance, the interaction with English use was only significant when social support score was greater than 0.89 (range 0-4), and the interaction with ethnic discrimination was only significant when social support score was below 0.64 (range 0-4). In other words, there was no significant interaction at very low levels of social support.

Discussion

This study sought to quantify the association of select social stressors with alcohol use among immigrant sexual and gender minority Latinos and to determine whether social support moderates any such relationship. It extends current research in several ways. First, it tests theoretically derived hypotheses about stressors that are salient to the study population, a hard-to-reach sub-group about whom little is known. Second, it reports findings from North Carolina, a non-traditional settlement state that has experienced recent rapid growth of its Latino population. Third, it identifies modifiable factors that could be leveraged for alcohol risk-reduction interventions among immigrant sexual and gender minority Latinos.

Fifty-three percent of participants reported no alcohol use in the past year. In contrast, recent studies of immigrant Latino men in North Carolina found that non-drinkers accounted for only 26% and 37% of participants (Grzywacz et al., 2007; Loury et al., 2011). As those studies presumed heterosexuality (i.e., did not assess sexual orientation), their findings may not be directly comparable to our sample. National studies of sexual minority men have found even lower levels of alcohol abstainers, ranging from 10% to 19% (Cochran, Keenan, Schober, & Mays, 2000; Colfax et al., 2004; Drabble et al., 2005). As findings from these larger samples have rarely been disaggregated by race/ethnicity, comparison with our sample is also limited. Nevertheless, our study appears to have detected a lower than expected level of current drinking. As a self-reported measure, the low prevalence may be due to underreporting of alcohol use due to social desirability biases (Tourangeau, Rips, & Rasinski, 2000). Additional research is necessary to establish stable prevalence estimates of current drinking among the study population. In addition, although the assessment inquired about reasons for drinking, no data were collected on the converse, i.e., reasons for not drinking. To improve our field's knowledge base, we recommend that future studies assess motivations for both drinking and not drinking.

Despite the large proportion of abstainers, this study's findings suggest high levels of risky drinking among the study population. Nearly two-thirds of current drinkers (61%) reported at least one heavy drinking episode in the past 30 days. Considering the full sample, including abstainers, 23% of participants reported heavy episodic drinking. Few studies are available for comparison, however, this estimate is less than the *Brothers y Hermanos* study, which found 40% of Latino MSM respondents in Los Angeles and New York reporting at least one heavy episodic drinking episode in the past three months (Mizuno et al., 2012). Differences between these studies may not be unexpected. In general, Latinos in North Carolina are younger, have immigrated more recently, and are from different regions of Latin America than their peers living in traditional settlement states (Griffith, 2005; Kochlar

et al., 2005). Accordingly, study participants' alcohol use may differ from that of sexual and gender minority Latinos in Los Angeles and New York. Additional research is necessary to understand differences in risky drinking patterns between traditional and non-traditional Latino settlement states.

There was mixed support for our *a priori* hypotheses. As predicted, ethnic discrimination was positively associated with any drinking and with heavy episodic drinking, although the latter relationship depended on level of social support. Notably, at low social support, there was a positive association between ethnic discrimination and heavy episodic drinking, consistent with stress-reactive drinking. At high social support, however, the association was negative, suggesting a protective effect of social support consistent with the stress-buffering hypothesis. Contrary to expectations, sexual orientation discrimination was not associated with any drinking outcome. The lack of an association may be due to response bias. First generation Latino immigrants, particularly those with greater traditional gender attitudes (i.e. *machismo*), may be less likely to disclose sexual orientation discrimination as it could be seen as shameful or stigmatizing. Alternately, participants may not have attributed mistreatment to their sexuality. If so, our measure would not have captured any relationship. Nevertheless, sexual orientation likely remains an important stressor that may be related to alcohol use. In a companion qualitative study, all participants identified being a sexual minority as an important source of stress, and some identified drinking as a coping response to stressors (manuscript in preparation). We recommend further research to understand how sexual orientation and gender identity may produce stress among Latinos, what type of events may be perceived as discrimination, and whether they may be associated with alcohol use.

Further related to sexual orientation, we had hypothesized that internalized negative stereotypes about gay men would produce greater psychological strain and that some sexual minority Latinos would turn to alcohol as a coping response. Conversely, we had presumed that social comfort around gay men and personal comfort with and acceptance of one's same-sex sexual orientation would produce less stress and would require fewer coping responses, thereby having a negative association with drinking. We found no support for the hypothesized relationships. Our null findings may be the result of measurement problems. Although these reflect key constructs in Minority Stress Theory (Meyer, 1995, 2003), they may not be salient for immigrant Latinos or may not have been adequately operationalized. Additional formative research may determine whether a cultural adaptation of Minority Stress Theory for sexual minority Latinos is warranted.

As expected, social support was negatively associated with any drinking. It also moderated the relationships of English use and ethnic discrimination with heavy episodic drinking. Probing the interactions we discovered antagonistic relationships (i.e., simple slopes changed directions at different levels of social support). Findings for ethnic discrimination were largely as expected based on stress-reactive drinking and stress-buffering hypotheses. At high social support, the negative association between ethnic discrimination and heavy drinking may be due to the availability of additional supportive resources for coping with stressors. Conversely, at low social support, the positive association may be due to the dearth of interpersonal relationships and their attendant supportive functions, resulting in

greater likelihood of coping by heavy drinking. The higher simple intercept at high social support versus low social support may reflect the social nature of drinking. In the absence of ethnic discrimination, a person may be less likely to drink heavily if he has few drinking companions.

Findings for English use challenged our assumptions. Consistent with a recent study of Latinos in North Carolina in which language barriers were strongly associated with heavy drinking (Ornelas et al., 2011), we had predicted that English use would be negatively associated with drinking. We assumed that greater English use would facilitate navigating daily life in the US, thereby producing less stress, which in turn would be associated with less drinking. At one standard deviation below the group mean, however, English use was positively associated with heavy episodic drinking. This may reflect an unexpected source of stress. With greater English use, participants may have greater opportunities for social interactions with non-Latinos. This may expose them to greater experiences of discrimination, thereby producing higher stress and leading to greater drinking.

Greater English use may also reflect integration into American society and adoption of Anglo-American drinking norms. English use has been widely used as a proxy measure of acculturation, yet there is little consensus about its relationship with alcohol use. It deserves further exploration as the literature is replete with inconsistent findings. One of the earliest investigations of alcohol use among immigrant Latinos found a positive association between any drinking and a composite measure of preferred language, ethnicity of friends and other social contacts, and endorsement of traditional Latino cultural values (Caetano, 1987). Later research with Latino men, however, found no association between alcohol use and a similar measure of preferred language, ethnic identification, and nativity (Markides, Ray, Stroupbenham, & Trevino, 1990), a positive relationship between alcohol use and English language preference and US nativity (Neff & Hoppe, 1992), and a negative relationship between alcohol use and greater English language use (Karriker-Jaffe & Zemore, 2009). We recommend additional research to understand the role of English use and its association with social support and drinking behaviors, particularly among Latinos in non-traditional settlement states.

Potential Limitations

Several methodological limitations must be considered. First, the data were collected in a cross-sectional survey, thereby precluding any causal inferences. Nevertheless, these findings provide useful information because association is a necessary condition to establish causation. Second, the parent study utilized respondent-driven sampling (RDS), a non-probabilistic sampling method designed to reach hidden or hard-to-reach populations. RDS methods introduce bias, but by applying post-hoc sampling weights in the regression analyses we reduced bias associated with the sampling method and arrived at generalizable estimates. Third, the sample size for analysis was modest and may have reduced the statistical power of the regression models. This was particularly apparent in the wide confidence intervals around some point estimates. Recognizing the potential limitation, we used multiple imputation to replace missing observations, thus ensuring use all possible information. Larger samples in future research, however, will provide more precise

parameter estimates. Finally, we recognize the possibility of modeling errors, specifically omitted variable bias. Our analysis was constrained by the variables assessed in the parent study, which had not sought to investigate alcohol use. Thus, models may have omitted salient predictors or covariates, such as drinking behavior in the country of origin. Such omissions may lead to incorrect inferences about various relationships with alcohol use.

Conclusion

These findings address a gap in the empirical literature about drinking patterns among sexual and gender minority Latinos in non-traditional settlement states. Although a large proportion of our sample abstained from alcohol, the majority of current drinkers reported at least one heavy episodic drinking episode in the past 30 days, indicating that immigrant sexual and gender minority Latinos should constitute a priority population for alcohol risk-reduction interventions. Our study identified several modifiable factors associated with drinking, including social support, English use, and ethnic discrimination. These variables may be amenable to community and policy level interventions, such as efforts to bolster social support within the Latino community, to ensure bilingual public services (already mandated by Title VI of the Civil Rights Act of 1964), and to reduce discrimination towards Latinos in the general population. This study also identified gaps in knowledge, which may form the basis of a research agenda. Further investigation of drinking patterns, including correlates of risky drinking, may extend our knowledge and lead to more effective interventions. We encourage further research to clarify the most salient stressors for the study population and how they may relate to alcohol use. Comparisons with sexual and gender minority Latinos in traditional settlement states, in particular, may identify contextual factors that contribute to alcohol-related risk. Finally, based on our experiences with community-academic partnerships, we encourage participatory research approaches that involve sexual and gender minority Latinos.

Acknowledgments

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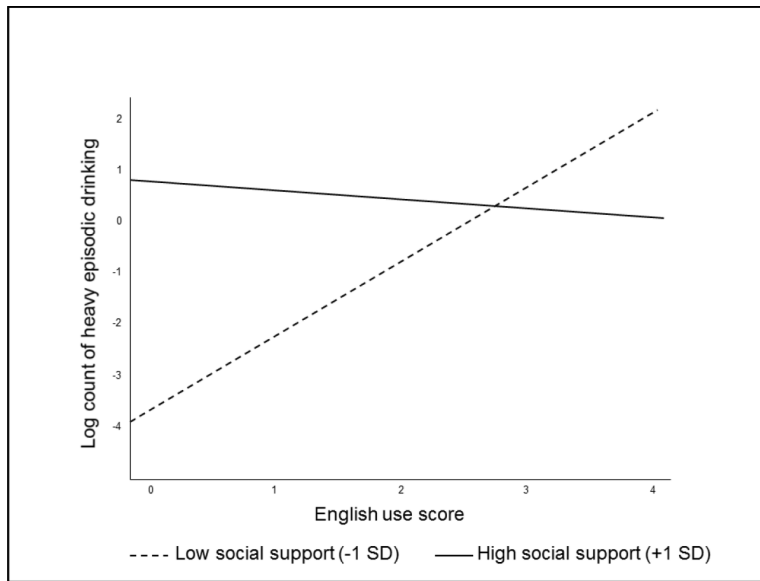
Figure 1.
Conditional Effect of English Use on Log-Count of Heavy Episodic Drinking Episodes in Past 30 Days
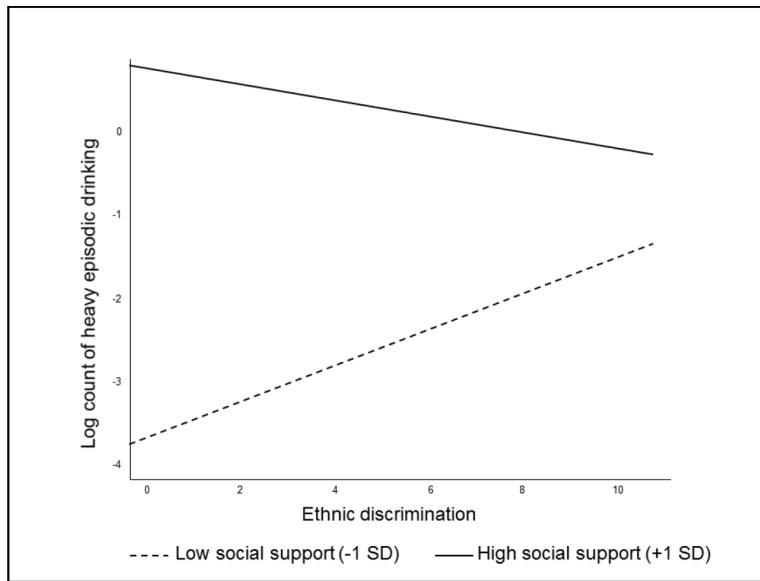
Figure 2.
Conditional Effect of Ethnic Discrimination on Log-Count of Heavy Episodic Drinking
Episodes in Past 30 Days

Table 1

Final Logistic Model of Drinking Status (Any vs. None) among Immigrant Sexual and Gender Minority Latinos (n=190)

Variable	aOR	(95% CI)	*p*-value
Ethnic discrimination	1.232	(1.09, 1.39)	<0.001
Internalized negative stereotypes	0.900	(0.71, 1.15)	0.39
Social support	0.492	(0.28, 0.86)	0.01
Age	0.982	(0.93, 1.04)	0.55
High school diploma, GED, or higher	0.636	(0.27, 1.52)	0.31

aOR = adjusted odds ratio

95% CI = 95% confidence interval

GED = General Education Development test

Table 2

Final Poisson Model of Heavy Episodic Drinking among Immigrant Sexual and Gender Minority Latinos Who Are Current Drinkers (n=90)

Variable	aIRR	(95% CI)	*p*-value
Migration as an adult	1.24	(1.05, 2.29)	0.50
English use	1.68	(1.08, 2.60)	0.02
Ethnic discrimination	1.04	(0.95, 1.14)	0.41
Social support	54.96	(0.81, 452.32)	<0.001
English use*social support	0.23	(0.10, 0.54)	<0.001
Ethnic discrimination*social support	0.75	(0.66, 0.87)	<0.001
Dating, partnered, or married	0.54	(0.32, 0.92)	0.02

aIRR = adjusted incident rate ratio

95% CI = 95% confidence interval