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Factors Explaining Variation in Alcohol Use Disorder Prevalence across Border and Non-border Communities in Texas

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Abstract

Background—U.S. border populations have been found to be at high risk for alcohol problems. However, results from the U.S.-Mexico Study on Alcohol and Related Conditions (UMSARC) revealed surprisingly large variation in alcohol outcomes even *among* Texas border sites, with alcohol use disorder (AUD) prevalence ~1.5–1.6 times greater in the border city of Laredo compared to both San Antonio and the border site of McAllen/Brownsville. Because a better understanding of this variation is important to identifying environmental influences on AUD, we developed and tested a conceptual model addressing variation in AUD prevalence across Texas UMSARC sites.

Methods—Surveys involved in-person, household interviews with Mexican-origin residents of the Texas border cities Laredo (n=751) and McAllen/Brownsville (n=814), with San Antonio as an off-border comparison (n=771). Interviews assessed past-year DSM-5 AUD; past-year heavy drinking; coping and enhancement motives; and seven indicators of substance use climate and stress exposure hypothesized to mediate site effects. Analyses, conducted separately by gender, included regressions and structural equation modeling with mplus.

Results—Preliminary analyses revealed that site effects on AUD prevalence were, unexpectedly, exclusive to men, and that Laredan men were similar to McAllen/Brownsville men on demographics, acculturation, and cross-border mobility. However, sites differed dramatically on most of the hypothesized risk factors. Structural equation models confirmed that site effects on AUD were partially mediated via effects of site on indicators of a permissive climate (i.e., permissive drinking norms, high drug availability) and stress exposures (i.e., high exposure to violence/crime, low family support), and via downstream effects on drinking motives and heavy drinking.

Conclusions—Findings of very high rates of past-12-month AUD among Laredan men (35%) suggest the possibility of significant heterogeneity even within demographically similar border areas and underline the need for additional study of the border region. Findings regarding our conceptual model suggest that this model may constitute a useful initial framework for future research on alcohol problems at the border. However, additional research using representative

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samples is needed to confirm and expand this model to comprehensively address relevant individual and community factors.

Keywords

alcohol dependence; Latino; Hispanic; immigration; disparities

Introduction

Stretching approximately 2,000 miles, the U.S.-Mexico border has been defined by the U.S.-Mexico Border Health Association as the 25 counties touching the border across four U.S. states, along with the 39 municipalities touching the border across 6 Mexican states (Driessen and de Cosío, 1995). More than 14.6 million people live in the border area, about half in each country, and at current growth rates the combined population of border counties and municipalities will reach 29 million in 2045 (Lee et al., 2013). In the U.S., rates of poverty and unemployment are exceptionally high in the border region, which includes some of the poorest counties in the nation (Lee et al., 2013; U.S. Census Bureau, 2013). Nevertheless, due to economic conditions in Mexico, U.S. metropolitan border areas have become destinations for many Mexicans hoping to obtain employment (Ward, 1999). Consequently, upwards of 30% of Mexican immigrants to the U.S. come from border areas in Mexico (Marcelli and Cornelius, 2001), and many Mexican immigrants reside at least temporarily in the U.S. border area, which is home to the heaviest concentration of Mexican-origin individuals in the U.S. (Koerber, 2007). Thus, the border is (at least a temporary) home to many Mexicans immigrants, with potentially long-lasting effects on health behaviors and outcomes.

The borderlands have been the focus of substantial recent media attention due to elevated drug trafficking and drug-related violence, and remain an area of high policy and legal tension (Ramirez et al., 2013). Until recently, however, large-scale, epidemiological studies focusing on alcohol and drugs have been lacking. Nevertheless, two parallel, epidemiological surveys of the U.S. border were conducted by the University of Texas in 1996 and 2002–3. Comparing border residents to other Texans, the 2002–3 study reported higher rates of alcohol abuse, alcohol dependence, and drug problems on (vs. off) the border, despite equivalent or lower levels of alcohol and drug use (Wallisch and Spence, 2006). Results also revealed *increasing* alcohol and drug problems at some border sites between 1996 and 2003 (Spence and Wallisch, 2007), suggesting a need for greater monitoring of substance use problems in border communities.

More recently, our team initiated a study of Mexican-origin border residents (the 2011–13 U.S.-Mexico Study of Alcohol and Related Conditions, or UMSARC) that, like prior studies, sampled Texas, but unlike those studies, also sampled on- and off-border locations in Mexico. This large-scale epidemiological study involved household surveys with 2,336 Mexican Americans in Texas (sampling San Antonio and border sites Laredo and McAllen/Brownsville) and 2,460 Mexicans in Nuevo Leon and Tamaulipas (sampling Monterrey and border sites Nuevo Laredo and Reynosa/Matamoros). Recent UMSARC analyses have shown marginally higher rates of alcohol use disorders (AUD's) among current drinkers on

(vs. off) the U.S. border (Cherpitel, 2015a). Higher rates of AUD for border (vs. off-border) residents have likewise been reported by Caetano and team in another large border study, particularly for younger respondents (aged 18–29) and females (Caetano et al., 2013). Unexpectedly, UMSARC analyses also showed large variation in AUD risk among seemingly comparable border sites: In Laredo, rates of AUD were ~1.5–1.6 times those in both McAllen/Brownsville and San Antonio (Cherpitel et al., 2015a). This suggests the possibility of significant heterogeneity within the border region, contradicting previous understandings of the border as a uniformly high-risk area.

Mechanisms underlying the elevated substance use problems in (at least some) border areas remain largely unknown. An analysis of Caetano and team's data suggested that elevations in *acute* alcohol problems among young border (vs. off-border) resident were attributable to increased bar attendance among these residents (Mills et al., 2014). Nevertheless, reports on these data have not addressed mechanisms driving differences in rates of *AUD's* on and off the border.

Accordingly, the current study aimed to develop and test an innovative conceptual model relating UMSARC study site to AUD prevalence. We developed a novel model given the absence of existing models relating to AUD risk in the border region. Nevertheless, our model was informed by Valdez' (1993) theoretical work on drug use among border populations (which highlights roles for cultural permissiveness, the drug trade, rampant crime, and poverty and unemployment in drug use at the border) and Rhodes's (2005) social-structural model of HIV risk among injecting drug users (suggesting roles for law enforcement practices, social norms, and social network support, among other factors, in drug use among vulnerable populations). Our model integrates a stress-and-coping perspective (Pearlin et al., 1981) with the recognition that a permissive climate regarding alcohol and drug use may exacerbate heavy drinking in certain border locations.

We specifically suggest roles for *three indicators of a permissive climate*, most previously associated with problem drinking: permissive drinking norms (Elder et al., 2000; Lindenberg et al., 1999), high drug availability, (Elder et al., 2000; Lindenberg et al., 1999), and lax enforcement of alcohol- and drug-related laws (Lippman-Kreda et al., 2009; Paschall et al., 2012). The model further identifies *three border stressors* that may contribute to elevations in AUD, each again having been associated with problem drinking: exposure to violence/crime (Kilpatrick et al., 1997; Lown and Vega, 2001), the erosion of social bonds/support (Lindenberg et al., 1999; Loury et al., 2011), and low socioeconomic status (SES), particularly unemployment (Dooley and Prause, 1998). Because bar attendance was not assessed, we could not incorporate this variable. All variables were measured at the individual level (i.e., environmental exposures were operationalized as respondent perceptions of the same). We hypothesized that variation across site in AUD prevalence would be at least partially explained via associations between study site and the above risk factors (i.e., indicators of a permissive climate and stressors) and via their downstream effects on drinking motives. Indicators of a permissive climate were expected to directly predict enhancement motives for drinking, and stressors to predict coping motives; in turn, drinking motives were expected to predict heavy drinking and thus AUD, with coping motives additionally showing a direct effect on AUD (Windle and Windle, 2015; Zemore et

al., 2015) (see Figure 1). Because prior findings suggest that associations between border residence and alcohol outcomes may vary by gender (Caetano et al., 2013), preliminary analyses investigated gender differences in associations between site and AUD prevalence.

Materials and Methods

Survey Design

The current analysis uses U.S. UMSARC data only. UMSARC methods involved in-person interviews with Mexican-origin respondents in two pairs of sister metropolitan areas (“sister cities”) at the Texas-Mexico border and one adjacent *non-border* metropolitan area on each side of the border (N=4,796). On the U.S. side, sampling was carried out in the Texas border cities of Laredo (n=751) and McAllen/Brownsville (n=814), and in one off-border comparison site, San Antonio (n=771). Texas was selected for U.S. sampling as it is the largest U.S. border state and because a single-state focus limits heterogeneity in the geographic, cultural, and sociopolitical factors that might affect alcohol use and problems. Our sister city pairs were selected because (on the U.S. side) they comprise a large proportion of the Mexican-origin individuals living in border counties, and because (for both sides) both sister cities are within 150 to 250 miles of a large off-border city, itself connected to these border areas by a major transportation corridor, ensuring comparability. Both Laredo and McAllen/Brownsville are medium-size metropolitan areas, and both are connected via multiple international bridges to their respective Mexican sister cities. Both are predominantly Mexican-origin (78–87%), and are located in the top three poorest counties in the U.S. (U.S. Census Bureau, 2013).

During 2011–13, household in-person interviews were conducted in the U.S. by the Public Policy Institute (PPRI) at Texas A&M University using multistage area-probability sampling with stratification by city. In the U.S., primary sampling units (PSU’s) were defined as census block groups with 70% Latino population; blocks served as the secondary sampling units (SSU’s). Three households per SSU (9 per PSU) were randomly selected and screened for eligible residents (i.e., aged 18–65, Mexican-origin). Eligible residents were then enumerated and a respondent selected using the last-birthday technique. To minimize confounding of the timing of data collection and geographic location, data collection was staggered so that each off-border location was sampled in two temporally distinct stages. Interviews were conducted by extensively trained interviewers in English and Spanish, and lasted ~45 minutes. On the U.S. side, the combined cooperation rate was 84% (with a 53% overall response rate; 53% for San Antonio, 66% for Laredo, and 45% for McAllen/Brownsville), AAPOR version 4 (The American Association for Public Opinion Research, 2011). For more, see Cherpitel et al. (2015a).

Measures

Indicators of a permissive climate—Perceived drinking norms were assessed using a 4-item scale adapted from Baer et al. (1991). Items ask respondents to judge the opinions of important people in their lives regarding (for the respondent) acceptable overall drinking frequency and acceptable drinking quantity on 3 occasions: a special occasion, an ordinary occasion, and if planning to drive ($\alpha=.76$). **Perceived drug availability** was

assessed with a 2-item scale asking whether the respondent had been approached by someone wishing to sell drugs in the past 30 days, and whether the respondent had seen drug deals in the past 12 months (Pearson $r=.37$). **Perceived enforcement of alcohol- and drug-related laws** was assessed using a 4-item scale adapted from the Community Trials and prevention projects at the Prevention Research Center, Oakland (Holder et al., 2000; Treno and Holder, 1997). Items assessed perceived police enforcement of laws related to loud parties, underage alcohol purchases, driving while intoxicated, and dealing drugs ($\alpha=.67$).

Stressors—Exposure to violence/crime was measured using a 7-item scale (Martinez and Richters, 1993; Richters and Martinez, 1992). Respondents were asked if they had heard gun shots, seen somebody beaten up, seen somebody stabbed, seen somebody shot, seen someone pull a gun on someone else, seen violence related to drug dealing/gangs, and seen somebody arrested in the prior 12 months. Although the original scale includes an eighth item on witnessing drug deals, this item was used to separately assess drug availability (see above; 7-item $\alpha=.71$). **Social support** was measured using the widely used and well-validated Multidimensional Scale of Perceived Social Support (MSPSS) (Zimet et al., 1988), which separately measures support from a significant other, family, and friends with 4 items each ($\alpha's=.90-.93$). Measures of **socioeconomic status** included income, education, and employment status.

Psychological mediators—To assess **drinking motives**, surveys included Cooper's (1994) Coping and Enhancement Motives subscales (at 5 items each). Items assess drinking for mood regulation and tension reduction (Coping), and for the feelings and excitement alcohol can engender (Enhancement). Research substantiates the scale's factor structure and factor invariance across gender, race, and age. Coping and Enhancement subscale were our focus because they both strongly predict heavy drinking and drinking problems (Cooper, 1994) ($\alpha's=.88$).

Alcohol outcomes—Four measures were used to assess **heavy drinking**. First, total alcohol volume in the past 12 months was obtained using an adaptation of the Knupfer series (Room, 1990), which solicits typical drinking frequency and number of drinks per occasion for each beverage type: Responses are summed across beverages. Surveys also solicited frequency of drinking 12+, 8–11, and 5–7 drinks/day in the past 12 months using a 7-point scale ranging from never to every day/almost every day (Greenfield et al., 2006). Surveys incorporated the NESARC's flashcard methodology for measuring drink alcohol content. Total volume was log-transformed and indicators of high-volume drinking were dichotomized or trichotomized (based on preliminary analyses). **Alcohol use disorders (AUD's)** in the past 12 months were assessed using an adaptation of the Alcohol Section of the CIDI (World Health Organization, 1993): 18 items addressed the 11 criteria for a DSM-5 AUD diagnosis (American Psychiatric Association, 2013). Items were a subset of CIDI items selected to address each of the DSM-5 criteria. The DSM-5 assumes a single, unidimensional construct, with scores 2 positive for AUD; 2–3 symptoms indicate mild, 4–5 moderate, and 6+ severe AUD.

Additional variables—Basic demographic variables included gender, age, and marital status. Acculturation measures included nativity (U.S.- or foreign-born), interview language, and English and Spanish proficiency assessed using the Multidimensional Acculturation Scale II (MAS=II) (Rodriguez et al., 2007). Prior research has confirmed the 4-factor structure of the MAS-II (α 's=.78–.93) and shown expected correlations with birthplace, importance of family, and psychological well-being (Rodriguez et al., 2007). Finally, given associations between high cross-border mobility and worse alcohol and drug problems (Cherpitel et al., 2015b), we examined frequency of visits to Mexico both in the lifetime and past 12 months.

Analysis

Summary scores for multi-item scales were created by averaging across items. Core analyses then involved testing bivariate associations between study site and past-12-month AUD, separately by gender; to confirm gender differences, we also tested the interaction between gender and site in predicting AUD. Next, to contextualize site effects, we explored associations between study site and demographic and sociocultural characteristics. Analyses targeted standard demographics as well as potential confounds of associations between site and past-12-month AUD prevalence (i.e., acculturation-related variables, cross-border mobility). Indicators of socioeconomic disadvantage were included in these analyses. We then tested bivariate associations between study site and the remaining proposed risk factors, as well as between risk factors and heavy drinking and AUD. Finally, we tested our overall conceptual model using a structural equation modelling (SEM) approach. All variables were treated as manifest variables except for heavy drinking, which was treated as a latent variable with total volume and high-volume drinking items as indicators. Modifications to the initial model were informed by preliminary analyses; model fit statistics; modification indices; theory; and plausibility (Byrne et al., 1989). Because our main outcome (past-12-month AUD) was dichotomous (2+ symptoms vs. none), we used robust weighted least squares (WLSMV) estimation. Statistical mediation was tested using *mplus*' "model indirect" command syntax; $p<.05$ was used throughout to establish significance.

Data were weighted to reflect the multistage clustered sampling design and to adjust the sample to the census distribution for each site on education, age, and gender. All analyses, with the exception of the SEM, were conducted using Stata (Stata Corp., 2009); the SEM was implemented in *mplus*, version 7 (Muthen and Muthen, 2013). All analyses accounted for the complex survey design, including both data weighting and clustering.

Results

Figures 2 and 3 display associations between study site and prevalence of past-12-month AUD within gender. Results suggest quite different findings for site across genders. Among men, AUD prevalence differed substantially between Laredo and San Antonio, with Laredans showing 1.8 times the prevalence of any AUD and 2.4 times the prevalence of severe AUD's (vs. San Antonio). Rates of AUD among men were equivalent between McAllen/Brownsville and San Antonio. Women, by contrast, showed equivalent rates of AUD regardless of study site, with estimates showing no indication of elevations in Laredo.

Confirming these gender differences, a logistic regression predicting past-12-month AUD from gender, site, and their interaction revealed a significant interaction effect ($p < .05$; not shown). Because differences across site were limited to men, subsequent tables and figures focus on men. A causal chain analysis examining the lack of association between site and AUD prevalence among women is presented in the Discussion.

Table 1 shows associations between study site and demographic and sociocultural characteristics among men. Contrary to expectations, Laredans were *not* lower on socioeconomic status than San Antonians: Conversely, they were significantly higher on income, more likely to be employed, and more likely to be college graduates. Compared to San Antonians, Laredans were also more likely to prefer a Spanish interview, and showed higher Spanish fluency and lower English fluency. Last, Laredans reported higher cross-border mobility than those from San Antonio. McAllen/Brownsville respondents resembled Laredans in many respects. Like Laredans, they were more likely than San Antonians to be employed and college graduates. McAllen/Brownsville was also similar to Laredo (and different from San Antonio) on nativity, language, and cross-border mobility. This suggests that Laredo was not distinctive among the border sites on demographic or sociocultural variables likely to explain the concentration of alcohol problems there.

We now examine overall variation in the remaining risk factors (excepting SES) across sites, again targeting men. As Table 2 shows, results are consistent with predictions for most of the risk factors. Namely, Laredans reported significantly more permissive drinking norms, greater drug availability, and greater exposure to violence/crime, vs. San Antonians; they were also lower on significant other and family support, both being protective factors. However, they did not differ on perceived law enforcement, and were unexpectedly higher on friend support. By contrast, McAllen/Brownsville residents showed a pattern of overall lower risk, despite being statistically equivalent to San Antonians on significant other and friend support and lower on perceived law enforcement.

Table 3 provides detail on the specific items relating to drug availability and exposure to violence/crime, which were especially elevated among men in Laredo. The extremely high rates of encounters with drug dealers and witnessing of quite violent crimes (e.g., seeing someone beaten up, seeing violence related to drug dealing/gangs) in Laredo are notable.

A last set of preliminary analyses (not shown) were linear and logistic regressions testing associations between our hypothesized risk factors and past-12-month heavy drinking and AUD, again with men only. As expected, analyses revealed significant associations between all risk factors and both heavy drinking and AUD, with two exceptions. One, indicators of socioeconomic status (i.e., income, employment status, and education) were unrelated to alcohol outcomes, excepting greater odds of AUD for those with some college (vs. less than high school) and greater and lower odds (respectively) of heavy drinking for those earning \$15–30,000/year and \$60,000 plus a year (vs. less than \$15,000/year). Second, perceived enforcement of alcohol- and drug-related laws was unrelated to alcohol outcomes (both p 's $> .10$). Both heavy drinking and AUD were significantly associated with permissive drinking norms, drug availability, and exposure to violence/crime (positively), along with all

three forms of social support (negatively), though more weakly for friend and significant other support (all p 's<.05).

Finally, we developed a structural equation model relating study site to past-12-month heavy drinking and AUD via risk factors and drinking motives. This analysis, conducted on men, included only current (past-12-month) drinkers, as drinking motives questions are not applicable to nondrinkers. We excluded socioeconomic factors and perceived law enforcement from the model, as these factors did not differ by site in the expected ways or strongly predict alcohol outcomes. We also omitted friend and significant other support, which were weak predictors of alcohol outcomes and added little to prediction of the same when family support was accounted for (not shown).

Figure 4 shows the final model adjusting for demographic variables (trimming nonsignificant covariates). This model achieved acceptable model fit (see legend), and results overall support the hypothesized model whereby site effects on AUD are mediated by indicators of a permissive climate (i.e., drinking norms, drug availability) as well as stressors at the border (i.e., exposure to violence/crime, low social support), themselves related to drinking motives and heavy drinking. As expected, indicators of a permissive climate were associated (exclusively) with enhancement motives, whereas stressors were associated (exclusively) with coping motives; further, coping motives showed the predicted direct effect on AUD independent of heavy drinking. Figure 4 also shows three unexpected pathways, including reciprocal pathways between coping motives and enhancement motives as well as a direct effect of family support on heavy drinking. Notably, the effect of coping motives on heavy drinking was negative, but this effect should be interpreted quite cautiously as the bivariate effect was positive. Tests of the significance of indirect pathways (conducted using *mplus*' VIA command language) produced significant indirect effects for residing in Laredo (vs. San Antonio) on AUD via higher drug availability ($p<.05$), higher exposure to violence/crime ($p<.05$), and lower family support ($p<.01$); there were significant indirect effects for residing in McAllen/Brownsville (vs. San Antonio) on AUD via less permissive drinking norms ($p<.05$), lower drug availability (though marginally, $p=.05$), and lower exposure to violence/crime ($p<.05$). These findings support mediational roles for all four risk factors. The adjusted model explained 62% of the variance in past-12-month AUD.

Discussion

Results Overview

While the U.S.-Mexico Study of Alcohol and Related Conditions (UMSARC) is not a probabilistic sample of the entire border region, it does offer a historically rare and perhaps unique opportunity to study variation in alcohol use disorders (AUD's) across two seemingly comparable sites within the Texas border region: Laredo and McAllen/Brownsville. The collection of exceptionally large samples from these two sites, combined with the strong battery of individual-level measures, enables rich, comparative study of these communities. Results from the current analysis confirmed elevated rates of past-12-month AUD's in Laredo, but not McAllen/Brownsville (vs. San Antonio)—though only for men; among women, past-12-month AUD prevalence did not differ by site. We also found that male residents of Laredo and McAllen/Brownsville differed in their exposure to risk factors

previously thought to characterize border populations generally, and that associations between site and past-12-month AUD prevalence were at least partially explained by this variation. Specifically, study site among men was related to both indicators of a permissive climate and stressors (i.e., permissive drinking norms, high drug availability, exposure to violence/crime, and low family support), and these factors were themselves related to drinking motives and thus heavy drinking and AUD. Tests of the significance of indirect pathways in our model supported specific indirect effects involving drug availability and exposure to violence/crime for both Laredo and McAllen-Brownsville; lower family support was also implicated for Laredo, and less permissive drinking norms implicated for McAllen/Brownsville.

These results, though preliminary (given study limitations, below) are important because they highlight substantial heterogeneity in drinking patterns and consequences between seemingly homogeneous border cities, which points to the need for further examination of the border region. Results are also important because they point to factors that may help drive the elevated rates of AUD reported for Laredo. Results suggest specific roles for both a permissive culture and stresses of living at the border among Laredan men. Notably, our adjusted model explained over half the variance in past-12-month AUD among men, and pathways were robust to the inclusion of demographic covariates. Drinking motives were powerfully related to heavy drinking and AUD in this model, consistent with research demonstrating a strong role for drinking motives in alcohol consumption and problems, particularly for drinking to cope (Greenfield et al., 2009; Kail et al., 2000; Novak et al., 2003). Some (older) studies have found that coping motives are more common among Mexican-origin individuals than Anglos, particularly for those low on acculturation (Caetano and Mora, 1990; Neff et al., 1987), suggesting that coping motives may be especially important among border populations.

Results did not support expectations that socioeconomic disadvantage would relate to site differences in alcohol problems at the border. Rather, income, employment status, and education were only weakly and inconsistently related to heavy drinking and odds of an AUD in the past 12 months for both men and women. This may suggest that socioeconomic disadvantage is not a key contributor to alcohol problems along the border. Further, perceived enforcement of alcohol- and drug-related laws was not related to site or to alcohol outcomes as expected. Measurement limitations may be at least partly responsible. Residents' awareness of the enforcement of alcohol- and drug-related laws may well be poor, especially if they have not themselves broken laws, and may be biased upward where problem rates are greater, since law enforcement should become more visible under those conditions.

It is also worth noting that, when examining *lifetime* (vs. 12-month) AUD prevalence among men, results differ: rates are highest in San Antonio (54%), followed by Laredo (49%) and McAllen/Brownsville (42%) (results not shown). This may imply that elevations in past-12-month AUD among Laredan men are a contemporary phenomenon, and that alcohol problems along the border are prone to change (Maxwell et al., 2006).

Resistance to Risk among Women in our Sample

Contrasting with the men, women in our sample were surprisingly resistant to developing AUD's regardless of study site. Across sites, past-12-month prevalence rates were <10.2% for any AUD and <1.8% for severe AUD. Interestingly, all studied risk factors were significantly associated with both heavy drinking and past-12-month AUD among women, like they were among men, again excepting socioeconomic disadvantage and perceived law enforcement, as well as friend support (results not shown). However, site was not related to these risk factors in the same way across genders. Among women, Laredo was statistically equivalent to San Antonio on all studied risk factors, except that family and friend support were higher; McAllen/Brownsville residents showed somewhat less permissive norms, lower drug availability, and greater family support than San Antonians.

These results may suggest that conservative cultural norms help protect some Mexican American women from exposure to risk factors that encourage alcohol problems. That is, norms proscribing drinking and encouraging women to care for family and home may make it less likely that women are exposed to environments promoting heavier drinking and more likely that they prefer to limit drinking. This could be increasingly true for Mexican American women as they transition out of young adulthood and gradually take on caretaking roles. Disaggregated tests of women by age support this reasoning: Though site was unrelated to permissive drinking norms, drug availability, and exposure to crime/violence among women overall, site was significantly associated with all three outcomes among women aged 18–29 (all p 's<.01), with estimates suggesting the highest levels for Laredo, followed by San Antonio and last McAllen/Brownsville. Complete tests of gender-by-age interactions are not supported by the limited power in our sample, however.

Study Limitations and Broader Implications

Limitations associated with the current study suggest the need to interpret the above results cautiously. First, UMSARC surveys were conducted in only select on- and off-border locations in Texas. Consequently, the extent of heterogeneity in alcohol and drug outcomes in the border region broadly cannot be determined from the current data. Indeed, it may be that Laredo is one of only a very few urban areas where alcohol problems are significantly elevated, and/or that McAllen/Brownsville has an exceptionally low risk profile within the border region. It is similarly unclear whether results regarding the specific risk factors investigated here generalize to the entire border region. Studies sampling a broader range of communities are needed to describe the distribution of alcohol-related problems throughout the border region and to confirm or reject roles for the risk factors studied here. Second, the study's cross-sectional design precludes temporal lagging of variables, so we are not able to definitively establish causal connections between risk factors and AUD. This limitation highlights the value of future studies adopting longitudinal designs. Third, the current study was limited to variables measured at the individual level. Thus, we cannot know whether results for perceived law enforcement and perceived drug availability would replicate with more objective indicators. Relatedly, we were not able to address numerous neighborhood-level factors that may be important and may confound the relationships examined here, such as neighborhood alcohol outlet density, socioeconomic disadvantage, and social capital. Similarly, we were not able to address potential influences originating from Mexico on AUD

risk. Alcohol-related policies and practices south of the border could also contribute to the observed differences between border sites. Plans are thus in place to geocode the data and to address how the current model might be extended to incorporate both neighborhood-level factors and characteristics of bordering Mexican regions. Fourth, the current study did not assess bar attendance, which was an important mediator in prior work addressing border effects on *acute* alcohol problems (Mills et al., 2014). It seems unlikely that bar attendance fully explains the relationships under study, as bar attendance was not shown to mediate effects of border residence on AUD prevalence in that work. Still, drinking in public spaces generally could be related to some of the factors examined here (e.g., could make it more likely that residents observe drug deals and other crimes), and hence may confound associations with AUD.

It would also be valuable to follow up on findings from the current study suggesting an unexpectedly lower psychosocial risk profile in McAllen/Brownsville than San Antonio, with the former showing less permissive norms, drug availability, and exposure to violence/crime, but higher family support. The question of what protects certain border communities from risk exposure is of great interest also.

In conclusion, the current study constitutes a preliminary step in what we hope will be a long line of research describing the distribution and determinants of alcohol problems in the border region. Our finding of dramatic variation in AUD prevalence even among demographically similar (and economically disadvantaged) border communities constitutes an advance over prior research and signals a need for future studies explicitly designed to establish the extent of heterogeneity within the larger border region. Meanwhile, our conceptual model and findings regarding specific risk factors for AUD should offer a useful *starting point* for future research on elevations in AUD within the border region generally. However, additional research is needed to examine how other factors, and particularly environmental factors, may operate via and alongside the identified individual-level risk factors, and to replicate the current analyses in more representative samples. We hope that future research will ultimately produce a comprehensive model of AUD problems delineating risk and protective factors at both individual and community levels and addressing both national and international influences. Findings for extremely high rates of alcohol problems in Laredo—with over one third of men in Laredo reporting a past-year AUD—reinforce the need for such work, as does the wealth of research suggesting greater prevalence of alcohol and drug problems at the border generally (Caetano et al., 2013; Spence and Wallisch, 2007; Wallisch and Spence, 2006). In the meantime, those aiming to address heavy drinking and alcohol problems along the border should recognize the possibility of great heterogeneity even among seemingly similar border cities.

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Figure 1.
Conceptual model.

Figure 2.

Prevalence rates of alcohol use disorders (AUD's) across sites: Men only (N=1111).

Note: Statistical tests compared overall prevalence of any AUD for Laredo to San Antonio, and McAllen/Brownsville to San Antonio. *** $p < .001$.

Figure 3.

Prevalence rates of alcohol use disorders (AUD's) across sites: Women only (N=1225).

Note: Statistical tests compared overall prevalence of any AUD for Laredo to San Antonio, and McAllen/Brownsville to San Antonio. No significant differences.

Figure 4.

Adjusted Structural Equation Model of Site Effects: Male Current Drinkers Only.

Notes. *** $p<.001$, ** $p<.01$, * $p<.05$. Model fit statistics: $\chi^2(df=118, N=878)=204.2, p<.001$, CFI=.97, TLI=.96, RMSEA=.029 (.022, .035). Each pathway adjusted for age, age-squared, income, employment status, marital status, and acculturation (English proficiency); nonsignificant covariates trimmed. Totvol is total volume in the past year; 5–7, 8–11, and 12+ indicate past-year high-volume drinking.

Table 1

Demographic and sociocultural characteristics of U.S. study sites: Men only.

	San Antonio (N=378)	Laredo (N=353)	McAllen/Brownsville (N=380)
Socioeconomic Variables			
Income			
Less than \$15,000	29.1%	21.3% *	25.5%
\$15,001–\$30,000	23.8%	31.4%	26.9%
\$30,001–\$60,000	30.3%	28.4%	30.3%
\$60,001 plus	16.8%	18.9%	17.3%
Employment			
Employed full-time	51.1%	55.2% **	52.4% **
Employed part-time	13.2%	19.0%	13.9%
Employed seasonally/temp.	2.4%	2.3%	9.2%
Unemployed	14.0%	9.1%	9.7%
Other	19.3%	14.4%	14.7%
Education			
Less than HS diploma	34.4%	37.7% ***	29.8% *
HS diploma	21.4%	22.7%	20.8%
Some college	31.2%	18.1%	26.6%
College degree	13.0%	21.5%	22.7%
Other Demographic Variables			
Age (mean, SE)	38.4 (0.74)	37.5 (0.46)	38.5 (0.71)
Marital status			
Married	34.0%	30.9%	28.2%
Never married	53.1%	56.9%	61.7%
Sep/widowed/divorced	13.0%	12.2%	10.0%
Acculturation and Cross-border Travel			
Foreign-born nativity	27.0%	32.3%	38.0% **
Spanish interview	21.0%	49.0% ***	50.7% ***
English Proficiency score (mean, SE)	4.15 (0.07)	3.83 (0.04) ***	3.83 (0.09) **
Spanish Proficiency score (mean, SE)	3.21 (0.04)	4.04 (0.03) ***	3.84 (0.05) ***
Lifetime travel to Mexico			
Never visited Mexico	15.4%	12.3% ***	3.2% ***
Been to Mexico <100 times	71.9%	32.0%	48.5%
Been to Mexico >100 times	12.7%	55.7%	48.3%
Past-12-month travel to Mexico (any)	11.4%	33.5% ***	40.0% ***

Note: p values indicate comparisons of Laredo to San Antonio, and Mc/Allen Brownsville to San Antonio.

p<.001,**
p<.01,

*
p<.05.

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Table 2

Variation in risk factors across sites: Men Only.

	San Antonio (N=378)	Laredo (N=353)	McAllen/Brownsville (N=380)
Permissive drinking norms (mean, SE)	1.78 (0.04)	1.88 (0.03) *	1.64 (0.03) **
Perceived law enforcement (mean, SE)	3.05 (0.05)	3.08 (0.03)	2.73 (0.06) ***
Perceived drug availability (mean, SE)	0.19 (0.02)	0.27 (0.01) **	0.10 (0.01) ***
Exposure to violence/crime (mean, SE)	0.20 (0.01)	0.26 (0.01) ***	0.11 (0.01) ***
Significant other support (mean, SE)	4.52 (0.04)	4.33 (0.03) **	4.54 (0.04)
Family support (mean, SE)	4.38 (0.04)	4.25 (0.03) *	4.51 (0.04) *
Friend support (mean, SE)	3.83 (0.06)	3.98 (0.03) *	3.83 (0.06)

Note: p values indicate comparisons of Laredo to San Antonio, and Mc/Allen Brownsville to San Antonio.

p<.001,**
p<.01,*
p<.05,†
p<.10.

Table 3

Item analyses of drug availability and violence/crime measures across sites: Men Only.

	San Antonio (N=378)	Laredo (N=353)	Brownsville/McAllen (N=380)
Perceived drug availability			
Approached to sell drug past 30 days	11.6%	21.9% ***	5.5% **
Saw drug deals past 12 mos.	25.9%	31.7%	15.3% ***
Exposure to violence/crime			
Heard gun shots past 12 mos.	56.0%	49.7%	24.8% ***
Saw somebody beaten up past 12 mos.	10.8%	24.4% ***	9.2%
Saw somebody stabbed past 12 mos.	2.1%	5.1% **	1.6%
Saw somebody shot past 12 mos.	2.4%	8.0% **	0.5% **
Saw someone pull a gun on another person past 12 mos.	5.8%	11.9% ***	3.7%
Saw violence related to drug dealing/gangs past 12 mos.	13.3%	22.7% ***	7.9% *
Saw somebody arrested past 12 mos.	49.5%	59.4% **	32.5% ***

Note: p values indicate comparisons of Laredo to San Antonio, and Mc/Allen Brownsville to San Antonio.

p<.001,**
p<.01,*
p<.05.