Neighborhood Context and Drug Use Among Mexican Americans on and off the U.S.–Mexico Border

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ABSTRACT. Objective: Prior research has suggested that drug use rates may be high at the U.S.–Mexico border, but in more recent research rates varied significantly between border communities. This study reports findings on the mediating influence of neighborhood-level variables on the observed difference in past-year drug use rates between two border sites and an interior site, focusing on Mexican Americans. **Method:** Data were analyzed from the U.S.–Mexico Study on Alcohol and Related Conditions (UMSARC) on 1,345 Mexican-origin respondents ages 18–40 from the border sites of Laredo and Brownsville/McAllen compared with the nonborder site of San Antonio, separately for men and women. Neighborhood-level variables (based on census tracts and block groups) included drug availability, neighborhood insecurity, crime victimization, crime witnessing, off-premise alcohol outlet density, on-premise alcohol outlet density, percentage crossing the border more

than 100 times, neighborhood disadvantage, residential stability, and percentage of White/non-Hispanic. **Results:** When individual sociodemographic characteristics were controlled for, lower drug use among men in Brownsville/McAllen (vs. San Antonio) was partially mediated by lower drug availability and lower perceived neighborhood insecurity whereas increased drug use among women in both Laredo and Brownsville/McAllen was partially mediated by the lower proportion of White/non-Hispanic residents compared with San Antonio. **Conclusions:** Neighborhood-level variables partially explain the heterogeneity in drug use across sites at the U.S.–Mexico border, but different factors appear to be operating for men compared with women. These findings suggest the potential importance of addressing neighborhood factors in reducing drug-related harm at the U.S.–Mexico border. (*J. Stud. Alcohol Drugs*, 81, 770–779, 2020)

DRUG USE at the U.S.–Mexico border is an understudied area but one of continuing concern. The U.S.–Mexico border region is home to the highest concentration of Mexican-origin individuals in the United States, who constitute a large and rapidly growing population that has historically shown disproportionately high rates of substance-related problems (Bureau of Transportation Statistics, 2011; Koerber, 2007). Border residents experience very high rates of poverty, low employment, low education, and poor health (Lee et al., 2013; U.S. Census Bureau, 2013), with Texas border counties including some of the poorest in the country (Lee et al., 2013).

Border residents are exposed to rampant crime related to drug trafficking, with some border cities situated on major drug transportation routes (Office of National Drug Control Policy, 2011). Potential stresses related to exposure to drug trafficking and violence might be expected to result in problematic drug use among border residents, although epidemiological research on drug use at the border is limited, with only a small number of population-based studies (Reingle et al., 2014; Wallisch & Spence, 2006). A 2002–2003 Texas border study found that a third of the respondents reported lifetime illicit drug use, and, among those reporting last-year use, 46% reported either drug abuse or dependence

(Wallisch & Spence, 2006). Comparison of the 2002–2003 data with those from a 1996 Texas study (Wallisch, 1998) found lifetime and past-year drug use and problems increased significantly, paralleling the rise in alcohol use and problems during this same time (Wallisch & Spence, 2006). These studies are limited by their age, however, particularly because the border region has been the focus of recent media attention due to drug trafficking and associated violence (Cherpitel et al., 2015a), which may have contributed to temporal shifts in drug use since these earlier studies.

The U.S.–Mexico Study on Alcohol and Related Conditions (UMSARC; Cherpitel et al., 2015a), a general population survey of Mexican-origin residents living in Texas, provides more recent epidemiological data on border communities. Results showed that past-year co-occurrence of heavy drinking (5+ men/4+ women) and drug use was twice as prevalent at the U.S. border (14.7%) than off-border (7.2%). However, drug use was not homogeneous across border sites. This same study found that Laredo residents reported significantly higher rates of past-year drug use (32.8%) and prescription drug misuse (25.4%) than did residents of both Brownsville/McAllen (15.6% and 9.4%, respectively) and San Antonio (17.9% and 9.3%, respectively; Borges et al., 2018). These elevated rates of drug use in Laredo are remarkable given that the two border locations are demographically very similar (Zemore et al., 2016), and they suggest that drug use at the border may be concentrated in certain hotspots and may potentially be explained by unique environmental risk factors.

To date, little research has addressed possible mechanisms that might explain elevations in drug use at specific border locations. Influences that might conceivably account for el-

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evated rates include such neighborhood factors as the level of criminal activity and neighborhood safety, drug availability, density of alcohol outlets, and frequency of border crossings to obtain drugs or for drinking and nightlife. Other factors that may also have a bearing on elevated rates of drug use include the level of disadvantage of the neighborhood, residential instability, and co-ethnic density, although much of the research addressing the prevalence of these risk factors on the border is dated.

In older studies, rates of crime witnessing and violent victimization were found to be high at the border and to contribute to the general perceived safety of the neighborhood (Hendricks, 2007; Robbins, 2005). The Texas border study found a large majority of residents believed that drug trafficking was prevalent and was associated with corruption and crime, and almost half thought their own neighborhood was unsafe (Wallisch, 1998). Another study found that neighborhood safety was protective for both alcohol use disorder and drug use disorder in a Hispanic national sample (Savage & Mezuk, 2014).

Greater drug use has been positively associated with greater perceived drug availability and neighborhood drug trafficking (Freisthler et al., 2005; Lambert et al., 2004). The Texas border study found 82% of respondents agreed there was a lot of drug trafficking in their neighborhood and 57% said it would be easy to obtain drugs (Wallisch, 1998). Higher alcohol outlet density has also been found to be associated with greater alcohol use, leading to a climate of greater permissiveness of both alcohol and other drug use (Gruenewald et al., 1993a, 1993b). Early studies found that, in some border communities, enforcement of alcohol- and drug-related laws was lax (Valdez, 1993; Valdez & Mata, 1999), and alcohol and drugs were highly accessible because of cross-border travel, which offers easy access to cheap alcohol (Baker, 1997; Lange et al., 2002; Power, 1998) and to unregulated prescription medications (Rivera et al., 2009). Previous analysis of the UMSARC found that frequent crossing of the border, especially for obtaining over-the-counter or prescription drugs and for drinking/nightlife, was significantly predictive of co-occurring heavy drinking and drug use (Cherpitel et al., 2015b).

Disadvantaged neighborhoods often have less-protective social environments that fail to control antisocial or illegal behaviors of the residents (Karriker-Jaffe, 2011) as well as diminished physical environments (Latkin & Curry, 2003), both of which can negatively affect health risk behaviors (Latkin et al., 2005). Residential stability has been found to be protective for both physical and mental health (Matthews & Yang, 2010; Yang et al., 2011), and co-ethnic density has been shown to have protective effects on many health outcomes among U.S. Hispanics, including alcohol problems (Bécares et al., 2012; Lee & Liechty, 2015).

The present study is exploratory, capitalizing on our team's rich UMSARC data to investigate neighborhood-level

factors that help explain why certain border communities may be especially vulnerable to drug use. The study compares on- and off-border sites on key neighborhood factors and tests whether any differences in these factors across sites help to mediate differences in drug use. Analyses should inform future research attempting to understand why neighborhoods and communities may differ on drug use and problems, particularly in border states. Ultimately, and pending future research, findings may inform intervention and prevention strategies to reduce drug-related harm in U.S.–Mexico border communities that are most susceptible to drug harms. The UMSARC data are uniquely suitable, among existing data sets, for addressing this aim, providing both rich contextual information as well as individual-level data and thus permitting rigorous control for individual differences. This study focuses on Mexican-origin respondents only, as the UMSARC sampled only this population; however, Mexican-origin respondents comprise very large proportions of the populations of U.S. border states.

We hypothesized that elevated drug use rates observed among Mexican-origin residents in Laredo compared with Brownsville/McAllen and San Antonio would be explained by greater perceived neighborhood insecurity, greater exposure to neighborhood violence and crime, higher neighborhood alcohol and drug availability, and more frequent border crossing in Laredo. We also explored effects for neighborhood disadvantage, residential instability, and racial/ethnic composition, although we did not expect these factors to vary significantly across the two border sites or to explain previously observed site differences. Analyses were performed separately by gender for those ages 18–39, the group most likely to use drugs.

Method

Sample

The study was conducted with Mexican-origin respondents living in the two Texas border metropolitan areas of Laredo (Webb County; $n = 751$) and McAllen/Brownsville (Cameron/Hidalgo Counties; $n = 814$) and the nonborder metropolitan area of San Antonio (Bexar County; $n = 771$). The two border sites comprise a large proportion of the Mexican-origin population living in Texas border counties. Both are a similar distance (150–250 miles) from San Antonio and connected by a major transportation corridor to San Antonio.

Using multistage area-probability sampling (with stratification by city), primary sampling units, defined as census block groups with at least 70% Hispanic population, were identified, with census blocks serving as the secondary sampling unit. Three households per secondary sampling unit were randomly selected and screened for the presence of a Mexican-origin resident between 18 and 65 years of age.

Eligible respondents were enumerated, selecting the resident with the most recent birthday. Each household was visited at least three times on different days of the week and hours of the day.

Those interviewed reflect a combined cooperation rate of 84%, based on households in which enumeration indicated an eligible respondent (i.e., a Mexican American adult age 18–65), and a response rate of 53%, based on the fraction of those households in which enumeration was not conducted, both using Version 4 of the American Association for Public Opinion Research (American Association for Public Opinion Research, 2011).

Interviews

Following informed consent, face-to-face interviews in respondents' homes were conducted using computer-assisted personal interviewing lasting 45 minutes and administered by trained interviewers recruited from the local community and supervised by the Public Policy Research Institute at Texas A&M University. Respondents were given the choice of being interviewed in either English or Spanish and were offered a \$25 gift card as a token of appreciation for their time.

Measures

Drug use during the last year. Any drug use during the last year, the dependent variable, was measured by frequency of use of illicit substances and prescription drugs not used as prescribed, drawn from items used in the 2005 National Alcohol Survey (Greenfield et al., 2006). Prescription drugs included pain relievers, sedatives, stimulants, and other prescription drugs. Illicit drugs included marijuana, cocaine/crack, heroin/opium, methamphetamines, hallucinogens, and other recreational drugs. An indicator of "any drug use" was created for the use of either illicit or prescription drugs.

Individual-level variables. Individual-level variables included employment status (full time, part time/self-employed, other), yearly family income (<\$15,000, \$15,000–30,000, >\$30,000–60,000, >\$60,000), religion (Protestant vs. other), and whether the respondent was foreign-born. Respondents were asked the number of times they had ever crossed the border and, in the past year, the frequency and main reason for crossing (shopping, health or medical care, over-the-counter or prescription drugs, nightlife/drinking, visiting family or friends, work/study/other). Crossing for drugs or nightlife was coded as a dichotomous variable of any crossing versus no crossing.

Neighborhood-level mediators. Survey data were linked with neighborhood-level data at the census tract and block group level. As exact addresses were not available for geocoding, the block group centroid was used as the indicator of residential location. Using survey data from all 2,336 UM-

SARC respondents (including those age 40 and older), four neighborhood-level ecometric measures were constructed, for drug availability, general neighborhood insecurity, crime victimization, and crime witnessing. Specifically, a nonlinear two-level random-intercept model (Raudenbush & Sampson, 1999) was fitted to the items in each domain, and the random effects of neighborhood were estimated as ecometric measures of neighborhood context for each of the 159 census tracts. Calculation of the ecometric measures took into account the individual-level variables above.

Neighborhood ecometric variables. Perceived drug availability was assessed with a two-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. Perceived neighborhood insecurity was measured by two items asking how safe the respondent felt walking alone in his/her neighborhood (Ruston & Akinrodey, 2002). Crime victimization was measured using a five-item scale asking whether the respondent had experienced a theft (car and home), mugging, or physical attack in the past 12 months (Roosa et al., 2010). Crime witnessing was measured using a seven-item scale asking whether the respondent had heard gun shots or had seen someone arrested or violence related to drug dealing or gang warfare in the past 12 months (Hunter et al., 2002). Responses to all items were binary (yes vs. no) except for the general neighborhood insecurity items, which were dichotomized into secure versus insecure from the original four-point Likert scale.

The tract-averaged reliability values of the four ecometric measures (Raudenbush & Sampson, 1999) were drug availability (.62), general neighborhood insecurity (.64), crime victimization (.64), and witnessing crime (.76), with crime victimization being lower in part because of frequencies of crimes included in the measure.

Other neighborhood variables. To maximize variability, the block group centroid ($j = 263$) was used to calculate measures of alcohol availability for each neighborhood. Data on 6,301 businesses with active alcohol licenses located in the three Texas counties were obtained from the Texas Alcohol Beverage Control website. Retail addresses of these establishments were geocoded using ArcGIS software v.10.4.1 (Esri, Redlands, CA). The number of outlets within 1.5 roadway miles of each block group centroid was calculated separately for on-premise outlets (including bars and restaurants; $M = 19.4$, $SD = 15.4$) and off-premise outlets (including liquor stores, convenience stores, and grocery stores; $M = 36.9$, $SD = 24.7$).

Respondent survey data also were linked with data from the 2009–2014 American Community Surveys (U.S. Census Bureau, 2014), using census tract data for three neighborhood demographic characteristics that were controlled for in the mediation models. Neighborhood disadvantage was a composite variable based on the average percent-

age of families that were female headed, percentage of residents with incomes below the federal poverty level, percentage of adults over age 25 without a high school diploma, male unemployment rate (for those age 16 and older), percentage holding blue collar jobs, and percentage of residents without access to a car, which showed high reliability (Cronbach's $\alpha = .77$; $M = 27.0$, $SD = 6.6$). Residential instability was based on the percentage of tract residents who had moved in the past 5 years ($M = 34.5$, $SD = 10.1$). White/non-Hispanic residents was based on the corresponding percentage of tract residents ($M = 6.1$, $SD = 6.0$); between 56% and 99% of neighborhood residents were Hispanic. In addition, based on survey data, the percentage of tract residents who crossed the border more than 100 times in their life for any reason was calculated and used as a neighborhood-level control variable ($M = 39.2$, $SD = .01$). Total crossings were thought to be an indicator of ties to the other side of the border, which may be associated with substance use.

Data analysis

Descriptive statistics for the total younger than age 40 ($N = 1,345$ located in 159 neighborhoods) were calculated for any drug use in the last 12 months, neighborhood-level mediators, and individual characteristics. Gender differences were investigated using regression analysis for continuous variables and cross-tab and chi-square test for binary and categorical variables. Bivariate analysis was conducted for proposed mediators and individual characteristics to explore associations with drug use. The main analysis for drug use was conducted on the whole sample and then on gender-stratified samples. Given that there are just three sites, we only focused on the fixed effects of site and treated site as a characteristic of the neighborhoods (Level 2 variable). Then the indirect effects of site (Laredo vs. San Antonio and Brownsville/McAllen vs. San Antonio) on any drug use through neighborhood-level mediating factors were assessed using a 2-2-1 multilevel mediation model (Krull & MacKinnon, 2001), adjusting for all covariates at the individual and neighborhood level. In this model, the logit link function was specified for the dichotomous outcome variable separately for men and for women, and a generalized structural equation model was estimated. This model simultaneously estimated the associations of each site with the hypothesized neighborhood mediators (Table 2) as well as the associations of the neighborhood mediators and individual-level control variables with the outcome (Table 3). Last, based on maximum likelihood estimation with robust standard errors, the product of coefficients approach via the delta method was used to calculate the standard errors for indirect effect evaluation. Model interpretability and goodness-of-fit tests (Akaike and Bayesian Information Criteria) were also used to guide the final

model selection. Analyses were weighted to reflect multistage clustered sampling design, using Stata Version 15 (StataCorp LP, College Station, TX).

Results

Neighborhood and demographic characteristics

Table 1 shows neighborhood and demographic characteristics for the total sample and separately for men and women younger than age 40. More than one third of men reported drug use in the last year compared with nearly 20% of women. Men reported significantly higher rates of drug use than women across all sites, but both men and women in Laredo reported higher rates than their counterparts in either Brownsville/McAllen or San Antonio. Although illicit drug use was similar across all sites (14.9%–19.1%), the use of prescription drugs not used as prescribed was greater in Laredo (23.0%) than in either Brownsville/McAllen (9.6%) or San Antonio (9.9%) (not shown). Significant differences in employment and income were also seen, with men more likely to be employed and to have a higher income than women.

Controlling for demographic characteristics in Table 1, direct effect models of site on any drug use in the last 12 months (not shown) found that the likelihood of drug use in Laredo was higher than that in San Antonio (odds ratio [OR] = 1.8, $p < .01$), whereas no significant difference was found between Brownsville/McAllen and San Antonio. Men in Laredo were marginally more likely to report drug use than their counterparts in San Antonio (OR = 1.5, $p < .10$), whereas for women those in Laredo were two and a half times more likely to report drug use than those in San Antonio (OR = 2.5, $p < .01$).

Border site differences in neighborhood-level variables

Table 2 shows border site differences in neighborhood variables comparing each border site with San Antonio, controlling for individual-level variables in Table 3. For men, compared with neighborhoods in San Antonio, neighborhoods in Laredo had greater neighborhood disadvantage ($p < .05$), a lower proportion of White/non-Hispanic residents ($p < .01$), and a larger proportion who crossed the border more than 100 times ($p < .01$), whereas neighborhoods in Brownsville/McAllen had lower drug availability, neighborhood insecurity, crime victimization, and crime witnessing (all $ps < .01$) and a larger proportion crossing the border more than 100 times ($p < .01$) than San Antonio. For women, site differences were similar to those for men in both Laredo and Brownsville/McAllen, with the exception of a lower proportion of White/non-Hispanic residents in women's neighborhoods in Brownsville/McAllen ($p < .05$) compared with San Antonio.

TABLE 1. Neighborhood and demographic characteristics of the sample

Variable	All under 40 (<i>N</i> = 1,345)	Men under 40 (<i>n</i> = 667)	Women under 40 (<i>n</i> = 678)
Any drug use in past 12 months, %	25.4	34.2	17.2***
San Antonio	22.5	32.2	12.6***
Laredo	35.2	41.2	29.2*
Brownsville/McAllen	19.1	29.1	10.8***
Neighborhood variables			
Drug availability, <i>M</i> (<i>SD</i>)	-.023 (.02)	.003 (.03)	-.047 (.03)
Neighborhood insecurity, <i>M</i> (<i>SD</i>)	-.072 (.03)	-.075 (.05)	-.069 (.05)
Crime victimization, <i>M</i> (<i>SD</i>)	-.004 (.01)	-.002 (.01)	-.007 (.01)
Witnessing crime, <i>M</i> (<i>SD</i>)	-.003 (.03)	.039 (.04)	-.042 (.05)
Off-premise alcohol outlet density, <i>M</i> (<i>SD</i>)	32.401 (0.75)	33.554 (1.09)	31.322 (1.03)
On-premise alcohol outlet density, <i>M</i> (<i>SD</i>)	17.060 (0.48)	17.160 (0.69)	16.967 (0.67)
Crossing border >100 times, <i>M</i> % (<i>SD</i>)	.392 (.01)	.379 (.01)	.403 (.01)
Neighborhood disadvantage, <i>M</i> (<i>SD</i>)	26.518 (0.23)	26.299 (0.31)	26.722 (0.33)
Residential instability, <i>M</i> (<i>SD</i>)	34.034 (0.30)	33.678 (0.42)	34.367 (0.43)
White/non-Hispanic, <i>M</i> % (<i>SD</i>)	5.884 (0.21)	5.962 (0.27)	5.812 (0.33)
Individual-level variables			
Age in years, <i>M</i> (<i>SD</i>)	28.229 (0.22)	27.918 (0.31)	28.521 (0.30)
Employment, %***			
Full time	43.5	55.3	32.5
Part time or self-employed	21.9	21.8	21.9
Other	34.6	22.9	45.6
Income, %***			
<\$15,000	30.4	21.9	38.4
\$15,000–\$30,000	25.8	27.9	23.8
>\$30,000–\$60,000	28.6	31.3	26.2
>\$60,000	15.2	18.9	11.7
Protestant, %	19.1	18.9	19.3
Foreign-born, %	28.7	26.6	30.6
Crossing border for drugs/nightlife, %	12.1	10.4	13.8

p* < .05; **p* < .001 for gender difference.

Neighborhood and individual-level predictors

Table 3 shows neighborhood variables predicting the likelihood of individual-level drug use during the last year. Controlling for individual-level sociodemographic characteristics, greater perceived drug availability ($p < .01$) and residential instability ($p < .05$) were positively predictive of drug use for men, whereas, surprisingly, perceived neighborhood insecurity ($p < .05$) and on-premise alcohol outlet density ($p < .05$) were protective. Part-time employment ($< .05$) and crossing the border for drugs/nightlife ($p < .05$) were also positively predictive of drug use among men. Among women, residential instability ($p < .01$) was predictive of drug use, whereas the proportion of White/non-Hispanic residents in the neighborhood ($p < .05$) was protective.

Indirect effects of neighborhood-level variables

Table 4 shows indirect effects of neighborhood mediators on drug use, comparing each border site with San Antonio. Among men, the association of residence in Brownsville/McAllen with lower drug use was partially mediated by lower drug availability and lower neighborhood insecurity. For women, the association of residence in both Laredo and

Brownsville/McAllen with drug use was partially mediated by the lower proportion of White/non-Hispanic residents compared with San Antonio neighborhoods.

Gender-stratified models

As seen in Figure 1, in the model for men, Brownsville/McAllen had lower rates of drug availability and lower rates of neighborhood insecurity than San Antonio. Both drug availability and neighborhood insecurity were associated with increased likelihood of past-year drug use. Thus, there were significant indirect effects of living in Brownsville/McAllen on reduced drug use through reduced drug availability (indirect effect calculated from product of coefficients: $OR_{ab} = 0.75$, $p < .05$) and marginally through reduced neighborhood insecurity ($OR_{ab} = 1.38$, $p < .10$).

In the model for women, both Brownsville/McAllen and Laredo had neighborhoods with lower proportions of White/non-Hispanic residents than San Antonio. The proportion of White/non-Hispanic residents was negatively associated with past-year drug use. Thus, there were indirect effects of living in both Brownsville/McAllen ($OR_{ab} = 1.35$, $p < .10$) and in Laredo ($OR_{ab} = 1.96$, $p < .05$) on the increased likelihood of drug use through the decreased proportion of White/non-Hispanic residents.

TABLE 2. Border site differences in the neighborhood-level variables (compared with San Antonio)

Variable	All under 40 (N = 1,345)		Men under 40 (n = 667)		Women under 40 (n = 678)	
	B (SE)	p	B (SE)	p	B (SE)	p
Drug availability						
Laredo	0.211 (0.17)	.221	0.173 (0.17)	.309	0.25 (0.20)	.203
Brownsville/McAllen	-0.490 (0.11)	.000	-0.538 (0.13)^a	.000	-0.44 (0.11)	.000
Neighborhood insecurity						
Laredo	-0.191 (0.22)	.380	-0.296 (0.23)	.197	-0.09 (0.22)	.700
Brownsville/McAllen	-1.023 (0.20)	.000	-1.164 (.21)	.000	-0.90 (0.21)	.000
Crime victimization						
Laredo	0.004 (0.05)	.931	-0.010 (0.05)	.845	0.02 (0.05)	.711
Brownsville/McAllen	-0.121 (0.04)	.003	-0.149 (0.04)	.000	-0.10 (0.04)	.016
Witnessing crime						
Laredo	0.291 (0.17)	.085	0.282 (0.18)	.110	0.30 (0.18)	.101
Brownsville/McAllen	-1.093 (0.17)	.000	-1.147 (0.18)	.000	-1.04 (0.17)	.000
Off-premise alcohol outlet density						
Laredo	3.577 (5.06)	.479	5.412 (5.14)	.292	1.73 (5.57)	.756
Brownsville/McAllen	-4.194 (4.98)	.400	-5.012 (5.86)	.393	-3.40 (4.68)	.468
On-premise alcohol outlet density						
Laredo	-0.996 (3.20)	.755	-0.198 (3.28)	.952	-1.80 (3.48)	.605
Brownsville/McAllen	0.544 (3.17)	.864	0.256 (3.52)	.942	0.77 (3.23)	.812
% Crossing border >100 times						
Laredo	0.453 (0.03)	.000	0.434 (0.03)	.000	0.47 (0.03)	.000
Brownsville/McAllen	0.372 (0.03)	.000	0.334 (0.03)	.000	0.41 (0.03)	.000
Neighborhood disadvantage						
Laredo	3.588 (1.27)	.005	3.469 (1.36)	.011	3.71 (1.35)	.006
Brownsville/McAllen	-0.877 (1.48)	.553	-1.858 (1.54)	.229	-0.06 (1.50)	.968
Residential instability						
Laredo	1.774 (2.09)	.397	1.879 (2.15)	.382	1.67 (2.35)	.478
Brownsville/McAllen	2.301 (2.00)	.249	3.885 (2.09)	.063	0.84 (2.09)	.689
% White/non-Hispanic						
Laredo	-7.149 (1.22)	.000	-6.771 (1.21)	.000	-7.53 (1.31)	.000
Brownsville/McAllen	-2.617 (1.47)	.074	-1.816 (1.54)	.239	-3.33 (1.50)	.027

Notes: Coefficients in Table 3 were estimated simultaneously with the coefficients in Table 2. ^aCoefficients in **bold** are components of the indirect effects shown in Figure 1.

Discussion

We hypothesized that elevated drug use rates observed in Laredo compared with Brownsville/McAllen and San Antonio would be explained by neighborhood factors including higher perceived neighborhood insecurity, greater exposure to neighborhood violence and crime, greater neighborhood alcohol and drug availability, and more frequent border crossing, whereas effects of neighborhood disadvantage, residential instability, and racial/ethnic composition would not be significant. Mediation analysis did not support this hypothesis. Among men, the marginally greater probability of drug use in Laredo compared with San Antonio was not explained by any of these neighborhood factors. However, perceived drug availability and perceived neighborhood insecurity were both lower in Brownsville/McAllen than in San Antonio, resulting in a significant indirect effect of living in Brownsville/McAllen on reduced drug use, controlling for demographic characteristics, which was not found in the direct effects model. Among women, the significantly greater probability of drug use in Laredo compared with San Antonio was explained, in part, by the significant indirect effect of living in Laredo through the lower proportion of White/non-Hispanic residents. However, the mediation model

indicated the same significant indirect effects of living in Brownsville/McAllen, which also were not found in the direct effects model.

Drug availability was observed to work in the direction expected. Greater drug availability has been found to be positively associated with greater perceived availability and neighborhood drug trafficking (Freisthler et al., 2005; Lambert et al., 2004), and the border may provide a permissive climate for obtaining alcohol and drugs. Frequency of crossing the border, especially for obtaining over-the-counter prescription drugs or for drinking/nightlife, has been found to be significantly predictive of heavy drug use, but frequency of border crossing was not found to be a significant mediator here. Greater alcohol outlet density has also been found to be associated with greater alcohol and drug use (Gruenewald et al., 1993a, 1993b); however, neither off- nor on-premise alcohol outlet density was a significant mediator. Alcohol outlet density was not significantly associated with increased drug use, and greater on-premise density instead was associated with reduced drug use by men.

Perceived neighborhood insecurity also worked in the expected direction. Rates of crime witnessing and violent victimization, both of which may be high on the border, have been associated with perceived neighborhood insecurity

TABLE 3. Neighborhood- and individual-level predictors of any drug use in past 12 months

Variable	All under 40 (N = 1,345)		Men under 40 (n = 667)		Women under 40 (n = 678)	
	OR [95% CI]	p	OR [95% CI]	p	OR [95% CI]	p
Neighborhood variables						
Drug availability	1.27 [0.87, 1.86]	.212	1.70 [1.22, 2.37]^a	.002	0.77 [0.39, 1.49]	.429
Neighborhood insecurity	0.89 [0.69, 1.13]	.324	0.76 [0.59, 0.98]	.032	0.94 [0.66, 1.36]	.751
Crime victimization	0.58 [0.23, 1.46]	.245	0.42 [0.16, 1.11]	.079	0.67 [0.16, 2.76]	.580
Witnessing crime	1.20 [0.90, 1.61]	.211	1.19 [0.88, 1.62]	.267	1.26 [0.77, 2.05]	.353
Off-premise alcohol outlet density	1.01 [0.99, 1.03]	.123	1.02 [1.00, 1.04]	.101	1.01 [0.99, 1.03]	.272
On-premise alcohol outlet density	0.97 [0.94, 1.00]	.055	0.96 [0.93, 0.99]	.016	0.98 [0.95, 1.01]	.284
% Crossing border >100 times	0.55 [0.24, 1.27]	.163	0.48 [0.19, 1.23]	.129	0.51 [0.17, 1.51]	.225
Neighborhood disadvantage	0.97 [0.92, 1.01]	.167	0.97 [0.93, 1.01]	.125	0.98 [0.91, 1.06]	.637
Residential instability	1.03 [1.01, 1.04]	.002	1.02 [1.00, 1.04]	.032	1.04 [1.02, 1.06]	.001
% White/non-Hispanic	0.96 [0.92, 1.00]	.074	0.97 [0.93, 1.02]	.274	0.91 [0.85, 0.98]	.016
Individual-level variables						
Age	0.86 [0.63, 1.18]	.359	0.74 [0.48, 1.13]	.162	1.11 [0.76, 1.62]	.589
Gender	0.37 [0.27, 0.51]	.000				
Employment (part-time)	1.63 [1.11, 2.41]	.014	1.78 [1.08, 2.93]	.025	1.18 [0.60, 2.35]	.631
Employment (others)	0.99 [0.61, 1.59]	.972	1.48 [0.81, 2.71]	.198	0.57 [0.31, 1.04]	.067
Income (between 15K and 30K)	1.26 [0.81, 1.95]	.305	1.43 [0.85, 2.41]	.177	1.15 [0.56, 2.36]	.698
Income (between 30K and 60K)	0.79 [0.49, 1.26]	.327	1.06 [0.65, 1.71]	.827	0.57 [0.26, 1.25]	.158
Income (over 60K)	0.70 [0.38, 1.30]	.259	0.80 [0.43, 1.48]	.481	0.79 [0.32, 1.97]	.610
Protestant	0.80 [0.51, 1.25]	.332	0.77 [0.43, 1.35]	.357	0.78 [0.37, 1.65]	.522
Foreign-born	0.62 [0.40, 0.97]	.035	0.74 [0.42, 1.30]	.293	0.59 [0.31, 1.12]	.105
Crossing border for drugs/nightlife	1.95 [1.16, 3.29]	.012	1.88 [1.06, 3.33]	.031	1.64 [0.75, 3.57]	.216
Constant	0.82 [0.19, 3.66]	.799	0.91 [0.21, 3.90]	.896	0.20 [0.02, 2.20]	.188

Notes: Coefficients in Table 2 were estimated simultaneously with the coefficients in Table 3. OR = odds ratio; CI = confidence interval.

^aCoefficients in **bold** are components of the indirect effects shown in Figure 1.

TABLE 4. Indirect effects of neighborhood variables on any drug use last 12 months (by site)

Variable	All under 40		Men under 40		Women under 40	
	OR [95% CI]	p	OR [95% CI]	p	OR [95% CI]	p
Laredo (vs. San Antonio) (n = 857)						
Drug availability	1.05 [0.92, 1.20]	.461	1.10 [0.92, 1.31]	.316	0.94 [0.81, 1.09]	.379
Neighborhood insecurity	1.02 [0.95, 1.10]	.534	1.09 [0.94, 1.25]	.246	1.01 [0.96, 1.05]	.828
Crime victimization	1.00 [0.95, 1.05]	.929	1.01 [0.92, 1.10]	.849	0.99 [0.95, 1.03]	.721
Witnessing crime	1.06 [0.94, 1.18]	.338	1.05 [0.95, 1.17]	.360	1.07 [0.90, 1.28]	.443
Off-premise alcohol outlet density	1.05 [0.90, 1.21]	.543	1.09 [0.89, 1.33]	.395	1.02 [0.89, 1.17]	.774
On-premise alcohol outlet density	1.03 [0.86, 1.23]	.759	1.01 [0.76, 1.33]	.952	1.03 [0.90, 1.19]	.650
% Crossing border >100 times	0.76 [0.52, 1.12]	.163	0.73 [0.49, 1.10]	.130	0.73 [0.43, 1.22]	.226
Neighborhood disadvantage	0.89 [0.75, 1.05]	.167	0.89 [0.76, 1.05]	.167	0.94 [0.72, 1.21]	.623
Residential instability	1.05 [0.94, 1.17]	.422	1.04 [0.94, 1.15]	.408	1.07 [0.88, 1.29]	.511
% White/non-Hispanic	1.33 [0.96, 1.82]^a	.084	1.21 [0.86, 1.70]	.283	1.96 [1.10, 3.49]	.023
Brownsville/McAllen (vs. San Antonio) (n = 911)						
Drug availability	0.89 [0.73, 1.08]	.237	0.75 [0.59, 0.95]	.017	1.13 [0.83, 1.52]	.442
Neighborhood insecurity	1.13 [0.87, 1.47]	.345	1.38 [0.98, 1.96]	.066	1.05 [0.76, 1.47]	.753
Crime victimization	1.07 [0.94, 1.22]	.315	1.14 [0.95, 1.36]	.163	1.04 [0.90, 1.20]	.592
Witnessing crime	0.82 [0.59, 1.12]	.212	0.82 [0.58, 1.16]	.266	0.79 [0.47, 1.31]	.354
Off-premise alcohol outlet density	0.95 [0.81, 1.11]	.506	0.92 [0.74, 1.15]	.472	0.96 [0.84, 1.10]	.575
On-premise alcohol outlet density	0.98 [0.83, 1.17]	.861	0.99 [0.74, 1.33]	.942	0.99 [0.88, 1.10]	.804
% Crossing border >100 times	0.80 [0.58, 1.10]	.176	0.78 [0.57, 1.08]	.138	0.76 [0.48, 1.20]	.236
Neighborhood disadvantage	1.03 [0.93, 1.14]	.585	1.06 [0.94, 1.21]	.337	1.00 [0.95, 1.05]	.968
Residential instability	1.06 [0.96, 1.18]	.250	1.09 [0.97, 1.22]	.131	1.03 [0.88, 1.21]	.686
% White/non-Hispanic	1.11 [0.94, 1.30]	.213	1.05 [0.93, 1.19]	.438	1.35 [0.95, 1.91]	.098

Notes: CI = confidence interval; OR = odds ratio. ^aCoefficients in **bold** are the indirect effects shown in Figure 1.

(Hendricks, 2007; Swarns, 2006), whereas neighborhood safety, in turn, has been found to be protective for alcohol and drug use disorders (Savage & Mezuk, 2014). Findings here are consistent with these studies of lower perceived neighborhood insecurity as a significant mediator resulting in decreased drug use in Brownsville/McAllen.

Although the effect of racial/ethnic composition of the neighborhood on drug use was hypothesized not to be significant, among women, increased drug use in both border sites was found through the lower proportion of White/non-Hispanic residents. Co-ethnic density, and particularly recent immigrant density, has been found in prior research to have

FIGURE 1. Results of gender-stratified models that account for other neighborhood- and individual-level variables. B/McA = Brownsville/McAllen; OR = odds ratio.

a protective effect on negative health outcomes, including substance use among U.S. Hispanics (Bécares et al., 2012; Lee & Liechty, 2015). However, the large proportions of Hispanics living in U.S. border communities (as well as in San Antonio) do not necessarily reflect “immigration” density, as many of these individuals have resided in these communities for generations. Future work to replicate these findings in samples of younger women would be informative.

Significant mediators for men were found only for Brownsville/McAllen, suggesting that other factors may be operating for higher drug use rates in Laredo. Men in Laredo were more likely than those in San Antonio to live in disadvantaged neighborhoods, with a greater proportion of White/non-Hispanic residents and frequent border crossing activity, although none of these factors were significant mediators of drug use. Other variables among men were significant predictors of drug use, including on-premise alcohol outlet density (as a negative predictor), neighborhood residential instability, and individual-level border crossing for drugs/nightlife and part-time employment, but no site differences were found for these. For women, residential instability was positively associated with increased drug use, but no site differences were found. It should be noted that although these variables are discussed as predictors, the associations are only correlational rather than causal.

Other unmeasured geographical and cultural differences across sites exist that could have influenced study outcomes and may warrant future research. For example, proximity to illicit drug trafficking routes would affect drug availability. Although being foreign-born was not a significant predictor of drug use, the proportion of new immigrants might be an important predictor among those most recently arrived.

Sister-city differences across the two border sites may have affected reasons for crossing the border and drug use. In addition, availability of substance use treatment could affect drug use.

Although the purpose of this study was to explain heterogeneity in drug use rates previously observed across two border sites with sociodemographic similarities (Zemore et al., 2016), drug use, defined as any use of illicit substances or nonmedically used prescription drugs in the last year, likely included very occasional users along with those using quite heavily. In addition, although all sites had similar proportions of illicit drug users, Laredo had a larger proportion of non-medically prescribed use of prescription drugs, and this also may have obscured differences across sites and has different implications for prevention and treatment. Neighborhood-level mediators studied may not have had the same association with drug use across the range of users (heavy vs. occasional) or type of use (illicit vs. prescription). Further, neighborhood-level mediators analyzed may not have adequately captured their respective domains of neighborhood context as purported because of the limited number of indicators available for some of the constructs. In addition, the neighborhood-level econometric measures estimated from a multilevel nonlinear model were predicted values and may not completely be exogenous to outcome variables. Therefore, the effects of the econometric measures may be attenuated somewhat. Future research may incorporate more advanced estimation procedures (e.g., instrumental variables) to overcome this limitation.

Findings here suggest important border site and gender differences in drug use and neighborhood-level mediators in two sociodemographically similar metropolitan areas. It is

important to note, however, that relatively few community-level effects were observed. The assumed protective effect on substance use of living in a co-ethnic enclave may not be valid for younger Hispanic women and is an area in need of future research. Findings here may also suggest the importance of addressing such factors as availability of alcohol and drugs, general neighborhood safety, and criminal activity at the community level, as well as their importance for potentially informing intervention and prevention strategies to reduce drug-related harm at the U.S.–Mexico border. In view of the UMSARC's limited geographic coverage of the border region, future studies are needed to confirm that the factors identified as predictors of drug use in the present study are also related to drug use in communities throughout the border region.

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