Age at Immigration and Substance Use and Problems Among Males and Females at the U.S.–Mexico Border

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ABSTRACT. **Objective:** Although substance use and problems among Mexican Americans are associated with both immigration to the United States and living at the U.S.–Mexico border, little is known about relationships between age at immigration and substance use by gender within the border context. The purpose of this study was to analyze the association of age at immigration with heavy alcohol use, alcohol use disorders (AUD), and drug use among Mexicans Americans living both on and off the U.S.–Mexico border. **Method:** Household surveys were conducted, using area probability sampling of 2,336 Mexican Americans (1,185 female), ages 18–65, living at the Texas–Mexico border in the metropolitan areas of Laredo and McAllen/Brownsville, and in the nonborder location of San Antonio. **Results:** Females immigrating before age 12 were less likely to report heavy alcohol use (odds ratio [OR] = 0.309), and those immigrating before age 21 were less likely to report any drug use during the last year compared with their U.S.-born counterparts (OR = 0.473; OR = 0.386, respectively). Males immigrating after age 20 were less likely to report heavy alcohol use (OR = 0.478), and those immigrating between ages 12 and 20 were less likely to report AUD (OR = 0.479) and drug use (OR = 0.255) compared with their U.S.-born counterparts. Early age at immigration (before age 12) was significantly associated with drug use for males living on the border compared with those living off the border. **Conclusions:** Findings suggest that among females, immigrating before age 12 (vs. being born in the United States) is protective against heavy alcohol and drug use, but among males, immigrating before age 12 results in similarly heavy patterns of use as their U.S.-born counterparts, partially supporting previous findings that early immigration is particularly risky in relation to substance use and AUD. (*J. Stud. Alcohol Drugs, 78,* 827–834, 2017)

MEXICAN AMERICANS ARE a large and rapidly growing population, constituting the largest subgroup of Hispanics in the United States (70%) and 11% of the total population, a figure that is expected to double by 2050 (Gonzalez-Barrera & Lopez, 2013). Mexico constitutes the largest source of immigrants to the United States. More than half immigrate to the four states bordering Mexico (Bureau of Transportation Statistics, 2011; Romellón & Vazquez, 2007), and the vast majority live in 12 bi-national metropolitan areas that include nine sister-cities. Texas, with 16 border counties and six sister-cities, contains the highest concentration of immigrating Mexican Americans and is one of the fastest growing areas of the country.

A greater prevalence of substance use and related problems has been found among U.S.-born Mexican Americans compared with those emigrating from Mexico, a prevalence that is elevated at higher levels of acculturation, particularly among females (Alegría et al., 2007a; Breslau et al., 2007; Caetano et al., 2008; Turner et al., 2006; Zemore, 2007). These findings may reflect changes in norms related to alcohol consumption with increased acculturation to the United States (Caetano, 1987; Zemore, 2005) and subsequent deterioration of traditional Mexican family-oriented values and extended-family orientation (Keefe, 1984; Vega, 1990).

Studies conducted in Mexico have found that those who immigrated to the United States (and returned) were more likely to use alcohol and other drugs and to report a current substance use disorder than those who had remained in Mexico (Borges et al., 2007), and the longer the amount of time spent in the United States, the higher the prevalence of substance use (Alderete et al., 2000; Borges et al., 2009; Vega et al., 1998).

Age at immigration has also been found to be an important factor in relation to substance use and other negative health outcomes, including psychiatric disorders (Breslau et al., 2007; Vega et al., 2004). Mexican Americans immigrating before age 14 have been found to have alcohol- and drug-use patterns and problems similar to those born in the United States, with greater use and associated problems than those immigrating at a later age (Borges et al., 2011, 2016; Reingle et al., 2014). One potential explanatory mechanism for this phenomenon is the presumed rapid acquisition of substance use norms and behaviors of the dominant culture by those immigrating at a younger age, including an earlier onset of drinking and other drug use (Strunin et al., 2007). A number of adverse physical, mental, and social consequences (Bonnie & O'Connell, 2004) may follow, including problematic substance use (Grant et al., 2001; Hingson et al., 2006). It has been suggested that a "sensitive period" may exist for acculturation, with those immigrating as children becoming

more acculturated than adult immigrants, regardless of how much time is spent living in the United States (Cheung et al., 2011).

Substance use and related problems among Mexican Americans have been found to be associated with living at the U.S.–Mexico border, regardless of nativity. A 2003 Texas survey found that although volume of consumption among Mexican Americans living at the border was no greater than that for those living off the border, problems of abuse and dependence were higher, with 23% reporting one or more binge drinking episodes during the previous month, 7% reporting heavy drinking, and 12% reporting symptoms of alcohol dependence (Caetano et al., 2008; Wallisch & Spence, 2006). Comparison of these data with an earlier 1996 Texas survey found that past-year alcohol use disorders (AUDs) had doubled at border sites during this time, and lifetime and past-year drug use and problems also increased significantly (Wallisch & Spence, 2006).

More recent data from the U.S.–Mexico Study on Alcohol and Related Conditions (UMSARC) found a higher monthly volume and greater prevalence of AUD among Mexican Americans living at the Texas–Mexico border compared with those living in a nonborder location. AUD continued to be greater at the border, compared with the nonborder, at the same average monthly volume and number of heavy drinking days (Cherpitel et al., 2015a). Co-occurring hazardous alcohol and other drug use was also more common among those living at the border than those not (Borges et al., 2015). Those residing at the border may be especially vulnerable to harmful alcohol and other drug use and related problems because of increased availability of these substances at the border and because of the effects of stressors unique to the border context. UMSARC findings of greater alcohol and other drug use and problems at the border were found to be partially mediated by indicators of exposure to stress (high exposure to violence/crime, low family support) (Zemore et al., 2016). On the other hand, the border, with the highest density of immigrating Mexican Americans (Bureau of Transportation Statistics, 2011; Romellón & Vazquez, 2007), may provide a protective environment in which recent immigrants are more insulated from immersion into the dominant culture and subsequent harmful substance use and related behaviors. One study found that those who immigrated to the United States at younger ages and resided in border locations were at lower risk for harmful alcohol and other drug use than their counterparts who lived in nonborder locations (Reingle et al., 2014).

Given this potential interplay between immigration and border context, we analyzed the association of age at immigration with alcohol and other drug use and problems in the UMSARC sample, controlling for border location. Because gender differences have been found in the association between drinking patterns and length of residency in the United States among Mexican immigrants (Caetano &

Medina-Mora, 1988; Medina-Mora et al., 2002), analyses are conducted separately for males and females. Findings here are important for shedding further light on risk factors associated with substance use and problems, which have been found to be high among Mexican Americans residing at the U.S.–Mexico border.

Method

Household survey sample

Area probability sampling with face-to-face interviewing was carried out on Mexican American respondents between ages 18 and 65 living in the three Texas border metropolitan areas of Laredo (Webb County; $n = 751$) and McAllen/Brownsville (Cameron/Hidalgo Counties; $n = 814$), and in the nonborder metropolitan area of San Antonio (San Antonio County; $n = 771$). Cooperation rate across the combined sites was 84%, based on households in which enumeration indicated that an eligible respondent (i.e., a Mexican American adult in appropriate age range) was confirmed to reside, and response rate was 53.1%, based on the fraction of those households in which enumeration was not conducted that were estimated to contain eligible residents, both using Version 4 of the American Association for Public Opinion Research (2011).

Metropolitan areas were selected because they comprise a large proportion of Mexican American individuals living in the Texas border counties; about 75% of those living in Texas border counties are Mexican American (U.S. Census Bureau, 2007). The Laredo metropolitan area, located midway along the Texas–Mexico border, is a major commercial and retail link between Mexico and Texas (Wallisch & Spence, 2006). The McAllen and Brownsville metropolitan areas, located along the eastern side of the Texas–Mexico border, lie in the southernmost part of the Rio Grande river valley. Providing a contrast for the border sites, San Antonio, with a Hispanic population of 61%, was selected as the nonborder location.

Fieldwork data collection

Interviews of about 45 minutes in length were conducted in the respondents' homes by the Public Policy Research Institute at Texas A&M University. 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 ages 18 and 65 years. Eligible residents were then enumerated, and the one with the most recent birthday was selected as the respondent.

Following informed consent, interviews were conducted by extensively trained interviewers recruited from the local community (e.g., schoolteachers, health workers, graduate students, local residents) and supervised by the Public Policy Research Institute. 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 the time taken completing the interview.

Instruments

The interview was conducted using a computer-assisted personal interviewing system in the respondents' homes. Among other demographic characteristics (gender, age, education, marital status, employment), respondents were asked their country of nativity (United States or Mexico) and, for those born in Mexico, the age at which they first came to live in the United States. Age at immigration was categorized as younger than age 12, ages 12–20, and age 21 years or older. Age categories were selected to capture those who immigrated before reaching adolescence and those who immigrated after reaching adulthood; these are age groups that might be expected to differ in relation to vulnerability to substance use and problems.

Heavy alcohol use

Heavy alcohol use was defined as four or more drinks/day for women and five or more drinks/day for men at least monthly in the last 12 months. Alcohol consumption items were taken from the 2005 National Alcohol Survey (Greenfield et al., 2006), which included measurements of quantity, frequency, and volume of alcohol consumption.

Alcohol use disorder

AUD during the last 12 months was measured from the 11 diagnostic criteria of the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (DSM-5; American Psychiatric Association, 2013), using an adaptation of the Alcohol Section of the Composite International Diagnostic Interview core (World Health Organization, 1993). DSM-5 collapses the DSM-IV alcohol abuse and dependence criteria into a single, unidimensional construct, dropping the criterion on legal problems and adding the criterion on craving from the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (World Health Organization, 1992), with a score of 2 or more being positive for AUD (Hasin et al., 2013).

Other drug use

Drug use was measured by the frequency of illicit substance use and nonmedically used prescription drugs during the last 12 months, adapted from items used in the 2005 National Alcohol Survey (Greenfield et al., 2006) and the Mexican National Addiction Survey (Encuesta Nacional de Adicciones; Medina-Mora et al., 1989). 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.

Data analysis

Using multiple logistic regression, odds ratios (ORs) and 95% confidence intervals (CIs) were estimated for age at immigration predicting, separately, heavy drinking, AUD, and other drug use, all during the last year, by gender, with border proximity (Laredo/Brownsville/McAllen vs. San Antonio), age, education, marital status, and employment being controlled for. An exploratory analysis was then performed, examining the interaction of border context (border vs. nonborder) by age at immigration, separately for men and women for all three outcome measures, with the same demographic characteristics being controlled for. Age at immigration (<12, 12–20, ≥21 years) was analyzed using U.S. born as the reference category. The data were weighted, reflecting the probability of selection into the sample and adjusting for demographic differences between the population and the sample. A raking algorithm (Deville et al., 1993; Izrael et al., 2004) approach was used to iteratively adjust the sampling weights to match Census marginal distributions of education and the combined gender by age distribution, separately within each site. To adjust for design effects inherent in multistage clustered sampling, Stata's (StataCorp LP, College Station, TX) *svy* commands were used for all model parameter estimation.

Results

Table 1 shows demographic and substance use characteristics by gender. A larger percentage of males were born in the United States compared with females, whereas a smaller percentages of males immigrated after age 20. Among those immigrating, no difference was found in the number of years living in the United States by gender, with nearly half of all immigrants having immigrated more than 21 years ago. Males were more than twice as likely to report heavy drinking and AUD compared with females, and nearly twice as likely to report other drug use, all during the last year.

Table 2 shows ORs and 95% CIs for age at immigration, compared with being U.S. born, as a predictor of heavy drinking, separately for males and females, with border location and demographic characteristics being controlled for. Females immigrating before age 12 and males immigrating after age 20 were both less likely to report heavy alcohol use compared with their U.S.-born counterparts. No significant

TABLE 1. Demographic and substance use characteristics by gender

Variable	Female (n = 1,185) %	Male (n = 1,151) %	Total (N = 2,336) %
Age, in years			
18–29	27.6	31.6	29.5
30–49	46.4	45.5	46.0
≥50	26.0	22.9	24.5
Education			
<High school	38.2	33.9	36.1
High school graduate	17.2	21.7*	19.3
Some college	25.4	25.4	25.4
College graduate	19.2	19.0	19.1
Marital status			
Single	24.9	31.0**	27.8
Married/living together	51.7	57.3*	54.3
Separated/widowed/divorced	23.4	11.7***	17.9
Employment			
Full time	35.8	52.9***	43.9
Part time or seasonal	19.9	19.4	19.7
Other	44.3	27.8***	36.4
Age at immigration			
U.S. born	62.1	67.6*	64.7
<12 years	9.4	10.1	9.7
12–20 years	14.4	12.0	13.3
≥21 years	14.1	10.3*	12.3
Site			
Nonborder	32.1	34.0	33.0
Border	67.9	66.0	67.0
Years living in United States, non-U.S. born			
0–5	9.8	7.0	8.6
6–10	15.3	17.0	16.1
11–20	31.2	28.0	29.8
≥21	43.7	48.0	45.5
Substance use, last 12 months			
Heavy drinking	12.0	27.9***	19.5
Alcohol use disorder	9.2	24.2***	16.3
Any drug use	16.4	28.0***	21.9

*p < .05; **p < .01; ***p < .001 comparisons between males and females.

TABLE 2. Odds ratios (ORs) and 95% confidence intervals (CIs) for age at immigration on heavy alcohol use[a] for males and females

Variable	Female OR	Female [95% CI]	Male OR	Male [95% CI]
Age at immigration (ref.: U.S. born)				
<12 years	0.309*	[0.109, 0.877]	0.844	[0.448, 1.590]
12–20 years	0.748	[0.316, 1.770]	0.698	[0.395, 1.233]
≥21 years	0.967	[0.281, 3.332]	0.478*	[0.237, 0.966]
Border (ref.: nonborder)	1.026	[0.608, 1.733]	1.097	[0.793, 1.518]
Age (ref.: 18–29 years)				
30–49 years	0.575	[0.293, 1.129]	0.903	[0.604, 1.349]
≥50 years	0.260**	[0.108, 0.622]	0.618	[0.373, 1.023]
Education (ref.: <high school)				
High school graduate	1.301	[0.675, 2.507]	1.014	[0.660, 1.560]
Some college	0.794	[0.415, 1.518]	0.846	[0.553, 1.295]
College graduate	0.582	[0.237, 1.427]	0.749	[0.437, 1.284]
Marital status (ref.: single)				
Married/living together	0.846	[0.413, 1.734]	1.505	[0.994, 2.277]
Separated/widowed/divorced	1.237	[0.544, 2.816]	1.677	[0.971, 2.896]
Employment (ref.: full time)				
Part time or seasonal	0.777	[0.377, 1.603]	0.621*	[0.388, 0.994]
Other	0.433**	[0.246, 0.765]	0.787	[0.522, 1.186]
Intercept	0.421	[0.140, 1.269]	0.452**	[0.261, 0.780]

Notes: Ref = reference. [a]4+ drinks/day for females and 5+ drinks/day for males at least monthly in the last 12 months.
*p < .05; **p < .01.

border effects were found in heavy alcohol use for either gender.

Table 3 shows ORs and CIs for AUD. Neither age at immigration nor border proximity predicted AUD among females, whereas among males, those immigrating between ages 12 and 20 were less likely to report AUD than their U.S.-born counterparts. Males living at the border were 71% more likely to report AUD compared with those residing off the border.

Age at immigration was predictive of reporting drug use in the last year for both males and females. Females who immigrated before age 12 and from ages 12 to 20 were less likely to report drug use than their U.S. counterparts; males immigrating between ages 12 and 20 were also less likely to do so (Table 4). Living at the border was positively predictive of reporting drug use for both males and females.

An exploratory analysis was performed for all three outcome variables, examining the interaction of border versus nonborder context by age at immigration (not shown). Only among males, and only for any drug use, was a significant interaction detected, with males living on the border and immigrating before age 12 significantly more likely to report any drug use than those living off the border who immigrated before age 12 (OR = 5.01, 95% CI [1.04, 24.4]).

Discussion

The effects of age at immigration from Mexico to the United States on past-year heavy alcohol use, AUD, and other drug use were examined in a general population sample of Mexican American males and females living both on and off the Texas border. Although it has been suggested

TABLE 3.   Odds ratios (ORs) and 95% confidence intervals (CIs) for age at immigration on alcohol use disorders for males and females

Variable	Female OR	[95% CI]	Male OR	[95% CI]
Age at immigration (ref.: U.S. born)				
<12 years	0.780	[0.335, 1.816]	0.966	[0.539, 1.731]
12–20 years	0.745	[0.292, 1.902]	0.479*	[0.253, 0.907]
≥21 years	1.489	[0.440, 5.038]	0.533	[0.241, 1.180]
Border (ref.: nonborder)	0.946	[0.544, 1.644]	1.714**	[1.226, 2.394]
Age (ref.: 18–29)				
30–49 years	0.493	[0.243, 1.002]	0.648*	[0.428, 0.980]
≥50 years	0.120***	[0.042, 0.344]	0.208***	[0.111, 0.390]
Education (ref.: <high school)				
High school graduate	1.275	[0.627, 2.591]	0.825	[0.539, 1.263]
Some college	0.598	[0.288, 1.241]	0.676	[0.438, 1.043]
College graduate	0.548	[0.213, 1.412]	0.578	[0.324, 1.031]
Marital status (ref.: single)				
Married/living together	0.334**	[0.165, 0.674]	0.982	[0.630, 1.531]
Separated/widowed/divorced	0.831	[0.373, 1.851]	2.546**	[1.454, 4.458]
Employment (ref.: full time)				
Part time or seasonal	0.736	[0.361, 1.503]	0.862	[0.559, 1.330]
Other	0.564	[0.311, 1.022]	0.908	[0.600, 1.372]
Intercept	0.520	[0.191, 1.415]	0.484**	[0.284, 0.824]

Note: Ref. = reference.
*p < .05; **p < .01; ***p < .001.

that age at immigration may influence age at onset of drinking and other substance use among young adults (Strunin et al., 2007) and lead to problematic substance use (Grant et al., 2001; Hingson et al., 2006), data here suggest a more complex picture related to gender.

The Reingle et al. (2014) study, which did not disaggregate on gender, found those immigrating at younger ages (<14) had substance use patterns similar to U.S.-born Mexican Americans. In the present study, females immigrating at an early age were not found to have substance use and problems levels similar to U.S.-born females but instead were protected from heavy alcohol and other drug use. However, males immigrating before age 12 were found to report substance use outcomes similar to those of their U.S.-born counterparts. Females immigrating before age 12 were less likely to report heavy alcohol use, and those immigrating before age 21 were less likely to report any drug use during the last year compared with their U.S. counterparts. Although males immigrating after age 20 were less likely to report heavy alcohol use, those immigrating between ages 12 and

TABLE 4.   Odds ratios (ORs) and 95% confidence intervals (CIs) for age at immigration on any drug use for males and females

Variable	Female OR	[95% CI]	Male OR	[95% CI]
Age at immigration (ref.: U.S. born)				
<12 years	0.473*	[0.235, 0.950]	1.129	[0.631, 2.019]
12–20 years	0.386*	[0.169, 0.882]	0.255***	[0.130, 0.503]
≥21 years	0.744	[0.333, 1.663]	0.573	[0.275, 1.197]
Border (ref.: nonborder)	1.701*	[1.004, 2.882]	1.427*	[1.027, 1.984]
Age (ref.: 18–29)				
30–49 years	1.151	[0.654, 2.027]	0.847	[0.569, 1.259]
≥50 years	0.925	[0.468, 1.828]	0.274***	[0.15 4, 0.486]
Education (ref.: <high school)				
High school graduate	0.876	[0.540, 1.421]	0.742	[0.482, 1.143]
Some college	0.497**	[0.306, 0.806]	0.796	[0.521, 1.217]
College graduate	0.504*	[0.264, 0.963]	0.422**	[0.236, 0.753]
Marital status (ref.: single)				
Married/living together	0.790	[0.488, 1.279]	0.922	[0.611, 1.391]
Separated/widowed/divorced	0.630	[0.323, 1.228]	0.900	[0.519, 1.561]
Employment (ref.: full time)				
Part time or seasonal	1.242	[0.726, 2.125]	1.623*	[1.066, 2.469]
Other	0.729	[0.446, 1.193]	1.267	[0.844, 1.902]
Intercept	0.296**	[0.149, 0.588]	0.574*	[0.340, 0.971]

Note: Ref. = reference.
*p < .05; **p < .01; ***p < .001.

20 were less likely to report AUD and other drug use compared to their U.S. counterparts. An earlier study, however, found that females, but not males, immigrating before age 13 were at higher risk of having opportunities to use alcohol, although an earlier age at immigration was associated with an increased likelihood of opportunities to use drugs among both males and females, with risk greater among females (Borges et al., 2012). In addition, a modification effect was found for age at immigration and border residence for males, with those immigrating before age 12 significantly more likely to report any drug use than those living off the border who immigrated before age 12.

Age at immigration may play a differential role for males and females in subsequent substance use and problems, and previous studies suggest that this may be related, at least in part, to level of acculturation. Higher acculturation (which may suggest a younger age at immigration) among females has been found to predict greater odds of drinking, greater volume of consumption, and AUD, whereas associations between acculturation and drinking among males have been less consistent, with some research indicating positive associations and some indicating negative (Zemore, 2007). Among both male and female immigrants, however, higher acculturation has been found to be related to higher odds of drug use and abuse (Alegría et al., 2007a; Turner et al., 2006).

Length of time living in the United States (which is positively related to acculturation) has been found to be positively associated with the likelihood of substance use among Mexican Americans (Alderete et al., 2000; Borges et al., 2009; Vega et al., 1998). Males migrating from Mexico have been found to adopt quantity and frequency patterns of heavy drinking similar to U.S. males within 5 years of immigration (Caetano & Medina-Mora, 1988; Medina-Mora et al., 2002); however, among females, drinking rates were greater for those who immigrated but were not related to length of residency in the United States. Although the number of years of living in the United States was not taken into account in the models in the present study, no significant difference was found between male and female immigrants (Table 1), and age at the time of the survey was included in the regression models.

Studies examining relationships between age at immigration and substance use and problems, as well as mental health disorders, among Mexican Americans have used varying cut points for age. One study found that immigration to the United States after age 25 provided a protective effect for substance use disorders (Alegría et al., 2007b), and the longer immigrants remained in their home country, the less cumulative risk of onset of substance use disorders (Alegría et al., 2007c). Other cut points of age at immigration have been used in other studies (Borges et al., 2011, 2016; Breslau et al., 2007; Vega et al., 2004), and it is possible that other age categorizations in the present study may have

provided different results. Although the age categories of pre-adolescence (<12 years) and adulthood (≥21 years) are theoretically driven by the literature on substance use, from a developmental perspective it has been pointed out that few differences would be expected between a child born in the United States of recent immigrant parents and one who immigrates to the United States before age 6, both of whom would integrate into American culture as they enter the educational system (Suárez-Orozco & Suárez-Orozco, 2001).

In the present study, living at the border was predictive of AUD among males and of any drug use among both males and females, compared with living off the border, with males living on the border and immigrating before age 12 significantly more likely to report any drug use than those living off the border who immigrated before age 12. In the Reingle et al. (2014) study, however, Mexican Americans who immigrated at earlier ages and lived off the border were at greater risk for substance use than those who lived at the border. Previous analysis of the UMSARC data found that frequency of crossing the border was positively related to alcohol and other drug use and problems (Cherpitel et al., 2015b), and those immigrating more recently (especially those living close to the border) may be more likely to cross the border for a variety of reasons, including frequenting less restrictive drinking establishments (Lange & Voas, 2000) and obtaining pharmaceutical drugs (Valdez & Sifaneck, 1997).

Strengths and limitations

A strength of the present study is that Texas includes almost two thirds of all U.S. border counties, which limits potential heterogeneity in geographic, cultural, and sociopolitical factors that may have affected study results. However, findings here may not be representative of border sites or nonborder sites in the other border states (i.e., New Mexico, Arizona, and California). In addition, the study included only metropolitan areas, and findings may differ for rural areas, including the *colonias,* which are unincorporated areas along the border consisting of substandard housing in which the majority of residents are first-generation immigrants. There is also potential for recall bias in past-year substance use as well as in age at immigration, which for some may be well in the past.

In conclusion, findings here suggest that age at immigration, as well as border context, may play a differential role in the likelihood of alcohol and other drug use and problems for Mexican American males compared with females. This is an area of research requiring future exploration as an important predictor of substance use in this population.

References

Alderete, E., Vega, W. A., Kolody, B., & Aguilar-Gaxiola, S. (2000). Effects of time in the United States and Indian ethnicity on DSM-

III-R psychiatric disorders among Mexican Americans in California. *Journal of Nervous and Mental Disease, 188,* 90–100. doi:10.1097/00005053-200002000-00005

Alegría, M., Mulvaney-Day, N., Torres, M., Polo, A., Cao, Z., & Canino, G. (2007a). Prevalence of psychiatric disorders across Latino subgroups in the United States. *American Journal of Public Health, 97,* 68–75. doi:10.2105/AJPH.2006.087205

Alegría, M., Shrout, P. E., Woo, M., Guarnaccia, P., Sribney, W., Vila, D., . . . Canino, G. (2007b). Understanding differences in past year psychiatric disorders for Latinos living in the US. *Social Science & Medicine, 65,* 214–230. doi:10.1016/j.socscimed.2007.03.026

Alegría, M., Sribney, W., Woo, M., Torres, M., & Guarnaccia, P. (2007c). Looking beyond nativity: The relation of age of immigration, length of residence, and birth cohorts to the risk of onset of psychiatric disorders for Latinos. *Research in Human Development, 4,* 19–47. doi:10.1080/15427600701480980

American Association for Public Opinion Research. (2011). *Standard definitions: Final dispositions of case codes and outcome rates for surveys* (revised 2011, 7th ed.). Retrieved from WebCite® at http://www.webcitation.org/5ymByeilL. Deerfield, IL: Author.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: Author.

Bonnie, R. J., & O'Connell, M. E. (2004). Consequences of underage drinking. In R. J. Bonnie & M. E. O'Connell (Eds.), *Reducing underage drinking: A collective responsibility* (pp. 58–69). Washington, DC: National Academies Press.

Borges, G., Breslau, J., Orozco, R., Tancredi, D. J., Anderson, H., Aguilar-Gaxiola, S., & Mora, M. E. (2011). A cross-national study on Mexico-US migration, substance use and substance use disorders. *Drug and Alcohol Dependence, 117,* 16–23. doi:10.1016/j.drugalcdep.2010.12.022

Borges, G., Cherpitel, C. J., Orozco, R., Zemore, S. E., Wallisch, L., Medina-Mora, M. E., & Breslau, J. (2016). Substance use and cumulative exposure to American society: Findings from both sides of the US-Mexico border region. *American Journal of Public Health, 106,* 119–127. doi:10.2105/AJPH.2015.302871

Borges, G., Medina-Mora, M. E., Breslau, J., & Aguilar-Gaxiola, S. (2007). The effect of migration to the United States on substance use disorders among returned Mexican migrants and families of migrants. *American Journal of Public Health, 97,* 1847–1851. doi:10.2105/AJPH.2006.097915

Borges, G., Medina-Mora, M.-E., Orozco, R., Fleiz, C., Cherpitel, C., & Breslau, J. (2009). The Mexican migration to the United States and substance use in northern Mexico. *Addiction, 104,* 603–611. doi:10.1111/j.1360-0443.2008.02491.x

Borges, G., Rafful, C., Benjet, C., Tancredi, D. J., Saito, N., Aguilar-Gaxiola, S., . . . Breslau, J. (2012). Mexican immigration to the US and alcohol and drug use opportunities: Does it make a difference in alcohol and/or drug use? *Drug and Alcohol Dependence, 125, Supplement 1,* S4–S11. doi:10.1016/j.drugalcdep.2012.05.007

Borges, G., Zemore, S., Orozco, R., Cherpitel, C. J., Ye, Y., Bond, J., . . . Wallisch, L. (2015). Co-occurrence of alcohol, drug use, DSM-5 alcohol use disorder, and symptoms of drug use disorder on both sides of the U.S.–Mexico border. *Alcoholism: Clinical and Experimental Research, 39,* 679–687. doi:10.1111/acer.12672

Breslau, J., Aguilar-Gaxiola, S., Borges, G., Kendler, K. S., Su, M., & Kessler, R. C. (2007). Risk for psychiatric disorder among immigrants and their US-born descendants: Evidence from the National Comorbidity Survey Replication. *Journal of Nervous and Mental Disease, 195,* 189–195. doi:10.1097/01.nmd.0000243779.35541.c6

Bureau of Transportation Statistics. (2011). *North American Border Crossing/Entry Data.* Washington, DC: Author. Retrieved from WebCite® at http://www.webcitation.org/68anjZYIM.

Caetano, R. (1987). Acculturation and attitudes toward appropriate drinking among U.S. Hispanics. *Alcohol and Alcoholism, 22,* 427–433.

Caetano, R., & Mora, M. E. (1988). Acculturation and drinking among people of Mexican descent in Mexico and the United States. *Journal of Studies on Alcohol, 49,* 462–471. doi:10.15288/jsa.1988.49.462

Caetano, R., Ramisetty-Mikler, S., Wallisch, L. S., McGrath, C., & Spence, R. T. (2008). Acculturation, drinking, and alcohol abuse and dependence among Hispanics in the Texas-Mexico border. *Alcoholism: Clinical and Experimental Research, 32,* 314–321. doi:10.1111/j.1530-0277.2007.00576.x

Cherpitel, C. J., Ye, Y., Bond, J., Zemore, S. E., Borges, G., & Greenfield, T. K. (2015a). Border effects on DSM-5 alcohol use disorders on both sides of the U.S.-Mexico border. *Drug and Alcohol Dependence, 148,* 172–179. doi:10.1016/j.drugalcdep.2015.01.003

Cherpitel, C. J., Ye, Y., Zemore, S. E., Bond, J., & Borges, G. (2015b). The effect of cross-border mobility on alcohol and drug use among Mexican-American residents living at the U.S.-Mexico border. *Addictive Behaviors, 50,* 28–33. doi:10.1016/j.addbeh.2015.06.008

Cheung, B. Y., Chudek, M., & Heine, S. J. (2011). Evidence for a sensitive period for acculturation: Younger immigrants report acculturating at a faster rate. *Psychological Science, 22,* 147–152. doi:10.1177/0956797610394661

Deville, J.-C., Särndal, C.-E., & Sautory, O. (1993). Generalized raking procedures in survey sampling. *Journal of the American Statistical Association, 88,* 1013–1020. doi:10.1080/01621459.1993.10476369

Gonzalez-Barrera, A., & Lopez, M. H. (2013). *A demographic portrait of Mexican-origin Hispanics in the United States.* Washington, DC: Pew Research Center. Retrieved from WebCite® at http://www.webcitation.org/6Qtqb3sME

Grant, B. F., Stinson, F. S., & Harford, T. C. (2001). Age at onset of alcohol use and DSM-IV alcohol abuse and dependence: A 12-year follow-up. *Journal of Substance Abuse, 13,* 493–504. doi:10.1016/S0899-3289(01)00096-7

Greenfield, T. K., Nayak, M. B., Bond, J., Ye, Y., & Midanik, L. T. (2006). Maximum quantity consumed and alcohol-related problems: Assessing the most alcohol drunk with two measures. *Alcoholism: Clinical and Experimental Research, 30,* 1576–1582. doi:10.1111/j.1530-0277.2006.00189.x

Hasin, D. S., O'Brien, C. P., Auriacombe, M., Borges, G., Bucholz, K., Budney, A., . . . Grant, B. F. (2013). DSM-5 criteria for substance use disorders: Recommendations and rationale. *American Journal of Psychiatry, 170,* 834–851. doi:10.1176/appi.ajp.2013.12060782

Hingson, R. W., Heeren, T., & Winter, M. R. (2006). Age at drinking onset and alcohol dependence: Age at onset, duration, and severity. *Archives of Pediatrics & Adolescent Medicine, 160,* 739–746. doi:10.1001/archpedi.160.7.739

Izrael, D., Hoaglin, D. C., & Battaglia, M. P. (2004). *To rake or not to rake is not the question anymore with the enhanced raking macro.* Paper 207-29 from the 29th Annual SAS Users Group International (SUGI) Conference. Montreal, Canada. Retrieved from WebCite® at http://www.webcitation.org/6NC5onWaa

Keefe, S. E. (1984). Real and ideal extended familism among Mexican Americans and Anglo Americans: On the meaning of close family ties. *Human Organization, 43,* 65–70. doi:10.17730/humo.43.1.y5546831728vn6kp

Lange, J. E., & Voas, R. B. (2000). Youth escaping limits on drinking: Binging in Mexico. *Addiction, 95,* 521–528. doi:10.1046/j.1360-0443.2000.9545214.x

Medina-Mora, M. E., Conyer, R. T., Sepúlveda, J., Monrreal, R. O., Rascón, M. L., Solache, G., . . . Guiot, E. R. (1989). Extensión del consumo de drogas en México: Encuesta Nacional de Addicciones. Resultados nacionales [Scope of the consumption of drugs in Mexico: Results of the National Survey of Drug Addictions]. *Salud Mental, 12,* 7–12. Retrieved from http://www.revistasaludmental.mx/index.php/salud_mental/article/view/368

Medina-Mora, M. E., Natera, G., & Borges, G. (2002). Alcoholismo y abuso de bebidas alcohólicas. In Secretaría de Salud (Ed.), *Observatorio Mexicano en Tabaco, Alconol y Otras Drogas* (pp. 15–25). Mexico City, Mexico: CONADIC, Secretaría de Salud.

Reingle, J. M., Caetano, R., Mills, B. A., & Vaeth, P. A. (2014). The role of immigration age on alcohol and drug use among border and non-border Mexican Americans. *Alcoholism: Clinical and Experimental Research, 38,* 2080–2086. doi:10.1111/acer.12440

Romellón, J. S., & Vazquez, R. C. (2007). *Encuesta Sobre Migración en la Frontera Norte de México.* Cuauhtémoc, C.P., México: Confederación Nacional de Asociaciones Profesionales.

Strunin, L., Edwards, E. M., Godette, D. C., & Heeren, T. (2007). Country of origin, age of drinking onset, and drinking patterns among Mexican American young adults. *Drug and Alcohol Dependence, 91,* 134–140. doi:10.1016/j.drugalcdep.2007.05.013

Suárez-Orozco, C., & Suárez-Orozco, M. M. (2001). *Children of immigration.* Cambridge, MA: Harvard University Press.

Turner, R. J., Lloyd, D. A., & Taylor, J. (2006). Stress burden, drug dependence and the nativity paradox among U.S. Hispanics. *Drug and Alcohol Dependence, 83,* 79–89. doi:10.1016/j.drugalcdep.2005.11.003

United States Census Bureau. (2007). *Annual estimates of the population of metropolitan and metropolitan statistical areas* (pp. Table 1. Population change in the 100 metropolitan statistical areas with the largest numeric gain: April 101, 200 to July 101, 2006). Author.

Valdez, A., & Sifaneck, S. (1997). Drug tourists and drug policy on the U.S.–Mexican border: An ethnographic investigation of the acquisition of prescription drugs. *Journal of Drug Issues, 27,* 879–898. doi:10.1177/002204269702700413

Vega, W. A. (1990). Hispanic families in the 1980s: A decade of research. *Journal of Marriage and the Family, 52,* 1015–1024. doi:10.2307/353316

Vega, W. A., Kolody, B., Aguilar-Gaxiola, S., Alderete, E., Catalano, R., & Caraveo-Anduaga, J. (1998). Lifetime prevalence of DSM-III-R psychiatric disorders among urban and rural Mexican Americans in California. *Archives of General Psychiatry, 55,* 771–778. doi:10.1001/archpsyc.55.9.771

Vega, W. A., Sribney, W. M., Aguilar-Gaxiola, S., & Kolody, B. (2004). 12-month prevalence of DSM-III-R psychiatric disorders among Mexican Americans: Nativity, social assimilation, and age determinants. *Journal of Nervous and Mental Disease, 192,* 532–541. doi:10.1097/01.nmd.0000135477.57357.b2

Wallisch, L. S., & Spence, R. T. (2006). Alcohol and drug use, abuse, and dependence in urban areas and colonias of the Texas–Mexico border. *Hispanic Journal of Behavioral Sciences, 28,* 286–307. doi:10.1177/0739986305286137

World Health Organization. (1992). *ICD-10: International Statistical Classification of Diseases and Related Health Problems* (Tenth revised ed. Vol. 1). Geneva, Switzerland: Author.

World Health Organization. (1993). *Composite International Diagnostic Interview: Authorized Core Version 1.1.* Geneva, Switzerland: Author.

Zemore, S. E. (2005). Re-examining whether and why acculturation relates to drinking outcomes in a rigorous, national survey of Latinos. *Alcoholism: Clinical and Experimental Research, 29,* 2144–2153. doi:10.1097/01.alc.0000191775.01148.c0

Zemore, S. E. (2007). Acculturation and alcohol among Latino adults in the United States: A comprehensive review. *Alcoholism: Clinical and Experimental Research, 31,* 1968–1990. doi:10.1111/j.1530-0277.2007.00532.x

Zemore, S. E., Cherpitel, C. J., Ye, Y., Borges, G., Li, L., & Wallisch, L. S. (2016). Factors explaining variation in alcohol use disorder prevalence across border and nonborder communities in Texas. *Alcoholism: Clinical and Experimental Research, 40,* 1707–1716. doi:10.1111/acer.13124