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ORIGINAL PAPER

Substance Use by Immigrant Generation in a U.S.-Mexico Border City

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Abstract Immigrant generation status has an impact on substance use, with lower use rates for recent immigrants. Substance use surveillance data are reported at the national and state levels; however, no systematic collection of data exists at the city level for the general population. In particular, rates of substance use have not been published for El Paso, Texas. The aims of this study are to estimate the prevalence of substance use among Hispanics in El Paso and to determine the association between substance use and immigrant generation. Hispanic residents of El Paso (N = 837) were interviewed. Demographic, immigration, and substance use data were collected. Bivariate analysis indicated that substance use increased as immigrant generation increased, while perceived problems with substance use decreased. In comparison to Texas and national data, our data showed that the rates of tobacco, marijuana, and illicit drug use were lower among young adults in El Paso.

Keywords Substance use · Hispanic · U.S.-Mexico border · Immigrant generation

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Introduction

Popular stereotypes associate Hispanic immigrants with drugs and crime. Studies show, however, that Hispanics have lower substance use rates than do non-Hispanics [1]; and, in what Rumbaut and Ewing [2] term the *assimilation paradox*, as Hispanic immigrants become more assimilated into U.S. culture, they show higher rates of substance use, alcoholism, criminal behavior, and incarceration [2–4]. Among Mexican-Americans, immigrant experience and use of the Spanish language are protective factors for substance use and other disorders [5]. Nevertheless, in a study of Hispanics who live on the Texas-Mexico border, higher acculturation was associated with lower rates of alcohol use disorders among men and a higher frequency of heavy episodic drinking among women [6]; however, it is not clear if his is the case among Hispanics living in El Paso.

The literature compares social and health outcomes between different immigrant generations [7, 8]. Several studies indicate that the prevalence of substance use increases as immigrant generation increases. An analysis of the National Longitudinal Study of Adolescent to Adult Health (Add Health) shows that problematic alcohol use among Hispanics and Asians increases across immigrant generations (6.9 % for first generation, 14.3 % for second generation, and 21.6 % for third and later generations) [9]. The same pattern is observed for lifetime marijuana use (7.9, 17.9, and 32.5 %, respectively) and for other drugs (3.3, 7.8, and 12.7 %, respectively) [10]. The Add Health study also found that self-reported cigarette, tobacco, and marijuana use increased as immigrant generation increased among a representative sample of Asians, Hispanics, and Whites, supporting the assimilation paradox [9].

The assimilation paradox also exists when comparing rates of substance abuse among immigrants in the United

States with rates in their countries of origin. In Los Angeles, foreign-born Mexicans have lower illicit drug use rates than do U.S.-born Mexican-Americans [11]. Moreover, among residents in border cities in Mexico, lifetime or past-year use of such drugs as alcohol, marijuana, and cocaine is more prevalent for those who had lived in the United States compared to those without a history of migration [12]. In a 2009–2010 study conducted with Mexican migrants in Tijuana, rates of substance use varied by migration stage. Males were at increased risk for illicit drug use at the destination and return stages of their trips, compared to use before migration [13].

Although an association between immigrant generations and substance use among Hispanics in the United States has been reported, it is not known whether the same pattern holds for populations on the U.S.-Mexico border with a large population of Hispanics. In 2010, 74.9 % of 80.7 % El Paso residents were Hispanic, compared to 37.6 % in Texas and 16.3 % in the United States [14]. Reports show that most drugs smuggled into the United States from Mexico pass through the El Paso/Juárez region [15]. Given the city's accessibility to drugs and the existence of multigenerational Hispanics, El Paso provides an excellent laboratory to test this relationship.

Previous research uses, at most, three levels to describe immigrant generation: First-generation immigrants are foreign-born individuals with both foreign-born parents, second generation are U.S.-born individuals with at least one foreign-born parent, and third generation, with U.S.-born grandparents [10, 16–19]. The use of a broader spectrum of immigrant generations helps to improve the understanding of generational associations with substance use.

Federal agencies gather nationwide substance use data; however, data are not available at the city level or differentiated by immigrant generation. Nevertheless, a number of studies have focused on alcohol and substance use at the city level. One study, using a sample of 400 Hispanics in El Paso in 2002–2003, found that the estimated rates for lifetime, last month, and abuse and dependence for alcohol (81.1, 43.7, 11.8 %, respectively) and drug use (33.2, 4.7, 4.0 %, respectively) were similar to those at the state and national levels [20]. An earlier study of predominantly Hispanic college students in El Paso found that over half were currently drinking alcohol, and nearly a quarter were using other illegal drugs [21]. Recent data on alcohol and drug use, however, are not available for Hispanic El Pasoans.

Theoretical/Conceptual Framework

Although there is evidence of an association between substance use and immigrant generation among Hispanics in the country as a whole, there is no research on whether the same phenomenon occurs in U.S.-Mexico border cities. Acculturation is often invoked to explain these generational differences. Acculturation, however, is not a linear, unidirectional process; rather, we can identify, "two independent dimensions under-lying the process of acculturation: individuals' links to their cultures of origin and to their societies of settlement" [22]. Research has found that, in supportive contexts, bicultural individuals, regardless of immigrant generation, "have better physical and psychological health" than do those who are not bicultural [23].

The literature demonstrates that, as migrant generation increases, so does substance use. Notably, however, acculturation as a gross measure used in many studies may not fully capture the protective and risk factors that accompany the immigration experience [24]. We expect that the explanatory power of acculturation on the rates of substance use should be lower in El Paso, given the binational, bilingual, and bicultural population of this border city, which allows for ethnic cultural replenishment and cultural maintenance across generations [25]. We chose to examine the relationship between acculturation and acceptance of substance use by asking whether respondents perceived having substance-related problems. We hypothesize that the most acculturated Hispanics would tend to be less concerned about substance use, compared to recent immigrants.

The aims of this study are to: [1] update the scarce literature on substance use in border cities by focusing on the use of tobacco, alcohol, marijuana, cocaine, heroin, methamphetamine, and "spice" (synthetic marijuana or K2) among Hispanic El Pasoans; [2] test the hypotheses that, as immigrant generation increases, (a) substance use will increase and (b) perceived problems with substance use will decrease; and [3] compare the rates for substance use in El Paso with rates in Texas and the United States.

Methods

Participants

Data collection followed a purposive maximum variation sampling technique, with the aim of including at-risk hidden populations, particularly recent immigrants. Participants were reached through the efforts of bilingual students of an immigrant background who are deeply embedded within the El Paso community, who were able to identify and interview members of these hard-to-reach sub-populations.

Data Collection

To understand differences in substance use among Hispanics in a major border city, we collected data in El Paso

County during 2011 and 2012 through in-person confidential surveys. The survey instrument and sampling frame were modeled, in part, on the methodology of a previous successful survey [26]. Drawn from a sample of 873 non-homeless Hispanic adults, the sample has demographic characteristics similar to those of the El Paso Census Data. Unlike the census, however, we also gathered data on migrant generation, housing, and immigration status.

The study was approved by the National Institute on Minority Health and Health Disparities and by the University of Texas at the El Paso Institutional Review Board. Before engaging in data collection and management, all personnel were trained for 6 weeks in research methodology and sensitivity to minorities and vulnerable populations and were certified as having successfully completed training in how to interact ethically with human subjects. A plan for unexpected events was set in place, and physical and mental health professionals with experience in working with immigrants were available for referrals.

Measures

Demographic data included age, gender, cross-border mobility to and from Juárez, and immigrant generation. We used a measure for immigrant generations that differentiates those who migrated to the United States as adults (first generation) and as minors less than 16 years of age (1.5 generation) as well as those U.S.-born individuals with at least one foreign-born parent (second generation), U.S.-born grandparents (third generation), and U.S.-born great-grandparents (fourth generation and later). Additionally, U.S. legal status, education attainment, household income, and languages spoken were collected.

Measures of current substance use include alcohol, tobacco, and cigarette use in the past 30 days as well as lifetime use of other drugs, including marijuana, cocaine, heroin, methamphetamine, and spice. To measure perceptions of substance use, participants were asked whether they perceive alcohol or illicit drug use as a problem for themselves or their family and whether and where they had been enrolled in in-patient services in the past 6 months, including an drug/alcohol treatment center, psychiatric facility, jail/prison/halfway house, medical hospital, or another facility.

Analysis

Data were analyzed using SPSS, Version 21 [27]. Descriptive statistics for all measures included sample sizes, medians for continuous variables, and percentage for categorical variables. Bivariate associations of all measures with immigrant generation status, a categorical variable with five levels, were determined by a Kruskal–Wallis test

for continuous variables and Pearson's Chi Squared test or Likelihood Ratio test for categorical variables. Multivariate analyses for each measure of substance use and context with immigrant generation were adjusted for age and gender using Multiple Logistic Regression. Significant associations were determined with a p value of <0.05 and marginal significance with a p value of <0.10. These results are presented in Table 1.

Results

Among this sample of 837 Hispanic El Paso residents, the median age was 30 (37.8 % were 18–25 years old, and 62.2 % were 26 years old or older), and 42.9 % were male. Over a quarter (26 %) were classified as first generation, 15.3 % as 1.5 generation, 34.6 % as second generation, 14.6 % as third generation, and the remaining 9.4 % as fourth or later generation. The majority of participants were U.S. citizens (79.2 %), and 3.3 % were undocumented. Over one-third had a high school education or less (37.8 %), and close to half had income less than $30,000 (50.8 %). The majority were bilingual (78.6 %), and 41.9 % indicated that they had crossed the border into Juárez. Tobacco and cigarette use was reported by 17.5 % of participants, and 64.9 % reported alcohol consumption. Overall, 8.7 % reported any current illicit drug use, and most (7.7 %) reported using marijuana, followed by cocaine (1.8 %), spice (0.6 %), methamphetamine (0.5 %), and heroin (0.3 %). Participants reported that they perceive alcohol or illicit drug use to be a problem for themselves (9.5 and 5.3 %, respectively) or for their families (30.5 and 12.5 %, respectively). One percent of participants reported having entered a drug treatment or other facility in the past 6 months.

Immigrant generation was statistically significantly associated with age, gender, education, income, language spoken, and cross-border mobility (p values of <0.05). Participants who were second or higher generation were younger than those who were first or 1.5 generation. Rates for Spanish speaking only or more Spanish than English, having less than high school education, and the percentage who reported cross-border mobility generally decreased as immigrant generation increased. All participants were U.S. citizens of at least second generation; undocumented status is relevant only for first and 1.5 generations.

Use of alcohol, any illicit drug, and cocaine as well as perceiving illicit drug use as a problem (p values of <0.05) were statistically significantly associated with immigrant generation, while marijuana use and a family's having problems with alcohol were marginally associated (p values of <0.10). As immigrant generation increased, so did the proportion of alcohol use (60.4, 66.4, 72.8, 74.4, and

Table 1 Descriptive statistics and bivariate associations of demographic and substance use characteristics by immigrant generation among hispanics (N = 837) in El Paso, TX in 2011–2012

	Immigrant Generation												
	Overall		First		1.5		Second		Third		Fourth and Later		
	n	%	n	%	n	%	n	%	n	%	n	%	
Demographic characteristics													
Median age	837	30	215	46	128	35.5	276	25	115	25	76	26.5	*
Gender	837		218		128		290		122		79		*
Male		42.9 %		31.2 %		47.7 %		46.9 %		44.3 %		50.6 %	
Female		57.1 %		68.8 %		52.3 %		53.1 %		55.7 %		49.4 %	
U.S. legal status	836		218		128		290		122		79		a
Citizen		79.2 %		44.0 %		59.4 %		100.0 %		100.0 %		100.0 %	
Resident		15.2 %		39.9 %		31.3 %		0.0 %		0.0 %		0.0 %	
Work/student visa		2.3 %		7.3 %		2.3 %		0.0 %		0.0 %		0.0 %	
Undocumented		3.3 %		8.7 %		7.0 %		0.0 %		0.0 %		0.0 %	
Education	832		218		127		289		121		77		*
Less than high school		14.5 %		35.3 %		18.9 %		4.2 %		3.3 %		5.2 %	
High school/GED		23.3 %		17.0 %		24.4 %		21.5 %		32.2 %		32.5 %	
Tech/1–2 years college		28.4 %		19.3 %		21.3 %		34.6 %		34.7 %		32.5 %	
College and more		33.8 %		28.4 %		35.4 %		39.8 %		29.8 %		29.9 %	
Household Income	837		218		128		290		122		79		*
Less than $20,00		36.7 %		51.4 %		33.6 %		32.4 %		30.3 %		26.6 %	
Between $20,000 and $30,000		14.1 %		12.4 %		14.1 %		14.1 %		13.9 %		19.0 %	
Between $30,000 and $40,000		10.5 %		8.3 %		14.8 %		9.7 %		12.3 %		10.1 %	
Between $40,000 and $50,000		8.8 %		5.0 %		10.2 %		10.0 %		9.8 %		11.4 %	
More than $50,000		29.9 %		22.9 %		27.3 %		33.8 %		33.6 %		32.9 %	
Languages spoken	828		215		128		287		119		79		*
Only Spanish		15.3 %		42.3 %		14.1 %		5.2 %		0.8 %		2.5 %	
Spanish more than English		20.9 %		36.7 %		30.5 %		14.6 %		8.4 %		3.8 %	
Spanish and english equally		32.5 %		18.1 %		43.0 %		44.6 %		24.4 %		22.8 %	
English more than Spanish		25.1 %		1.9 %		11.7 %		31.4 %		48.7 %		51.9 %	
English only		5.6 %		0.0 %		0.8 %		3.1 %		17.6 %		19.0 %	
Other		0.6 %		0.9 %		0.0 %		1.0 %		0.0 %		0.0 %	
Cross-border mobility	824	41.9 %	213	62.0 %	127	56.7 %	286	38.5 %	120	19.2 %	78	10.3 %	*
Substance use													
Any tobacco products	837	17.5 %	217	16.1 %	128	19.5 %	290	16.9 %	122	19.7 %	79	16.5 %	
Cigarette	836	17.5 %	217	14.7 %	128	18.0 %	290	14.8 %	122	15.6 %	79	13.9 %	
Alcohol	784	64.9 %	207	60.4 %	119	66.4 %	268	72.8 %	117	74.4 %	73	78.1 %	*‡‡

Table 1 continued

	Immigrant Generation												
	Overall		First		1.5		Second		Third		Fourth and Later		
	n	%	n	%	n	%	n	%	n	%	n	%	
Any Illicit drugs	790	8.7 %	205	4.4 %	124	6.5 %	272	11.4 %	115	13.0 %	74	8.1 %	*
Marijuana	790	7.7 %	205	4.4 %	124	5.6 %	272	9.2 %	115	13.0 %	74	6.8 %	**
Cocaine	789	1.8 %	204	0.0 %	124	0.0 %	272	4.4 %	115	0.9 %	74	1.4 %	*
Heroin	789	0.3 %	204	0.0 %	124	0.0 %	272	0.7 %	115	0.0 %	74	0.0 %	
Methamphetamine	789	0.5 %	204	0.0 %	124	0.8 %	272	1.1 %	115	0.0 %	74	0.0 %	
Spice	789	0.6 %	204	0.5 %	124	0.8 %	272	0.7 %	115	0.0 %	74	1.4 %	
Substance use context													
Perceive alcohol use as a problem	824	9.5 %	211	9.5 %	128	10.9 %	287	9.8 %	121	9.1 %	77	6.5 %	
Family has problem with alcohol	817	30.5 %	207	30.0 %	127	25.2 %	287	31.0 %	118	39.8 %	78	24.4 %	**
Perceive illicit drug use as a problem	825	5.3 %	211	10.0 %	127	5.5 %	288	4.9 %	121	0.0 %	78	2.6 %	*†
Family has problem with drugs	816	12.5 %	207	10.6 %	126	8.7 %	287	13.9 %	119	11.8 %	77	19.5 %	
Drug/alcohol treatment center	836	1.0 %	217	0.0 %	128	2.3 %	290	0.7 %	122	0.8 %	79	2.5 %	

* Significant (p value <0.05) and ** marginally significant (p value <0.10) bivariate associations are noted

† Significant (p value <0.05) and ‡ marginally significant (p value <0.10) multivariate associations adjusted for age and gender are noted

[a] was not generated given that all U.S. born are U.S. citizens

78.1 %). With the exception of fourth generation and later, as immigrant generation increased, the proportion of use of illicit drugs (4.4, 6.5, 11.4, 13.0, and 8.1 %) and marijuana (4.4, 5.6, 9.2, 13.0, and 6.8 %) increased, while perceptions of illicit drug use as problematic (10.0, 5.5, 4.9, 0, and 2.6 %) decreased. After adjusting for age and gender, as immigrant generation increased, perceiving illicit drug use as a problem statistically significantly decreased ($p < 0.001$), and alcohol use marginally significantly increased ($p = 0.052$).

The National Survey on Drug Use and Health (NSDUH), led by the SAMHSA's Center for Behavioral Health Statistics and Quality, reports rates for tobacco products, cigarettes, alcohol, illicit drugs, and marijuana use in the past month as well as cocaine use in the past year by age group (18–25 versus 26+) for Texas and the United States [28]. These rates were compared to those of Hispanic El Pasoans (Table 2).

Rates of tobacco products and cigarette use in El Paso were lower, while alcohol use rates were higher compared to those of Texas and the United States for both age groups. This trend in alcohol use is consistent with the findings for an older sample of high school students in El Paso in 2001, for whom rates of current alcohol consumption (57.9 %) were higher than state (48.6 %) and national rates (47.1 %) [29]. For 18- to 25-year-olds, rates for any illicit drug use and marijuana use were lower in El Paso compared to Texas and the United States, while cocaine use in El Paso was half the rate of Texas and twice the national rate. Among those 26 or older, rates of any illicit drug and marijuana use were intermediate between Texas and the U.S. rates, and cocaine use in El Paso was 50 % higher in Texas and over twice as high compared to U.S. rates. The high rates of cocaine use may be due to the increased flow of cocaine into the West Texas region. This is based on data from seizures at El Paso's port of entry and from law enforcement [15]. Our findings further illuminate how immigrant generation, as a marker for related socio-cultural factors, may be a protective factor for alcohol and drug use.

Discussion

This is the first study to examine substance use patterns among Hispanics living in El Paso by immigrant generation. In addition to providing current rates for alcohol, tobacco, and illicit drug use in El Paso, we compare them with Texas and national rates. Although El Paso is situated on a main drug trafficking route [30, 31], estimated rates of substance use are not higher in El Paso as compared to Texas and the United States.

As we had hypothesized, our findings show that immigrant generation is significantly related to alcohol, illicit drug, and cocaine use, consistent with national data that indicate that substance-use prevalence rates are lower among foreign-born Hispanic youth [32] as compared to U.S.-born youth [33]. Also as hypothesized, perceiving substance use as a problem decreases as immigrant generation increases. This is consistent with other studies of Latino adults that indicate that perceived health risks due to substance use is higher for immigrants compared to U.S.-born individuals [7]. Further research is needed to better understand why, when, and how Hispanics in El Paso engage with substance use patterns.

Limitations

A limitation in the data collection was that a time frame for current substance use was not specified; hence, the measures for substance use are non-specific. We assumed that responses about current use were comparable to responses about use in the last month. If some respondents were referring to lifelong use, our findings may be an overestimate, which would reinforce our findings.

Table 2 Substance Use in El Paso, Texas, and United States in 2011–2012

	18–25			26+		
	EP (%)	TX (%)	US (%)	EP (%)	TX (%)	US (%)
Any tobacco products	19.3	35.7	38.8	16.3	24.7	26.7
Cigarette	16.5	31.0	32.7	14.6	20.5	22.1
Alcohol	73.1	56.6	60.5	66.9	51.9	55.3
Any Illicit drugs	13.9	16.9	21.4	5.5	4.9	6.7
Marijuana	12.9	13.8	18.9	4.5	3.3	5.1
Cocaine*	2.3	4.2	1.1	1.4	0.9	0.6

El Paso (EP), Texas (TX), and United States (US)

Data for El Paso is self-report and does not specify a time frame for use

* Cocaine use in the last year reported for TX and US. Use in past month for all other drugs

In addition, substance use rates for Texas and the United States were available only for "use during the past year," which would be likely higher than "use in the last month." The use rates in the present study were not from a representative sample, while NSDUH rates for Texas and U.S. were.

Although the analyses were adjusted for age and gender, we were unable to adjust for other factors that may affect substance use and are associated with immigrant generation, such as income and education, given the low sample size, particularly due to missing values.

Contributions to the Literature

To our knowledge, this is the first study to do assess the association between substance use and immigrant generation among a large sample of Hispanics on the U.S.-Mexico border. Few substance use studies measure immigrant generation, and those that do rarely make the distinction between first, 1.5, and second generation. Very few cities have Latino populations who have resided for three, four, or more generations. We have shown that, overall, the most recent immigrants have lower substance use rates and higher perceptions of substance use as a problem than do those who are 1.5, second, or third generation. Then, rates drop again for those who are of fourth or more generation. Given that El Paso has a long history of Hispanic presence, our detailed generation-status data are an important improvement over a simple dichotomous comparison between native and foreign-born, often used in the literature, or those who spend a proportion of their life in the country [22].

This study's sample included hard-to-reach sub-populations overcoming the limitations of household surveys that tend to underrepresent vulnerable populations given they are tied to a physical home address. Further, due to the manner in which the surveys were conducted, most respondents shared their immigration status: 3.3 % of the sample were undocumented. Undocumented immigrants could have a lower incentive to self-disclose substance abuse due to fear of deportation and low social desirability of the response.

As with self-report drug use studies, substance use may have been underreported [33]. Nevertheless, the in-depth and confidential nature of the survey conducted by a trusted person, as compared to a health organization, government agency, or phone interviewers, results in higher self-reports. Thus, we feel that the study's findings may be generalizable to the Hispanic population in El Paso, which represents over 83 % of the general population in El Paso.

We hypothesized that recent immigrants have lower substance use because the purpose of migration is generally to work, save money, and send remittances [34]. The 1.5, second, and third generations often face discrimination, low socio-economic status, low educational attainment, and limited employment opportunities [35, 36], all of which place them at greater risk of substance use than the first generation, but Hispanic cultural traits act as protective factors. The bicultural adaptation, possible at the border, allows for this cultural maintenance. As biculturalism decreases, the third generation may face cultural diffusion and be the most lost between cultures [22], thus, the higher substance use rates. After four generations, the respondents are culturally indistinguishable from White Americans. Thus, the finding that some substance use decreases for the fourth generation and later can be related to better overall integration into U.S. society, social mobility, higher education, and opportunities for advancement [37, 38]. In future research, we will test this hypothesis with other outcome variables and controls.

To conclude, this study shows how individuals who migrate before age 16 have certain behaviors and how the upward trend for substance use stops after the third generation. Further research is needed to better understand these behaviors across age groups and immigrant generation status. Nevertheless, fourth and later generations still have higher substance use than does the first generation, providing further evidence for the healthy immigrant hypothesis. This research is expected to help identify turning points for intervention strategies, and inform future efforts to reduce substance use among increasingly acculturated Hispanics across the United States.

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