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Determinants of Alcohol and Drug Driving Among Latino Immigrants in Miami Dade County, Florida

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Abstract

Background.—Little is known about the pre- and post-immigration drinking and drug driving behavior of Latino immigrants. Despite showing drinking risky behaviors, many recent immigrants of low socioeconomic status (SES) do not drive while impaired by alcohol (DWI) due largely to limited access to a vehicle. This effort examines the DWI and as driving while impaired by drugs (DWID) behaviors of Latino immigrants who have access to a vehicle.

Methods.—Data came from an ongoing longitudinal sample of Latino immigrants to Miami-Dade County, FL. Bivariate analyses and logistic regression were applied.

Results.—Pre-immigration DWI and DWID was the best predictor of post-immigration DWI and DWID.

Discussion.—Future interventions should make efforts to 1) identify immigrants who had DWI and DWID in their country of origin; and 2) design and deliver specific and culturally-relevant messages to persuade them not to engage in DWI and DWID after immigration.

Keywords

Latinos; risk perceptions; DWI; DWI; recent immigrants; Miami/Dade Co.; Florida; Immigrants; drinking and driving; drugged-driving

Background

Monetarily and in lives lost, alcohol-related crashes are a burden to society. Studies of crash data have consistently shown an over-involvement of Latinos in alcohol-related crashes (Romano, et al. 2010; United States. National Highway Traffic Safety 2010). It has been suggested that recent Latino immigrants (RLIs) may be at higher risk for involvement with impaired driving due to a failure of fully understanding the risks associated with driving while impaired (DWI) as a result of cultural norms from their countries of origin,

including lax enforcement of DWI laws (Caetano and Clark 1998; Cherpitel and Tam 2000; National Highway Traffic Safety Administration 1995). Yet, there is a scarcity of knowledge regarding the pre- and post-immigration DWI trajectories of RLIs. Recently, an examination of the drinking and DWI patterns of a cohort of Latino immigrants in South Florida of relative low socioeconomic status (SES) reported that although these RLIs were at risk of DWI involvement (e.g., high frequency of binge drinking, low understanding of traffic laws, and inadequate perception of risk), they rarely incurred in that behavior, mainly because of their limited access to vehicle.

Knowledge on RLI's involvement in driving while impaired by drugs (DWID) is scarcer. Although compared with alcohol, the use of illicit drugs is less prevalent among RLIs (Cyrus, et al. 2015), drug use is a contributor to impaired driving which has been receiving enormous attention (DuPont, et al. 2013; Romano, et al. 2014; Romano and Voas 2011; Romano and Pollini 2013b; Scherer, et al. 2015). Nevertheless, DWID is a severely understudied phenomenon among RLIs. The overall goal of this study is to examine factors contributing to DWI and DWID among RLIs.

Several possible contributors to DWI and DWID were examined. There is ample consensus that women are less likely to DWI than men (Bergdahl 2007; Dobson, et al. 1999). Women's involvement in DWID however is less clear, varying sharply with the type of drug being considered (Romano and Pollini 2013a). Due to inexperience, immaturity, and risk taking, young drivers are among the drivers most likely to be involved in DWI crashes (e.g., (Fell, et al. 2007; Fell, et al. 2016) as well as DWID events (Romano and Pollini 2013a).

Socioeconomic status such as income or education can also influence the likelihood of DWI and DWID (e.g., (Romano, et al. 2003; Romano, et al. 2006). Acculturative stressors related to the context of the immigrant receiving community have also been shown to impact the post-immigration alcohol use patterns of recent Latino immigrants (Sanchez, et al. 2014) and therefore, they may also influence DWI and DWID. Indeed, the evidence clearly shows that acculturation increases drinking and driving, particularly among Latinas (Romano, et al. 2005). Family cohesion (Gladys, et al. 2015), positive religious coping (Sanchez, et al. 2015), and a positive neighborhood environments (elevated social capital) have also been associated with lower rates of alcohol misuse among Latino immigrants, and therefore may also influence DWI involvement (Sanchez, et al. 2016). This manuscript examines these contextual determinants of impaired driving among RLIs to Miami/Dade Co. With a population about 65% Hispanic (53% Cuban, 7% Colombian, 6% Nicaraguan, 3% Honduran, 17% Other South American, 14% Other Latin American), Miami-Dade County is one of the main destinations for Latino immigrants to the United States (U.S. Census-American Factfinder, 2010). More specifically, this study builds upon our previous examination of DWI behaviors among recent Latino immigrants to Miami-Dade County, with the goal of achieving a more comprehensive understanding of the impaired driving phenomenon in the target population by i) simultaneously examining DWI and DWID behaviors, ii) examine the contribution of demographic, socioeconomic, legal, neighborhood, and cultural factors that influence DWI and DWID among recent Latino immigrants in Southern Florida, and iii) examine how the contribution of these factors is moderated by pre-immigration DWI and DWID behaviors. We hypothesize that after arrival,

factors promoting and/or protecting immigrants from alcohol and drug use will also protect them against DWI and DWID.

Methods

Data

Data came from an ongoing longitudinal substance abuse study following an initial sample of 527 recent Latino immigrants in Miami-Dade County, FL (De La Rosa, et al. 2011; De La Rosa, et al. 2013a; De La Rosa, et al. 2012). That study sampled Latinos aged 18 to 34 who have immigrated to the United States from Latin America with the intention of staying. Unique to this effort is its success in reaching, accessing, and retaining the participation of undocumented immigrants, for which respondent-driven sampling (RDS) was the appropriate recruitment strategy. The initial wave of recruits (*seeds*) was asked to refer three individuals in his or her social network who met the study's eligibility criteria. Seeds were recruited via flyers posted in neighborhoods with substantial Latino populations, during health fairs, and through community health centers. The depth of the chains were no more than three legs from the seed (De La Rosa, et al. 2013a).

For this study, attempts to re-contact all participants from that study were made about 6 years later. Of them, 467 accepted participation in a survey about their drinking and driving patterns. Participants were aged 23–40 when interviewed for the present study. All interviews were conducted in Spanish. The sample distribution by country of origin was 53% Cuban, 17% South American, 6% Nicaraguan, and 24% Other Latin American. Of these participants, 184 (35%) had not have access to a vehicle in a past year. Because by not having access to a vehicle it was not possible for them to DWI and/or DWID, these drivers were excluded from the study, leaving 347 (65%) subjects selected for this study.

Measures

DWI, DWID (Outcome Variable).—DWI and DWID were assessed through responses to these questions: “*in the last 12 months have you driven within 2 hours after drinking an alcoholic beverage?*” (DWI); “*in the last 12 months, how often did you drive after consuming marihuana, cocaine or other illegal drugs?*” (DWID). Those who did not DWI or DWID but reported driving at least occasionally over the last year were classified as drivers who did not DWI or DWID.

Legal immigration status.—Participants' legal immigration status (LIS) status was measured by fourteen possible categories (e.g., temporary or permanent resident, temporary work visa, undocumented or expired visa). These categories were recoded into a 3-item categorical variable: “permanent”, “temporary”; and “undocumented”.

Demographics.—We assessed the immigrants' gender, and marital status. Despite expectations about the contribution of these factors to DWI and DWID, our previous research with the present data sample indicated that age did not play a factor in shaping DWI rates, largely because of the limited age variation (De La Rosa, et al. 2013c). Subsequently, we excluded age from these analyses.

Socio-economics.—We assessed the education level (1 = *less than high school*, 2 = *high school*, 3 = *some /full tertiary studies*), household income (< \$10,000; \$10,000), and employment of the participants (assessed as 0 = *unemployed* 1 = *currently employed*).

Acculturation Stress/Cultural Values—The validated Spanish version of the immigration stress subscale of the Hispanic Stress Inventory Scale–Immigrant Version (Cervantes, et al. 1991) was used to measure acculturative stress. This scale is a measure of psychosocial stress-event experiences for Latino immigrants. It has been widely used with this population (Ellison et al., 2009; (Loury and Kulbok 2007). The instrument is in a 5-point Likert-type scale format and the subscale used contains 18 questions. The participant reports whether or not he/she experienced a particular stressor. If the stressor was experienced, then a follow-up question is asked regarding the appraisal of how stressful that particular event was to the respondent (1 = *not at all*, to 5 = *extremely*). A stress frequency score is calculated by summing the number of stressful events participants reported, while a mean score is calculated for stress level appraisal. Example items are as follows: (1) “*I felt guilty about leaving my family and friends in my home country*”; (2) “*Because of my poor English, it has been difficult for me to deal with day-to-day situations*”; (3) “*Because I am Latino, I have had difficulty finding the type of work I want.*” For this effort we operationalized this variable by looking at the distribution of responses for stress frequency and stress level appraisal and subsequently creating three-level variable that classifies participants’ number of stressful events and appraisal of stress levels into “Low” (0–1), “Medium” (Between 1 and 2); and “High” (2 or more).

In addition, an item taken from the Latino Cultural Values Scale (Kim et al., 2009) assessed participant’s appraisal of preserving cultural traditions. Specifically, participants were asked the degree to which they agreed with the following statement: *One does not need to maintain one’s cultural traditions*. Responses were provided on a 4-point Likert scale ranging from 1 (strongly disagree) to 4 (strongly agree).

Family Cohesion

The survey collects questions pertaining to the family cohesion subscale of the Family Functioning Scale (Bloom 1985). Answers to the following questions (“*In my family each member helps one another and supports each other*”; “*My family does things together*”; and “*In my family we get along well with each other*” are answered on a 4-point Likert scale ranging from (1 = *very untrue* to 4 = *very true*) with higher scores indicating higher levels of family cohesion. To preserve power because of the small sample size, we reclassified them as two-level variables indicating low (those who answered 1 and 2) and high family cohesion (those who answered 3 or 4).

Religious Coping.

The survey’s questionnaire asked questions covering several religiosity domains. The following questions were asked: i) *I tend to question the power of God*. Secure attachment to God has been related to high life satisfaction and lower levels of anxiety and depression (Freeze and DiTommaso 2014; Wei, et al. 2012); ii) *I focus on religion to stop worrying about my problems*. Pertaining to the coping domain of religiosity, this question informs

about participants' religions as a path to reduce stress through the provision of hope (Idler, et al. 2003); iii) *I sought help from God in letting go of my anger*. This question focuses on religious support, which has been shown to relate with good health outcomes (Idler, et al. 2003); and iv) *I looked for a stronger connection with God*. This question focuses on religious intensity, which can be used as an indicator of feelings of self-worth (Idler, et al. 2003).

Neighborhood's Social Capital

The following question was used to capture a measure of the social capital of the immigrant's neighborhood: "*Where I live, people is willing to help their neighbors*". Participants responded to a 5-point Likert scale ranging from 1=Very Unlikely to 5=Very Likely. To preserve statistical power we collapsed these levels into three: Never/Rarely, Maybe, Often/Always.

DWI and DWID in country of origin

To examine if pre-immigration DWI and DWID behaviors influence post-immigration DWI and DWID, we asked the following two questions: "*Prior to coming to this country had you ever driven after drinking too much?*", and "*Prior to coming to this country how often did you drive after consuming marihuana, cocaine or other illegal drugs?*". A 5-point Likert scale ranging from 1= "Every Day" to 5="Never" was used. To preserve statistical power, the 5 levels were collapsed into "Never" (level "5") and "At least once" (levels 1 to 4).

Analysis

We first applied bi-variate analyses to examine the association between the three levels of the post-immigration outcome variable (DWID; DWI; No DWI-DWID) and the post-immigration explanatory variables (drivers' demographics, SES, family cohesion, religiosity, acculturation-related, and the RLIs neighborhood's characteristics). We also examined the association between pre- and post-immigration DWID and DWI. To conduct these examinations we estimated the prevalence and 95% confidence intervals (CI) of each of the explanatory variables at each of the three levels of the outcome variable.

Next we ran a multinomial logistic regression to ascertain which among the factors identified as significant by the bivariate analyses contributed the most to DWID or DWI. We made these comparisons relative to the RLI drivers who did not incur in any of these behaviors (i.e., the reference level). To reduce potential collinearity problems, a step wise regression procedure (option forward) was applied to further streamline the model. All analyses were conducted under a SAS® 9.4 framework.

Results

The majority of the sample of RLIs with access to a vehicle did not DWI or DWID (87.6%, n=304). Of the 12.4% of the drivers who DWI or DWID (n=43), about half was involved only in DWI (n=24) and about 35% (n=15) in DWID only. Very few drivers did both DWI and DWID (n=4). Interestingly thus, the drivers who were involved in DWI or DWID tended to engage in either one or the other, but not both. Although those who DWI and DWID

constitute a group of drivers of significant research interest, because of their small numbers we grouped them with those who only DWID in the past year. Thus, the resulting DWID research category (n=19) includes drivers who in the past 12 months have incurred in DWID, either in combination with DWI or not; leaving 304 drivers who did not DWI or DWID in the past year. As a result, our outcome variable has the following 3 levels denoting: DWI in the past year (but not DWID); DWID in the past year; and neither DWI or DWID in the past year.

Bivariate analyses

Demographics and Socioeconomics—Table 1 shows the distribution of the demographic and socioeconomic variables by the outcome variable. Neither the drivers' gender, country-region of origin, legal immigration status (LIS), education attainment, household income, employment or marital status were associated with participants' DWI. On the other hand, male and undocumented drivers were more likely to engage in drugged-driving (DWID) than female drivers and drivers with permanent residency status, respectively. The latter indicates that although undocumented immigrants are less likely to have access to a vehicle (as shown by Romano et al., 2015), those among them who have access to a vehicle are more likely to be involved in DWID than their permanent resident counterparts.

Neighborhood's Social Capital—Table 1 also shows the RLIs' perception of their neighborhood's social capital, as it relates to the outcome variable. About three quarters of the RLIs (n=256) reported they live in a neighborhood in which its inhabitants tend to help each other. Only 10% of the drivers (n=34) indicate they do not live in such a helpful neighborhood. The RLIs who live in a neighborhood with a relative high social capital are less likely to DWID or DWI than those living in neighborhoods with a relative low social capital.

Acculturation Stress, Cultural value—Table 1 also shows no significant association between acculturation stress frequency or appraisal (stress level) at any level of the outcome variable. Drug-driving was more associated not believing in the need to preserve cultural traditions. No such difference was detected for drinking and driving behaviors.

Religiosity—Table 1 also shows the distribution of the four measures of religiosity used by this effort across the outcome variables. Immigrant drivers who often question the power of God (negative religious coping/low levels of life satisfaction) are more likely to DWID than those who never or rarely do such questioning.

The likelihood of DWI was lower among those who tend to focus on religion as a way to stop worrying about their problems (positive religious coping) than among those who do not. Thus, despite its success in avoiding alcohol, this dimension of religiosity failed to protect against drug-driving.

Family cohesion—Table 1 also shows that RLIs who report that family members get along well, and tend to do things together are less likely to DWI and DWID.

DWI and DWID in the country of origin—Table 1 also shows that RLIs who DWI or DWID in their country of origin were more likely to repeat that behavior after immigration

Logistic Regression

The bivariate analyses conducted in the previous section allowed the identification of variables associated with DWI and DWID. To assess the relative contribution of these variables on the outcome variable we run logistic regression. After the stepwise process ended, the following variables remained in the selected model: “Focused on religion to stop worrying about problems” (Religiosity); “We really get along well in our family” (Family cohesion), “Family does things together” (Family cohesion); “pre-immigration DWI”, and “pre-immigration DWID”. To this selected model we then added “gender” (a factor that has consistently been found associated with DWI and DWID) to create the final model. Table 2 shows the outcome of this regression. Pre-immigration DWI and DWID behaviors contributed significantly to the post-immigration behaviors. Odds ratio (OR) for the contribution of pre-immigration DWI on post-immigration DWI were OR=17.2. The ORs for the contribution of pre-immigration DWID on post-immigration DWID was 10.8. Religiosity (i.e., a relative reduced focus on religion) and reduced family cohesion (i.e., family members not getting along) are two factors also contributed to post-immigration DWI. Lack of family cohesion (i.e., family members rarely doing things together) also contributed to DWID. Although gender was not a significant contributor to DWI or DWID, it became significant once the family cohesion and religiosity variables were removed from the model (not shown). In that case, compared to men, women were less likely to be involved in DWID. Finally, it is important to note the wide CIs shown in Table 2. Likely a reflection of the small sample size, the implications of this result are discussed in the next section.

Discussion

Current information on patterns and rates of substance use by Latinos in America consistently portrays a picture that shows Latino immigrants being less likely to abuse alcohol or illicit drugs than their US-born counterparts (Alvarez, et al. 2007), (Caetano, et al. 2009). Although over time, a fraction of these immigrants begin to adopt patterns and levels of alcohol and drug use similar to their US-counterparts (Abraído-Lanza, et al. 2005). There is, however, a dearth of knowledge regarding the immigrants’ trajectories to alcohol and drug abuse, in particular those involving DWI and DWID. Funded by the NIAAA, this research team began examining trajectories to impaired driving by RLIs to Miami/Dade Co., FL, and reported that although many of the RLIs were at risk of DWI (i.e., high rates of binge drinking and low understanding of US alcohol and traffic laws) they rarely drove impaired. Limited access to vehicles (and among undocumented immigrants the desire to avoid encounters with law enforcement) protected many of the recent immigrants from drinking and driving (Romano, et al. 2016). This effort goes a step further focusing on the immigrants who do have access to a vehicle, and examines what are the factors that would make them engage (or not engage) in drinking- and drugged-driving.

We found that among the RLIs with access to a vehicle, the likelihood of drugged-driving was higher among men than among women, in particular those living under duress (undocumented, living in disadvantaged neighborhoods). Family cohesion and religious coping were protective factors against drug driving, likely because of its protective influence on substance use. Although interesting and informative, none of the findings described above were unexpected. These findings are consistent with previous research on the factors shaping the use of alcohol and/or illicit substances among RLIs to Miami/Dade Co. (Cyrus, et al. 2015; Ibañez, et al. 2015; Sanchez, et al. 2015).

Most interestingly and perhaps the main contribution of this effort comes from our regression model. Intended to examine the relative contribution of all significant predictors to DWID and DWI, the regression model indicates that the likelihood of post immigration DWID and DWI is highly influenced by immigrants' DWID and DWI behaviors in the country of origin. Simply stated, those who were involved in drinking and driving and drugged-driving before immigration, tend to repeat that behavior after arrival to the U.S. Related to this possibility is our finding that while drug-driving was more prevalent among immigrants who do not believe in the need to preserve traditions than with such belief, no such difference was detected for drinking and driving behaviors. This finding may be related to Latinos (Cubans in particular) in their countries of origin being more prone to drink and/or abuse alcohol than illicit drugs (González 2013).

The significance of this finding is apparent, as it suggests that future interventions should pay close attention to pre-immigration DWI and DWID involvement. By examining pre- and post-immigration DWID and DWI, this effort provides a unique and novel view of a still understudied phenomenon. In particular, it points to the vital need for future research that examines how pre-immigration factors impact post-immigration behaviors among Latino immigrants. More specifically, this effort suggests that future research should focus on 1) identify immigrants who engaged in DWI and DWID in their country of origin in particular if they are men, as they might be at a higher risk of repeating that behavior post-immigration; and 2) design and deliver intervention with specific and culturally-relevant messages to prevent them from engaging in those risk behaviors in the host country.

Limitations

Although it provides an important contribution to an understudied phenomenon, this study is not without its limitations. Our study was based on a relative small sample of RLIs. Incorporated to an ongoing longitudinal examination of 527 recent immigrants to Miami (De La Rosa, et al. 2013b; Sanchez, et al. 2014), the parent study (Romano, et al. 2016) used information from 467 Latino immigrants. From that sample, this study examined only the 347 participants who had access to a vehicle in the past year. Although large enough for direct comparisons, it is unlikely the sample was sufficient to tolerate more complex interactions. Moreover, the relative small size of our sample is likely responsible for the large CIs accompanying the OR estimates obtained by the logistic regression. It is possible therefore that our analyses were able to detect the significance of only the most relevant contributing factors, leaving other potentially contributors, mediators, moderators, as non-significant. Concerns about statistical power and data partitioning also precluded the

analyses of dual interactions between the effects included in the regression model. Further, our study also faced limitations typically associated with self-reported data (Stockwell, et al. 2004) as well as generalizability, given the unique nature of Miami/Dade Co. as an established immigrant-receiving community.

Despite its limitations, this study represents a valuable contribution to the literature. Findings from the present study point towards pre- and post-immigration factors contributing to DWID and DWI among recent Latino immigrants in the U.S., while underscoring the need for novel future research directions in this area of investigation.

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Biography

Eduardo Romano is a Senior Research Scientist at the Pacific Institute for Research and Evaluation (PIRE). He has been a Research Scientist at PIRE for 18 years. He has conducted research and published on the risks associated with impaired driving among the general population of drivers, and particularly among women and minorities. His research has been funded largely by the National Institutes of Health (NIH), in particular the National Institute on Alcohol Abuse and Alcoholism (NIAAA) and the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD), as well as by the National Highway Traffic Safety Administration (NHTSA) and the Office of Juvenile Justice and Delinquency Prevention (OJJDP), among others. At PIRE Dr. Romano is currently a member of its Board of Directors (since 2013), PIRE's Institutional Review Board (since 2008), and PIRE's "Red Team" (Reviewer of PIRE grants before submission). Outside PIRE, he is an adjunct professor at the School of Public Health, University of Maryland; a member of the Transportation Research Board's Committee on Women's Issues in Transportation (ABE70); and a friend of the Committee on Alcohol, Other Drugs, and Transportation (ANB50).

Mariana Sanchez holds a doctoral degree in social welfare from Florida International University. She has over 17 years of experience in conducting behavioral longitudinal research with Latinos. Currently, she holds a postdoctoral research associate position at the Center for Research on U.S. Latino HIV/AIDS & Drug Abuse (CRUSADA) at Florida International University. As part of multidisciplinary team of researchers she investigates the influence of sociocultural determinants on the substance use and HIV risk behaviors of Latinos. Specifically her research interests include the impact of religion and spirituality on the health behaviors of Latinos.

Mario de la Rosa, PhD, is a professor of social work at the Robert Stempel College of Public Health & Social Work at Florida FIU. He is an internationally known researcher who has published more than 70 scholarly publications focusing on Latino substance abuse, substance use as a risk factor for HIV/AIDS, violence, delinquency, and cross-cultural issues. He has conducted research documenting the influence of familial factors on the

substance abuse and HIV risk behaviors of adult Latina immigrants and the impact that pre-immigration factors have on the use of alcohol among recent young-adult Latino immigrants. Over the course of his academic career, he has received more than 15 million dollars in funding from the National Institutes of Health (NIH) and has served on numerous NIH scientific review committees and peer-review scientific editorial boards. He is a past member of the National Institute on Minority Health and Health Disparities (NIMHD) National Advisory Council.

Benjamin Ertman is an undergraduate student at St.Marys....

He is majoring in psychology....

He spent the summer of xxxx as an intern at the Pacific Institute for Research and Evaluation (PIRE), Calverton Center; where he was tasked to conduct basic research (data manipulation and initial tabulations) necessary for this effort.

Mr. Ertman will graduate in xxxx,

He plans to attend graduate school after his graduation

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Table 1.
Recent Latino Immigrants who had driven in the past year

.. Distribution of demographic, legal, socioeconomic, neighborhood's social capital, acculturation-related variables and pre-immigration DWID and DWI by post-immigration DWID and DWI

		N	DWID	DWI	None
Demographics					
Gender	Male	188	9.04%	9.57%	81.38%
	Female(Ref)	159	1.26%	3.77%	94.97%
Marital Status	Married/Partner	151	5.96%	4.64%	89.40%
	Separated/Widow	53	NA	5.66%	94.34%
	Single(Ref)	143	6.99%	9.79%	83.22%
Country-Region of Origin	Cuba (Ref)	171	2.92%	7.02%	90.06%
	Nicaragua	23	8.70%	8.70%	82.61%
	South America	100	4.00%	7.00%	89.00%
	Other	53	15.09%	5.66%	79.25%
Legal Immigration Status	Permanent resident(Ref)	269	1.86%	5.95%	92.19%
	Temporal Resident/visa	42	16.67%	9.52%	73.81%
	Undocumented	36	19.44%	11.11%	69.44%
Education	No High School(Ref)	95	1.05%	5.26%	93.68%
	High School Complete	166	6.63%	7.23%	86.14%
	Some/Full Tertiary studies	86	8.14%	8.14%	83.72%
Household Income	\$10,000 or less(Ref)	319	4.39%	6.90%	88.71%
	More than \$10,000	28	17.86%	7.14%	75.00%
Employment	Unemployed(Ref)	108	3.70%	2.78%	93.52%
	Currently Employed	239	6.28%	8.79%	84.94%
Where I live, people is ready to help his/her neighbors	Never/Rarely(Ref)	34	20.59%	11.76%	67.65%
	Maybe	50	12.00%	10.00%	78.00%
	Yes/Always	256	1.95%	5.47%	92.58%
Acculturation					
Average level of immigration stress	Low -1(Ref)	172	6.40%	5.81%	87.79%
	Medium - 1.01 – 1.99	146	4.11%	6.16%	89.73%
	High - 2+	29	6.90%	17.24%	75.86%
Number of stressful immigration related events	0(Ref)	143	7.69%	6.99%	85.31%
	.00–2.99	116	1.72%	5.17%	93.10%
	3+	88	6.82%	9.09%	84.09%
Need to preserve traditions?	No(Ref)	169	8.88%	6.51%	84.62%

		N	DWID	DWI	None
	Yes	177	2.26%	7.34%	90.40%
Religiosity					
Looked for a stronger connection with god	Never/rarely (Ref)	147	5.44%	10.88%	83.67%
	Often/A Lot	200	5.50%	4.00%	90.50%
Question the power of God	Never/rarely (Ref)	302	3.64%	7.28%	89.07%
	Often/A Lot	45	17.78%	4.44%	77.78%
Sought help from God in letting go of my anger	Never/rarely (Ref)	149	6.04%	12.08%	81.88%
	Often/A Lot	198	5.05%	3.03%	91.92%
Focused on religion to stop worrying about problems	Never/rarely (Ref)	188	5.26%	11.58%	83.16%
	Often/A Lot	155	5.73%	1.27%	92.99%
Family Cohesion					
In our Family everybody helps everybody	No(Ref)	21	4.76%	4.76%	90.48%
	Yes	326	5.52%	7.06%	87.42%
We really get along well in our family	No(Ref)	25	12.00%	24.00%	64.00%
	Yes	322	4.97%	5.59%	89.44%
Family does things together	No(Ref)	103	15.53%	9.71%	74.76%
	Yes	244	1.23%	5.74%	93.03%
Pre-Immigration					
DWI in the country of origin	Never(Ref)	332	4.82%	5.12%	90.06%
	At Least Once	15	20.00%	46.67%	33.33%
DWID in the country of origin	Never(Ref)	321	2.80%	5.92%	91.28%
	At Least Once	26	38.46%	19.23%	42.31%

DWID, DWI, and None stand for driving while impaired by drugs, driving while impaired by alcohol, and drivers who did not DWID or DWI, respectively. DWID include a few drivers who also drove while impaired by alcohol. "N" denotes sample size. Percentages are shown by row. Acculturation-related scales defined in text. Statistical comparisons are made by column. "Ref" denotes reference level. Percentages in bold denote $\alpha = .05$ significant difference with the reference level. For instance, the 10.8% of males that DWID is significantly higher than the 1.3% of females who DWID.

Table 2.

Outcome of the logistic regression model for the likelihood of post-immigration DWID or DWI. Odds Ratio estimates for gender and variables selected by the Stepwise process

		Post-Immigration		
		DWID	DWI	None
Gender Female vs. Male	Coefficient Estimate (SE)	−0.809 (0.41)	−0.365 (0.28)	
	OR Estimate	0.198	0.482	Ref.
	OR 95% Wald Confidence Limits	0.039	0.158	
		1.003	1.466	
Pre-Immigration DWI	Coefficient Estimate (SE)	0.947 (0.51)	1.423 (0.40)	
	OR Estimate	6.645	17.226	Ref.
	OR 95% Wald Confidence Limits	0.886	3.569	
		49.818	83.147	
Pre-Immigration DWID	Coefficient Estimate (SE)	1.189 (0.32)	0.215 (0.45)	
	OR Estimate	10.784	1.534	Ref.
	OR 95% Wald Confidence Limits	3.086	0.263	
		37.686	8.951	
Focus on Religion Never/Rarely vs Often/A lot	Coefficient Estimate (SE)	0.675 (0.31)	0.969 (0.39)	
	OR Estimate	1.145	6.948	Ref.
	OR 95% Wald Confidence Limits	0.333	1.517	
		3.938	31.828	
We really get along well in our family Yes vs No	Estimate (SE)	−0.123 (0.46)	−0.736 (0.32)	
	OR	0.884	0.479	Ref.
	95% Wald Confidence Limits	0.362	0.257	
		2.16	0.893	
Family does things together No vs Yes	Coefficient Estimate (SE)	1.326 (0.42)	0.108 (0.27)	
	OR Estimate	14.197	1.242	Ref.
	OR 95% Wald Confidence Limits	2.706	0.423	
		74.489	3.651	

DWID, DWI, and None stand for driving while impaired by drugs, driving while impaired by alcohol, and drivers who did not DWID, or DWI, respectively. DWID includes a few drivers who also drove while impaired by alcohol. "OR" stands for odds ratio. ORs in bold denote $\alpha=5\%$ statistical significance with respect to the reference level (Ref). ORs are estimated from the coefficient estimates. SE denote the standard error of the coefficient estimates