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Recency of Immigration and Immigrant Alcohol and Tobacco Use.

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Abstract

Patterns of alcohol and tobacco use, abuse and dependence are likely to differ as a function of life-course variations such as immigrant status. In this study, I use nationally-representative data to assess patterns of alcohol and tobacco use among immigrants. I employ hierarchical logistic regression to explore the variations in alcohol and tobacco use among immigrants by recency of immigration. Findings indicate that alcohol and tobacco use among foreign-born immigrants significantly vary by racial and ethnic backgrounds. Notably, recency of immigration had the most significant effect on Hispanic immigrants. I discuss the implications of these findings regarding the use of alcohol and tobacco among immigrants.

Recency of Immigration and Immigrant Alcohol and Tobacco Use.

Introduction

The number of immigrants in the U.S. has increased dramatically over the last few decades. The Census Bureau estimates that there was a 57% increase in the foreign-born population between 1990 and 2000 (Malone, Baluja, Costanzo, & Davis, 2003). High rates of immigration have renewed interest in understanding both the current situations and the long-term trajectories of immigrant groups (Landale, Oropesa, & Gorman, 1999). In 2002, the Department of Homeland Security (DHS) documented more than a million immigrants entering the U.S. (U.S. Department of Homeland Security, 2002). DHS also reports that there are an estimated 7 million undocumented immigrants illegally residing in the U.S (2002).

With the number of immigrants increasing every year, many facets of the health services in the U.S. have sought to implement public health programs that are tailored to meet the needs of diverse immigrant groups. Despite the growing diversity of immigrants to the United States, studies of immigrants' health outcomes have focused primarily on the Mexican or Hispanic-origin population. When it comes to substance use research, there is scant information regarding foreign-born individuals of non-Hispanic origin. Failure to disaggregate data on other immigrant groups results in a limited picture of the substance use-related problems that they might have. Because high prevalence of substance use may place immigrants at higher risk for personal, family, and social problems, greater attention to the immigrant population is warranted.

Past research that explores the degree to which recency of immigration influences substance-related behaviors has had clear limitations. Most studies look at very selective groups and their findings do not address the issue at the national level nor do they effectively

explain the variation within immigrant groups. For example, very little is known about Asian Americans when it comes to substance use. The present study attempts to fill this gap by providing nationally representative findings and by including various immigrant groups that often do not receive attention in substance use research (i.e. Asian and African immigrants). Of particular interest here is the pattern of alcohol and tobacco use, since smoking and drinking can lead to drug use and other high risk behaviors such as violence (Ellickson, Tucker, & Klein, 2003). They are also the most frequently abused substances in the U.S., and their legal status makes them more readily available to immigrants (Rebhun, 1998; Rush &Wild, 2003). Marital status and presence of children in the household may also influence alcohol and tobacco use among immigrants.

This paper discusses only some of the significant results of this study. In addition to these findings, the full study will include statistical analyses that involve more refined measures of substance use. It will also include usage of illegal drugs as additional outcome measures in the statistical models discussed here. Finally, the completed study will include a set of geographic variables in the statistical models to examine the geographic variation of substance use among immigrants.

Theory

Foreign-born immigrants adopt the social norms and health behaviors of the receiving country as they become more acculturated (Epstein, Botvin, & Diaz, 1998; Blake, Lesky, Goodenow, & O'Donnell, 2001). The concept of acculturation is often defined as the change in attitudes and behaviors of people that results from contact with a different culture. Redfield, Linton, and Herskovits (1936) defined acculturation as the "phenomena which result when groups of individuals having different cultures come into continuous first-hand contact with subsequent chances in the original culture patterns of either or both groups" (p.

149). The qualification of *continuous contact* makes acculturation a long-term phenomenon arising from permanent relocation (i.e., immigration).

Researchers have postulated that increasing substance abuse among immigrants is the product of "Americanization" (Dawson, 1998). As immigrants adopt the health behaviors of their immediate social reference groups and racial/ethnic peers in the U.S., risks for negative health outcomes may increase (Blake, Lesky, Goodenow, & O'Donnell, 2001). Previous research has shown that acculturation can yield both negative and positive health outcomes. One of the negative consequences of acculturation is its role in the development of substance abuse (Gil, Vega, & Dimas, 1994). Magaña and Hovey (2003) found that recent immigrants are more vulnerable to psychosocial stressors associated with depression and anxiety. According to Pearlin's (1999) stress process framework, stressors are hardships, demands, frustrations, threats, or other conditions that challenge people's adaptive capacities. These stressors are also known to facilitate and increase substance use (Magaña and Hovey, 2003; Vega, Sribney, & Achara-Abrahams, 2003).

Two theoretical models that are useful in explaining the substance use patterns among immigrants are the acculturative stress model and the learning model of acculturation. The acculturative stress model of immigrant alcohol and drug use posits that immigrants develop problems as a psychological reaction to the situation of immigration itself (Thomas, 1995). Recent immigrants may use alcohol to relieve from the hardships they might face adjusting to the new social setting. For example, recent immigrants may not find jobs that pay them an adequate income to support their families. Such economic hardships may act as stressors. Recent immigrants from non-English speaking countries may not communicate well with others because of language barriers. Thus, the difficulties in creating a social network may lead them to feel lonely, isolated, impoverished, and even discriminated against in their new country.

The learning model of acculturation posits that local customs of the receiving country are assimilated by immigrants (Rebhun, 1998). In other words, new immigrants adopt the new pattern of substance use as a part of the assimilation process. Thus, the learning model suggests that increases or decreases in the substance use among recent immigrants are dependent upon the substance use pattern and acceptance of use among peers of the host country.

Review of Literature

Immigration, acculturation, and Substance Use

Past studies have found a strong relationship between acculturation and the development of substance use behaviors (Gil, Vega, & Dimas, 1994; Epstein, Botvin, & Diaz, 1998; Blake, Lesky, Goodenow, & O'Donnell, 2001). As immigrants go through the acculturation process, they change their behaviors in response to the culture and regulations of the host country (Rebhun, 1998). Patterns of alcohol and tobacco use are no exception. The association between the pattern of substance use, especially alcohol and tobacco, was also found to be associated with how recently immigrants arrived in the United States. Blake et al. (2001) studied the substance use patterns of Massachusetts adolescents and concluded that immigrants who stayed longer in the U.S. were more likely than recent immigrants to use alcohol.

Cultural expectations often change and exacerbate as a result of acculturation. For example, alcohol use is an integral part of daily functioning in Mexican culture (Caetano & Medina-Mora, 1988). Caetano & Medina-Mora (1988) found that Mexican immigrants rapidly increase alcohol use following arrival in the U.S. However, the opposite pattern was observed for Japanese Americans. Immigration to the U.S. was found to moderate the drinking behaviors of Japanese male immigrants (Rehbun, 1998).

Racial and Ethnic Variations in Immigrant Substance Use

Immigrants to the U.S. come from various racial and ethnic backgrounds. In substance use research, Hispanic immigrants from Mexico and other Latin American countries have been the subjects of detailed study. Although there has been some scholarly attention to Asian American substance use, non-Hispanic immigrants from Asia and Africa have received less attention. Asian immigrants and African immigrants are often referred to as "model minorities" and this stereotype suggests that they can take care of their own (Liu, Yu, Chang, & Fernandez, 1990; Takyi, 2002). This stereotype may underestimate their substance use problems. Hispanic immigrants, in general, show lower rates of alcohol and tobacco use than non-Hispanic immigrants (Rehbun, 1998). Asian immigrants also show lower rates of alcohol and tobacco use than the general population (Rehbun, 1998; D' Avanzo et al, 1994).

Sex Differences

Sex differences in alcohol and tobacco consumption among immigrants has been a widely studied topic. In the case of Mexican immigrants, it has been found that women have higher rates of abstention and they consume far less alcohol than men (Gilbert, 1991). Mexican women when compared to Anglo women in America are more likely to be abstainers because "female drinking is constrained by ideas of virtue and respectability" (Rebhun, 1998:501).

Previous studies have found that the generational status and duration of immigration may alter female drinking behavior. While Mexican immigrant women in general are more likely to be abstainers than women who remain in Mexico, they may develop drinking behaviors due to acculturation (Gilbert, 1991). For example, as Mexican women join the

American workforce, they begin to drink because American culture allows this behavior in women (Rebhun, 1998). Female abstinence from drinking has been found among Asian immigrants as well. Studies note high rates of abstinence among Chinese and Korean immigrant women and that heavy drinking was found to be an almost exclusively male behavior (Rebhun, 1998; Lubben, Chi, & Kitano, 1989).

Age

Sinha et al. (2003) found that rates of substance abuse continue to rise among young adults ages 18–25. There is, however, little information on the clinical characteristics of young immigrant adults referred to treatment. Substance abuse and heavy alcohol use among younger adults has been well documented (Vega & Rumbaut, 1991; Substance Abuse and Mental Health Services Administration [SAMHSA], 2000; Sinha, Easton, & Kemp, 2003). This suggests that young adult immigrants may be more vulnerable to heavy substance use.

Income

The national per capita income in 1999 for Asians, Hispanics, and Non-Hispanic whites was $21,893, $12,111, and $ 24,819 respectively (The U.S. Bureau of the Census, 2000). Although these numbers may not provide relevant information for recent immigrants from Asia and Latin America, they do indicate that they are economically challenged. The inverse relationship between poverty and substance use has been found in numerous studies (Zlotnick, Marjorie, & Robertson, 2002). Thus, recent immigrants who may have poor financial resources and who are economically disadvantaged may be at a greater risk for substance use (Rehbun, 1998).

Marriage, Family, and Substance Use

Although alcohol use is embedded in the fabric of everyday life, its use is superimposed upon the ongoing life structure (Miller-Tutzauer, Leonard, & Windle, 1991). Patterns of substance use, abuse and dependence are likely to differ as a function of life-course variations such as immigrant status. Marriage, divorce, loss of a job, and change in peer structure has all been related to changes in patterns of consumption. Numerous studies have demonstrated a consistent relationship between marital status and alcohol use (Miller-Tutzauer, Leonard, & Windle, 1991). Walton et al. (2003) found that being single strongly predicted alcohol and drug use. Presence of young children after marriage can also influence the alcohol and tobacco use patterns. Gilbert (1985) in his study of Mexican American families found that the presence of women and children limits men's drinking.

Research Question and Hypotheses

Does recency of immigration matter in predicting the prevalence of alcohol and tobacco use among foreign-born immigrants? The two theoretical models of acculturation discussed earlier yield hypotheses regarding patterns of alcohol and tobacco use among recent immigrants.

The acculturative stress model of immigration to alcohol and tobacco use suggests that the likelihood of alcohol and tobacco use will be higher among those who are at the early stage of immigration, compared to immigrants who stayed for longer duration because they may use alcohol and tobacco as stress coping mechanism. Thus, (H_1) alcohol and tobacco consumption among immigrants is inversely associated with recency of immigration.

In contrast, the learning model of acculturation suggests the opposite pattern of alcohol and tobacco use among foreign-born immigrants. Thus, (H_2) the likelihood of alcohol and tobacco use will increase linearly with the duration of immigration and eventually reach that of non-immigrants possibly due to cultural assimilation.

Previous studies have found strong variation in patterns of substance use among immigrants from diverse racial and ethnic backgrounds (Lubben, Chi, & Kitano, 1989; Dawson, 1998; Rebhun, 1998; Magaña and Hovey, 2003). Thus, (H3) alcohol and tobacco use among immigrants will vary by racial and ethnic backgrounds. Numerous studies have documented an association between marital status, presence of women and children, and alcohol use (Gilbert, 1985; Miller-Tutzauer, Leonard, & Windle, 1991; Walton et al., 2003). Thus, the extent to which immigrant's marital status and prevalence of children further explain the variations in the alcohol and tobacco use is examined.

Method

Data

Data for the present study are taken from the 2002 National Survey on Drug Use and Health (NSDUH) series (formerly titled National Household Survey on Drug Abuse), which measures the prevalence and correlates of drug use in the United States. NSDUH data are nationally representative. They are gathered and maintained by Substance Abuse and Mental Health Services Administration of the United States Department of Health and Human Services (SAMHSA). The surveys provide quarterly, as well as annual, estimates on the use of illicit drugs, alcohol, and tobacco in the civilian non-institutional population aged 12 and older. The dataset includes extensive annual information on socio-demographic and substance use characteristics of randomly selected respondents.

Sample

The NSDUH survey asks two questions that determine the respondent's immigrant status. The first question asks whether a respondent was born in the U.S. If a respondent answered yes, a follow-up question assesses the respondent's duration of stay in the U.S.

Thus, foreign-born respondents who did not specify how long they have lived in the U.S. were excluded from the dataset. The focus here is primarily on persons who are 18 years or older. Thus, respondents under 18 years of age were also excluded from the dataset. The final sample includes 36,339 (un-weighted) respondents who are 18 and older. Eleven percent (N=4,155) of respondents are immigrants.

Measures and Statistical Methodology

The variables used in the analysis and their value coding appear in Table 1. The dependent measures used in the analysis are prevalence of tobacco and alcohol product use in the past month, dichotomously coded to show whether a respondent has used (coded as 1) or has not used (coded as 0) each substance in the past month.

The NSDUH dataset includes information on self-reported estimates of the number of times the respondent used alcohol and tobacco in the past week, in the past month, and in the past year. Although these are preferable measures of alcohol and tobacco usage,; however, since all three measures have large quantity of missing value, they were not used in the present study.

Recency of immigration is recoded into 5 categories (Non-immigrants, Respondent has lived in U.S.: At least 5 years, At least 5 years but less than 10 years, At least 10 years but less than 15 years, and 15 years or more).

Because the dependent variables are dichotomous, hierarchical logistic regression was used to analyze the data. A set of socio-demographic variables including sex, age, race, educational attainment, employment status, and total family income were included as control variables. Marital status and number of children under 18 were also included in the analysis as control variables. The NSDUH data have been imputed to address inconsistent data among related variables or to replace missing data with non-missing values prior to its release.

Some of these statistically-imputed variables (sex, educational status, and employment status) are included in the analysis.

Table 1 about here

Characteristics of the Sample

Table 2 displays demographic characteristics of the overall sample stratified by immigrant status. Overall, immigrants comprised 11% (N=4,036) of the sample. Immigrants in this dataset came from diverse racial and ethnic backgrounds. Racial and ethnic groups consisted of non-Hispanic whites (N=25,590, 72.7%), Hispanics (N=4,336, 12.3%), non-Hispanic black/African Americans (N=4,217, 12%), and Asian Americans (N=1,052, 3%). A majority of recent immigrants (lived in the U.S. at least 5 years) were young (18 to 25 years of age), of Hispanic origin, and with income level lower than that of the overall group and also lower than Hispanic immigrants of longer duration.

Table 2 about here

Findings

Prevalence of Alcohol and Tobacco Use

Table 3 illustrates the bivariate relationship between the focal dependent measures (prevalence of alcohol and tobacco use in the past month) and our focal independent variable (recency of immigration). When compared to non-immigrants and to the overall sample, a lower percentage of immigrants reported having used alcohol or tobacco in the past month. While a similar percentage of recent immigrants and immigrants of longer duration reported having used tobacco in the past month, the percentage of foreign-born immigrants reporting

alcohol use in the past month gradually increased for immigrants who stayed in the U.S. for a longer duration.

Table 3 about here

Recency of Immigration and the Prevalence of Immigrant Alcohol and Tobacco Use

Table 4 displays the results of the hierarchical logistic regression analysis conducted for each of our dependent measures to estimate the odds of alcohol and tobacco use among immigrants. As can be seen in the odds coefficients shown in Table 4, there is a strong relationship between recency of immigration and use of alcohol and tobacco among immigrants, controlling for socio-demographic variables.

Table 4 about here

Similar to the findings illustrated in Table 3, these results show that immigrants, regardless of the duration of their stay in the U.S. are less likely than non-immigrants to have used tobacco and alcohol in the past month. In general, recent immigrants are almost 50% less likely to have used alcohol and tobacco than non-immigrants. In addition, the odds coefficients increase as a function of increase in the duration of immigration. Thus, the initial findings generally support the hypothesis based on the learning model of acculturation, which predicts gradual increase in alcohol and tobacco use among immigrants as they adapt to the alcohol and tobacco use behaviors of the native society.

Consistent with findings from previous studies, the general model results displayed in Table 4 shows that respondents between 18 and 49 years of age are almost twice as likely to have used alcohol and tobacco than respondents who are 50 years or older. Younger

respondents between 18 to 25 years of age are almost three times as likely to have used tobacco and twice as likely to have used alcohol in the past month than respondents who are older than 50. Male respondents were more likely than female respondents to have used alcohol and tobacco products.

Respondents who had up to 12 years of education are 1.71 times more likely to use tobacco than the respondents who had 13 or more years of education; however, they are less likely to use alcohol than the respondents with more years of education. Alcohol and tobacco use is higher among employed respondents. Low to lower middle income is associated with a higher likelihood of tobacco use than are respondents who report family income exceeding $75,000. Marital status is negatively associated with both alcohol and tobacco use. All racial and ethnic minority groups are less likely to use alcohol and tobacco than non-Hispanic whites.

Table 5 about here

The results of the logistic regression model including race by recency interaction terms is presented in Table 5. Odds coefficients in Table 5 for the interaction terms show an interesting pattern across racial and ethnic groups. Notably, recency of immigration had the most significant effect on Hispanic immigrants. Similarly, statistically significant results were found for non-Hispanic Asian Americans and non-Hispanic blacks at an early stage of immigration (up to 10 years).

Table 6 about here

Table 6 displays predicted probabilities of alcohol and tobacco use among immigrants by race and recency of immigration. The odds coefficients for each of the racial and ethnic groups by the duration of immigration were plotted to test hypothesized association between race and recency in immigration of predicting prevalence of alcohol and tobacco use. Non-Hispanic white natives are the reference group for both alcohol and tobacco use. Figure 1 shows odds ratios predicting alcohol use by recency of immigration and race / ethnicity. Since the NSDUH dataset consists of cross-sectional data, the plots shown in Figures 1 and 2 do not represent a longitudinal pattern but rather different immigrant cohorts. In general, the findings support the learning model of acculturation for both alcohol and tobacco use.

Figure 1 about here

The lines in Figure 1 represent each of the foreign-born racial and ethnic groups in the sample. Odds coefficients can be seen to increase linearly with longer duration of immigration for every racial and ethnic group except Asians and non-Hispanic white immigrants. Figure 2 shows a similar linear trend for tobacco use among immigrant groups except for foreign-born non-Hispanic white immigrants.

Figure 2 about here

In Figure 2, a slightly U-shaped curve for Asians and non-Hispanic white immigrants is observed. This implies two possible scenarios. First, it is possible that immigrants may increase alcohol use to cope with stress (acculturative stress model) when they arrive and gradually decrease use as they become comfortable with the new setting and/or as their living

standard improves. Then they may increase alcohol use as predicted by the cultural assimilation (learning model).

Summary and Conclusions

The present study advances prior research in that it extends information to include non-Hispanic immigrant groups using a nationally-representative probability sample. Most studies that assess substance use patterns employ very selective samples, small, unrepresentative samples or large, representative samples drawn from a homogenous population. The data this study uses provide a more representative sample of understudied racial and ethnic minorities.

Acculturation is often measured by assessing changes in the original culture patterns of immigrants (Redfield, Linton, & Herskovits, 1936). One way in which acculturation can be assessed is through health evaluations. Here, tobacco and alcohol are used as health-related behavioral changes due to acculturation. Applying the acculturative stress model, I hypothesized that the likelihood of alcohol and tobacco use would be higher among those who are at an early stage of immigration when compared to immigrants who stayed for a longer duration because they may use alcohol and tobacco as stress coping mechanism. Only partial support for this hypothesis was found in recent Hispanic immigrants. In contrast, strong support for the learning model of acculturation was found in both immigrant tobacco and alcohol use. The hypothesis based on this model predicted that the likelihood of alcohol and tobacco use would gradually increase linearly with the duration of immigration and eventually reach the level of non-immigrants due to cultural assimilation. As Figure 1 shows, there is a positive linear trend in immigration recency and alcohol and tobacco use in which further validates the learning model of acculturation.

Recency of immigration had the most significant effect on Hispanic immigrants. Further investigation on how the timing of immigration influences health behaviors of Hispanic immigrants appears warranted.

The results confirm findings from previous studies and indicate a complex pattern of relationships between race and recency of immigration in predicting alcohol and tobacco use among immigrants. The results also indicate that there is a significant variation in alcohol and tobacco use among immigrants from different racial and ethnic backgrounds. In general, recent immigrants are less likely to use alcohol and tobacco than non-immigrants. Also, both alcohol and tobacco use among immigrants increased gradually with the increase in the years since they entered the U.S.

When interpreting the results, note that this analysis compared four groups of immigrants stratified by recency of immigration to non-immigrants. Thus, the analysis consists of cross-sectional comparisons of different immigrant cohorts rather than providing a longitudinal assessment of a specific immigrant cohort. Socio-political atmosphere at the time of immigration may also contribute to the diversity of the immigrant groups. Future studies need to address this and other factors involved in immigrant health behaviors and health risk factors using a longitudinal design that oversamples racial and ethnic minorities as wells as immigrants..

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Table 1
Variable Names and Definitions

Name	Definition
Dependent Variables	
Tobacco Use	0 Did not use in past month 1 Used in past month
Alcohol Use	0 Did not use in past month 1 Used in past month
Independent Variable	
Recency of Immigration	0 At least 5 years 1 At least 5 years but less than 10 years 2 At least 10 years but less than 15 years 3 15 years or more 4 Non-immigrants (ref)
Control Variables	
Age	0 18-25 Years Old 1 26-34 Years Old 2 35-49 Years Old 3 50 or Older (ref)
Sex	0 Male 1 Female (ref)
Education	0 Up to 12 years 1 13 years or more (ref)
Employment Status	0 Worked past week, employed 1 Unemployed (ref)
Total Family Income	0 Less than $20,000 1 $20,000-$49,999 2 $50,000-$74,999 3 $75,000 or More (ref)
Marital Status	0 Married 1 Not married (ref)
# of Children Under 18	0 None 1 1 or more (ref)
Race[a]	0 Non-Hispanic White (ref) 1 Non-Hispanic Black 2 Non-Hispanic Asian 3 Hispanic

[a] Non-Hispanic Native American Indian/Alaska Native, Non-Hispanic Native Hawaiian/Other Pac Islander, and Non-Hispanic respondents who are specified as more than one race were excluded from the dataset because of the insufficient number of immigrants within this category.

Table 2

Socio-Demographic Characteristics by Recency of Immigration (in %)

	Overall	< 5 years	5 to 10 years	10 to 15 years	15 + years	Non-Immigrant	P
Age							
18-25 Years Old	49	65	55	48	25	49	
26-34 Years Old	15	20	27	25	16	14	
35-49 Years Old	23	12	16	23	36	23	
50 or Older	13	2	3	4	23	14	.001
Sex							
Male	47	51	52	47	47	46	
Female	53	49	48	53	53	54	.001
Education							
Up to 12 years	51	61	62	58	50	50	
13 years or more	49	39	38	42	50	50	.001
Employment Status							
Working, Employed	53	50	57	59	56	53	
Unemployed	47	50	43	41	44	47	.001
Income							
Less than $20,000	25	42	30	24	24	24	
$20,000-$49,999	39	42	44	48	40	39	
$50,000-$74,999	17	9	13	15	16	17	
$75,000 or More	19	7	13	13	21	20	.001
Marital Status							
Married	40	40	46	45	55	40	
Not Married	60	60	54	55	45	60	.001
# of Children Under 18							
None	67	71	59	56	57	68	
1 or more	33	29	41	44	43	32	.001
Race							
NonHisp White	73	16	15	15	31	79	
NonHisp Black	12	7	9	10	7	13	
NonHisp Asian	3	17	17	18	19	1	
Hispanic	12	59	58	57	44	7	.001
N (Not weighted)	35,195	1215	760	661	1400	31,159	
N (Weighted)	205,888,999	5,883,883	4,395,961	4,168,992	14,267,485	177,172,678	

Note. Numbers reflect weighted percentages. Columns may not add up to 100 due to rounding.

Table 3

Prevalence of Alcohol and Tobacco Use in the Past Month by Recency of Immigration (in %)

	Overall	< 5 years	5 to 10 years	10 to 15 years	15 + years	Non-Immigrant	*P*
Tobacco Use (Past Month)							
Not Used	61	75	77	79	74	59	
Used	39	25	23	21	26	41	.001
Alcohol Use (Past Month)							
Not Used	41	60	60	56	49	39	
Used	59	40	40	44	51	61	.001

Note. Numbers shown reflect weighted percentages. Columns may not add up to 100 due to rounding.

Table 4

Predictors and Odds of the Prevalence of Alcohol and Tobacco Use Among Immigrants: Results of Multiple Logistic Regression

Independent Variable	Model 1		Model 2		Model 3		Model 4	
	Tobacco	Alcohol	Tobacco	Alcohol	Tobacco	Alcohol	Tobacco	Alcohol
Recency of Immigration								
Less than 5 years	0.46***	0.42***	0.33***	0.40***	0.34***	0.41***	0.47***	0.50***
At least 5 years but less than 10 years	0.43***	0.43***	0.31***	0.39***	0.33***	0.41***	0.46***	0.50***
At least 10 years but less that 15 years	0.39***	0.49***	0.32***	0.47***	0.32***	0.48***	0.44***	0.59***
15 years or more	0.50***	0.66***	0.55***	0.71***	0.56***	0.73***	0.72***	0.87*
Non-Immigrants (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Age								
18-25 Years Old			3.25***	2.23***	2.59***	2.00***	2.68***	2.03***
26-34 Years Old			2.59***	1.86***	2.37***	1.93***	2.44***	1.97***
35-49 Years Old			2.29***	1.58***	2.18***	1.67***	2.23***	1.69***
50 or Older (ref)			1.00	1.00	1.00	1.00	1.00	1.00
Sex								
Male			1.82***	1.62***	1.81***	1.58***	1.81***	1.57***
Female (ref)			1.00	1.00	1.00	1.00	1.00	1.00
Education								
Up to 12 years			1.64***	0.56***	1.64***	0.57***	1.71***	0.57***
More than 12 years (ref)			1.00	1.00	1.00	1.00	1.00	1.00
Employment Status								
Working, Employed			1.22***	1.42***	1.23***	1.42***	1.24***	1.43***
Unemployed (ref)			1.00	1.00	1.00	1.00	1.00	1.00
Income								
Less than $20,000			1.63***	0.64***	1.45***	0.59***	1.56***	0.62***
$20,000-$49,999			1.33***	0.65***	1.27***	0.63***	1.33***	0.64***
$50,000-$74,999			1.06	0.70***	1.05	0.69***	1.07	0.69***
$75,000 or More (ref)			1.00	1.00	1.00	1.00	1.00	1.00
Marital Status								
Married					0.61***	0.75***	0.57***	0.70***
Not Married (ref)					1.00	1.00	1.00	1.00
Number of Children Under 18								
None					0.92**	1.13***	0.86***	1.08**
1 or more (ref)					1.00	1.00	1.00	1.00
Race								
NonHisp Black/Afr Am							0.53***	0.56***
NonHisp Asian							0.62***	0.54***
Hispanic							0.56***	0.76***
NonHisp White (ref)							1.00	1.00
Model N	39,195	39,195	35,186	35,186	35,186	35,186	35,186	35,186
Model χ2	0.00***	0.00***	75.66***	29.62***	54.87***	30.82***	22.93***	18.52***
Df	0	0	8	8	8	8	8	8

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

Table 5

Predictors and Odds of the Prevalence of Alcohol and Tobacco Use Among Immigrants: Results of Model 5 including Race by Recency Interaction

Independent Variable	Model 5	
	Tobacco	Alcohol
Recency of Immigration		
Less than 5 years	0.71*	0.92
At least 5 years but less than 10 years	0.89	0.86
At least 10 years but less that 15 years	0.73	1.01
15 years or more	0.90	1.12
Non-Immigrants (ref)	1.00	1.00
Race		
NonHisp Black/Afr Am	0.55***	0.56***
NonHisp Asian	0.63***	0.62***
Hispanic	0.61***	0.89***
NonHisp White (ref)	1.00	1.00
Race * Recency (interaction)		
NonHisp Black/Afr Am*Less than 5 years	0.26***	0.55*
NonHisp Black/Afr Am*At least 5 years but less than 10 years	0.21***	0.71
NonHisp Black/Afr Am*At least 10 years but less that 15 years	0.45	0.86
NonHisp Black/Afr Am*15 years or more	0.56	0.80
NonHisp Asian*Less than 5 years	0.49**	0.47**
NonHisp Asian*At least 5 years but less than 10 years	0.52*	0.40**
NonHisp Asian*At least 10 years but less that 15 years	0.71	0.50*
NonHisp Asian*15 years or more	0.93	0.71
Hispanic*Less than 5 years	0.62**	0.40***
Hispanic*At least 5 years but less than 10 years	0.43***	0.45**
Hispanic*At least 10 years but less that 15 years	0.47**	0.42***
Hispanic*15 years or more	0.62**	0.56***
Model N	35,186	35,186
Model χ2	29.99***	22.97***
Df	8	8

Note. Model includes all control variables

Table 6

Predicted Probabilities of Tobacco and Alcohol Use

|	Predicted Values			
	Tobacco		Alcohol	
	log odds	*odds*	*log odds*	*odds*
NonHisp White*Less than 5 years	-0.8233	0.439	-0.488	0.614
NonHisp White*At least 5 years but less than 10 years	-0.6033	0.547	-0.553	0.575
NonHisp White*At least 10 years but less that 15 years	-0.7993	0.450	-0.39	0.677
NonHisp White*15 years or more	-0.5863	0.556	-0.287	0.751
NonHisp Black/Afr Am*Less than 5 years	-2.761	0.063	-0.868	0.420
NonHisp Black/Afr Am*At least 5 years but less than 10 years	-2.786	0.062	-0.679	0.507
NonHisp Black/Afr Am*At least 10 years but less that 15 years	-2.197	0.111	-0.316	0.729
NonHisp Black/Afr Am*15 years or more	-1.765	0.171	-0.283	0.754
NonHisp Asian*Less than 5 years	-2.013	0.134	-0.930	0.395
NonHisp Asian*At least 5 years but less than 10 years	-1.728	0.178	-1.136	0.321
NonHisp Asian*At least 10 years but less that 15 years	-1.609	0.200	-0.767	0.465
NonHisp Asian*15 years or more	-1.132	0.323	-0.305	0.737
Hispanic*Less than 5 years	-1.788	0.167	-0.712	0.491
Hispanic*At least 5 years but less than 10 years	-1.934	0.145	-0.652	0.521
Hispanic*At least 10 years but less that 15 years	-2.037	0.130	-0.576	0.562
Hispanic*15 years or more	-1.556	0.211	-0.175	0.839
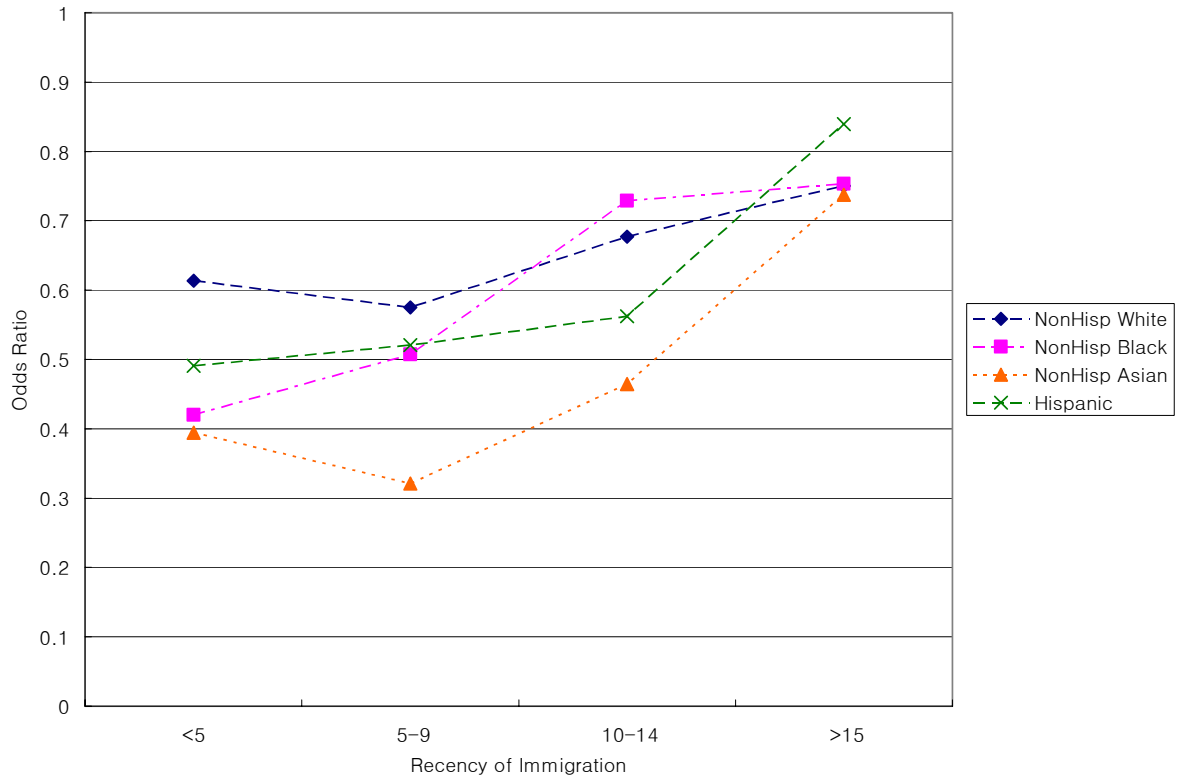
Figure 1
Odds ratios predicting Alcohol Use by Recency of Immigration and Race / Ethnicity (Non-Hispanic Natives as reference)
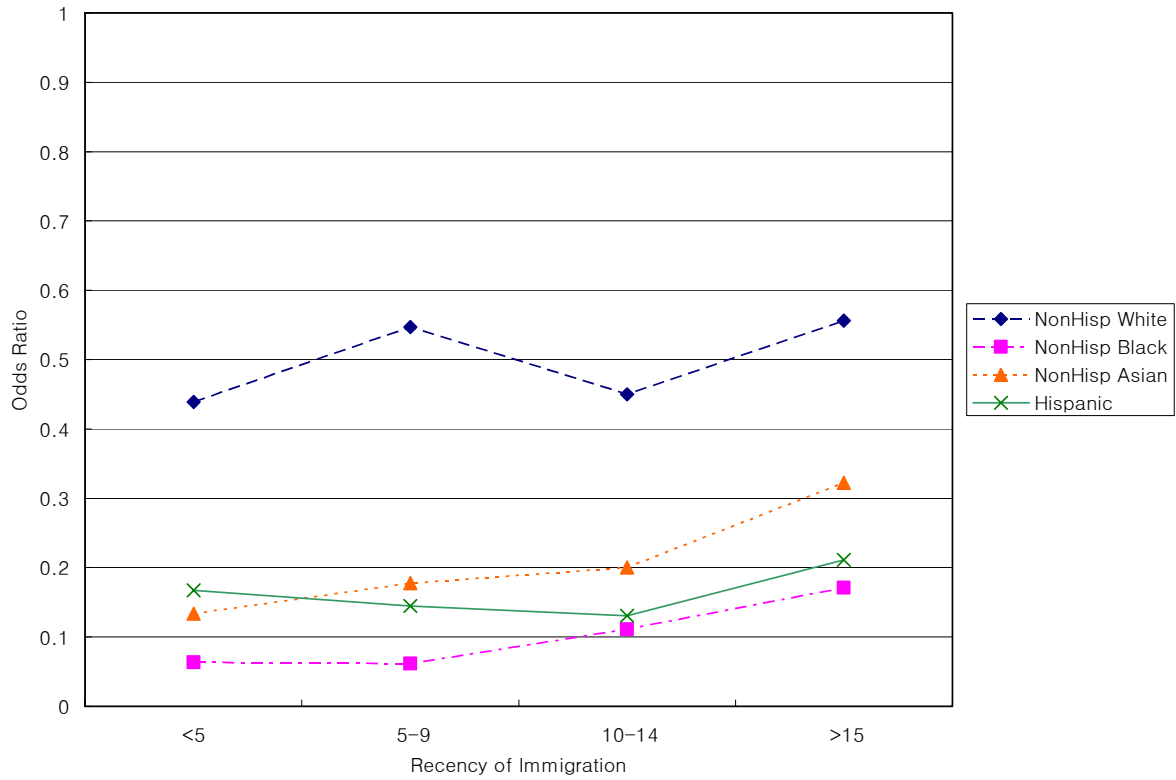
Figure 2

Odds ratios predicting Tobacco Use by Recency of Immigration and Race / Ethnicity (Non-Hispanic Natives as reference)