

# Ethnic Drinking Culture, Acculturation, and Enculturation in Relation to Alcohol Drinking Behavior Among Marriage-Based Male Immigrants in Taiwan

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Hung-Hui Chen, PhD<sup>1</sup>  and Li-Yin Chien, ScD<sup>2</sup> 

## Abstract

Drinking behavior among immigrants could be influenced by drinking-related cultural norms in their country of origin and host country. This study examined the association of ethnic drinking culture, acculturation, and enculturation with alcohol drinking among male immigrants in Taiwan. This cross-sectional survey recruited 188 male immigrants. Ethnic drinking culture was divided into dry and wet according to per capita alcohol consumption and abstinent rate in the countries of origin in reference to that in Taiwan. A scale, Bidimensional Acculturation Scale for Marriage-Based Immigrants, was developed to measure acculturation (adaptation to the host culture) and enculturation (maintenance of the original culture). Drinking patterns (abstinent, low-risk drinking, and hazardous drinking) were determined by scores on the Alcohol Use Disorder Identification Test. There was a significant interaction between ethnic drinking culture and enculturation/acculturation on drinking patterns. Multinomial logistic regression models identified that for those from dry ethnic drinking cultures, a high level of acculturation was associated with increased low-risk drinking, while a high level of enculturation was associated with decreased low-risk drinking. For those from wet ethnic drinking cultures, a low level of acculturation and high level of enculturation were associated with increased hazardous drinking. High family socioeconomic status was associated with increased drinking, while perceived insufficient family income was positively associated with hazardous use. To prevent hazardous use of alcohol, health education should be targeted at immigrant men who drink, especially among those who have economic problems, are from wet ethnic drinking cultures, and demonstrate low adaptation to the host culture.

## Keywords

migration, drinking pattern, alcohol use, acculturation and enculturation, Bidimensional Acculturation Scale for Marriage-Based Immigrants (BASMBI)

Alcohol is one of the most frequently abused substances in the world (World Health Organization, 2014). According to the *Global Status Report on Alcohol and Health 2014*, about 5% of the global burden of disease and injury is due to alcohol consumption (World Health Organization, 2014). Men consume more alcohol, drink more frequently, are less likely to be abstainers, have higher alcohol-related physical and behavioral problems, and are more likely to be hazardous drinkers than women (Erol & Karpyak, 2015; Grant et al., 2015; Kendler, Edwards, & Gardner, 2015).

Over the past two decades, marriage-based immigration has become more common around the world (Charsley, Bolognani, Spencer, Ersanilli, & Jayaweera, 2016; United Nations, 2016). Since Taiwan has strict rules regarding citizenship, the majority of immigrants obtain their immigrant

status through marriage to Taiwanese citizens. There has been a 5% increase in the number of foreigners who married Taiwanese women and immigrated to Taiwan from 2015 to 2016 (National Immigration Agency, 2016). The increased rate seems similar to that in Japan but lower than that in immigration-friendly countries (Ministry of Health,

<sup>1</sup>Institute of Public Health, National Yang-Ming University, Taipei, Taiwan

<sup>2</sup>Institute of Community Health Care, National Yang-Ming University, Taipei, Taiwan

## Corresponding Author:

Li-Yin Chien, ScD, MPH, Professor, Institute of Community Health Care, National Yang-Ming University, 155 Li-Nong Street, Sec. 2, Beitou, Taipei 11221, Taiwan.  
Email: lychien@ym.edu.tw



Labour and Welfare, 2015). Marriage-based immigrants in Taiwan usually immigrate alone, away from their original family and friends, and marry a person of a different culture (Chen, Hwang, Tai, & Chien, 2013). Most of those marriage-based male immigrants are from China (56.8%), followed by Western countries (25.2%; United States, United Kingdom, France, Germany, and Australia), Southeast Asian countries (11.5%; Thailand, Vietnam, Indonesia, Philippines, and Cambodia), and Northeast Asian countries (6.5%; Japan and Korea; National Immigration Agency, 2016).

Alcohol sales increased 120% from 2008 to 2014 in Taiwan (National Treasury Administration, 2015). A national survey in 2010 in Taiwan reported that the rate of abstainers in the previous 12 months was 50.6% among males and 61.6% among the general population (Twenty-First Century Foundation, 2010). Per capita alcohol consumption in Taiwan recorded in 2003 was 3.9 liters, which was believed to be an underestimation, as the consumption of privately brewed alcohol was not recorded (Executive Yuan, 2015). According to the *Global Status Report on Alcohol and Health 2014* (World Health Organization, 2014), the abstinence rate in the previous 12 months was 55.7% to 98.1% for Southeast and South Asian countries, 31.1% to 55.2% for Northeast Asian countries, and 5.2% to 33.8% for Western countries. Alcohol consumption per capita was 0.2 to 6.8 liters for Southeast and South Asian countries, 8.0 to 12.3 liters for Northeast Asian countries, and 10.1 to 13.4 liters for Western countries (World Health Organization, 2014). Alcohol use in Taiwan seems higher than that in Southeast Asian countries, South Asian countries, and China, but lower than that in Northeast Asian and Western countries. Taiwan being in the middle of alcohol use among countries provides a unique scenario for the study to examine the influence of immigration from societies of different drinking cultures on drinking behaviors.

According to the *Global Status Report on Alcohol and Health 2014* (World Health Organization, 2014), people in Northeast Asian and Western countries view alcohol as a regular drink and have positive attitudes toward alcohol use and thus have a high prevalence of heavy drinking and alcohol use disorders. People in China, Vietnam, Thailand, Philippines, and India usually drink during specific celebrations and social activities. People in countries such as Indonesia, Myanmar, Malaysia, Bangladesh, and the Middle East rarely drink alcohol owing to their religion and sociocultural context.

Alcohol use varies by country because of different drinking cultures and social acceptance of alcohol. Ethnic drinking culture refers to drinking-related cultural norms and behavioral practices in the country of origin. Studies in the United States revealed that ethnic drinking culture was related to drinking behaviors, heavy episodic

drinking, and drunkenness among immigrants (Cook, Mulia, & Karriker-Jaffe, 2012; Cook, Bond, Karriker-Jaffe, & Zemore, 2013; Cook & Caetano, 2014; Cook, Karriker-Jaffe, Bond, & Liu, 2015).

Acculturation is the process of learning that occurs when individuals from a different cultural background are exposed to continuous, firsthand contact with a new culture (Berry, 1992; Sam & Berry, 2006). With the culturally pluralistic nature of contemporary society, orientation to both original and new cultures should be considered. Under the bidimensional acculturation model, acculturation is the process of adjusting to the receiving culture acquisition, and enculturation is the process of adjusting to the heritage culture retention (Berry, 1997; Ryder, Alden, & Paulhus, 2000). Alcohol use among immigrants could be influenced by the maintenance of the original culture (enculturation) as well as adaptation to the drinking culture in the host country (acculturation) (Arends-Tóth & van de Vijver, 2004; Flannery, Reise, & Yu, 2001; Ryder et al., 2000). A U.S. study of Hispanic college students reported that a high level of enculturation and low level of acculturation was associated with lower alcohol-related problems (Des Rosiers, Schwartz, Zamboanga, Ham, & Huang, 2013). One study reported that bicultural Korean American males were more likely to be current alcohol drinkers than traditional Korean American males (Ryu, Crespi, & Maxwell, 2013). In contrast, a U.S. study reported that acculturation or enculturation did not have significant effects on alcohol use severity among late adolescent Hispanics (Cano et al., 2015).

The association between acculturation and drinking behavior may differ by ethnic drinking culture. In other words, there may be interaction between ethnic drinking culture and acculturation. A study of Asian Americans in the United States reported that Korean ethnicity was a risk factor for drinking behavior; acculturation was associated with decreased drinking behavior for Korean Americans but was associated with increased drinking behavior for Chinese Americans (Hendershot, Dillworth, Neighbors, & George, 2008). Cook et al. (2012) identified an interactive effect of ethnic drinking culture and language use at home on drinking behaviors among U.S.-born Asian Americans.

The association between different cultural orientations and drinking behavior may be due to culture-related social motives and alcohol expectancies (Kuntsche et al., 2015). Most previous studies linking ethnic drinking culture and acculturation were conducted in the United States. To the best of our knowledge, no studies have been conducted to examine drinking behavior of male immigrants in Taiwan or other Asian countries. Few studies have focused on the concept of the effect of bidimensional acculturation (acculturation and enculturation) on

drinking behavior among immigrants. Furthermore, the interaction between ethnic drinking cultures and acculturation/enculturation has been less studied. Therefore, the purpose of this study was to examine the association of ethnic drinking culture, acculturation, and enculturation with alcohol drinking patterns (abstinent, low-risk drinking, and hazardous drinking) among marriage-based male immigrants in Taiwan.

## Methods

This cross-sectional questionnaire survey was conducted to examine knowledge, attitudes, and behavior regarding substance use/abuse among immigrants in Taiwan. The study population was adult immigrants married to Taiwanese individuals and currently living in Taiwan. The survey variables included sociodemographics, immigration-related variables, stress, social support, as well as knowledge, attitudes, and behavior regarding substance use/abuse. Network sampling was used to recruit study participants across Taiwan. The study questionnaires were completed by 945 immigrants (188 males and 757 females). The data were collected from June through November 2013. This study was approved by the institutional review board at Taipei City Hospital (TCHIRB-1020119).

The analysis was restricted to male immigrants. Male immigrants comprised only 0.17% of the Taiwanese population (or 7.9% of the immigrant population). We were unable to obtain a usable population list owing to concerns about privacy protection laws as well as changes of address after landing; there was no information available as to where and how to locate male immigrants. Therefore, network sampling was used to recruit the study participants. To ensure an adequate number and variety of samples, gatekeepers who worked in places where male immigrants were likely to go (e.g., health centers, churches, foreign restaurants, foreign grocery stores, and language schools) were approached by the researchers. Posters and bilingual questionnaires were provided in these places. Participants were also asked to help invite their immigrant friends and leave their postal and e-mail addresses if they were willing to join this study.

To protect participants' privacy and ensure the accuracy of responses, two types of anonymous questionnaires, an electronic version and a paper version with a self-addressed stamped envelope, were provided. Face-to-face or telephone interviews were conducted if the participants preferred. If recruited, participants left their addresses, and an incentive voucher from a convenience store worth 100 New Taiwan dollars was provided after they had returned the completed questionnaires. Of the 188 participants, 118 completed through paper questionnaire and 14 through electronic questionnaire; 34 were face-to-face interviewed and 22 were telephone interviewed. There were no significant differ-

ences in ethnic drinking culture, acculturation, enculturation, and drinking patterns by mode of data collection.

## Measures

The dependent variable was current alcohol drinking patterns. Main independent variables were ethnic drinking culture, level of enculturation, and level of acculturation. Other independent variables included sociodemographic variables (country of origin, age, educational level, work status, marital status, family socioeconomic status [SES], and perceived family income sufficiency), substance exposure (drinking behavior before immigration, lifetime smoking behavior, and lifetime use of illicit substances), and immigration-related variables (duration of immigration and Chinese language ability).

Current drinking patterns was defined as drinking patterns from the past 12 months through to the present measured using the Alcohol Use Disorder Identification Test (AUDIT), which has 10 items self-rated on a 0- to 4-point Likert scale, with total scores ranging from 0 to 40 (Saunders, Aasland, Babor, de la Fuente, & Grant, 1993; Volk, Steinbauer, Cantor, & Holzer, 1997). The AUDIT has been extensively used in populations of different ethnic backgrounds (Allen, Litten, Fertig, & Babor, 1997; Volk et al., 1997). The participants were divided into three drinking patterns according to their AUDIT scores: abstinent (0), low-risk drinking (1–7; a small to moderate amount of alcohol use without negative impacts on life), and hazardous drinking ( $\geq 8$ ; hazardous alcohol consumption, abnormal drinking behavior, alcohol dependence, or alcohol problems). The sensitivity and specificity for hazardous alcohol use were 92% and 94%, respectively (Saunders et al., 1993).

Ethnic drinking culture was divided into wet and dry based on per capita alcohol consumption and abstinence rates in the past 12 months in their country of origin in reference to those in Taiwan (Cook et al., 2012; Holmila, Raitasalo, Knibbe, & Selin, 2009; Joosten, Knibbe, Derickx, Selin, & Holmila, 2009; Room & Mäkelä, 2000). Wet ethnic drinking culture refers to alcohol use being higher in the country of origin than that in the host country, while dry ethnic drinking culture refers to alcohol use being lower in the country of origin than that in the host country. The choice of host country (Taiwan) as the reference to define wet versus dry drinking culture was because those male immigrants are currently living in Taiwan and there is no absolute standard in dividing drinking culture. Since most of the current study participants had lived in Taiwan for more than 10 years, the country-specific per capita alcohol consumption in liters of ethanol consumed for adults 15 years old or older from 2003 to 2005 was used (World Health Organization, 2014). Countries of origin with per capita alcohol

**Table 1.** Ethnic Drinking Culture and Current Drinking Pattern (N = 188).

Variables	Per capita alcohol consumption (average 2003–2005) <sup>a,b</sup>	Reported abstinence rates in the past 12 months in 2010 <sup>a</sup>	n	Abstinent (n = 69)	Low-risk drinking (n = 100)	Hazardous drinking (n = 19)
Dry ethnic drinking cultures			117	54 (46.2%)	58 (49.6%)	5 (4.3%)
China	4.9	55.9%	45	22 (48.9%)	22 (48.9%)	1 (2.2%)
Southeast and South Asia	0.2–6.8	55.7%–98.1%	67	30 (44.8%)	34 (50.7%)	3 (4.5%)
Middle East	0.3–3.4	86.2%–93.5%	5	2 (40.0%)	2 (40.0%)	1 (20.0%)
Taiwan	3.9 <sup>c</sup>	50.6% <sup>d</sup>	—	—	—	—
Wet ethnic drinking cultures			71	15 (21.1%)	42 (59.2%)	14 (19.7%)
Northeast Asia	8.0–12.3	31.1%–55.2%	20	3 (15.0%)	12 (60.0%)	5 (25.0%)
West			51	12 (23.5%)	30 (58.8%)	9 (17.7%)
North America	9.5–9.8	22.9%–31.1%	37	10 (27.0%)	21 (56.8%)	6 (16.2%)
Europe	10.8–13.4	5.2%–33.8%	12	1 (8.3%)	8 (66.7%)	3 (25.0%)
Oceania (Australia)	10.1	16.0%	2	1 (50.0%)	1 (50.0%)	0 (0.0%)

Note. Southeast and South Asian countries = Vietnam, Indonesia, Thailand, Philippines, Myanmar, Malaysia, India, and Bangladesh.

Middle Eastern countries = Turkey, Lebanon, and Egypt.

Northeast Asian countries = Japan and Korea.

North American countries = United States and Canada.

European countries = United Kingdom, France, Germany, Greece, and Czech Republic.

<sup>a</sup>Data are from the *Global Status Report on Alcohol and Health 2014* (World Health Organization [WHO]).

<sup>b</sup>In liters of pure alcohol.

<sup>c</sup>The value is from the Taiwan's report of per capita alcohol consumption in Taiwan, which was believed to be an underestimation as the consumption of privately brewed alcohol was not recorded.

<sup>d</sup>The value is from the Taiwan's report of market share analysis table of tobacco and alcohol.

consumption between 0.2 and 6.8 liters and abstinence rates between 55.7% and 98.1%, including Middle Eastern, South Asian, and Southeast Asian countries, and China, were defined as having dry ethnic drinking cultures. Those with per capita alcohol consumption between 8.0 and 13.4 liters and abstinence rates between 5.2% and 55.2%, including Northeast Asian and Western countries, were defined as having wet ethnic drinking cultures (Table 1).

As no scales had been adapted and validated among male immigrants in Taiwan, acculturation and enculturation were measured using self-developed scales. Based on literature review and our observation, the process of acculturation has been shown to reflect attitudes and behavior toward necessities of life including communication, social interaction, ethnic identity, and shopping preferences and behavior (Fortner, Pekow, Dole, Markenson, & Chasan-Taber, 2011; Martinez-Schallmoser, Telleen, & MacMullen, 2003; Salant & Lauderdale, 2003; Urquia, O'Campo, & Heaman, 2012). Therefore, we designed two separate and parallel scales, Bidimensional Acculturation Scale for Marriage-Based Immigrants (or BASMBI), to measure acculturation and enculturation including the four dimensions (communication, social interaction, ethnic identity, and shopping preferences and behavior; Table 2). Each included 10 items rated on a 5-point Likert scale (0–4) with total scores ranging from 0 to 40. A higher

score on the acculturation scale indicated a higher level of adaptation to the Taiwanese host culture; a higher enculturation score indicated a higher level of maintenance of the original culture. The content validity was examined by five experts from the fields of social science, nursing, public health, and medicine. The experts rated the appropriateness of the questions on a 4-point Likert-scale (1–4) and provided feedback on revising a question if the question received a score of <3. Item-level content validity index was calculated as the number of expert ratings  $\geq 3$  divided by the total number of experts. Scale content validity index was the average of all item-level content validity index. The scale content validity index was 0.94 and 0.96 for the acculturation and enculturation scales, respectively.

Based on the design of the scales, the second-order four-factor structure was examined through confirmatory factor analysis (CFA) for each of the two scales. In the acculturation model, relative chi-square ( $\chi^2/df$ ), comparative fit index (CFI), incremental fit index (IFI), goodness of fit index (GFI), and root mean square error of approximation (RMSEA) were 1.88, 0.98, 0.98, 0.94, and 0.069, respectively. The respective values for the enculturation model were 3.06, 0.91, 0.91, 0.91, and 0.10. Both models had acceptable model fit. All factor loadings for the acculturation and enculturation scales were more than 0.3 and these are displayed in Table 2. Internal consistency as

**Table 2.** Confirmatory Factor Analysis of the Acculturation and Enculturation Scales in the Bidimensional Acculturation Scale for Marriage-Based Immigrants (BASMBI).

Subscales and items	Acculturation scale		Enculturation scale	
	Second-order factor loading	First-order factor loading	Second-order factor loading	First-order factor loading
Communication	0.60		0.38	
1. How often do you speak <u>Mandarin or Taiwanese/ native language</u> with adult family members?		0.85		0.84
2. How often do you speak <u>Mandarin or Taiwanese/ native language</u> with neighbors, friends, or coworkers?		0.90		0.85
3. How often do you use <u>Mandarin or Taiwanese/ native language</u> to think/memorize?		0.83		0.70
4. How often do you watch the <u>local/mother country's</u> TV channels or listen to the <u>local/mother country's</u> radio stations?		0.62		0.44
Social interaction	0.73		0.64	
5. How often do you interact with <u>native Taiwanese/ mother country's</u> friends?		0.83		0.68
6. How often do you ask <u>native Taiwanese/mother country's</u> friends for help or favor?		0.86		0.82
Ethnic identity	0.83		0.42	
7. How often do you think that you are part of <u>Taiwanese/people of your mother country</u> ?		0.81		0.97
8. How often do your <u>native Taiwanese/mother country's</u> friends think that you are part of <u>Taiwanese/people of your mother country</u> ?		0.86		0.78
Shopping preference and behavior	0.57		0.68	
9. Do you prefer shopping in the store owned by <u>Taiwanese/person from your mother country</u> ?		0.99		0.87
10. How often do you shop in the store owned by <u>Taiwanese/person from your mother country</u> ?		0.73		0.86

Note. Underlined is the part that is different for acculturation and enculturation scales. For acculturation scale, the “before/” is the item word. For enculturation, the “/after” is the item word.

Each item was rated on a 5-point Likert scale from 0 to 4 for *rarely, seldom, sometimes, often, and usually*, respectively.

Items 1 and 2 were adapted from Anderson et al., 1993. Items 3 and 4 were adapted from Barona & Miller, 1994. Item 5 was adapted from Briman & Tyler, 1994. Items 6 and 8 were adapted from Chen et al., 2011. Items 7, 9, and 10 were adapted from Gim Chung et al., 2004. Please note that the item adaptation involved concept rather than exact wording.

assessed using Cronbach's  $\alpha$  was 0.86 for the acculturation scale and 0.78 for the enculturation scale. The level of acculturation and enculturation was divided into low and high based on the median scores (30 for the acculturation scale and 20 for the enculturation scale).

Family SES was measured using Hollingshead's Two-Factor Index of Social Position (Hollingshead, 1957). Family SES was composed of the higher of the occupational and educational levels of each couple. Occupational and educational levels were divided into five categories with a score of 1 to 5 and multiplied by an assigned weight of 7 and 4, respectively. Family SES was divided into low (11–29), middle (30–40), and high (41–55) based on the sum of the scores (Lin, 2005). Perceived family income sufficiency was measured by the question “Do you perceive your family income to

be sufficient for your living expenses?” rated on a 5-point Likert scale: *very insufficient* (0), *insufficient* (1), *just enough* (2), *sufficient* (3), *very sufficient* (4). We grouped 0 and 1 as *not enough* and 2 to 4 as *just enough or more*.

Drinking behavior before immigration was measured by two questions “Have you ever drunk alcohol? (no, yes)” and “When was the first time that you drank? (before coming to Taiwan, after coming to Taiwan).” Lifetime smoking behavior was measured by the question “Have you ever smoked?” with yes/no response. Lifetime illicit substance use was measured by one item “Have you ever used drugs, including superglue, MDMA, amphetamine, heroin/morphine, marijuana, ketamine, FM2, N<sub>2</sub>O, LSD, GHB, Cocaine, PMMA, 2C-B, M-AMP, or 5-MeO-DIPT?”

Duration of immigration was measured by one question "How long has it been since you immigrated to Taiwan?" Self-rated Chinese language ability was measured using a four-item, 5-point Likert scale ranging from 0 (*very poor*) to 4 (*very good*) for listening, speaking, reading, and writing ability. The scale has been used previously among immigrant women in Taiwan (Chen et al., 2011; Chen et al., 2013). The internal consistency of the scale in this study as assessed by Cronbach's  $\alpha$  was 0.95. Level of Chinese language ability was divided into low (0–10) and high (11–16) based on median scores.

### Statistical methods

Data analysis was conducted using IBM SPSS 20.0 (IBM Corp, Somers, NY, USA) and SAS (Statistical Analysis System) version 9.3 (SAS Institute Inc., Cary, NC, USA). Characteristics of the participants were described using frequencies, percentages, means, and standard deviations. Bivariate comparisons between participant characteristics and ethnic drinking culture as well as ethnic drinking culture, acculturation/enculturation, and drinking patterns were performed using  $\chi^2$  statistics or Fisher's exact test. Fisher's exact test was used when more than 20% of the cells had an expected count of less than 5.

CFA for the acculturation and enculturation scales was performed using LISREL 8.80. The goodness of fit for CFA models was assessed using  $\chi^2/df$ , CFI, IFI, GFI, and RMSEA. A  $\chi^2/df$  of less than 5 was deemed acceptable in our study (Schumacker & Lomax, 2010). A value  $\geq 0.9$  for the CFI, IFI, and GFI signaled good model fit (Kline, 2010; Schumacker & Lomax, 2010). An RMSEA range from 0.08 to 0.10 signaled an acceptable fit and a value  $\leq 0.08$  indicated a good fit (MacCallum, Browne, & Sugawara, 1996).

Multinomial logistic regression was used to determine factors associated with drinking patterns. Drinking patterns were divided into abstinent, low-risk drinking, and hazardous drinking, with abstinent being the reference group. The interactive association of "acculturation and ethnic drinking culture" and "enculturation and ethnic drinking culture" with drinking patterns was examined separately in the data analysis due to the small cell size. The interaction term "ethnic drinking culture and acculturation/enculturation" was composed of four groups each: "dry drinking culture and low level of acculturation/enculturation (reference group)," "dry drinking culture and high level of acculturation/enculturation," "wet drinking culture and low level of acculturation/enculturation," and "wet drinking culture and high level of acculturation/enculturation."

Exponential  $\beta$ s are the odds ratios for the predictors. The odds ratio of a coefficient indicates how the risk of the outcome falling in the comparison group compared to

the risk of the outcome falling in the reference group changes with the variable in question (Chan, 2005; Kwak & Clayton-Matthews, 2002). Model fitting was determined by the  $-2(\log \text{likelihood})$  and likelihood ratio test, with a  $p$  value of less than 0.05 demonstrating that the model was significantly better than the null model.

### Results

Of the 188 male immigrants, 59.6% were from China and Southeast and South Asian countries ( $n = 112$ ), 27.1% were from North American, European and Oceania countries ( $n = 51$ ), 10.6% were from Northeast Asian countries ( $n = 20$ ), and 2.7% were from Middle East countries ( $n = 5$ ; Table 1). The mean age of the study participants was 43.47 ( $SD = 11.67$ ) years, and 62.7% were younger than 45 years. The mean duration of immigration was 12.90 ( $SD = 10.43$ ; median = 12.33) years, and 56.3% had lived in Taiwan for more than 10 years. Almost all of the participants ( $n = 186$  or 98.9%) lived in urban cities, with the majority living in the Northern urban area ( $n = 157$  or 83.5%). From the past 12 months through to the present, the prevalence of low-risk drinking and hazardous drinking was 53.2% ( $n = 100$ ) and 10.1% ( $n = 19$ ), respectively. About 60% of the participants drank before immigration.

The characteristics of the study participants were compared between wet and dry ethnic drinking culture groups (Table 3). About three quarters of those from wet drinking cultures and one quarter of those from dry drinking cultures had high family SES (74.6% vs. 26.4%;  $\chi^2 = 42.460$ ,  $df = 2$ ,  $p < .001$ ). Those from wet drinking cultures were more likely to perceive their family income as just enough or sufficient and be lifetime smokers compared with those from dry drinking cultures. Those from wet drinking cultures were more likely to drink before immigration than those from dry drinking cultures (81.7% vs. 47.9%;  $\chi^2 = 21.183$ ,  $df = 1$ ,  $p < .001$ ).

Current drinking patterns by ethnic drinking culture are presented in Table 1. The majority of male immigrants from dry ethnic drinking cultures were either abstinent or low-risk drinkers. The male immigrants from wet ethnic drinking cultures were more likely to be low-risk drinkers (58.8%–60.0% vs. 40.0%–48.9%) or hazardous drinkers (17.7%–25.0% vs. 2.2%–20.0%) than those from dry ethnic drinking cultures.

The associations of enculturation, acculturation, and ethnic drinking culture with drinking pattern are presented in Table 4. Although enculturation and acculturation levels were not significantly associated with drinking pattern, the interactions between ethnic drinking culture and acculturation as well as between ethnic drinking culture and enculturation were significantly associated with current drinking patterns. Participants from wet drinking cultures with a

**Table 3.** Characteristics of the Study Participants by Ethnic Drinking Culture (*N* = 188).

Variables	Dry ethnic drinking culture ( <i>n</i> = 117)	Wet ethnic drinking culture ( <i>n</i> = 71)	$\chi^2/df$	<i>p</i> value
Age <sup>a</sup>			1.316/1	.251
<45	77 (65.8%)	39 (57.4%)		
≥45	40 (34.2%)	29 (42.6%)		
Educational level			28.458/1	<.001*
Senior high school/vocational school or lower	58 (49.6%)	8 (11.3%)		
College/university or higher	59 (50.4%)	63 (88.7%)		
Family SES			42.460/2	<.001*
Low	43 (36.8%)	6 (8.5%)		
Middle	43 (36.8%)	12 (16.9%)		
High	31 (26.4%)	53 (74.6%)		
Full-time job			0.292/1	.589
No	27 (23.1%)	14 (19.7%)		
Yes	90 (76.9%)	57 (80.3%)		
Perceived family income sufficiency <sup>b</sup>			5.162/1	.023*
Not enough	20 (17.2%)	4 (5.7%)		
Just enough or more	96 (82.8%)	66 (94.3%)		
Currently married and living with spouse			0.061/1	.805
No	15 (12.8%)	10 (14.1%)		
Yes	102 (87.2%)	61 (85.9%)		
Place of residence			15.284/3	<.001* <sup>d</sup>
North, urban	106 (90.6%)	51 (71.8%)		
Central, urban	3 (2.6%)	5 (7.1%)		
South, urban	6 (5.1%)	15 (21.1%)		
South, rural	2 (1.7%)	0 (0%)		
Lifetime smoking			5.618/1	.018*
No	67 (57.3%)	28 (39.4%)		
Yes	50 (42.7%)	43 (60.6%)		
Lifetime illicit substance use			11.981/1	<.001* <sup>d</sup>
No	117 (100.0%)	64 (90.1%)		
Yes	0 (0.0%)	7 (9.9%)		
Drinking before immigration			21.183/1	<.001*
No	61 (52.1%)	13 (18.3%)		
Yes	56 (47.9%)	58 (81.7%)		
Duration of immigration <sup>c</sup>			1.219/1	.269
<10 years	53 (46.9%)	27 (38.6%)		
≥10 years	60(53.1%)	43(61.4%)		
Level of Chinese language ability			14.462/1	<.001*
Low	44 (37.6%)	47 (66.2%)		
High	73 (62.4%)	24 (33.8%)		
Level of acculturation			17.643/1	<.001*
Low	56 (47.9%)	56 (78.9%)		
High	61 (52.1%)	15 (21.1%)		
Level of enculturation			5.182/1	.023*
Low	47 (40.2%)	17 (23.9%)		
High	70 (59.8%)	54 (76.1%)		
Current drinking pattern			18.733/2	<.001*
Abstinent	54 (46.2%)	15 (21.1%)		
Low-risk drinking	58 (49.6%)	42 (59.2%)		
Hazardous drinking	5 (4.3%)	14 (19.7%)		

Note. Acculturation = adaptation to the host (Taiwan) culture; enculturation = maintenance of heritage culture. SES = socioeconomic status.

<sup>a</sup>Missing = 3 for age. <sup>b</sup>Missing = 2 for perceived family income sufficiency. <sup>c</sup>Missing = 5 for duration of immigration. <sup>d</sup>Fisher's exact test.

\**p* < .05.

**Table 4.** Ethnic Drinking Culture, Acculturation, and Enculturation by Current Drinking Pattern (N = 188).

Variables	Abstinent (n = 69)	Low-risk drinking (n = 100)	Hazardous drinking (n = 19)	$\chi^2/df$	p value
Level of acculturation				5.260/2	.072
Low	44 (63.8%)	53 (53.0%)	15 (78.9%)		
High	25 (36.2%)	47 (47.0%)	4 (21.1%)		
Level of enculturation				3.794/2	.150
Low	20 (29.0%)	40 (40.0%)	4 (21.1%)		
High	49 (71.0%)	60 (60.0%)	15 (78.9%)		
Ethnic drinking culture and acculturation				26.310/6	<.001 <sup>a</sup>
Dry drinking culture, low level of acculturation	32 (46.4%)	21 (21.0%)	3 (15.8%)		
Dry drinking culture, high level of acculturation	22 (31.9%)	37 (37.0%)	2 (10.5%)		
Wet drinking culture, low level of acculturation	12 (17.4%)	32 (32.0%)	12 (63.2%)		
Wet drinking culture, high level of acculturation	3 (4.3%)	10 (10.0%)	2 (10.5%)		
Ethnic drinking culture and enculturation				25.363/6	<.001 <sup>a</sup>
Dry drinking culture, low level of enculturation	16 (23.2%)	30 (30.0%)	1 (5.3%)		
Dry drinking culture, high level of enculturation	38 (55.1%)	28 (28.0%)	4 (21.1%)		
Wet drinking culture, low level of enculturation	4 (5.8%)	10 (10.0%)	3 (15.8%)		
Wet drinking culture, high level of enculturation	11 (15.9%)	32 (32.0%)	11 (57.9%)		

Note. Acculturation = adaptation to the host (Taiwan) culture; enculturation = maintenance of heritage culture. <sup>a</sup>Fisher's exact test. \*p < .05.

low level of acculturation had the highest rate of hazardous use, and those from dry drinking cultures with a high level of acculturation had the highest rate of low-risk use. Participants from wet drinking cultures with high level of enculturation had the highest rate of hazardous use, and those from dry drinking cultures with a high level of enculturation had the highest rate of abstinence.

Multinomial logistic regression reported that the interaction between ethnic drinking culture and acculturation (Models 1 and 3) as well as ethnic drinking culture and enculturation (Models 2 and 4) on drinking pattern were significant (Table 5). The model fitting demonstrated that all four models were statistically significant (Model 1:  $\chi^2 = 25.980$ ,  $df = 6$ ,  $p < .001$ ; Model 2:  $\chi^2 = 25.823$ ,  $df = 6$ ,  $p < .001$ ; Model 3:  $\chi^2 = 48.462$ ,  $df = 10$ ,  $p < .001$ ; Model 4:  $\chi^2 = 48.134$ ,  $df = 10$ ,  $p < .001$ ).

In the model examining the interaction between ethnic drinking culture and acculturation, multivariate results reported that male immigrants in the low-risk drinking group were more likely to have high family SES (OR = 3.22, 95% CI [1.49, 6.98]) relative to that in the abstinent group. Male immigrants in the low-risk drinking group were more likely to be "from dry drinking cultures with a high level of acculturation" (OR = 2.30, 95% CI [1.01, 5.23]) than "from dry drinking cultures with a low level of acculturation" relative to those in the abstinent group. Those in the hazardous drinking group were more likely to have high family SES (OR = 6.83, 95% CI: 1.48, 31.57) and perceive family income as insufficient (OR = 17.17, 95% CI [2.41, 122.34]) relative to those in the

abstinent group. Male immigrants in the hazardous drinking group were more likely to be "from wet drinking cultures with a low level of acculturation" (OR = 16.58, 95% CI [2.20, 124.71]) than "from dry drinking cultures with a low level of acculturation" relative to those in the abstinent group (Model 3). Other variables were not significantly associated with drinking pattern and were not included in the final model.

In the model examining the interaction between ethnic drinking culture and enculturation, multivariate results reported that male immigrants in the low-risk drinking group were more likely to have high family SES (OR = 3.27, 95% CI [1.52, 7.01]) relative to those in the abstinent group. Male immigrants in the low-risk drinking group were less likely to be "from dry drinking cultures with a high level of enculturation" (OR = 0.41, 95% CI [0.19, 0.92]) than "from dry drinking cultures with a low level of enculturation" relative to those in the abstinent group. Those in the hazardous drinking group were more likely to have high family SES (OR = 7.34, 95% CI [1.61, 33.53]) and perceive their family income as insufficient (OR = 14.62, 95% CI [2.41, 88.85]) relative to those in the abstinent group. Those in the hazardous drinking group were more likely to be "from wet drinking cultures with a high level of enculturation" (OR = 14.76, 95% CI [1.33, 163.29]) than "from dry drinking cultures with a low level of enculturation" relative to those in the abstinent group (Model 4). Other variables were not significantly associated with drinking pattern and were not included in the final model.



**Table 5.** Multinomial Logistic Regression Models for Current Drinking Pattern Among Male Immigrants.

Variables	Low-risk drinking			Hazardous drinking		
	OR	95% CI	<i>p</i> value	OR	95% CI	<i>p</i> value
<b>Model 1</b>						
Ethnic drinking culture and acculturation						
Dry drinking culture, low level of acculturation	1			1		
Dry drinking culture, high level of acculturation	2.56	[1.20, 5.49]	.016*	0.97	[0.15, 6.29]	.974
Wet drinking culture, low level of acculturation	4.06	[1.72, 9.62]	.001*	10.68	[2.56, 44.51]	.001*
Wet drinking culture, high level of acculturation	5.08	[1.25, 20.65]	.023*	7.11	[0.83, 60.75]	.073
<b>Model 2</b>						
Ethnic drinking culture and enculturation						
Dry drinking culture, low level of enculturation	1			1		
Dry drinking culture, high level of enculturation	0.39	[0.18, 0.86]	.019*	1.68	[0.17, 16.27]	.652
Wet drinking culture, low level of enculturation	1.33	[0.36, 4.94]	.667	12.00	[0.97, 148.32]	.053
Wet drinking culture, high level of enculturation	1.55	[0.62, 3.87]	.347	16.00	[1.80, 142.44]	.013*
<b>Model 3</b>						
High family SES	3.22	[1.49, 6.98]	0.003*	6.83	[1.48, 31.57]	.014*
Perceived family income being insufficient	1.25	[0.43, 3.60]	0.685	17.17	[2.41, 122.34]	.005*
Ethnic drinking culture and acculturation						
Dry drinking culture, low level of acculturation	1			1		
Dry drinking culture, high level of acculturation	2.30	[1.01, 5.23]	.047*	1.27	[0.10, 16.87]	.854
Wet drinking culture, low level of acculturation	2.17	[0.80, 5.92]	.129	16.58	[2.20, 124.71]	.006*
Wet drinking culture, high level of acculturation	3.59	[0.83, 15.60]	.088	9.42	[0.78, 114.53]	.078
<b>Model 4</b>						
High family SES	3.27	[1.52, 7.01]	.002*	7.34	[1.61, 33.53]	.010*
Perceived family income being insufficient	1.01	[0.36, 2.81]	.985	14.62	[2.41, 88.85]	.004*
Ethnic drinking culture and enculturation						
Dry drinking culture, low level of enculturation	1			1		
Dry drinking culture, high level of enculturation	0.41	[0.19, 0.92]	.031*	1.06	[0.09, 12.18]	.961
Wet drinking culture, low level of enculturation	0.86	[0.22, 3.43]	.634	8.54	[0.57, 129.02]	.122
Wet drinking culture, high level of enculturation	0.92	[0.34, 2.49]	.865	14.76	[1.33, 163.29]	.028*

Note. The reference was the abstinent group. Acculturation = adaptation to the host (Taiwan) culture; enculturation = maintenance of heritage culture. SES = socioeconomic status.

\**p* < .05.

## Discussion

This study demonstrated that ethnic drinking culture was significantly associated with current drinking pattern among male immigrants in Taiwan. In addition, the interaction between ethnic drinking culture and enculturation/acculturation was significant, meaning that associations differed in those from different ethnic drinking cultures with different levels of acculturation/enculturation. This study is unique in that the ethnic drinking culture could be divided into high (wet) and low (dry) levels in reference to the host country's (Taiwan) drinking culture. Previous studies were mostly conducted in Western countries with high alcohol consumption. Therefore, it was hard to separate the effect of wet ethnic drinking culture from that of the host culture on drinking behavior.

The study results identified that male immigrants who were "from dry ethnic drinking cultures with a high level

of acculturation" (more adapted to the host culture) were more likely to be low-risk drinkers; male immigrants who were "from wet ethnic drinking cultures with a low level of acculturation" (less adapted to the host culture) were more likely to be hazardous drinkers than those who were "from dry ethnic drinking cultures with a low level of acculturation." A previous study indicated that immigrant women from dry drinking cultures who had frequent interaction with Taiwanese friends were associated with increased low-risk drinking (Liu, Chen, Lee, Chu, & Chien, 2017). Those findings seem suggest that as immigrants from dry drinking cultures become more acculturated, they may show increased participation in social activities and exposure to alcohol and thus become low-risk or social drinkers. For those from wet ethnic drinking cultures, a low level of adaptation to the host culture may cause stress and psychological problems (Arends-Tóth & van de Vijver, 2004; Berry, 2003; Flannery et al., 2001;

Ryder et al., 2000). Heavy alcohol use may be used to cope with stressful life situations in their country of origin (de Goeij et al., 2015 ; Lory, Jesse, & Wu, 2011). Therefore, they are more likely to be hazardous drinkers. Further studies are needed to test these hypotheses.

In this study, male immigrants who were "from dry drinking cultures with a high level of enculturation" were less likely to be low-risk drinkers, while those who were "from wet drinking cultures with a high level of enculturation" were more likely to be hazardous drinkers than were those "from dry ethnic drinking cultures with a low level of enculturation." The drinking patterns of high-enculturated immigrants seem congruent with those in their countries of origin (Cook et al., 2015; Currie et al., 2011).

For male immigrants from dry drinking cultures, a high level of acculturation was associated with increased low-risk drinking, while a high level of enculturation was associated with decreased low-risk drinking. These findings are similar to findings in previous U.S. studies (Des Rosiers et al., 2013; Schwartz et al., 2011). For male immigrants from wet drinking cultures, a low level of acculturation and high level of enculturation was associated with increased hazardous drinking. Few studies have been conducted to examine drinking patterns among immigrants from wet drinking cultures; however, an Israeli study reported that former Soviet Union immigrants maintained their heavy drinking after they immigrated to Israel (Sznitman, Baron-Epel, & Boker-Keinan, 2013). This study treated acculturation and enculturation independently owing to the limited sample size. Future research could consider the level of acculturation and enculturation with ethnic drinking cultures concurrently in the model to further examine the issue.

Alcohol drinking behavior differed by wet and dry ethnic drinking cultures among male immigrants. In the current study, those from countries with wet drinking cultures had a higher prevalence of drinking (78.8% vs. 53.9%) and hazardous drinking (19.7% vs. 4.3%) in the past 12 months than those from countries with dry drinking cultures. The prevalence of alcohol use in the past 12 months among male immigrants from dry drinking cultures was similar to the rate in Taiwan (about 50%), whereas those from wet drinking cultures still had a higher prevalence than that in Taiwan. The results suggest that male immigrants from wet drinking cultures are more likely to maintain their drinking culture. Nonetheless, their low level of acculturation and high level of enculturation were associated with an increased risk of hazardous drinking.

In addition to alcohol use, exposure to cigarettes and illicit substances was also higher among male immigrants from wet drinking cultures than among those from dry drinking cultures. Our results seem consistent with the findings that rates of illicit substance use are generally

higher in countries where alcohol use is common (Merikangas & McClair, 2012). Exposure to cigarettes is high among male immigrants, suggesting the need for public health attention. Very few participants reported the use of illicit substances in the study, which may be related to the fear of being penalized and social desirability bias.

Male immigrants from wet drinking cultures were more likely to have high family SES and perceived income sufficiency; however, they were more likely to have a low level of Chinese language ability, low level of acculturation, and high level of enculturation than those from dry drinking cultures. Though level of Chinese language ability was not related to alcohol use pattern in this study, language ability may be related to acculturation and enculturation (Chen, Benet-Martínez, & Harris Bond, 2008), which in turn are related to alcohol use behavior. Language classes can be provided to male immigrants to increase their integration into the host society.

High family SES was related to both low-risk and hazardous drinking among male immigrants, regardless of their ethnic drinking culture. Alcohol may be more affordable for individuals with high SES. Similar associations have been reported previously (Cook et al., 2012; World Health Organization, 2014). Perceived family income insufficiency was associated with an increased risk of hazardous drinking, but not low-risk drinking. Income insufficiency causes great stress for male immigrants (Li, Hofstetter, Irving, Chhay, & Hovell, 2014), which thus increases the risk of hazardous drinking (de Goeij et al., 2015; Lory et al., 2011).

The study demonstrated acceptable validity and reliability of the newly developed acculturation and enculturation scales among male immigrants in Taiwan. The four facets composing the scales were communication, social interaction, ethnic identity, and shopping preferences and behavior. The concepts of the BASMBI items were borrowed from several previous studies (Anderson et al., 1993; Barona & Miller, 1994; Briman & Tyler, 1994; Chen et al., 2011; Gim Chung, Kim, & Abrew, 2004). The study findings supported those of previous studies in the United States that acculturation and enculturation were not just language-based but were multi-oriented concepts (Barry, 2001; Cuellar, Arnold, & Maldonado, 1995). Nonetheless, facets or dimensions covered by different scales vary. Future research is needed to further validate the scale and compare results from different bidimensional acculturation scales. In this study, median scores were used to dichotomize the level of acculturation/enculturation into high or low. Though the use of the median may seem arbitrary, this approach has been used in previous studies (Liu, Berhane, & Tseng, 2010). Interaction between ethnic drinking culture and acculturation/enculturation was the main interest of this study; thus, categorical combinations were used because

it is difficult to interpret the interaction terms in combinations of covariates in the regression models (Aiken & West, 1991; Jaccard & Turrissi, 2003).

The results of this study should be viewed within the context of several limitations. The use of a cross-sectional design indicated correlations rather than causal relationships. The participants were recruited by network sampling. The representativeness of the samples was a concern. Although the distribution of their country of origin was similar to that in a national report (China and Southeast Asian countries: 58.5%, Northeast Asian countries: 10.6%, other countries: 30.9%; National Immigration Agency, 2016), the samples were mostly from the Northern and urban areas in Taiwan. In addition, since most of the male immigrants in Taiwan immigrated through marriage to Taiwanese women, we focused on marriage-based immigrant men. A more heterogeneous sample of male immigrants is needed to examine whether geographic locale, marital status, or immigration type were related to alcohol drinking patterns. The data were collected through different modes in order to increase responses. Though we did not find significant differences in main variables by mode, mode effect was still possible. There were some missing data in variables including age ( $n = 3$ ), perceived family income sufficiency ( $n = 2$ ), and duration of immigration ( $n = 5$ ). Reasons for missing data were not clear due to the anonymity of the questionnaires. Since the extent of the missing data was small, it may not have influenced the study results. We divided ethnic drinking culture into wet and dry based on alcohol use in their country of origin in reference to that in Taiwan (host country). Use of host country as reference may need to be further validated in future study. The classification of ethnic drinking culture into wet and dry may not seem to fit the available data perfectly owing to the wide range of regional data and the underestimation of per capita alcohol consumption in Taiwan. Comparison of characteristics between participants from wet or dry cultures (Table 2), such as higher current alcohol use, lifetime cigarette use, lifetime illicit substance use, and alcohol use, before immigration generally supported the validity of the classification. Though the division seems to be in accordance with our observations, classification errors could still be possible. The data were self-reported; thus, whether the participants offered honest responses or were influenced by social desirability could not be determined. Only 19 male immigrants were identified as having hazardous drinking, which thus limited the statistical power.

## Conclusion

Ethnic drinking culture interacted with acculturation/enculturation in association with drinking patterns among

male immigrants. Future studies with larger sample sizes and more heterogeneous samples may be needed to further examine this issue. To prevent hazardous use of alcohol, health education regarding its potential harmful effects should be targeted at immigrant men who drink, especially among male immigrants with high SES or perceived insufficient family income, and those from wet ethnic drinking cultures with a low level of adaptation to the host culture. To decrease hazardous drinking among male immigrants from wet ethnic drinking cultures, health professionals could develop interventions to encourage integration into the host society and avoidance of alcohol as a way to cope with stress. Perceived income insufficiency was associated with an increased risk of hazardous alcohol use. Policies to assist immigrants to achieve sustainable incomes may be needed to decrease hazardous alcohol use among male immigrants. Furthermore, the acculturation/enculturation scale needs to be further validated in other immigrant populations. Future studies can use longitudinal designs to further examine the interactive association of ethnic drinking culture, acculturation, and enculturation on changes in drinking behaviors over time.

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## ORCID iDs

Hung-Hui Chen  <https://orcid.org/0000-0001-7972-3495>

Li-Yin Chien  <https://orcid.org/0000-0002-4210-2975>

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