Acculturation and Alcohol Drinking Behavior among Chinese International University Students in the Midwest

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ACCULTURATION AND ALCOHOL DRINKING BEHAVIOR AMONG CHINESE
INTERNATIONAL UNIVERSITY STUDENTS IN THE MIDWEST

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The purpose of this study was to explore the relationship between alcohol consumption and acculturation among Chinese international university students in the Midwestern part of the United States. A sample of 91 students from a university in the Midwest participated in the study. All were Chinese and included undergraduate and graduate students. Measures used included the General Ethnicity Questionnaire–Chinese Version (Abridged); the General Ethnicity Questionnaire–American Version (Abridged); the Alcohol Expectancy Questionnaire (AEQ-3); the Alcohol Use Questionnaire, consisting of two subscales, drinking frequency and drinking quantity; and a demographic form created by the author.

Results indicated that older Chinese international students were less likely to view, read, or listen to English using American media such as television, radio, film, or literature. The longer Chinese students stayed in the US, the more likely they were to use English as a communication language at school, home, and work. Results indicated that age and gender were significant predictors of the students’ social affiliation with American culture. Older Chinese international students were less likely to be affiliated socially with American culture, and males were more likely to be affiliated socially with American culture. Chinese international students who were more affiliated socially with American culture were more likely to be drinkers than be non-drinkers. Chinese
international students who were more affiliated socially to American culture were more likely to expect aggressive alcohol expectancy. This study failed to find support for a mediation model where social affiliation with American culture predicted aggressive alcohol expectancy, which in turn predicted the current alcohol drinking frequency.
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CHAPTER 1 INTRODUCTION

Alcohol is the most widely consumed drug worldwide (Paul, Kingston, Tsanaclis, Berry, & Guwy, 2008). Different cultures have different alcohol-drinking patterns. Members of different ethnic and cultural groups show preferences for different types of alcoholic beverages, which may, in turn, affect alcohol access, content and exposure (Heath, 2000). Different cultural groups also show preferences for different frequency and quantities of alcoholic beverages and for different choices of drinking environment and context (Heath, 2000). For example, in Chinese culture, alcohol plays an important role in communication and business. Chinese people have continually regarded alcohol as a representation of happiness and the embodiment of the auspiciousness of an occasion (Newman, 2002). Alcohol drinking at a moderate rate is encouraged, and it is a way to show respect to families and facilitate interpersonal communication (Martinic and Measham, 2008). On the other hand, alcohol is an integral part of social and business life in American culture. It normally accompanies many social events. While many Americans enjoy drinking on a regular basis, excessive alcohol consumption is regarded as a social problem (Ferreira & Willoughby, 2007; Larimer, 2013; and Hingson, Zha, & Weitzman, 2009).

Nowadays, there are an increasing number of Chinese students coming to the United States for study abroad, particularly at the undergraduate level. Enrollments of Chinese student rose to almost 235,000 students in 2013, an increase of 21 percent (Institute of International Education, 2013). The enrollment of Chinese undergraduates at a Midwestern University for the fall semester of 2014 was 727 (3.64%) and for the fall
semester of 2015 was 1094 (4.37%) (University of Nebraska-Lincoln, 2015). Gibson (2001) described acculturation as changes that take place as individuals contact with culturally dissimilar people, group, and social influences. Chinese international students generally have lived a long time in their country of origin and have had to acculturate to a new environment when they come to America. As cultural context is one of the variables affecting alcohol-drinking patterns, research indicates that individual drinking patterns are affected by changes in the cultural environment (Xue, Newman, Shell & Fang, 2005). Therefore, changes in Chinese students’ alcohol-drinking patterns may be attributable to the acculturation process.

**Purpose Statement**

The purpose of this study is to investigate the potential relationship between alcohol-drinking behavior and acculturation among Chinese international university students who study in the Midwestern part of the United States. Although many studies have been done of acculturation and alcohol use (Bryant & Kim, 2013; Pedersen, Hsu, Neighbors, Lee & Larimer, 2013; Des Rosiers, Schwartz, Zamboanga, Ham & Huang, 2012), there is much less research on the relationship between acculturation and alcohol use, particularly among Chinese international students. To fill this gap, we explored alcohol use, acculturation, and alcohol expectancy and their interrelationships among Chinese international students at a university in the Midwest. Knowledge and understanding of factors contributing to alcohol use among students may help academic institutions better understand Chinese international students’ alcohol-drinking behavior, and provide social supports for coping with their problematic drinking. In this study, the
interaction among acculturation, alcohol expectancies and alcohol use will be investigated. Age, gender, and length of stay in US are three major factors that influence acculturation, and these will be included as well. This study will also investigate the interactions among age, gender, and length of stay, as well as acculturation and alcohol use.

**Research Questions**

The central research question of this study is: does acculturation display a potential causal role in alcohol drinking behavior among Chinese students who study at Midwest in the United States?

Four subsequent questions help support the central question:

1) What are Chinese international students’ alcohol-use patterns?
   a. What are Chinese international students’ current alcohol-drinking frequency and current alcohol-drinking quantity when they are in the United States?
   What were Chinese international students’ previous alcohol-drinking frequency and previous alcohol-drinking quantity when they were in China?
   b. Does it change when Chinese international students change their culture context?
   c. Does it vary by gender, age, and length of stay in the United States?

2) How might acculturation towards Chinese culture and acculturation towards American culture be linked to alcohol drinking frequency?
   a. Are the two acculturation constructs best represented by a univariate or multivariate construct?
b. If the two acculturation constructs are best represented by multivariate constructs, then which aspects of acculturation are stronger predictors of alcohol drinking frequency?

c. How gender, age, and length of stay in the United States affect acculturation?

3) How might alcohol expectancy be linked to alcohol drinking frequency?

a. Are alcohol expectancy construct best represented by a univariate or multivariate construct?

b. If alcohol expectancy constructs are best represented by multivariate constructs, then which aspects of alcohol expectancy are stronger predictors of alcohol drinking frequency?

c. How gender, age, and length of stay in the United States affect alcohol expectancy?

4) Does the significant aspects for alcohol expectancy mediate links between acculturation aspects and alcohol drinking frequency?

**Theoretical Model**

This study hypothesized that Chinese student’s alcohol-drinking behavior may be different from their original drinking behavior in China because of acculturation. Chinese students’ age, length of stay and gender would be three major predictors of their acculturation level. Acculturation might also have an impact on alcohol expectancy, and alcohol expectancy is another important motivating factor in drinking behavior. The main hypotheses of this study are: Male Chinese students are more acculturated than female students are. The older Chinese students are, the more they are acculturated. In addition,
the longer they stay in the United States, the more they are acculturated (see Figure 1). The higher the acculturation level (perceiving themselves as American), the less negative alcohol expectancy they have, and the more alcohol they prefer to consume (see Figure 2). The higher the acculturation level (perceiving themselves as American), the more positive alcohol expectancy they have, and the more alcohol they prefer to consume (see Figure 3).

**Figure 1.** Model Predicting Acculturation

**Figure 2.** Mediation Model Predicting Drinking Frequency (Model 1)
Figure 3. Mediation Model Predicting Drinking Frequency (Model 2)
CHAPTER 2 LITERATURE REVIEW

This chapter will first review studies of alcohol consumption in both the United States and China, especially studies focused on the university context. Then, prior studies that have examined relations between acculturation and alcohol use will be reviewed. Finally, theories, concepts and potential measures will be described including the measures selected for this study.

Alcohol Consumption in Chinese Universities

According to historical records and archeological evidence, alcohol drinking in China dates back 7,000 years (Grant, 2013). In China, alcohol use appears to be controlled by culture, tradition, social pressure, and the economy, rather than by government (Newman, 2002). Alcohol drinking among Chinese is generally characterized by moderation (Lu, Engs & Hanson, 1997). However, there has been an increase in alcohol consumption and related problems because of rapid economic development and westernization in China (Cochrane, Chen, Conigrave, & Hao, 2003). Results from surveys showed that 15% of people younger than 20 years old reported drinking in the last 30 days (Yang, Zhou, Sherliker, Cai, Peto, Wang, Millwood, Smith, Hu, Yang & Chen, 2012), and the proportion of the population that drinks every day rises steadily from the youngest ages of 15 to 19 to the oldest of 70 to 74 (Ma & Kong, 2006). In 2009, beer sales in China were estimated to account for 22% of global sales, which makes China the largest beer producer in the world (Alcohol in Moderation, 2008). According to the Global Status Report on Alcohol and Health (2014) published by the World Health Organization (WHO), annual alcohol consumption per capita (for ages 15
years and older) in China increased from 5.8 liters of pure alcohol in 2003-2005 to 6.7 liters in 2008-2010; and 17.3% of drinkers were reported to have engaged in heavy episodic drinking in the past 30 days. The report also showed that the proportion of liver cirrhosis attributable to alcohol was 73% for males and 59.8% for females, much higher than the age-standardized death rates for males and females. The proportion of alcohol-attributable road traffic accidents was 22.2% for males and 4.4% for females, according to the same WHO report.

Alcohol use and related problems in Chinese university students also has attracted the attention of researchers (Abdullah & Fielding, 2002; Unger, Li, Johnson, Gong, Chen, Li, Trinidad, Tran, & Lo, 2001; Li, Barbor, Zeigler, Xuan, Morisky, Hovell, Nelson, Shen, & Li, 2015; and Ji, Hu, & Song, 2012). The China National Youth Risk Behavior Survey investigated alcohol-related risky behaviors among Chinese college students and found that 49.3% of them were current drinkers and 23.5% were binge drinkers (Ji et al., 2012). As different researchers use different measures to assess the rate of alcohol use, this rate varies by samples. For example, among 834 university students in Nanjing City (in southeastern China), the alcohol-use rate was 52.88% (Jin, 2015). Among 791 university students in Shandong City (in northern China), the alcohol-use rate was 61.06% (Zhou & Xu, 2014). Among 530 university students in Beijing and Zhengzhou City (in northern China), 74.5% of them reported drinking alcohol during the past year (Newman, Huang, Shell, & Qian, 2014). Among 1,816 university students in Shaanxi Province (in western China), the overall alcohol consumption rate was 40.8% (Yu, 2014). Among 1,032 university students in Wuhan City (in central China), the rate of alcohol
use was 79.6% (Luo, 2013). A national study indicated regional differences in the rate of alcohol use, as the alcohol use rate was 37.9% for eastern China, 42.8% for central China, and 50.8% for western China (Millwood et al., 2013). Researchers also looked into alcohol use in special administrative regions in China. Sixty-one percent of 1,197 Chinese undergraduates in Hong Kong reported that they were alcohol drinkers (Abdullah and Fielding, 2002), and Griffiths, Lau, Chow, Lee, Kan, & Lee (2006) reported that 62% of 2,968 Chinese undergraduates in Hong Kong claimed they drank alcohol, while 7% reported binge drinking.

In recent decades, alcohol-related problems have been increasingly noted among Chinese university students studying in China. A survey conducted in Yunnan province indicated that 49.11% of university students reported that they picked a fight after drinking alcohol, and 40.36% of drinkers claimed that they were sent to the hospital because of binge drinking (Luo, Yang, He, Li, Wang, & Xiao, 2012). A logistic regression analysis for alcohol use and related problems among Chinese university students indicated that alcohol use is significantly related to drunk driving, smoking (odds ratio of 14.386), gambling (odds ratio of 3.565), serious quarrels or fights (odds ratio of 4.366), and unwanted sexual behavior (an odds ratio of 4.600) (Merrick, Zhang, Tian, Qian, & Newman, 2008). University students with a western cultural orientation have reported heavy alcohol use and related problems (Tang, Xiang, Wang, Cubells, Babor, & Hao, 2013; Shell, Newman, & Fang, 2010). In China, the policy research related to alcohol-related problems only beginning to catch up with recent changes in alcohol consumption. Unlike the National Minimum Drinking Age Act in the United
States, there is no minimum legal drinking age in China, and only a few districts have age limits on the purchase of alcohol (Guo and Huang, 2015).

**Alcohol Consumption in American Universities**

In American culture, excessive alcohol consumption is regarded as a social problem. High levels of mortality, morbidity, and social malaise are associated with the abuse of alcohol, and increasing numbers of women and youth are abusing it (Ferreira & Willoughby, 2007). According to the WHO *Global Status Report on Alcohol and Health* (2014), in 2014, annual alcohol consumption per capita (for ages 15 years and older) in the United States decreased from 9.5 liters of pure alcohol in 2003-2005 to 9.2 liters in 2008-2010, and 24.5% of U.S. drinkers were reported to have engaged in heavy episodic drinking in the past 30 days. The report also showed that the proportion of liver cirrhosis attributable to alcohol was 60.6% for males and 62.2% for females, much higher than the age-standardized death rates both males and female. The proportion of alcohol-attributable road traffic accidents was 12.4% for males and 4.2% for females, according to the same WHO report. In addition, alcohol consumption in the United States is highly regulated by government. It has adopted a minimum age requirement of 21 for purchasing alcoholic beverages. The National Minimum Drinking Age Act of 1984 (23 U.S.C. § 158) was passed by Congress on July 17, 1984, and punishes every state that allows persons below age 21 to purchase and publicly possess alcoholic beverages.

Researchers have long been concerned with excessive drinking and its related health and social impact in university settings in the United States (Gilles, Turk, & Fresco, 2006; Neighbors, Larimer, Geisner, & Knee, 2004). College students have been
identified as a high-risk population for alcohol abuse in America because alcohol is one of the most widely used substances by university students and because alcohol use has been associated with several negative health and social consequences (National Institute on Alcohol Abuse and Alcoholism, 2004; Larimer, 2013). Young adults in universities drink more frequently than non-college-attending peers (Slutske, 2005). A national survey conducted in 2005 indicated that 45% of college students between the ages of 18 and 24 reported binge drinking in the last 30 days (Hingson, Zha, & Weitzman, 2009). Alcohol drinking among college students was strongly associated with the decision to have sex and with indiscriminate and risky forms of sex, such as having multiple or casual partners, but only a few studies suggested that alcohol drinking was associated with protective behaviors such as condom use (Cooper, 2002). Research by Wechsler, Lee, Kuo, & Lee (2000) indicated that binge drinking among college students created problems for themselves and for other students at their college (e.g. they had serious arguments or quarrels, experienced an unwanted sexual advance, were injured, or missed a class). Recent surveys found that alcohol consumption and binge drinking were also strongly associated with tobacco smoking in college students (Ames et al., 2010; and Dierker, Canino, & Merikangas, 2006). An international study of drinking and driving among university students in 23 countries indicated that 43% of male and 28% of female university students in the United States said that they had driven after binge drinking during the past year, the highest rate among 23 countries (Steptoe, Wardle, Bages, Sallis, Sanabria, & Sanches, 2004).
Government and university administrators provide a number of preventive programs to help college students reduce alcohol-related problems. For example, the Brief Alcohol Screening and Intervention for College Students (BASICS) program was aimed at students 18 to 24 years old who drink alcohol heavily and have experienced or are at risk for alcohol-related problems such as violence, poor class attendance, drunk driving, and sexual assault (Dimeff, 1999). Research also showed that BASICS was an effective intervention tool for male students because they showed significantly decreased drinking in a follow-up study, compared to the control group (DiFulvio, Linowski, Mazziotti, & Puleo, 2012). BASICS also helped reduce both alcohol consumption and alcohol-related problems in all college students, according to Fachini, Aliane, Martinez, & Furtado (2012).

In conclusion, comparing the alcohol-consumption data from the WHO report for China and the U.S., Americans consume more alcohol per capita than the Chinese, and the rate of heavy episodic drinking among drinkers is higher in the U.S. than in China. According to studies from China and America (Ji et al., 2012; Jin, 2015; Gilles et al., 2006; Neighbors et al., 2004; and Zhang, Casswell, & Cai, 2008), there are many similarities, as well as differences, in alcohol use and alcohol-related problems between students in American universities and Chinese universities. However, it is difficult to compare alcohol consumption data between Chinese college students and American college students because different studies used different methods and approaches to measure college students’ alcohol consumption.
Studies about Acculturation and Alcohol Use

There are a relatively greater number of studies related to the relationship between acculturation and alcohol consumption among Hispanics, Latinos, Mexican Americans, and Asian-Americans. However, only a few studies investigated acculturation and alcohol use for Chinese or Chinese Americans. Bryant and Kim (2013) examined the relationship between acculturation and alcohol consumption patterns among Asian and Hispanic immigrants in California. Their study indicated that acculturation was significantly related to the past year’s binge drinking for Asians, and to total days of binge drinking for Asians. For Asian immigrants in California, a higher level of acculturation predicted a greater likelihood of alcohol consumption but a decreased chance of binge drinking and fewer binge-drinking days. Des Rosiers et al. (2012) suggested that acculturation orientations were differentially associated with alcohol-related risk outcomes. A study indicated that there was an association between acculturation and alcohol use (including binge drinking) among female Mexican American college students, and no association was found among male Mexican American college students (Raffaelli, Stone, Iturbide, McGinley, Carlo, & Crockett, 2007). Since Chinese/Chinese Americans are different population from Hispanic/Latinos/Mexican Americans, the results of these studies may not serve as reference standard. These studies may provide approaches and frameworks for studies related to acculturation and alcohol use.

There are many studies examining acculturation experiences and alcohol use among Chinese people, especially for adolescents and adults. However, there are few
studies examining the relationship between acculturation and alcohol use for Chinese international college students. Hendershot, Dillworth, Neighbors, and George’s (2008) study indicated that acculturation had no effect on drinking frequency or maximum hours of drinking among Chinese Americans. Hendershot, MacPherson, Myer, Garr, and Wall’s (2005) study indicated that a higher level of acculturation was significantly related to a greater likelihood of current and heavy episodic use among Asian American youth (including Chinese Americans and Korean Americans). Lum, Corliss, Mays, Cochran, and Lui’s (2009) indicated that alcohol use was more prevalent among American-born female Asian college students than among their foreign-born peers.

Some studies did not reveal the relationship between acculturation and alcohol use, but they still convey important aspects of acculturation or alcohol use for Chinese international students. Wei et al. (2007) showed that there were significant main effects of acculturative stress and maladaptive perfectionism on depression among Chinese international students in U.S., no significant two-way interactions, and a significant three-way interaction, indicating that acculturative stress, maladaptive perfectionism, and length of time in the United States interacted to predict depression among Chinese international students in the U.S. Gfroere and Tan’s (2003) study found that foreign-born adolescents had lower rates of substance use (cigarettes, alcohol, marijuana, and other illicit drugs) compared with US-born adolescents. However, as these foreign-born adolescents’ length of residence increases, the risk of substance use increases (Gfroere and Tan, 2003).
In conclusion, contradictory results were found in different studies. Some studies view acculturation as risk factor for alcohol use for Asian Americans (Hendershot et al., 2005), and some studies found no significant results (Hendershot et al., 2008). Gender, length of residence, place of birth, prior education, and other factors may influence how acculturation interacts with alcohol use (Gfroere & Tan, 2003; Lum et al., 2009).

**Acculturation Theories and Measures**

Acculturation was originally used to describe the process when groups of individuals having different cultures come into continuous first-hand contact with succeeding changes in the original culture patterns of either or both groups (Redfield, Linton, & Herskovits, 1936). Gibson (2001) defined acculturation as changes that take place as a result of contact with culturally dissimilar people, groups, and social influences as applied to individuals. This traditionally unidimensional model was used by many empirical acculturation studies (Tweed, Conway, & Ryder, 1999; McCrae, Yik, Trapnell, Bond, & Paulhus, 1998; and Davis & Katzman, 1999). In addition, in recent decades, Berry’s theory was frequently used as the theoretical framework in the acculturation field (Berry, 2005 and Berry, 1997). The acculturation process is underpinned by two independent dimensions, the so-called bidimensional model of acculturation (Berry, 1997): the newcomers’ desire to maintain their identification with their original culture and their desire to adopt the values of the dominant culture. These two dimensions interact to produce four strategies in relation to acculturation: assimilation, integration, separation, and marginalization (Berry, 2005). Assimilation refers to the abandonment of one’s original cultural values and the total adoption of the dominant culture. Integration
refers to the adoption of some cultural values of the dominant culture, while still holding some values of their original culture. Separation refers to the complete retention of the values of one’s original culture, while avoiding values associated with the dominant culture. Lastly, marginalization refers to the avoidance of both sets of cultural values, resulting in isolation from his or her original culture and the dominant culture. Berry developed an East Asian Acculturation Measure that included 29 items, which assessed the level of assimilation, separation from other Asians, integration, and marginalization (Berry, 2001). There are also other empirical studies that adopted the bidimensional model (Dere, Ryder & Kirmayer, 2010; Gim Chung, Kim, & Abreu, 2004).

Although the bidimensional model is broader and potentially more inclusive than the unidimensional model (Ryder, Alden, & Paulhus, 2000), this study will use the traditional unidimensional model (Baker, Soto, Perez, & Lee, 2012; Murray, Klonoff, Garcini, Ullman, Wall, & Myers, 2014). The bidimentional model or its expanded version- the multidimensional model (Gim Chung, Kim, & Abreu, 2004; Schwartz, Unger, Zamboanga, & Szapocznik, 2010) were too complex to apply on a small sample wherein which small or nonexistent clusters would be found.

There are many unidimensional model of acculturation measures. Asian American Multidimensional Acculturation Scale (AAMAS) includes questions related to Asian American’s culture identity, language use, cultural knowledge, and food preferences (Gim Chung et al., 2004). Internal-External Ethnic Identity Measure was an instrument that assessed ethnic affiliation, food orientation, and family collectivism and identified Chinese Americans as either an internal group, an external group, or an internal-external
undifferentiated group (Kwan & Sodowsky, 1997). The Marin and Marin Acculturation Scale (Marin, Sabogal, Marin, Otero-Sabogal, & Perez-Stable, 1987) is an instrument that assessed the level of acculturation among American Born Chinese Americans. It includes 12 items that assess language use, media preferences, and ethnic diversity of social relations (Marin et al., 1987).

In this study, the General Ethnicity Questionnaire (abridged) was used (Tsai, Ying, & Li, 2000). The General Ethnicity Questionnaire is an instrument that assesses acculturation orientation, which includes 75 items asking about Chinese/Chinese American’s language use, social affiliations, culture practices, and cultural identification.

**Alcohol Expectancy Theories and Measures**

The expectancy theory was derived from Bandura’s social cognitive theory (Bandura, 1986). According to Bandura’s expectancy theory, behaviors were explained partially by an individual’s belief or expectancy that a certain behavior will lead to a particular effect (Bandura, 1993). Additionally, expectancies have reinforcing effects on individual’s behavior over time (Jones, Corbin, & Fromme, 2001). Alcohol expectancy is the expectancy regarding alcohol drinking. Alcohol expectancies are effects attributed to alcohol that an individual anticipates experiencing when drinking, and expectancies can influence the behavioral effects of alcohol and decisions regarding alcohol use (Brown, Christiansen, and Goldman, 1987). Leigh (1989) stated that alcohol expectancy consists of the beliefs individuals hold about the effects of alcohol on their behavior, moods, and emotions and is an important factor in motivating drinking behavior. Shell, Newman and Qu (2009) stated that expectancy theory is a memory-based cognitive learning theory.
Expectancy is the repeated perception of the association between a behavior and an outcome and it leads to the memorization of the association. Examples of alcohol expectancy statements are the following: If I drink alcohol, then I will feel relaxed; if I drink alcohol, then I will be seen as strong; and, if I drink alcohol, it will be easier to join in the conversation (Shell, Newman & Qu, 2009; Qu, 2006).

Research also indicated that individuals held positive and negative beliefs regarding alcohol use. Positive expectancies were associated with beliefs that positive effects will occur because of alcohol consumption (Brown, Goldman, & Christiansen, 1985, Rohsenow, 1983). On the other hand, negative expectancies were associated with beliefs that negative effects will occur as a consequence of alcohol consumption (Leigh and Stacy, 2004). Research suggests that alcohol expectancies are an important factor in maintenance of alcohol consumption (Christiansen, Goldman, & Inn, 1982), and in prediction of future alcohol use (Christiansen, Smith, Roehling, & Goldman, 1989). Research also suggests that positive alcohol expectancies represent motivation to drink and negative expectancies represent motivation to restrain excessive alcohol use (Jones & McMahon, 1996; Finn, Bobova, Wehner, Fargo, & Rickert, 2005).

There were many studies regarding the association between alcohol expectancies and alcohol use. Alcohol drinking quantity was consistently associated with alcohol expectancy (McMahon, Jones & O’donnell, 1994; Chen, Grube, & Madden, 1994). Brown, Goldman, Inn, & Anderson (1980) and Read, Wood, Lejuez, Palfai, & Slack (2004) suggested that women generally have more positive alcohol expectances than men. Johnson and Glassman (1999) suggested that men more generally expect negative
alcohol expectancies (e.g., sexual arousal and aggressive behavior) than women. There is also increasing literature suggesting that alcohol expectancies mediate alcohol consumption. Research indicated that a decrease in positive expectancies and an increase in negative expectancies would lead to a decrease in alcohol consumption (Leigh and Stacy, 2004; Darkes, Greenbaum, & Goldman, 2004; and Finn, Bobova, Wehner, Fargo & Rickert, 2005).

In this study, the Revised Alcohol Expectancy Questionnaire (AEQ-3) was used. Brown, Christiansen, and Goldman (1980) designed two instruments, the adolescent form and the adult form, to measure alcohol-related expectancies. The Adult AEQ included 90 items asking about respondents’ anticipated behavior and decisions regarding alcohol use. Both the Adult AEQ (coefficient alphas range from .72 to .92) and the Adolescent AEQ (coefficient alphas range from .47 to .82) yield acceptable internal consistency (Brown, Christiansen, & Goldman, 1987). Rohsenow (1983) modified the Adult AEQ and created the 40-item Alcohol Effects Questionnaire (AEQ-2). George, Frone, Cooper, Russell, Skinner, and Windel (1995) developed the Revised Alcohol Expectancy Questionnaire (AEQ-3), which includes 40 items that consisted of a correlated eight-factor model with six positive expectancies and two negative expectancies. The Revised Alcohol Expectancy Questionnaire (AEQ-3) was a widely used measure in the recent decade (Sims, Noel, Maisto, 2007; and Hayaki, Anderson, & Stein, 2008).

**Measures of Alcohol Drinking**

There were many alcohol-drinking measures available. Most of the assessment and evaluation of alcohol drinking were largely dependent on self-reports (Sobell and
Sobell, 1995). Alcohol consumption consist of the frequency and quantity of drinking (Pitkänen, 2006). Some instruments measure alcohol-drinking frequency, some instruments measured alcohol-drinking quantity, and some instruments measured both alcohol drinking quantity and alcohol drinking frequency. Each measure has advantages and limitations, so how to select the appropriate measure for a given purpose is an important issue for researchers.

Studies related to alcohol drinking frequency measures had a long history. The Alcohol Timeline Followback and the Form 90 were relatively older measures that measured alcohol-drinking frequency. The Alcohol Timeline Followback (TLFB) was an assessment instrument using retrospective daily estimates of alcohol use for 30-360 days before an interview (Sobell, Brown, Leo, and Sobell, 1996). It was usually used with adults and adolescents. Form 90 assessed alcohol use by means of recalling daily alcohol drinking for the prior 90 days before last the drink using a calendar and weekly grid (Miller and Del Boca, 1994). Form 90 was used with both adults and adolescents. Both TLFB and Form 90 have good reliability and validity. Recent years, increasing numbers of alcohol drinking measures were developed based on previous studies. For example, the 2015 National survey on Drug Use and Health (NSDUH) asked eight questions (each question may have sub-questions and branch logic) related to alcohol use (Center for Behavioral Health Statistics and Quality, 2014). These questions asked about whether and how often participants have used alcoholic beverages such as beer, wine, or liquor. Sample questions are “On how many days in the past 12 months did you drink an alcoholic beverage?” and “During the past 30 days, on how many days did you drink one
or more drinks of an alcoholic beverage?” These questions are all related to alcohol drinking frequency.

For the measure of quantity of alcohol use, the concept of standard drink will be used. A standard drink is any drink that contains about 14 grams of pure alcohol in United States (Turner, 1990). Generally, this amount of pure alcohol was found in 12-ounces of beer (5% alcohol content), 8-ounces of malt liquor (7% alcohol content), 5-ounces of wine (12% alcohol content), or 1.5-ounces of 80-proof (40% alcohol content) distilled spirits or liquor (e.g., gin, rum, vodka, whiskey) (U.S. Department of Health and Human Services, 2010). According to the Dietary Guidelines for Americans (U. S. Department of Agriculture, 2010), moderate alcohol consumption was defined as having up to one standard drink per day for women and up to two drinks per day for men. According to the National Institute on Alcohol Abuse and Alcoholism (2004), binge drinking was defined as a status of alcohol consumption that brings the blood alcohol concentration (BAC) level to 0.08% or more. This pattern of drinking usually corresponds to five or more drinks on a single occasion for men or four or more drinks on a single occasion for women, generally within about 2 hours (National Institute of Alcohol Abuse and Alcoholism, 2004).

Drinking quantity instruments asked average quantity per occasion, which means average or typical amount of drinking on a given day, with a day defined to include continued drinking past midnight. For example, a national health and nutrition examination survey measure the alcohol drinking quantity as “on the average, on the days that you drank alcohol, how many drinks did you have a day?” (Arif and Rohrer, 2005).
Stewart, Morris, Mellings and Komar (2006) asked participants how many standard drinks they usually consume per occasion to measure alcohol-drinking quantity.

Other measures such as Quantity-Frequency Variability (Cahalan, Cisin, & Crossley, 1969), NIAAA Quantity Frequency (Armor, Polich, & Stambul, 1978), Rand Quantity Frequency (Polich, Armor, & Braiker, 1981) and Cognitive Lifetime Drinking History (Russell, Marshall, Trevisan, Freudenheim, Chan, Markovic, Vana, & Priore, 1997) were relatively older measures that measured both alcohol drinking quantity and alcohol drinking frequency. For example, the Cognitive Lifetime Drinking History asks subjects to recall how much they drank on a typical day and whether drink size changed during their lifetime (Russell et al., 1997). The Rand Quantity Frequency asked subjects to recall how much they drank on a typical day during the 30 days before their last drink, and asked about beverage type (Polich et al., 1981). In recent years, measures that measured both alcohol use quantity and alcohol use frequency were very popular (Koenig, Jacob, and Haber, 2009; Havard, Shakeshaft, and Fisher, 2008; Fishburne and Brown, 2006). For example, the 2013 National Youth Risk Behavior Survey (YRBS) asked seven questions related to alcohol use (Kann et al., 2014). Sample questions are “During the past 30 days, on how many days did you have at least one drink of alcohol?”, “During the past 30 days, on how many days did you have 5 or more drinks of alcohol in a row, that is, within a couple of hours?”, and “During the past 30 days, what is the largest number of alcoholic drinks you had in a row, that is, within a couple of hours?” The first two questions were used to determine alcohol-drinking frequency, and the last question was used to measure alcohol-drinking quantity.
In this study, alcohol-drinking frequency was assessed by measuring the drinking frequency within the last year and the last 30 days adopted by Shell, Newman, and Fang (2000) and Wang (2011). Shell, Newman and Fang (2010) have used a measure to categorize participants by alcohol drinking frequency. Participants were divided into three categories: non-drinkers are those who reported never drinking or not drinking within the past year, occasional drinkers are those who drank in the last year but not in the past 30 days; and regular drinkers are those who drank within the last 30 days. Wang (2011) also divided participants into three types of drinkers: non-drinkers were those who reported they never drink, occasional drinkers were those who didn’t drink in the last month, and regular drinkers were those who drank from 1-3 days to above 20 days in the last month. In this study, alcohol-drinking quantity was assessed by measuring the drinking quantity on a typical day or on average. Alcohol-drinking quantity measure was adopted from questions in the Alcohol Use Disorder Identification Test (AUDIT Form, Babor, Higgins-Biddle, Saunders, & Monteiro, 2001). Participants were divided into three categories: non-drinkers are those who reported they never drink on a typical day and on average; moderate drinkers are those who drank less than five standard drinks on a typical day and on average; and heavy drinkers are those who drank more than five standard drinks on a typical day and on average.
CHAPTER 3 METHOD

Participants

Ninety-one Chinese international students who were either undergraduate or graduate students in a Midwestern university participated in the study. Students who met the following criteria qualified for participation in the study: (a) They were Chinese international students in a Midwestern university; (b) they spoke Chinese as their mother language; (c) they had achieved a proficient level of English comprehension; and (d) they had given informed consent and a form indicating such was obtained. Questionnaires from six individuals were not used in the analysis because of large numbers of missing values in the demographic section, the acculturation questionnaire or the alcohol expectancies questionnaire. Among the remaining 85 students, 42 (49.4%) were males and 43 (50.6%) were females. The age range of participants was from 18 to 39 (mean=24.09, SD=4.30). The length of stay of participants ranged from one month to 84 months with a mean of 30.92 months and a standard deviation of 19.94 months; 56.47% of participants were undergraduates and 43.53% of participants were graduate students. Specific demographic characteristics for this sample are displayed in Tables 1 and 2, Chapter 3.

Table 1 Demographic Information of Age and Length of Stay in United States

<table>
<thead>
<tr>
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<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Age</td>
<td>24.43</td>
<td>3.51</td>
<td>23.77</td>
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<tr>
<td>Length of Stay (months)</td>
<td>35.10</td>
<td>17.23</td>
<td>26.85</td>
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Table 2 *Demographic Information of Gender and Year in School*

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<th></th>
<th>Total</th>
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<td></td>
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<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
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<tr>
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<td>49.4</td>
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<td>50.6</td>
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<tr>
<td>Total</td>
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<td></td>
<td>85</td>
<td></td>
<td>170</td>
<td>100</td>
</tr>
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<td>Grade</td>
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<tr>
<td>Freshmen</td>
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<td>11.8</td>
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<td>17.6</td>
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<td>5.9</td>
<td>6</td>
<td>7.0</td>
<td>11</td>
<td>12.9</td>
</tr>
<tr>
<td>Junior</td>
<td>11</td>
<td>12.9</td>
<td>6</td>
<td>7.0</td>
<td>17</td>
<td>20.0</td>
</tr>
<tr>
<td>Senior</td>
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<td>2.3</td>
<td>3</td>
<td>3.5</td>
<td>5</td>
<td>5.9</td>
</tr>
<tr>
<td>Masters</td>
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<td>2.3</td>
<td>5</td>
<td>5.9</td>
<td>7</td>
<td>8.2</td>
</tr>
<tr>
<td>Doctorate</td>
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<td>20</td>
<td>13</td>
<td>15.3</td>
<td>30</td>
<td>35.3</td>
</tr>
</tbody>
</table>

**Measures (see Appendix D)**

*Drinking frequency.* Subjects’ current drinking frequency was measured based on reported frequency in the past 30 days and past year, respectively. Questions about their current drinking frequency asked: “How many days did you drink in last 30 days?” (1=never drank; 2=didn’t drink in the last month; 3=1-3 days; 4=4-9 days; 5=10-20 days; 6≥20 days) and: “How many days did you drink alcohol in the past 12 months?” (1=never drank; 2=1-5 days; 3=1 day per month; 4=1 day per week; 5=2-3 days per week; 6=≥6 days per week). Subjects’ previous drinking frequency in China was measured by similar questions: How many days did you drink alcohol during the 30 days before you came to the US?” and: “How many days did you drink alcohol in the 12 months before you came
to the US?” Subjects were categorized as non-drinkers (those who reported never drinking in the past 12 months and not drinking in the past year and past 30 days), occasional drinkers (those who drank in the last year but not in the last 30 days), and regular drinkers (those who drank more than 20 days within the last 30 and drank more than 2 days per week in the past year) (Shell et al., 2009).

Drinking quantities. Subjects’ current drinking quantity was measured based on reported quantities on average and on a typical day. A picture of a “standard drink” was provided. Questions about their current drinking quantities asked: “On a typical day when you drink in the US, how many standard drinks do you have?” (1=never drink; 2= < 1 standard drink; 3=1-2 standard drinks, 4=3-4 standard drinks, 5=5-6 standard drinks, 6= > 6 standard drinks) and: “On average, how many drinks per day do you have when you are in the US?” (1=never drink, 2= < 1 standard drink, 3=1-2 standard drinks, 4=3-4 standard drinks, 5=5-6 standard drinks, 6= > 6 standard drinks). Subjects’ previous drinking quantity when they were in China was measured by similar questions: “On a typical day when you drank in China, how many drinks did you have?” and: “On average, how many drinks per day did you have when you were in China?” Subjects were categorized as non-drinkers (those who reported they never drink on a typical day and on average); moderate drinkers (those who drank less than five standard drinks on a typical day and on average); and heavy drinkers (those who drank more than five standard drinks on a typical day and on average).

Acculturation. The General Ethnicity Questionnaire–Chinese Version (Abridged) and the General Ethnicity Questionnaire–American Version (Abridged) was used to
measure acculturation orientation (Tsai et al., 2000). The General Ethnicity Questionnaire—Chinese Version (abridged) asked subjects about their engagement in and attitudes about Chinese culture. Subjects were asked to rate the degree to which they agree with statements about Chinese culture (e.g. “When I was growing up, I was exposed to Chinese culture”) on a 5-point Likert scale (1= “strongly disagree”; 2= “disagree”; 3= “neutral”; 4= “agree”; 5= “strongly agree”). Mean score of items indicate subjects’ notion of being Chinese. The higher the mean score, the more likely subjects are significantly oriented to Chinese culture. General Ethnicity Questionnaire—American Version (Abridged) asked subjects about their engagement in and attitudes about American culture. Subjects were asked to rate the degree to which they agree with similar questions about American culture on a 5-point Likert scale. Mean scores of items indicate subjects’ notion of being American. The higher the mean score, the more likely subjects are significantly oriented to American culture. The original study reported high internal reliabilities for both scales (α = .92 for the GEQ-Chinese version and α = .92 for the GEQ-American version). In this study, exploratory factor analysis was used to reduce a large number of variables into a smaller set of variables. The internal reliability for reduced scale of both GEQ-Chinese version and GEQ-American version will be reported in Chapter 4.

Alcohol Expectancy. The Alcohol Expectancy Questionnaire (AEQ-3) (George et al., 1995) was used to measure subjects’ alcohol expectancy. Statements such as “drinking makes me feel warm and flushed” and “I am more romantic when I drink” presented the cognitive, affective, and behavioral outcomes an individual expects to
occur due to alcohol drinking (George, Frone, Cooper, Russell, Skinner, & Windle, 1995). Subjects were asked to rate the degree to which they agree with statements on a 5-point Likert scale (1= “not at all”; 2= “slightly”; 3= “somewhat”; 4= “moderate”; 5= “definitely”). Mean scores of items from subscales indicate positive and negative expectancy levels. The higher the score of positive alcohol expectancy, the more likely subjects expect positive outcomes due to alcohol drinking. The higher the score of negative alcohol expectancy, the more likely subjects expect negative outcomes due to alcohol drinking. The original study reported high internal reliabilities for eight expectancy subscales (from $\alpha = 0.83$ for subscale tension reduction and relaxation to $\alpha = 0.93$ for subscale sexual enhancement). In this study, exploratory factor analysis was used to reduce a large number of variables into a smaller set of variables. The internal reliability for reduced scale of Alcohol Expectancy Questionnaire will be reported in Chapter 4.

**Procedures**

Before beginning this study, approval was obtained from the University of Nebraska–Lincoln’s Institutional Review Board (IRB). Since participants under 21 of age were asked about their alcohol use, this research involved minimal risk for participants. After protocol regarding the processes and procedures of the survey was modified to maintain confidentiality during and after data collection, the IRB completed a full board review.

After approval was granted, investigators began to recruit participants. To target the particular population (Chinese international students), recruitment flyers were
distributed in the student union, dining halls, and residential halls in a Midwestern university, and recruitment emails were sent to Chinese students by the Chinese Student and Scholars Association, which had a large database of Chinese students’ and scholars’ emails. In recruitment emails and flyers, students were informed of the purpose, procedures, and incentives of this study. This study used an on-line survey based on Qualtrics in which participants completed the informed consent forms and questionnaires online. Students were also informed that if they volunteered to complete the questionnaire, they would be placed in a lottery pool for a $100 Walmart gift card, and that the odds of winning were approximately 1 in 80.

Once students decided to participate in this study, those who received recruitment emails could access the survey by clicking the website link anytime anywhere on computers or portable devices, and those who received recruitment flyers could access the survey by scanning the QR code or type in the website link anytime anywhere on computers or portable devices. Participants first read the online informed consent form that introduced the purpose, procedures, benefits, risks and discomforts, confidentiality, incentives, opportunity to ask questions, freedom to withdraw and investigators’ contact information. If they agreed to take part, they clicked the “accept” button to take them to questionnaire.

Students had sufficient time to answer the questionnaire. Most took 10 to 15 minutes to complete it (this data was retrieved from the Qualtrics backend database). At the end of the questionnaire, they were asked to provide their contact information. Once one of participants won the lottery, investigators were able to contact by email, cell phone
or wechat (a free mobile text and voice messaging communication service popular among Chinese people).

After 91 participants completed the questionnaire, investigators shut down the portal of the on-line survey and downloaded data from Qualtrics. Each participant was assigned an ID number. After the data was coded, investigators separated questionnaire data from the participants’ contact information; this way participants’ contact information was removed from the questionnaire data. The contact information was stored with the ID numbers separately from the questionnaire data with an ID number. These two forms of data were stored in a password-protected hard drive in a locked campus office.

After the data was coded, aggregated, and analyzed, a winner was chosen through a random drawing of participants’ ID numbers conducted by the investigators. Only the investigator knew the link between the questionnaire data and the contact information, and no other individuals were identifiable through this procedure except the winner. The investigator contacted the winner by the contact method the winner provided and a $100 Walmart gift card was presented to the winner.

Data Analysis

To examine how acculturation is related to alcohol expectancy and alcohol-drinking frequency, SPSS 22.0 was used for data analysis. Descriptive statistical analysis was used for demographic data. Mean score and standard deviation assessments were used for variables such as age and length of stay in the United States, and frequency was used for variables such as gender and grade. To measure participants’ current drinking frequency, crosstabs were used to show how participants answered regarding their current
drinking frequency in the past 30 days and the past 12 months. To measure participants’ previous drinking frequency in China, crosstabs were used to show how participants answered the question about their previous drinking frequency during the 30 days and the 12 months before they arrived in the United States. To measure participants’ changes in drinking frequency, crosstabs were also used to compare participants’ drinking frequency in China and America. A chi-square test was used to analyze drinking frequency by gender and by year in school. A t-test was used to analyze drinking frequency by length of stay in the United States.

SPSS 22.0 was used as an exploratory factor analysis to identify the underlying relationship between measured variables in the acculturation and alcohol expectancy scales. After the identified subscales of acculturation and alcohol expectancy, SPSS 22.0 was used for a binary logistic regression analysis to examine the relationships among acculturation, alcohol expectancy and alcohol-drinking frequency. The mediating role of alcohol expectancy was also examined in this process.
CHAPTER 4 RESULTS

Alcohol Drinking Patterns

*Drinking frequency.* Subjects’ current drinking frequency in the U.S. was measured by reported drinking frequency in the past 30 days and in the past 12 months. Among 85 subjects, 50 (58.8%) were non-drinkers, 33 (38.8%) were occasional drinkers, and two (2.4%) were regular drinkers. Subjects’ previous drinking frequency in China was measured by reported drinking frequency during the 30 days and 12 months before they came to the United States. Among 85 subjects, 44 (51.8%) were nondrinkers, 40 (47.1%) were occasional drinkers, and one (1.2%) was a regular drinker. Because the amount of regular drinkers (those who drank more than 20 days in the last 30 days and drank more than two days per week in the past year) was too small to be used in follow-up analysis, the drinking frequency categories were reclassified into nondrinker and drinker categories. For the current drinking frequency, among 85 subjects, 50 (58.8%) were nondrinkers and 35 (41.2%) were drinkers. For the previous drinking frequency, among 85 subjects, 44 (51.8%) were non-drinkers, and 41 (48.2%) were drinkers. Specific characteristics of this sample are displayed in Table 3, Chapter 4.

*Drinking quantity.* Subjects’ current drinking quantity was measured by reported drinking quantity in the past 30 days and in the past 12 months. Among 85 subjects, 37 (43.5%) were nondrinkers, 46 (54.1%) were moderate drinkers, and two (2.4%) were heavy drinkers. Subjects’ previous drinking quantity was measured by reported drinking quantity during the 30 days and 12 months before they came to the United States. Among 83 subjects (two were missing), 26 (31.3%) were nondrinkers, 55 (66.3%) were moderate
drinkers, and two (2.4%) were heavy drinkers. Because the amount of heavy drinkers (those who drank more than five standard drinks on a typical day and on average) was too small to be used in follow-up analysis, the drinking quantity categories were reclassified as nondrinker and drinker. For the current drinking quantity, among 85 subjects, 37 (43.5%) were non-drinkers and 48 (56.5%) were drinkers. For the previous drinking quantity, among 83 subjects, 26 (31.3%) were non-drinkers, and 57 (68.7%) were drinkers. Specific characteristics of this sample are displayed in Table 4, Chapter 4.

Table 3 Drinking Frequency

<table>
<thead>
<tr>
<th></th>
<th>Non-drinker</th>
<th>Occasional drinker</th>
<th>Regular drinker</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Current drinking frequency</td>
<td>50</td>
<td>58.8</td>
<td>33</td>
</tr>
<tr>
<td>Previous drinking frequency</td>
<td>44</td>
<td>51.8</td>
<td>40</td>
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</table>

<table>
<thead>
<tr>
<th></th>
<th>Non-drinker</th>
<th>Drinker</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Current drinking frequency</td>
<td>50</td>
<td>58.8</td>
</tr>
<tr>
<td>Previous drinking frequency</td>
<td>44</td>
<td>51.8</td>
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</table>
Table 4 *Drinking Quantity*

<table>
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<tr>
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<th>Occasional drinker</th>
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<th>Regular drinker</th>
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</thead>
<tbody>
<tr>
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<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Current drinking quantity</td>
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<td>2.4</td>
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<tr>
<td>Previous drinking quantity</td>
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<td>55</td>
<td>64.7</td>
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<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Current drinking quantity</td>
<td>37</td>
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<tr>
<td>Previous drinking quantity</td>
<td>26</td>
<td>31.3</td>
<td>57</td>
<td>68.7</td>
</tr>
</tbody>
</table>

*Change in drinking frequency.* Subjects who were non-drinkers as defined by both current and previous drinking frequency were categorized as consistent nondrinkers. Among 85 subjects, 32 (37.6%) were consistent non-drinkers. Subjects who were drinkers as defined by both current and previous drinking frequency were categorized as consistent drinkers. Among 85 subjects, 23 (27.1%) were consistent drinkers. Subjects who were drinkers as measured by previous drinking frequency and were non-drinkers as measured by current drinking frequency were categorized as changed from drinker to nondrinker. Among 85 subjects, 12 (14.1%) changed their drinking behavior as they quit drinking after they came to the United States. Subjects who were non-drinkers as measured by previous drinking frequency and were drinkers as measured by current drinking frequency were categorized as changed from nondrinker to drinker. Among 85 subjects, 18 (21.2%) changed their drinking behavior after they came to United States.
Table 5 Change in Drinking Frequency

<table>
<thead>
<tr>
<th>Change Category</th>
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<tbody>
<tr>
<td>Consistent non-drinker</td>
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<tr>
<td>Consistent drinker</td>
<td>23</td>
<td>27.1</td>
</tr>
<tr>
<td>From drinker to non-drinker</td>
<td>12</td>
<td>14.1</td>
</tr>
<tr>
<td>From non-drinker to drinker</td>
<td>18</td>
<td>21.2</td>
</tr>
</tbody>
</table>

*Drinking status by gender.* To examine the relationship of gender and drinking status, a chi-square analysis was used. Table 6 displayed the frequency distribution of three pairs of variables (gender and current drinking frequency, gender and previous drinking frequency, and gender and change in drinking frequency). There was no statistically significant chi-square result for gender groups and current drinking frequency ($\chi^2 = .017 \text{ with } df = 1 \text{ and } p = .897$), for gender groups and previous drinking frequency ($\chi^2 = .104 \text{ with } df = 1 \text{ and } p = .748$), and for gender groups and change in drinking frequency ($\chi^2 = 2.060 \text{ with } df = 3 \text{ and } p = .560$).
Table 6 *Drinking Status by Gender*

<table>
<thead>
<tr>
<th>Current drinking frequency</th>
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<tr>
<td>Non-drinker</td>
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<td>25</td>
</tr>
<tr>
<td>Drinker</td>
<td>17</td>
<td>18</td>
</tr>
</tbody>
</table>

χ² = .017 (df = 1, p = .897)

<table>
<thead>
<tr>
<th>Previous drinking frequency</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-drinker</td>
<td>21</td>
<td>23</td>
</tr>
<tr>
<td>Drinker</td>
<td>21</td>
<td>20</td>
</tr>
</tbody>
</table>

χ² = .104 (df = 1, p = .748)

<table>
<thead>
<tr>
<th>Change in drinking frequency</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consistent nondrinker</td>
<td>17</td>
<td>15</td>
</tr>
<tr>
<td>Consistent drinker</td>
<td>13</td>
<td>10</td>
</tr>
<tr>
<td>From drinker to non-drinker</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>From non-drinker to drinker</td>
<td>8</td>
<td>10</td>
</tr>
</tbody>
</table>

χ² = 2.060 (df = 3, p = .560)

*Note.* * = p ≤ .05, ** = p ≤ .01, *** = p ≤ .001.
**Drinking status by age.** An independent-samples t-test was conducted to compare ages of nondrinkers and drinkers. For subjects’ current drinking frequency, there was no significant difference in the scores for the age of nondrinkers (M=23.70, SD=4.42) and the age of drinker (M=24.66, SD=4.12); t (83) = -1.01, p=0.32. For subjects’ previous drinking frequency, there was no significant difference in the scores of age for the nondrinkers (M=24.11, SD=4.62), and drinkers (M=24.07, SD=3.97); t (83) =0.04, p=0.97. For subjects’ current drinking quantity, results indicate that current drinkers (M=25.56, SD=4.41) were older than current nondrinkers (M=22.19, SD=3.34); t (83) = -3.87, p<0.001. For subjects’ previous drinking quantity, results indicate that previous drinkers (M=22.56, SD=3.46) were older than previous nondrinkers (M=22.19, SD=3.34); t (81) = -2.40, p=0.02. Multinomial regression was conducted to predict change of alcohol use by age. The likelihood ratio chi-square of 2.09, p=0.55, tells us that our model does not fit significantly better than an empty model (i.e., a model with no predictors).

**Drinking status by length of stay in United State.** An independent-sample t-test was conducted to compare length of stay in the US for nondrinkers and drinkers. For subjects’ current drinking frequency, results indicated that current drinkers (M=36.60, SD=20.89) stayed longer in the U.S. than current nondrinkers (M=26.95, SD=18.47); t (83) = -2.25 p=0.03. For subjects’ previous drinking frequency, there was no significant difference in the scores of length of stay in the U.S. for nondrinkers (M=33.27, SD=19.21) and drinkers (M=28.40, SD=20.64; t (83) =1.13 p=0.26. For subjects’ current drinking quantity, results indicated that current drinkers had (M=38.04, SD=20.02) stayed longer
in the U.S. than current nondrinkers (M=21.69, SD=15.78); t (83) = -4.09, p<0.001. For subjects’ previous drinking quantity, results indicated that previous drinkers (M=34.59, SD=20.99) stayed longer in the U.S. than previous nondrinkers (M=24.08, SD=15.29); t (81) = -2.29, p=0.025. Multinomial regression was conducted to predict change of alcohol use by length of stay in United State. The likelihood ratio chi-square of 8.96, p=0.03 tells us that our model fit significantly better than an empty model (i.e., a model with no predictors). A one-unit increase of length of stay (months) is associated with a 2.43 decrease of length of stay (months) in the relative log odds of changing from non-drinker to drinker versus consistent non-drinker.

**Acculturation**

The General Ethnicity Questionnaire–Chinese Version (abridged) asked subjects about their engagement in and attitudes about Chinese culture. Level of cultural orientation towards Chinese culture was calculated by averaging across participants’ ratings of the General Ethnicity Questionnaire–Chinese Version (abridged). The General Ethnicity Questionnaire–American Version (Abridged) asked subjects about their engagement in and attitudes about American culture. Level of acculturation was calculated by averaging across participants’ ratings of the General Ethnicity Questionnaire–American Version (abridged). Because the notion of being Chinese and the notion of being American are based on their levels of engagement in both cultures for Chinese immigrants (Tsai, Ying, and Lee, 2000), and because all participants were Chinese immigrants who studied at a Midwestern university, both the General Ethnicity Questionnaire–Chinese Version (Abridged) and the General Ethnicity Questionnaire–
American Version (Abridged) were used. This study focused on how acculturation related to alcohol drinking behavior. Therefore, the General Ethnicity Questionnaire–Chinese Version (abridged) will be analyzed only for comparison with the General Ethnicity Questionnaire–American Version (Abridged). The General Ethnicity Questionnaire–American Version (Abridged) was used for further analysis of how acculturation may have interacted with other variables (e.g., age, gender, alcohol drinking frequency).

Acculturation scale evaluation. The General Ethnicity Questionnaire–Chinese Version (Abridged) and the General Ethnicity Questionnaire–American Version (Abridged) were evaluated separately. The General Ethnicity Questionnaire–Chinese Version (Abridged) was used to measure how strongly subjects were oriented to Chinese culture. There are 38 items in this questionnaire. Exploratory factor analysis was used to identify the underlying relationships between measured variables. Firstly, all items correlated at least 0.3 with at least one other item, suggesting reasonable factorability. Twenty-six items were eliminated because they did not contribute to a simple factor structure and failed to meet the minimum criteria of a primary factor loading of 0.5 or above and no cross loading of 0.3 or above. A maximum likelihood estimation factor analysis of the remaining 12 items, using varimax rotations, was conducted with the three factors explaining 17.91% of the variance. The factor-loading matrix is presented in Table 7, Chapter 4. The exploratory factor analysis yielded to three factor loadings. These factors were considered to be the specific domains of Chinese culture. The “social affiliation” factor (5 items, $\alpha = .893$) is individual’s need to feel a sense of involvement
and "belonging" within a social group, in this case, Chinese culture group. Statements such as “I would prefer to live in a Chinese/Chinese American community” and “I engage in Chinese forms of recreation” loaded in this factor. The “media” (4 items, $\alpha = .881$) factor is individuals’ preference for media in Chinese language. Questions such as “How much do you view, read, or listen to Chinese in film?” and “How much do you view, read, or listen to Chinese in literature?” ask about individual’s preference for media in Chinese language. The “pride” factor (3 items, $\alpha = .792$) is the pride for Chinese culture. Statements such as “I am proud of Chinese culture” and “Chinese culture has had positive impact on my life” loaded in this factor.

Table 7 Summary of EFA Result for GEQ-Chinese Version Using Maximum Likelihood Estimation (N=78)

<table>
<thead>
<tr>
<th>Items</th>
<th>Social Affiliation</th>
<th>Media</th>
<th>Pride</th>
</tr>
</thead>
<tbody>
<tr>
<td>I would prefer to live in a Chinese/Chinese American community.</td>
<td>.824</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I engage in Chinese forms of recreation.</td>
<td>.793</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I relate to my partner or spouse in a way that is Chinese.</td>
<td>.688</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I wish to be accepted by Chinese/Chinese Americans.</td>
<td>.665</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 7 (continued)

<table>
<thead>
<tr>
<th>Items</th>
<th>Factor Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Now, my friends are Chinese/Chinese American.</td>
<td>.640</td>
</tr>
<tr>
<td>How much do you view, read, or listen to Chinese in film?</td>
<td>.903</td>
</tr>
<tr>
<td>How much do you view, read, or listen to Chinese on TV?</td>
<td>.722</td>
</tr>
<tr>
<td>How much do you view, read, or listen to Chinese on the radio?</td>
<td>.701</td>
</tr>
<tr>
<td>How much do you view, read, or listen to Chinese in literature?</td>
<td>.629</td>
</tr>
<tr>
<td>I am proud of Chinese culture.</td>
<td>.847</td>
</tr>
<tr>
<td>Chinese culture has had positive impact on my life.</td>
<td>.785</td>
</tr>
<tr>
<td>I am embarrassed/ashamed of Chinese culture.</td>
<td>.557</td>
</tr>
</tbody>
</table>

*Note:* item “I am embarrassed/ashamed of Chinese culture” was reverse coded.
If a univariate construct is used, a total culture orientation towards Chinese culture is constructed using the mean score of 12 items above. Cronbach’s alphas for these 12 items was .870. Total culture orientation towards Chinese culture was significantly correlated with Chinese social affiliation \((r = .841, p < .01)\), Chinese media \((r = .841, p < .01)\), and pride for Chinese culture \((r = .634, p < .01)\). Chinese social affiliation was significantly correlated with Chinese media \((r = .541, p < .01)\) and pride for Chinese culture \((r = .349, p < .01)\). Chinese media was significantly correlated with pride for Chinese culture \((r = .319, p < .01)\). The correlation matrix is presented in Table 8, chapter 4. The correlations between the three domains (Chinese social affiliation, Chinese media, pride for Chinese culture) were relatively lower than correlations between total culture orientation towards Chinese culture and three domains. Therefore, Culture orientation can be best represented by a univariate construct.

### Table 8 Chinese Social Affiliation, Chinese Media, Pride for Chinese Culture, and Total Culture Orientation towards Chinese Culture Scale: Inter-correlations \((N = 83)\)

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Chinese social affiliation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Chinese media</td>
<td>.541**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. pride for Chinese culture</td>
<td>.349**</td>
<td>.319**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. total culture orientation towards Chinese culture</td>
<td>.841**</td>
<td>.841**</td>
<td>.634**</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* * = \(p \leq .05\), ** = \(p \leq .01\), *** = \(p \leq .001\).
The General Ethnicity Questionnaire–American Version (Abridged) was used to measure how strongly subjects were acculturated to American culture. There are 38 items in this questionnaire. Exploratory factor analysis was used to identify the underlying relationships between measured variables. First, all items correlated to a degree of at least 0.3 with at least one other item, suggesting reasonable factorability. Twenty-four items were eliminated because they did not contribute to a simple factor structure and failed to meet a minimum criteria of a primary factor loading of 0.5 or above and no cross loading of 0.3 or above. A maximum likelihood estimation factor analysis of the remaining 14 items, using varimax rotations, was conducted with the four factors explaining 8.38% of the variance. The factor-loading matrix is presented in Table 9, Chapter 4. The exploratory factor analysis yielded to four factor loadings. These factors were considered to be the specific domains of American culture. The “social affiliation” factor (4 items, \( \alpha = .910 \)) is individual’s need to feel a sense of involvement and “belonging” within a social group, in this case, American culture group. Statements such as “When I was a child, my friends were American” and “I relate to my partner or spouse in a way that is American” loaded in this factor. The “activities” factor (3 items, \( \alpha = .891 \)) is individuals’ participation in American activities. Statements such as “I engage in American forms of recreation” and “I celebrate American holidays” loaded in this factor. The “language” factor (4 items, \( \alpha = .932 \)) is individual’s English language use and proficiency. Questions such as “How fluently do you read English?” and “How fluently do you speak English?” loaded in this factor. The “media” factor (3 items, \( \alpha = .888 \)) is individuals’ preference for media in English language. Questions such as “How much do
you view, read, or listen to English in film?” and “How much do you view, read, or listen to English on TV?” loaded in this factor.

Table 9 Summary of EFA Results for GEQ-American Version Using Maximum Likelihood Estimation (N = 75)

<table>
<thead>
<tr>
<th>Items</th>
<th>Factor Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Social</td>
</tr>
<tr>
<td></td>
<td>Affiliation</td>
</tr>
<tr>
<td>Overall, I am American.</td>
<td>.880</td>
</tr>
<tr>
<td>When I was a child, my friends were American.</td>
<td>.833</td>
</tr>
<tr>
<td>The people I date are American.</td>
<td>.814</td>
</tr>
<tr>
<td>I relate to my partner or spouse in a way that is American.</td>
<td>.720</td>
</tr>
<tr>
<td>I engage in American forms of recreation.</td>
<td>.818</td>
</tr>
<tr>
<td>I listen to American music.</td>
<td>.640</td>
</tr>
<tr>
<td>I celebrate American holidays.</td>
<td>.626</td>
</tr>
<tr>
<td>How fluently do you read English?</td>
<td>.850</td>
</tr>
</tbody>
</table>
Table 9 (continued)

<table>
<thead>
<tr>
<th>Items</th>
<th>Social</th>
<th>Activities</th>
<th>Language</th>
<th>Media</th>
</tr>
</thead>
<tbody>
<tr>
<td>How fluently do you write English?</td>
<td>.834</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How fluently do you understand English?</td>
<td>.807</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How fluently do you speak English?</td>
<td>.794</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How much do you view, read, or listen to English in film?</td>
<td>.907</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How much do you view, read, or listen to English on the radio?</td>
<td>.807</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How much do you view, read, or listen to English on TV?</td>
<td>.799</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If a univariate construct is used, a total acculturation score is constructed using the mean score of 14 items above. Cronbach’s alphas for these 14 items was .902. Total acculturation was significantly correlated with American social affiliation ($r = .858$,
p<.01), American Language ($r = .716, p<.01$), and American media ($r = .618, p<.01$), but there was a nonsignificant correlation of -.004 ($p = n.s$) between total acculturation and American activities. The correlation matrix is presented in Table 10, chapter 4. The correlations between the three domains (American social affiliation, American Language, and American media) were relatively lower than correlations between total acculturation and these domains. In addition, American activities was not significantly correlated with three other domains (American social affiliation, American Language, and American media). Therefore, acculturation can be better represented by a multivariate construct instead of univariate construct.

Table 10 American Social Affiliation, American Activities, American Language, American Media, Total Acculturation Scale: inter-correlations (N=83)

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. American social affiliation</td>
<td></td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. American activities</td>
<td>-.089</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. American Language</td>
<td>.430**</td>
<td>-.023</td>
<td>-.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. American Media</td>
<td>.370**</td>
<td>-.007</td>
<td>.372**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. total acculturation</td>
<td>.858**</td>
<td>-.004</td>
<td>.716**</td>
<td>.618**</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* *p*< .05. **p*< .01. ***p*< .001.

**Acculturation and alcohol drinking frequency.** The acculturation construct is better represented by multivariate constructs, so it is important to find out which domains of acculturation are stronger predictors of alcohol drinking frequency. A binary logistic regression was used to predict current alcohol drinking frequency from American social
affiliation. A test of the full model against a constant only model was statistically significant, indicating that social affiliation, as a set, reliably distinguished between non-drinkers and drinkers (chi square = 6.299, p < .05 with df = 1). The binary logistic regression model predicting current alcohol drinking frequency from American media/American language/American activities did not return significant results. Therefore, American social affiliation is the strong predictor of current alcohol drinking frequency.

**Acculturation by gender.** An independent-samples t-test was conducted to compare the four acculturation domain scores between males and females. There was a significant difference in the scores of American social affiliation for male (M=2.974, SD=1.281) and female (M=1.976, SD=.747), t (79) = 4.322, p< .001, indicating that male scored significantly higher in American social affiliation than females. There was a significant difference in the scores of American activities for male (M=4.183, SD=.560) and female (M=3.830, SD=.729), t (81) = 2.468, p<.05, indicating that males scored significantly higher in American activities than females. There was not a significant difference between the scores on American language and American media for males and females. Results are presented in Table 11, Chapter 4.

**Acculturation by age and length of stay in United State.** A simple linear regression was calculated to predict American media use based on age. A significant regression equation was found (F (1, 78) =4.540, p=0.036), with an $R^2$ of 0.055. Subjects’ predicted American media use decreased while participant’s age increased. No significant simple linear regression model was found for predicting American social
affiliation/American activities/ American language based on age. A simple linear regression was calculated to predict American language use based on length of stay in the United States. A significant regression equation was found (F (1, 78) =8.909, \( p=0.004 \)), with an \( R^2 \) of 0.103. Subjects’ predicted English language use increased while length of stay in the United State increased. No significant simple linear regression model was found for predicting American social affiliation/American activities/American media based on length of stay in the U.S.

Table 11 *Summary of t-statistic Results for Acculturation Domains by Gender*

<table>
<thead>
<tr>
<th>Domain</th>
<th>Male</th>
<th>Female</th>
<th>t-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>American social affiliation</td>
<td>2.974</td>
<td>1.281</td>
<td>1.976</td>
</tr>
<tr>
<td>American activities</td>
<td>4.183</td>
<td>.560</td>
<td>3.830</td>
</tr>
<tr>
<td>American Language</td>
<td>3.783</td>
<td>.678</td>
<td>3.661</td>
</tr>
<tr>
<td>American Media</td>
<td>3.781</td>
<td>.694</td>
<td>3.643</td>
</tr>
</tbody>
</table>

*Note.* *p* < .05. **p** < .01. ***p** < .001.

*The model using gender, age, and length of stay to predict acculturation.* A multiple linear regression was conducted to predict four acculturation domains base on gender, age, and length of stay in United States.

A significant regression equation was found (F(3, 75) = 5.028, \( p = .003 \)), with an \( R^2 \) of 0.167 for predicting American social affiliation. However, length of stay in United
States does not contribute to this model. Results of this model are presented in Table 12 and Figure 4 in Chapter 4.

Table 12 *American Social Affiliation Predicted by Gender, Age, and Length of Stay in United States (N=80)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>5.247</td>
<td>.748</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>-.980</td>
<td>.232</td>
<td>-.429***</td>
</tr>
<tr>
<td>Age</td>
<td>-.063</td>
<td>.029</td>
<td>-.236*</td>
</tr>
<tr>
<td>Length of Stay in United States</td>
<td>.086</td>
<td>.055</td>
<td>.111</td>
</tr>
</tbody>
</table>

*Note. R²=.237. *p<.05. **p<.01. ***p<.001.*

*Figure 4. American Social Affiliation Predicted by Gender, Age, and Length of Stay in United States (N=80)*
A significant regression equation was found (F (3, 76) = 3.023, p = .035), with an R² of .107 for predicting American language use. However, gender and age do not contribute to this model. Results of this model are presented in Table 13 and Figure 5 in Chapter 4.

Table 13 American Language Use Predicted by Gender, Age, and Length of Stay in United States (N=79)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>3.666</td>
<td>.487</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>-.036</td>
<td>.150</td>
<td>-.027</td>
</tr>
<tr>
<td>Age</td>
<td>-.010</td>
<td>.019</td>
<td>-.064</td>
</tr>
<tr>
<td>Length of Stay in United States</td>
<td>.012</td>
<td>.004</td>
<td>.342**</td>
</tr>
</tbody>
</table>

Note. R²=.107. *p< .05. **p< .01. ***p< .001.

Figure 5. American Language Use Predicted by Gender, Age, and Length of Stay in United States (N=79)
No significant multiple regression model was found for predicting American activities/American media based on age, gender, and length of stay in the U.S.

**Alcohol Expectancy**

*Alcohol expectancy scale evaluation.* Alcohol expectancy evaluated the cognitive, affective, and behavioral outcomes individuals expected to occur due to alcohol drinking. There are 40 items in this questionnaire. Exploratory factor analysis was used to identify the underlying relationships between measured variables. First, all items correlated to a degree of at least 0.3 with at least one other item, suggesting reasonable factorability. Twenty-nine items were eliminated because they did not contribute to a simple factor structure and failed to meet a minimum criteria of a primary factor loading of 0.5 or above and no cross loading of 0.3 or above. A maximum likelihood estimation factor analysis of the remaining 11 items, using varimax rotations, was conducted with the three factors explaining 8.64% of the variance. The factor-loading matrix is presented in Table 14, Chapter 4. The exploratory factor analysis yielded to three factor loadings. These factors were considered to be the specific domains of alcohol expectancy. The “aggression” factor (4 items, $\alpha=.849$) is the aggressive behavior an individual expected if drinking alcohol. Statements such as “After a few drinks, it is easier to pick a fight” and “I’m more likely to get into an argument if I’ve had some alcohol” loaded on this factor. The “tension reduction” factor (3 items, $\alpha=.859$) is tension reduction that an individual expected if drinking alcohol. Statements such as “Alcohol makes me worry less.” and “Drinking gives me more confidence in myself” loaded on this factor. The “cognitive and physical impairment” factor (4 items, $\alpha=.825$) is cognitive and physical impairment an
individual expected if drinking alcohol. Statements such as “Drinking makes me less efficient” and “I cannot think as quickly after I drink” loaded on this factor.

Table 14 Summary of EFA Results for AEQ-3 Using Maximum Likelihood Estimation (N = 78)

<table>
<thead>
<tr>
<th>Item</th>
<th>Aggression</th>
<th>Tension reduction</th>
<th>Cognitive and physical impairment</th>
</tr>
</thead>
<tbody>
<tr>
<td>After a few drinks, it is easier to pick a fight.</td>
<td>.738</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If I have had a couple of drinks, it is easier for me to tell someone off.</td>
<td>.604</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drinking makes me more aggressive.</td>
<td>.594</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I’m more likely to get into an argument if I’ve had some alcohol.</td>
<td>.517</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drinking gives me more confidence in myself.</td>
<td>.741</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alcohol makes me worry less.</td>
<td>.562</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alcohol makes me less worried about doing things well.</td>
<td>.534</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drinking makes me less efficient.</td>
<td>.762</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 14 (continued)

<table>
<thead>
<tr>
<th>Items</th>
<th>Aggression</th>
<th>Tension reduction</th>
<th>Cognitive and physical impairment</th>
</tr>
</thead>
<tbody>
<tr>
<td>I cannot think as quickly after I drink.</td>
<td></td>
<td></td>
<td>.593</td>
</tr>
<tr>
<td>I can’t act as quickly when I’ve been</td>
<td></td>
<td></td>
<td>.491</td>
</tr>
<tr>
<td>drinking.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alcohol makes me careless about my</td>
<td></td>
<td></td>
<td>.487</td>
</tr>
<tr>
<td>actions.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Researchers usually categorize alcohol expectancies into negative alcohol expectancies and positive alcohol expectancies (Cooper, Frone, Russell, & Mudar, 1995; Lee, Greely, & Oei, 1999; Oei & Jardim, 2007; Patrick & Maggs, 2008). The original AEQ-3 (George et al, 1995) included five positive expectancy subscales (global positive, social and physical pleasure, social expressiveness, sexual enhancement, and tension reduction and relaxation) and three negative expectancy subscales (cognitive and physical impairment, careless unconcern, and power and aggression). In this study, two negative alcohol expectancy subscale (aggression and cognitive and physical impairment) and one positive alcohol expectancy subscale (tension reduction) were found. If a bivariate construct was used, negative alcohol expectancy was constructed using the mean score of 8 items for subscale aggression and subscale cognitive and physical impairment, and positive alcohol expectancy was constructed using the mean score of 3 items in subscale...
tension reduction. Negative alcohol expectancy was significantly correlated with aggression (r=.925, p<.01), cognitive and physical impairment (r=.878, p<.01) and tension reduction (also regarded as positive alcohol expectancy, r=.710, p<.01). The correlation matrix is presented in Table 15, Chapter 4. Results indicated that negative alcohol expectancy was highly correlated with two negative alcohol expectancy subscales. Therefore, both bivariate construct and multivariate construct can be used for analysis. In this study, the multivariate construct was used.

Table 15 Tension Reduction, Aggression, Cognitive and Physical Impairment, & Negative Alcohol Expectancy Scale: inter-correlations (N=83)

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. tension reduction (positive alcohol expectancy)</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. aggression</td>
<td>.706**</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. cognitive and physical impairment</td>
<td>.620**</td>
<td>.710**</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>4. negative expectancy</td>
<td>.710**</td>
<td>.925**</td>
<td>.878**</td>
<td>-</td>
</tr>
</tbody>
</table>

*Note.* *p*<.05. **p**<.01. ***p***<.001.

Alcohol Expectancy and Drinking Frequency. According to the exploratory factor analysis, three subscales emerged: aggression, tension reduction, and cognitive and physical impairment. A higher score for the aggression subscale indicates that the subjects were more likely to expect aggressive behavior due to alcohol drinking. A higher score for tension reduction indicated that the subjects were more likely to expect alcohol drinking to help them feel good and relaxed. A higher score for cognitive and physical impairment indicates that subjects were more likely to expect cognitive and physical
impairment. Logistic regression was conducted to predict alcohol-drinking frequency using three subscales of alcohol drinking expectancy, tension reduction, aggression, and cognitive and physical impairment as predictors. A test of the full model against a constant only model was statistically significant, indicating that predictors as a set reliably distinguished between non-drinker and drinker (chi square = 8.993, \( p = .029 \) with \( df = 3 \)). The Wald criterion demonstrated that only aggression made a significant contribution to prediction (\( p = .008 \)). Tension reduction and cognitive and physical impairment were not significant predictors. The odds ratio indicated that a one unit increase in aggression is associated with an odds ratio 0.259 times as large, and therefore participants more strongly endorsing aggression expectancies were 0.259 more times likely be drinkers instead of non-drinkers. The result of the logistic regression analysis is presented in Table 16, Chapter 4. Results indicated that aggression was the strongest predictor of alcohol drinking frequency.

*Alcohol expectancy by gender.* An independent-samples t-test was conducted to compare alcohol expectancy between males and females. There was not a significant difference in the scores for tension reduction for males (M=3.019, SD=0.904) vs. females (M=2.819, SD=1.056), \( t (80) =0.914, p=0.364 \), or for the scores for cognitive and physical impairment (Males, M=3.211, SD=0.819 and Females, M=2.923, SD=0.846, \( t (78) =1.544, p=0.127 \)). There was a significant difference in the score for the aggression subscale for males (M=3.006, SD=0.871) and females (M=2.587, SD=0.843), \( t (81) =2.455, p=0.029 \). Results are presented in Table 17, Chapter 4.
Table 16 *Summary of Logistic Regression Result for Alcohol Expectancy Predicting Alcohol-drinking Frequency (N = 79)*

<table>
<thead>
<tr>
<th></th>
<th>b</th>
<th>se</th>
<th>Wald</th>
<th>Prob.</th>
<th>Odds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tension reduction</td>
<td>.408</td>
<td>.286</td>
<td>20.32</td>
<td>.154</td>
<td>1.504</td>
</tr>
<tr>
<td>Aggression</td>
<td>-1.352</td>
<td>.506</td>
<td>7.146</td>
<td>.008**</td>
<td>.259</td>
</tr>
<tr>
<td>Cognitive and physical impairment</td>
<td>.841</td>
<td>.443</td>
<td>3.605</td>
<td>.058</td>
<td>2.320</td>
</tr>
</tbody>
</table>

Model $\chi^2 = 8.993$, $p = .029^*$

*Note.* $^*p < .05$. $^{**}p < .01$. $^{***}p < .001$. The dependent variable in this analysis is alcohol drinking frequency coded so that 0 = non-drinker and 1 = drinker.

Table 17 *Summary of t-statistic Result for Alcohol Expectancy by Gender*

<table>
<thead>
<tr>
<th></th>
<th>Male M</th>
<th>SD</th>
<th>Female M</th>
<th>SD</th>
<th>t-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggression</td>
<td>3.006</td>
<td>.871</td>
<td>2.587</td>
<td>.843</td>
<td>2.455*</td>
</tr>
<tr>
<td>Tension reduction</td>
<td>3.019</td>
<td>.904</td>
<td>2.819</td>
<td>1.056</td>
<td>.914</td>
</tr>
<tr>
<td>Cognitive and physical impairment</td>
<td>3.211</td>
<td>.819</td>
<td>2.923</td>
<td>.846</td>
<td>1.544</td>
</tr>
</tbody>
</table>

*Note.* $^*p < .05$. $^{**}p < .01$. $^{***}p < .001$.

*Alcohol expectancy by age and length of stay in United State.* A simple linear regression was calculated to predict alcohol expectancy based on age and length of stay in the US. No significant regression results were found.
Test of the Mediation Model

In order to test for potential mediation role of alcohol expectancy for the relation between acculturation and alcohol drinking behavior, we conducted a series of regression models. Correlation coefficient was used to measure the strength and the direction of a linear relationship between predictor, mediator, and the outcome variable. The predictor, acculturation, used multivariate construct. Four subscales (American social affiliation, American language, American media, & American activities) were included in the correlational analysis. The mediator, alcohol expectancy, used a multivariate construct. Three subscales (tension reduction, aggressions, and cognitive and physical impairment) were included in the correlational analysis. The outcome variable, alcohol drinking frequency, was also included in the correlational analysis. Detailed correlation coefficient results were presented in Table 18, Chapter 4. Results indicated that American social affiliation, indicating acculturation, was a stronger predictor of alcohol drinking frequency, and also that aggression, indicating alcohol expectancy, was the only significant predictor of alcohol drinking frequency. Therefore, subscale American social affiliation for acculturation was chosen as the predictor in the mediation model, and subscale aggression for alcohol expectancy was chosen as the mediator in the mediation model.

Frazier, Tix, and Barron (2004) stated that moderators address “when” or “for whom” as predictor is more strongly related to an outcome, whereas mediators address “how” or “why” one variable predicts or causes an outcome. Baron and Kenny (1986) defined mediator as the mechanism through which a predictor influences an dependent
variable of interest. In this study, we were interested in whether or not alcohol expectancy explained, or mediated the relationship between acculturation and alcohol use pattern. Thus, a mediation model is chosen to explore the relationship among acculturation, alcohol expectancy, and alcohol drinking frequency. We hypothesized that stronger social affiliation with American culture would predict lower levels of aggressive alcohol expectancies, and that expectancies, in turn, would predict higher alcohol drinking frequency.

According to Baron and Kenny (1986), there are four steps to establishing a mediation model. The first step is to show that there is a significant relation between the predictor (e.g., social affiliation for acculturation) and the outcome variable (e.g., alcohol drinking frequency). The second step is to show that the predictor (e.g., social affiliation for acculturation) is related to the mediator (e.g., aggression). The third step is to show that the mediator (e.g., aggression) is related to the outcome variable (e.g., alcohol drinking frequency). The last step is to show that the strength of the relation between the predictor and outcome variable is significant reduced when the mediator is introduced into the model.

To establish mediation, the first step is to conduct a binary logistic regression that predict alcohol drinking frequency from social affiliation for acculturation. A test of the full model against a constant only model was statistically significant, indicating that the social affiliation as a set reliably distinguished between non-drinkers and drinkers (chi-square = 6.299, $p < .05$ with $df = 1$). Exp(B) value of .875 indicates that when social
affiliation is raised by one unit, the odds ratio is .875 times as large and therefore participants are .875 more times likely to be drinkers than non-drinkers.

The second step is to conduct a simple linear regression that predicts aggression alcohol expectancy from social affiliation. A significant regression equation was found (F(1,79) = 33.402, p < .001), with an R2 of .297. Participants’ aggression for alcohol expectancy increased for each unit of social affiliation increased.

The third step is to conduct a binary logistic regression that predict alcohol drinking frequency from aggression. A test of the full model against a constant only model was not statistically significant, indicating that the aggression expectancies did not reliably distinguish between non-drinkers and drinkers (chi square = 1.863, p =.172 with df = 1).

The results of the analysis failed to support a mediation model. Significant linkages for the model of the relationship among American social affiliation, aggressive expectancy, and alcohol drinking frequency are shown in Figure 6, Chapter 4.
Table 18 Correlations among Acculturation, Alcohol Expectancy, and Alcohol Drinking Frequency

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Tension Reduction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Aggression</td>
<td></td>
<td>.706*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Cognitive and Physical Impairment</td>
<td></td>
<td></td>
<td>.620**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. American Social Affiliation</td>
<td></td>
<td>.417**</td>
<td>.545**</td>
<td></td>
<td>.362**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. American Activities</td>
<td></td>
<td></td>
<td></td>
<td>-.277*</td>
<td>-.076</td>
<td>-.122</td>
<td>-.089</td>
<td></td>
</tr>
<tr>
<td>6. American Language</td>
<td></td>
<td>.228*</td>
<td>.156</td>
<td>.266*</td>
<td>.430**</td>
<td>-.023</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. American Media</td>
<td></td>
<td>.190</td>
<td>.135</td>
<td>.123</td>
<td>.370**</td>
<td>-.001</td>
<td>.372**</td>
<td></td>
</tr>
<tr>
<td>8. Current Drinking Frequency</td>
<td></td>
<td>.035</td>
<td>-.150</td>
<td>.064</td>
<td>-.272*</td>
<td>-.159</td>
<td>.039</td>
<td>-.107</td>
</tr>
</tbody>
</table>

*Note:* *p* < .05. **p** < .01.
Figure 6. Mediation Model Predicting Drinking Frequency
CHAPTER 5 DISCUSSION

The purpose of this investigation was to explore the relationship between alcohol drinking behavior and acculturation among Chinese international university students in the Midwest of the United States. The study took place over the course of four months in early 2015. Participants were Chinese international undergraduate or graduate students at a Midwestern university.

Alcohol Drinking Status

Current alcohol drinking frequency results indicated that among 85 participants, majority (58.8%) of Chinese international students were currently nondrinkers; 38.8% of Chinese international students were currently occasional drinkers; and 2.4% were currently regular drinkers. Current alcohol drinking quantity results indicated that among 85 Chinese international students, majority (54.1%) of them were currently moderate drinkers who drank less than five standard drinks on a typical drinking day, 43.5% were currently non-drinkers, and 2.4% were currently heavy drinkers, those who drank more than five standard drinks on a typical drinking day. These results were similar to the results for Chinese students who study in Chinese universities (Ji et al., 2012; Jin, 2015; and Yu, 2014), while prior studies among Chinese college students found much higher percentage of regular drinkers (Shell, Newman, & Qu, 2009; Tang et al., 2013) than results in this study. Among 85 Chinese international students, most (64.7%) of them did not change their alcohol drinking behavior while 35.3% changed their alcohol drinking behavior; 37.6% of them were nondrinkers when in both China and the United States, 27.1% of them were drinkers when in both China and the US, 14.1% quit drinking
alcohol when they came to the U.S. from China, and 21.2% of them began drinking alcohol when they came to U.S. from China. One of the research questions was whether Chinese international students changed their alcohol-use pattern, and the results indicated that 35% Chinese international students did change their alcohol-use patterns when their environmental context changed.

No significant differences between males and females for Chinese students’ alcohol-drinking patterns was shown. Therefore, we cannot say that there were differences in current alcohol-drinking frequency, previous alcohol-drinking frequency, or change in alcohol-drinking frequency between males and females. Many previous research studies found that males were more likely to be current drinkers than females (Wilsnack et al., 2009; Blackwell and Burke, 2013). This study may not have not found similar results due to the small sample size or because of the relatively younger age for this sample.

Age was an important predictor of alcohol-drinking patterns. Results indicate that drinkers’ age was significantly higher than nondrinkers’ age when considering both their current alcohol-drinking quantity and previous alcohol-drinking quantity. Contrary to Moore et al.’s (2005) finding that alcohol consumption declined with increasing age, this study found out that alcohol consumption increased with increasing age. Explanations for this difference are: 1) sample in this study was young adults aged 18-39 years, but sample in Moore et al.’s study was aged 1-74 years; and 2) participants aged 21 and above may legally access alcohol, but participants aged below 21 are not legally allowed to consume alcohol in the United States.
Length of stay in the United States was also an important predictor of alcohol drinking patterns. Results indicated that drinkers’ length of stay in the U.S. was significantly longer than nondrinkers’ length of stay in the U.S. when considering participants’ current drinking frequency. Results indicated that drinkers’ length of stay in the US was not significantly different from nondrinkers’ length of stay when considering participants’ previous drinking frequency. There were also significant differences regarding length of stay in the US among consistent drinkers, consistent nondrinkers, and drinkers who became nondrinkers and nondrinkers who became drinkers. As participants stayed longer in U.S., previous non-drinkers were more likely to become drinkers rather than remain non-drinkers. An explanation for this result is simply that when participants stay longer in the U.S., the more likely they reach the legal drinking age, and more likely they were to consume alcohol.

Acculturation

Results of the study indicated that males were more likely to affiliate socially with aspects of American culture than were females, and males were also more likely to participate in American activities than females. Results also indicated that older Chinese international students were less likely to view, read, or listen to English language on television, on radio, in film, and in literature. This is perhaps because older students usually lived off campus, perhaps associating more exclusively with other Chinese students or residents, while younger students usually lived on campus. Younger students who lived on campus likely had more interactions with their American peers, and were more likely to expose to American media. Evidence also indicated that the longer
Chinese students stayed in the United States, the more likely were they to use English as a communication language at school, at home, and at work. This is perhaps because the longer Chinese students stayed in the United States, the better their English skills became and they may have encountered more opportunities and circumstances to interact with English speakers at school, at home, and at work. When using age, gender, and length of stay in the U.S. to predict American social affiliation, age and gender were significant predictors of social affiliation with American culture, while length of stay in the U.S. was not a significant predictor. Older Chinese students were less likely to be affiliate socially with American culture, while males reported that they were more likely to be affiliated socially with American culture. One possible explanation for results is that older Chinese students stayed longer in their home country and had higher degree of heritage-culture retention than younger Chinese students. Therefore older Chinese students may have been more likely to be affiliate socially with Chinese culture instead of American culture.

**Alcohol Expectancy**

Males were more likely to expect aggressive behavior due to alcohol-drinking than females and many previous studies have shown similar results (Lundahl, Davis, Adesso, & Lukas, 1997; and Cooper et al., 1992). Hypothetically, women are expected to be socialized to internalize distress, whereas men are expected to be socialized to externalize distress (Cooper et al., 1992). This same tendency and socialization effect may be reflected in mens’ views of the likely effects of alcohol. Age and length of stay in the United States did not predict alcohol expectancy. Chinese international students who engaged in American activities were less likely to expect tension reduction due to alcohol
drinking. One reason for this finding may be that Chinese students who reported being more likely to be engaged in American activities experienced less psychological impact as they adapted to a new culture, and thus were less likely to expect tension reduction due to alcohol drinking. Chinese students who were affiliated with American culture more were also more likely to expect aggressive behavior due to alcohol consumption. One reason for this finding may be that Chinese were more likely to view drinking as a socially acceptable practice and means of facilitating social interaction than Americans, whereas Americans were more likely to associate alcohol with violent and anti-social behavior than Chinese (O’Hare, 1995; Lu, Engs, & Hanson, 1997; Barnwell, Borders, Earleywine, 2006). Therefore, Chinese students who were more affiliated socially with American culture were more likely to share beliefs that alcohol induces aggressive behavior.

The Mediation Model

This study failed to find support for a mediation model indicating that American social affiliation (the aspect of aculturation that was a significant predictor of drinking frequency) predicted aggression expectancy (the aspect expectancy that predicted drinking frequency), which in turn had been expected to predict current alcohol drinking frequency. American social affiliation was linked to current alcohol drinking frequency and American social affiliation also predicted aggression expectancy. However, aggression expectancy did not predict current alcohol drinking frequency. One possible explanation for the non-significant result is that, although Chinese international students displayed aggression expectancies, their alcohol drinking frequency may have been
moderated by other factors such as mianzi (the desire to protect a person’s dignity and prestige) and guanxi (valuing personal connections). For example, we hypothesize that a person with higher aggression expectancy will have a lower alcohol drinking frequency. However, to maintain good relationships with friends, colleagues and supervisors, a Chinese student may be more likely to drink if others persuade him/her to drink. Another possible explanation is that some members of the intended population, who may have been more aculturated and displayed more positive alcohol expectancies, were not included in this study because of the small sample size. A study with a small sample size (low statistical power) also may have reduced chances of detecting effects present in the population.

Limitations

Although the study’s research design was generally sound, there were some limitations. First, the results may apply only to Chinese university students in the Midwest and not other geographical areas, and they may not apply to other ethnic groups. Second, the sample size is small. The population of Chinese international students at the Midwestern university was approximately 2,000, and only 91 students participated in the study. For a population size of 2,000, the margin of error reaches to 2% with a confidence level of 95%, that is, if the sample size was approximately 98. However, after excluding missing values, the sample size was too small for some important data analysis. For example, the original plan for data analysis was to categorize students into nondrinkers, occasional drinkers and regular drinkers within a multinomial logistic regression. Because of the small sample size, however, the final analysis was to categorize students
into only nondrinkers and drinkers. Third, this study asked participants to recall their drinking behavior when they were in China, so systematic error from a recall bias may have been likely, perhaps caused by differences in the accuracy of their memory regarding their past alcohol drinking experiences.

**Implications and Future Direction**

This study added to the literature base of research on potential acculturation effects for Chinese international students regarding their drinking behavior. Since there is not much research on this topic, and there are important emerging issues regarding problems with alcohol use, the findings from this study are meaningful and applicable and inform future studies. It may also help provide a more comprehensive understanding of acculturation effects across Chinese and American cultural interactions. In addition, important variables such as age, length of stay in the United States and gender were considered as potential factors in alcohol behaviors, and alcohol expectancy was more fully explored and the relationship between these factors was more closely examined. The area of acculturation and its impact on Chinese international students’ alcohol drinking behavior has not, however, yet been fully explored. Although this study failed to find support for a mediation model, we found that Chinese international students’ American social affiliations had a key impact on aggressive alcohol expectancies and also likely influenced alcohol drinking frequency. More research is needed to better understand these relationships because we do not yet understand. Interviews could be conducted with different groups of Chinese international students to determine how they
were acculturated to American culture, and why they may change or not change their alcohol drinking behavior.
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students living in the United States International Journal of Eating Disorders.


doi:10.1037/0033-2909.105.3.361


Alcohol consumption in 0.5 million people from 10 diverse regions of China:
prevalence, patterns and socio-demographic and health-related correlates.


Murray, K. E., Klonoff, E. A., Garcini, L. M., Ullman, J. B., Wall, T. L., & Myers, M. G.
(2014). Assessing acculturation over time: A four-year prospective study of Asian

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definition of binge drinking*. NIAAA newsletter, 3(3).

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*Self and Identity*, 3, 207–224. doi: 10.1080/13576500444000029

Newman, I. M. (2002). Cultural aspects of drinking patterns and alcohol controls in

Patterns of University Students. *Chinese Journal of Social Medicine*, 2014 (2), 105-
108.


World Health Organization.


representative prospective study of 220 000 men with 15 years of follow-up.


March 6, 2015
Shuangshuang Cai
Department of Educational Psychology
8320 Hollynn Ln, Apt 24 Lincoln, NE 68512

Eric Buhs
Department of Educational Psychology
226 TEAC, UNL, 68588-0345

IRB Number: 20141214751FB
Project ID: 14751
Project Title: Acculturation and Alcohol Drinking Behavior among Chinese International University Students in the Midwest: a Mixed Methods Study

Dear Shuangshuang:

The Institutional Review Board for the Protection of Human Subjects has completed its review of the Request for Change in Protocol submitted to the IRB.

The change request form has been approved to implement the following change(s):
Decrease number of participants from 250 to 80

The stamped and approved informed consent/assent form(s) has been uploaded to NUgrant. Please use the stamped form(s) to make copies to distribute to participants. If changes need to be made, please submit the revised form to the IRB for approval prior to use.

We wish to remind you that the principal investigator is responsible for reporting to this Board any of the following events within 48 hours of the event:
* Any serious event (including on-site and off-site adverse events, injuries, side effects, deaths, or other problems) which in the opinion of the local investigator was unanticipated, involved risk to subjects or others, and was possibly related to the research procedures;
* Any serious accidental or unintentional change to the IRB-approved protocol that involves risk or has the potential to recur;
* Any publication in the literature, safety monitoring report, interim result or other finding that indicates an unexpected change to the risk/benefit ratio of the research;
* Any breach in confidentiality or compromise in data privacy related to the subject or others; or
* Any complaint of a subject that indicates an unanticipated risk or that cannot be resolved by the research staff.

This letter constitutes official notification of the approval of the protocol change. You are therefore authorized to implement this change accordingly.
If you have any questions, please contact the IRB office at 472-6965.

Sincerely,

Julia Torquati, Ph.D.
Chair for the IRB
APPENDIX B. Approved Informed Consent Form

Title: Acculturation and Alcohol Drinking Behavior among Chinese International University Students in the Midwest

Purpose:
This research project will investigate Chinese international students’ acculturation (a process in which members of one cultural group may adopt the beliefs and behaviors of another group) and alcohol drinking behavior. You are being asked to participate because you are a Chinese international student in UNL. We are interested in learning more about how Chinese students acculturate to US culture related to alcohol use.

Procedures:
You will be asked to finish a 128 items questionnaire on-line. You will be asked questions such as “On how many days did you drink alcohol in the past 12 months from today” and “How much do you speak Chinese at home?” The procedures will last for 15 to 25 minutes. At the end of the survey, you will be asked whether you are willing to participate in the qualitative interview. You might be contacted by the investigator if you are selected and be asked if you are willing to participate further.

Benefits:
There is no direct benefit to you as an individual participant. Your participation will help us understand acculturation and its effects on alcohol drinking behavior which is important to your mental and physical health. Your participation will also help universities to make efforts to better support Chinese international students.

Risks and/or Discomforts:
Because we are collecting your contact information, there is a minimal risk that someone other than investigators could obtain access to your data and identify you. We have, however, taken precautions to prevent this from occurring.

Confidentiality:
Your responses will be stored electronically. Although we will separate your contact information from your response for the survey, we will use your responses to decide whether or not to contact you for the interview (if you are willing to participate—the interview is an optional process for you). Any information obtained during this study, like your contact information (if you choose to provide it) which could identify you will be kept strictly confidential. The data will be stored in a password-protected hard drive in investigator’s locked campus office and will only be accessed by the investigator during the study and for approximately one year afterward. The information obtained in this study may be published in scientific journals or presented at scientific meetings but the data will be reported as aggregated data.

**Incentives:**
You will be involved in a lottery pool for a $100 Walmart gift card. The odds of winning are approximately 1/80. The researcher will choose the winner via a random drawing. If you win the lottery, researcher will contact you by the method you provided.

**Opportunity to Ask Questions:**
You may ask any questions concerning this research and have those questions answered before agreeing to participate in or during the study. Or you may contact the investigator(s) at the phone numbers below. Please contact the University of Nebraska-Lincoln Institutional Review Board at (402) 472-6965 to voice concerns about the research or if you have any questions about your rights as a research participant.

**Freedom to Withdraw:**
Participation in this study is voluntary. You can refuse to participate or withdraw at any time without harming your relationship with researchers or the University of Nebraska-Lincoln, or in any other way receive a penalty or loss of benefits to which you are otherwise entitled.

**Consent, Right to Receive a Copy:**
You are voluntarily making a decision whether or not to participate in this research study. Your signature certifies that you have decided to participate having read and understood the information presented.

**Name and Phone number of investigator(s) :**
Shuangshuang Cai, Principal Investigator Office: (402) 472-6046
Eric Buhs, Ph.D., Secondary Investigator Office (402) 472- 6948

If you agree to take part in this research, please click on the “Accept” button below. You may print a copy of this page to keep for future reference.

Accept ○ Not Accept ○
APPENDIX C. Approved Recruitment Flyer

Call for Participations

Purpose of the Research:
The purpose of this study is to investigate the alcohol drinking behavior and acculturation among Chinese international students who study at Midwestern area.

Requirement:
If you’re willing to participate in this research, you will complete a 15-25 minutes on-line survey. The on-line survey website is https://qtrial2014az1.az1.qualtrics.com/SE/?SID=SV_b7XVAnGiaBpwYwB. You can also scan the QR code at the bottom of this flyer.

Incentives:
If you complete the survey, you will be included in a $100 Walmart gift card lottery. The odd of winning is approximately 1/80. If you are selected to participant in the interview session, you will receive $10 as compensation.

Confidentiality:
Participation in this study is voluntary. You can refuse to participate or withdraw at any time without harming your relationship with researchers or the University of Nebraska-Lincoln, or in any other way receive a penalty or loss of benefits to which you are otherwise entitled.

This flyer is an approved request for participation in research that has been approved or declared exempt by the University of Nebraska-Lincoln Institutional Review Board (IRB). The IRB number is 14751. Questions or concerns about the research, research participants’ rights should be directed to the IRB at (402) 472-6965.

Questions about this research should be addressed to Shuangshuang Cai, 402-480-0861, scai@unl.edu.

QR Code
APPENDIX D. Acculturation and Alcohol Drinking Behavior Questionnaire

Part I: Demographic Information.

1. What’s your gender?  Male____  Female____

2. How old are you? ____ years

3. How many months have you been in US? ____ month(s)

4. Year in School:
   Freshman ____
   Sophomore ____
   Junior ____
   Senior ____
   Masters ____
   Doctoral ____

5. On how many days did you drink alcohol in the past 12 months from today?
   ___________
   1) I never drank alcohol
   2) I did not drink any alcohol in the past 12 months
   3) I drank alcohol on 1 to 5 days in the past 12 months
4) I drank alcohol on at least 1 day every two months up to 1 day every month in the past 12 months
5) I drank alcohol on at least 2 days each month up to 1 day each week in the past 12 months
6) I drank alcohol on 2-3 days each week in the past 12 months
7) I drank alcohol on 4 or more days each week in the past 12 months

6. On how many days did you drink alcohol during the past 30 days from today?
   __________
   1) I never drank alcohol
   2) I did not drink any alcohol in the past 30 days
   3) I drank alcohol on 1 to 3 days of the past 30 days
   4) I drank alcohol on 4-9 days of the past 30 days
   5) I drank alcohol on 10 to 20 days of the past 30 days
   6) I drank alcohol on at least 20 days up to almost every day of the past 30 days

7. On how many days did you drink alcohol in the 12 months before you came to US?
   __________
   1) I never drank alcohol
   2) I did not drink any alcohol in the past 12 months before I came to America
   3) I drank alcohol on 1 to 5 days
   4) I drank alcohol on at least 1 day every two months up to 1 day every month
   5) I drank alcohol on at least 2 days each month up to 1 day each week
6) I drank alcohol on 2-3 days each week

7) I drank alcohol on 4 or more days each week

8. On how many days did you drink alcohol during the 30 days before you came to US?

1) I never drank alcohol

2) I did not drink any alcohol in the past 30 days before I come to America

3) I drank alcohol on 1 to 3 days

4) I drank alcohol on 4-9 days

5) I drank alcohol on 10 to 20 days

6) I drank alcohol on at least 20 days up to almost every day

Note: A “Standard Drink” is

Figure retrieved from http://www.niaaa.nih.gov/alcohol-health/overview-alcohol-consumption/standard-drink
9. On a typical day when you drink in US, how many drinks do you have?

____________

1) I never drink alcohol in US
2) less than 1 standard drink
3) 1-2 standard drink
4) 3-4 standard drink
5) 5-6 standard drink
6) more than 6 standard drink

10. On average, how many drinks per day do you have when you are in US?

____________

1) I never drink alcohol in US
2) less than 1 standard drink
3) 1-2 standard drink
4) 3-4 standard drink
5) 5-6 standard drink
6) more than 6 standard drink

11. On a typical day when you drank in China, how many drinks did you have?

____________

1) I never drink alcohol in China
2) less than 1 standard drink
3) 1-2 standard drink
4) 3-4 standard drink
5) 5-6 standard drink
6) more than 6 standard drink

12. On average, how many drinks per day did you have when you were in China? __
1) I never drink alcohol in China
2) less than 1 standard drink
3) 1-2 standard drink
4) 3-4 standard drink
5) 5-6 standard drink
6) more than 6 standard drink
Part II: Acculturation Questions

General Ethnicity Questionnaire-Chinese Version (abridged)\(^1\)

Please use the following scale to indicate how much you agree with the following statements. Circle your response.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>5</td>
<td></td>
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</tr>
</tbody>
</table>

1. I was raised in a way that was Chinese.  
2. When I was growing up, I was exposed to Chinese culture.  
3. Now, I am exposed to Chinese culture.  
4. Compared to how much I negatively criticize other cultures, I criticize Chinese culture less.  
5. I am embarrassed/ashamed of Chinese culture.  
6. I am proud of Chinese culture.  
7. Chinese culture has had a positive impact on my life.  
8. I believe that my children should read, write, and speak Chinese.  
9. I have a strong belief that my children should have Chinese names only.  
10. I go to places where people are Chinese/Chinese American.  
11. I am familiar with Chinese cultural practices and customs.  
12. I relate to my partner or spouse in a way that is Chinese.  
13. I admire people who are Chinese/Chinese American.  
15. I listen to Chinese music.  
17. I engage in Chinese forms of recreation.  
18. I celebrate Chinese holidays.  
19. At home, I eat Chinese food.  
20. At restaurants, I eat Chinese food.  
21. When I was a child, my friends were Chinese/Chinese American.  
22. Now, my friends are Chinese/Chinese American.  
23. I wish to be accepted by Chinese/Chinese Americans.  
24. The people I date are Chinese/Chinese American.  
25. Overall, I am Chinese.  

Please use the following scale to answer the following questions. Circle your response.  

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>A little</td>
<td>Somewhat</td>
<td>Much</td>
<td>Very much</td>
</tr>
</tbody>
</table>

26. How much do you speak Chinese at home?  
27. How much do you speak Chinese at school?  
28. How much do you speak Chinese at work?  
29. How much do you speak Chinese at prayer?  
30. How much do you speak Chinese with friends?  
31. How much do you view, read, or listen to Chinese on TV?  
32. How much do you view, read, or listen to Chinese in film?
33. How much do you view, read, or listen to Chinese on the radio? 1 2 3 4 5
34. How much do you view, read, or listen to Chinese in literature? 1 2 3 4 5
35. How fluently do you speak Chinese? 1 2 3 4 5
36. How fluently do you read Chinese? 1 2 3 4 5
37. How fluently do you write Chinese? 1 2 3 4 5
38. How fluently do you understand Chinese? 1 2 3 4 5

General Ethnicity Questionnaire-American Version (Abridged)

Please use the following scale to indicate how much you agree with the following statements. Circle your response.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
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<td>5</td>
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</tbody>
</table>

1. I was raised in a way that was American. 1 2 3 4 5
2. When I was growing up, I was exposed to American culture. 1 2 3 4 5
3. Now, I am exposed to American culture. 1 2 3 4 5
4. Compared to how much I negatively criticize other cultures, I criticize American culture less. 1 2 3 4 5
5. I am embarrassed/ashamed of American culture. 1 2 3 4 5
6. I am proud of American culture. 1 2 3 4 5
7. American culture has had a positive impact on my life. 1 2 3 4 5
8. I believe that my children should read, write, and speak English. 1 2 3 4 5
9. I have a strong belief that my children should have American names only.

10. I go to places where people are American.

11. I am familiar with American cultural practices and customs.

12. I relate to my partner or spouse in a way that is American.

13. I admire people who are American.


15. I listen to American music.

16. I perform American dance.

17. I engage in American forms of recreation.

18. I celebrate American holidays.

19. At home, I eat American food.

20. At restaurants, I eat American food.

21. When I was a child, my friends were American.

22. Now, my friends are American.

23. I wish to be accepted by Americans.

24. The people I date are American.

25. Overall, I am American.

Please use the following scale to answer the following questions. Circle your response.

1  Not at all  2  A little  3  Somewhat  4  Much  5  Very much

26. How much do you speak English at home? 1 2 3 4 5

27. How much do you speak English at school? 1 2 3 4 5
28. How much do you speak English at work? 1 2 3 4 5
29. How much do you speak English at prayer? 1 2 3 4 5
30. How much do you speak English with friends? 1 2 3 4 5
31. How much do you view, read, or listen to English on TV? 1 2 3 4 5
32. How much do you view, read, or listen to English in film? 1 2 3 4 5
33. How much do you view, read, or listen to English on the radio? 1 2 3 4 5
34. How much do you view, read, or listen to English in literature? 1 2 3 4 5
35. How fluently do you speak English? 1 2 3 4 5
36. How fluently do you read English? 1 2 3 4 5
37. How fluently do you write English? 1 2 3 4 5
38. How fluently do you understand English? 1 2 3 4 5
Part III: Alcohol Expectancy Questionnaire (AEQ-3)

Please use the following scale to indicate how much you agree with the following statements. Circle your response.

1 2 3 4 5
not at all slightly somewhat moderate definitely

1. Drinking makes me feel warm and flushed. 1 2 3 4 5
2. Alcohol lowers muscle tension in my body. 1 2 3 4 5
3. A few drinks make me feel less shy. 1 2 3 4 5
4. Alcohol helps me to fall asleep more easily. 1 2 3 4 5
5. I feel powerful when I drink, as if I can really make other people do as I want. 1 2 3 4 5
6. I'm more clumsy (笨拙的) after a few drinks. 1 2 3 4 5
7. I am more romantic when I drink. 1 2 3 4 5
8. Drinking makes the future seem brighter to me. 1 2 3 4 5
9. If I have had a couple of drinks, it is easier for me to tell someone off (责骂). 1 2 3 4 5
10. I can't act as quickly when I've been drinking. 1 2 3 4 5
11. Alcohol can act as an anesthetic (麻醉药) for me, it can stop pain. 1 2 3 4 5
12. I often feel sexier after I've had a few drinks. 1 2 3 4 5
13. Drinking makes me feel good. 1 2 3 4 5
14. Alcohol makes me careless about my actions. 1 2 3 4 5
15. Some alcohol has a pleasant, cleansing, tingly (刺痛感的) taste to me. 1 2 3 4 5
16. Drinking makes me more aggressive. 1 2 3 4 5
17. Alcohol seems like magic to me. 1 2 3 4 5
18. Alcohol makes it hard for me to concentrate. 1 2 3 4 5
19. I'm a better lover after a few drinks. 1 2 3 4 5
20. When I'm drinking, it is easier to open up and express my feelings. 1 2 3 4 5
21. Drinking adds a certain warmth and friendliness to social occasions for me. 1 2 3 4 5
22. If I'm feeling tied down or frustrated, a few drinks make me feel better. 1 2 3 4 5
23. I can't think as quickly after I drink. 1 2 3 4 5
24. Having a few drinks is a nice way for me to celebrate special occasions. 1 2 3 4 5
25. Alcohol makes me worry less. 1 2 3 4 5
26. Drinking makes me less efficient. 1 2 3 4 5
27. Drinking is pleasurable because it’s enjoyable for me to join in with people who are enjoying themselves. 1 2 3 4 5
28. After a few drinks, I am more sexually responsive, that is, more in the mood for sex. 1 2 3 4 5
29. I feel more physically coordinated after I drink. 1 2 3 4 5
30. I'm more likely to say embarrassing things after drinking. 1 2 3 4 5
31. I enjoy having sex more if I've had some alcohol. 1 2 3 4 5
32. I'm more likely to get into an argument if I've had some alcohol. 1 2 3 4 5
33. Alcohol makes me less worried about doing things well. 1 2 3 4 5
34. Alcohol helps me sleep better. 1 2 3 4 5
35. Drinking gives me more confidence in myself. 1 2 3 4 5
36. Alcohol makes me more irresponsible. 1 2 3 4 5
37. After a few drinks it is easier for me to pick a fight. 1 2 3 4 5
38. A few drinks make it easier for me to talk to people. 1 2 3 4 5
39. If I have a couple of drinks, it is easier to express my feelings. 1 2 3 4 5
40. Alcohol makes me more interesting. 1 2 3 4 5

Note:
