Abstract and Keywords

This chapter reviews a study exploring the influence of acculturation on alcohol use disorders (AUD) among a sample of Mexican-origin participants residing on and off the US-Mexico border region. The purpose of this study was to: (1) determine what domains of US acculturation predict AUD; (2) determine whether retaining aspects of Mexican culture protects against AUD; (3) examine potential mediators that might explain the relationship between acculturation and AUD, including factors relevant to a stress-based model and a normative model; and (4) determine whether the relationship between acculturation measures and AUD differs by environmental contexts. Findings suggest the influence of acculturation on Mexican women’s drinking behaviors might vary across environmental contexts. Characteristics of the border environment might exacerbate alcohol problems among more acculturated women. Findings also support a normative model of acculturation. Programs and prevention strategies at the border targeting drinking norms and motives might be particularly beneficial for women.

Keywords: acculturation, alcohol use disorder, Mexican American, US-Mexico border, drinking, norm, motive

Introduction

Migration is a global phenomenon. The number of persons living outside of their country of origin worldwide has reached unprecedented numbers. It is estimated that international migrants make up over 232 million persons globally, which is projected to double to approximately 400 million by 2050. Since 1990, the number of migrants has increased by 65% in industrialized countries and 34% in developing countries. The United States is the country with the largest number of international migrants, followed by
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Russia, Germany, Saudi Arabia, the United Arab Emirates, and the United Kingdom. Approximately 20% of the global migrant population resides in the United States, with the largest flow of migration coming from Mexico; over 13 million Mexicans have migrated to the United States since 1990 (Martin, 2013). Meanwhile, proportional to the native-born population, other countries have a larger representation of migrants: 24% of Australia’s, 24% of Switzerland’s, and 18% of Canada’s population is composed of migrants (Organisation for Economic Co-operation & Development, 2006). Given existing demographic and economic inequalities between countries, coupled with forced displacement of refugees and asylum seekers stemming from civil unrest and natural disasters, international migration is expected to continue to increase (Skeldon, 2013). Accordingly, this exponential growth of international migration has piqued notable scholarly interest in the effects of migration on various outcomes.

Understanding migrants’ experiences as they adapt to their receiving countries represents a vital area of research. The field of acculturation has gained distinguished scholarly attention over the past 3–4 decades (Berry, 1980; Schwartz, Unger, Zamboanga, & Szapocznik, 2010; Zemore, 2007). Acculturation is a complex construct that is broadly understood as migrants’ adoption of customs, traditions, language, and cultural identification of the host country (Abraído-Lanza, Armbister, Flórez, & Aguirre, 2006; Chun, Balls Organista, & Marín, 2003). However, the adaptation experiences of migrants may depend on the environmental contexts where migrants re-settle. For instance, research has found that migrants living in ethnic enclaves where their ethnic group is the majority may be less influenced by the dominant culture and therefore more likely to retain their native culture (Portes & Rumbaut, 2006; Schwartz, Pantin, Sullivan, Prado, & Szapocznik, 2006). Conversely, migrants living in less diverse areas may face greater pressures to acculturate to the dominant culture and be less likely to retain aspects of their native culture (Berry, 1997, 2003). These two environmental contexts have been largely studied to better understand the re-settlement experiences of migrants. However, one environmental context that has received less scholarly attention in the acculturation research is international border communities. International borders are distinct cultural environments that generally differ from the interior of a country, and therefore the ways migrants acculturate in these settings may also differ.

International borders are unique physical and social spaces that are commonly characterized by a substantial migrant and mobile population, cross-border influences, and a blending of cultures. For instance, the Spanish autonomous city of Melilla, located in the north coast of Africa, and sharing a border with Morocco, is predominately made up of Spanish and Riffian Berber (a northern Moroccan ethnic group) people. This geographic area is known for being a multicultural environment where both Spanish and Riffian-Berber are widely spoken (Soto Bermant, 2015). Similarly, on the Uruguay side of the Uruguay-Brazil border, the strong influences from Brazil and ease of crossing the border have contributed to high rates of bilingualism and Uruguayan Portuguese, a distinct variation of Portuguese with Spanish influences that is unique to border communities along this region (Carvalho, 2010; Carvalho, Yáñez, & Suárez, 2003; Newbury, 2011). In Asia, the India-China border is a space marked with centuries of
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cross-border relations and intermixing of persons from both sides. Residents of this region commonly identify with both countries, regardless of citizenship, and describe themselves as living simultaneously in both countries (Banerjee & Chen, 2013; Kurian, 2005). Further in the West Bengal region, along the India-Bangladesh border, the large labor markets of Kolkata, India, have served as a pull factor for cross-border migration from Bangladesh (Banerjee & Chen, 2013). This city has become a prominent cross-border social and economic space. These are just a few examples of how borders create different lived experience for migrants who reside in these distinctive spaces where two countries intersect. Importantly, there is often less emphasis on a “dominant” culture in these spaces, given the prominent influences of both nations. Thus, migrants in these settings may be more likely to retain their native culture while simultaneously adopting aspects of the dominant culture, creating a unique mixture of both.

Migrants’ acculturation experiences in diverse settings, including border environments, represent an important line of research, particularly as acculturation has been closely linked to health outcomes. As migrants adapt to their new social and physical environments, their mental and physical health may also be impacted. Notably, the health implications of acculturation have been studied largely within the context of the United States, which is not surprising, given its prominent migrant population. In 2015, migrants made up almost 50 million (14%) of the US population (Lopez, Passel, & Rohal, 2015). Specifically, a large body of research has linked US acculturation with harmful alcohol use and alcohol problems (e.g., higher levels of binge drinking, alcohol use disorders [AUD], drinking and driving) among migrants from diverse regions, including Asia, Southeast Asia, Latin America, the Pacific Islands, the Caribbean, and other countries (Abraído-Lanza et al., 2006; Berry, 1997; Bhattacharya, 2008; Breslau & Chang, 2006; Broman, Neighbors, Delva, Torres, & Jackson, 2008; Chartier & Caetano, 2010; Hahm, Lahiff, & Guterman, 2004; Lum & Vanderaa, 2010; Makimoto, 1998; Randolph, Stroup-Benham, Black, & Markides, 1998; Salant & Lauderdale, 2003; Yun & Park, 2008). The relationship between US acculturation and alcohol use has received particular attention among Latinos in the United States, as they make up the largest migrant group (Bernstein, 2006; Motel & Patten, 2012). Overall, Latinos are more likely to abstain from alcohol compared to other ethnic groups, but those who do drink are disproportionately impacted by higher rates of alcohol-related problems (Chartier & Caetano, 2010; Mulia, Ye, Greenfield, & Zemore, 2009; Zemore, 2007). Research has found that as Latinos acculturate to the United States they may be more likely to abuse alcohol and experience problems stemming from alcohol use. However, how acculturation relates to alcohol problems among Latinos in border settings is understudied. This represents a critical gap in the scientific literature, especially considering that Mexican Americans living in border communities along the US-Mexico border report higher rates of alcohol problems than do their counterparts off the border (Borges et al., 2015; Caetano, Mills, & Vaeth, 2012, 2013; Caetano, Vaeth, Mills, & Rodriguez, 2013; Cherpetiel, Ye, Bond, et al., 2015; Wallisch & Spence, 2006). A better understanding of the influence of acculturation on alcohol-related behaviors, especially in high-risk settings such as the border, is needed if...
we are to identify novel modes of intervention. Latinos make up a substantial part of the US population, and hence, understanding drivers of harmful alcohol use is important to the public health of the nation.

Critical research gaps in the acculturation and alcohol use literature remain. It is still unclear which dimensions of US acculturation (e.g., language acquisition, cultural identification) shape vulnerability to alcohol problems. This confusion may stem from the multiple and diverse measures of US acculturation, which have been used inconsistently (see Schwartz & Unger, this volume). It is also unclear whether it is the acquisition of US culture or the loss of the native culture that is adversely impacting the alcohol behaviors of migrants. Further, the causal mechanisms underlying how acculturation influences risk for alcohol-related problems are not well understood. Some researchers have suggested that migrants may use alcohol as a coping mechanism to deal with stressors as they adapt to a new environment (Ehlers, Gilder, Criado, & Caetano, 2009; Lee et al., 2013). Others have suggested that migrants simply take on more favorable drinking norms and therefore are more likely to drink heavily in the United States (compared to their native countries) (Caetano, 1987a, 1987c; Zemore, 2005). However, current evidence in support of either explanation is inconclusive. Lastly, missing from the acculturation and alcohol research is an examination of the role of the environmental contexts where migrants live. The social and physical contexts where migrants live may play a key role with regard to exposure to US culture and alcohol use. For instance, Latinos living along the US-Mexico border may acculturate differently than Latinos living in other contexts, and these acculturation experiences may have differential impacts on Latinos’ alcohol use and problems. If acculturation increases risk for problematic alcohol use, Latinos in environments that are conducive to alcohol use (i.e., cities with greater alcohol outlets, liberal drinking norms) may be at greater risk for alcohol-related problems. More research is needed to shed light on these important issues, which we discuss in further detail in subsequent sections of this chapter.

Chapter Outline

The objective of this chapter is to discuss the influence of US acculturation on drinking and the drinking behaviors of adult Latinos in the United States. We begin by providing a comprehensive review of the existing literature on alcohol use and acculturation among Latinos in the United States. Within this review we also provide important contextual information, such as a brief overview of how US acculturation has been measured within this field, and discuss critical research gaps. Following this discussion, we present results of an original study that addresses some of the research gaps we underscore in our review. Briefly, these original data examine the association between US acculturation and AUD among Mexican Americans by considering a multidimensional approach of acculturation and environmental contexts. We do this by using a sample of Mexican Americans living on and off the US-side of the US-Mexico border region. This study will
specifically aim to answer the following questions: (1) Which domains of US acculturation best predict AUD? (2) Does retaining aspects of Mexican culture protect against AUD? (3) How and why does US acculturation influence AUD? and (4) Do environmental contexts affect the influence of US acculturation on AUD? The US-Mexico border is an ideal setting to study acculturation given unique environmental characteristics related to culture (see Felipe Castro, this volume) and alcohol use (discussed later). Comparing a sample of participants living on and off the border will help elucidate whether US acculturation’s influence on AUD differs across environmental contexts. We conclude the chapter by contextualizing findings from our study and discussing future directions for the field.
Measuring and Operationalizing Acculturation: A Quick Overview

Before discussing the literature on US acculturation and alcohol among Latinos, we must first understand the concept of acculturation and how it is measured. Measuring US acculturation has been a source of long debate in the United States (see Doucerain, Ryder, & Segalowitz, this volume). The cause of this debate largely stems from disagreement over the central domains (e.g., values, attitudes, language, cultural identification) that should constitute the construct of US acculturation (Cabassa, 2003; Schwartz et al., 2010). Some studies have used markers of US acculturation such as language acquisition, age of migration, years residing in the United States, and nativity to study the link between US acculturation and alcohol use (Reingle, Caetano, Mills, & Vaeth, 2014; Vega, Sribney, Aguilar-Gaxiola, & Kolody, 2004; Zemore, 2007). These markers have been used as an indirect way to measure greater exposure to US society and have predicted alcohol outcomes. For instance, studies suggest that Latinos who migrate at younger ages (and therefore are more exposed to US culture) are at greater risk for negative outcomes related to alcohol than their counterparts migrating at older ages (Reingle et al., 2014). Proxy measures may provide reliable shorthand measures that reflect important aspects of assimilation to, adaptation to, and identification with US culture. However, researchers have raised concerns that proxy measures do not adequately reflect the construct of US acculturation and limit the interpretation of findings. Importantly, proxy measures also do not capture immigrant’s retention or loss of their native culture.

Moving away from proxy measures, researchers have often conceptualized US acculturation as a unidimensional process (Gordon, 1964). From this perspective, as migrants become more acculturated to the United States they may replace their native customs, culture, and language with that of the receiving country—ultimately leading to full assimilation (Abraído-Lanza et al., 2006). From such a unidimensional perspective, the process of US acculturation has been perceived as occurring on a linear continuum, where “adding” aspects of the receiving culture implies “subtracting” corresponding components of the heritage culture. Early research studies thus limited their measures of US acculturation by focusing primarily on language proficiency, usage, and involvement in US culture while disregarding central components of Latino culture (e.g., orientation to the native culture, Spanish language proficiency/usage) (Gil, Wagner, & Vega, 2000; Marín & Gamba, 1996; Marín, Sabogal, Marin, Otero-Sabogal, & Perez-Stable, 1987; Rodriguez, Myers, Mira, Flores, & Garcia-Hernandez, 2002). However, increased involvement in US culture does not necessarily imply a decreased involvement in Latino culture. Current research now recognizes that acculturation may be best operationalized as a multidimensional construct. Migrants may retain important aspects of their native culture while adopting new cultural customs of the receiving country. Recent multidimensional scales consider aspects of migrant’s native culture as central dimensions of acculturation (Cuellar, Arnold, & Maldonado, 1995; Marín et al., 1987; Rodriguez, Mira, Paez, & Myers, 2007). These scales expand on unidimensional scales by moving beyond acculturation to US society and assess other central components, such as...
Latino cultural identity, practicing traditional Latino customs, and attitudes toward one’s native culture (Cabassa, 2003; Rodriguez et al., 2007; Schwartz et al., 2010). In the following, we discuss research linking US acculturation and alcohol outcomes in Latinos.

Acculturation and Alcohol Use Among Latinos in the United States

The literature examining the relationship between acculturation and drinking among Latinos in the United States is extensive. Nationally representative studies have reported associations between US acculturation and alcohol outcomes, including drinking status, harmful alcohol use (i.e., heavy drinking, binge drinking), and AUD (Caetano, Ramisetty-Mikler, & Rodriguez, 2008, 2009; Zemore, 2007). However, evidence suggests that acculturation’s impacts on drinking largely depend on gender. In the subsequent section we review the existing literature on US acculturation and alcohol use among adult Latinos. We limit our discussion to studies that used composite scales to assess US acculturation and refrain from literature that used proxy variables (e.g., nativity, year of immigration), given notable critiques that these studies do not fully capture the construct of acculturation. As a note, we also include literature that used composite measures of English proficiency, usage, and preference to assess US acculturation. Copious research, discussed below, has found that English language strongly predicts alcohol outcomes among Latinos and may be the best indicator of US acculturation. However, we exclude research that used crude measures to measure language (e.g., “Do you speak English?” yes vs. no).

US Acculturation and Alcohol Use Among Latinas

US acculturation is strongly associated with alcohol consumption among Latinas. Latinas abstain from alcohol use at higher rates compared to White women and women from other ethnic groups (Galvan & Caetano, 2003). However, as Latinas acculturate to US society they become exceedingly likely to drink. A sizable body of evidence has produced consistent findings suggesting that US acculturation increases Latinas’ odds of drinking. A 2005 study using a nationally representative sample of Latinos (N = 1,586) from the 1995 National Alcohol Survey (NAS) found a linear relationship between US acculturation and drinking status among women. US acculturation in this study was measured using Caetano’s (1987b) US acculturation scale, which assesses the degree of involvement in US society via daily use and level of English and Spanish proficiency (speaking, reading, writing), language media preferences (e.g., books, music, radio, TV), ethnic environment (e.g., ethnicity of people who respondents interacted with at church, parties, the neighborhood), and central Latino cultural values. Composite scores range from 10 (low US acculturation) to 40 (high US acculturation). Findings show that drinking increased as levels of US acculturation increased: 25% of low, 42% of medium, and 64% of highly US
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Acculturated Latinas reported being current drinkers. In multivariate analyses, US acculturation independently predicted drinking status among Latinas. Women in the high US acculturation group had 1.72 greater odds of being drinkers (vs. those low in US acculturation). Similarly, women in the medium US acculturation group had 1.42 the odds of consuming alcohol compared to women in the low US acculturation group. These findings coincide with Caetano’s previous 1987 study that used a national sample of Latinos (N = 1,453), which also found that, compared to low US acculturated Latinas, highly US acculturated Latinas had five times the odds of being drinkers (Caetano, 1987b).

Studies using community samples of Latinos support these nationally representative findings. These studies also suggest a positive link between US acculturation, particularly English language acquisition, and drinking status among Latinas. Polednak (1997) assessed the role of US acculturation on the drinking behaviors among Latinas (N = 309) residing in New York and Connecticut via a four-item scale based on Spanish and English language usage and preference. This study found that greater preference and usage of English (vs. Spanish) increased Latina’s odds of drinking by 1.69. Further, greater use and preference of English (vs. Spanish) was a statistically significant predictor of drinking at least once a week (odds ratio [OR] = 1.86). Likewise, a 2005 study that used the Acculturation Rating Scale for Mexican Americans II Short Version (AMRSA-II-SV) found similar results (Kasirye et al., 2004). The AMRSA-II-SV is a 12-item instrument, made up of two separate six-item subscales, that measures Spanish and English language preference, separately, in diverse contexts (e.g., I think in Spanish/English; I enjoy Spanish/English music). Applying the instrument to a convenience sample of pregnant Latinas (n = 1,062) from a rural town in northern California, researchers found that women who had greater English preference were exceedingly more likely to be drinkers. The adjusted OR for being a drinker was seven times that of women who predominantly preferred Spanish over English (Kasirye et al., 2004). Similarly, using a four-item language usage scale, Marin and Posner (1995) found that Mexican and Central American women in San Francisco (n = 992) who spoke more English had 2.13 and 1.59 the odds, respectively, of being drinkers compared to their counterparts who spoke less English and more Spanish. Overall, this body of research suggests that, as Latinas acculturate to US society and take on the English language, their probability of engaging in drinking increases. Remarkably, these studies have shown English language usage and preference is a strong predictor of alcohol use among Latina women, despite using various measures and while controlling for sociodemographic and contextual factors.

Among Latinas who drink, US acculturation might also impact the frequency with which they engage in alcohol use and the quantity of alcohol they consume when drinking. Vaeth, Caetano, and Rodriguez (2012) used a national sample of 5,224 Latinos from the 2006 Hispanic Americans Baseline Alcohol Survey (HABLAS) to empirically assess how US acculturation was related to alcohol consumption. US acculturation was assessed via Caetano’s (1987b) composite scale, as previously described. When examining only the women in the sample, and controlling for sociodemographic factors, US acculturation predicted the mean number of drinks consumed per week and binge drinking (4 + drinks
per occasion) in the past year. Vaeth et al. also examined US acculturation and binge drinking separately by Latino subgroup (i.e., Cuban, Puerto Rican, Mexican, South/Central American). Compared to Cuban women in the low US acculturation group (reference group), women in the high US acculturation group from all Latino subgroups had significantly higher odds of reporting binge drinking in the past year, with odds ratios ranging from 3.47 to 10.33. Though there is some variation among Latino subgroups, the likelihood of drinking more frequently, and of binge drinking, was more pronounced among higher US acculturated women overall.

Other researchers using national-level data and Caetano’s (1987b) US acculturation measure have reported similar results suggesting that US acculturation has a strong influence on the drinking behaviors of Latinas who drink. Zemore (2005) documented an independent association between higher US acculturation and higher average volumes consumed, and more frequent events of drunkenness, among Latina drinkers. Earlier studies by Caetano et al. using a national sample of Latinos from the 1985 National Alcohol Survey (NAS) also documented associations between higher US acculturation and increased odds of frequent drinking and heavy drinking (i.e., 5 + drinks per occasion) among Latinas (Caetano, 1987a, 1987c; Caetano & Mora, 1988). Other regionally focused studies concur with findings at the national level. For instance, Marin and Posner (1995) found that Mexican American women characterized as high in US acculturation (i.e., spoke more English) constituted a larger proportion of heavy drinkers (4 + drinks per occasion) than did less US acculturated women (i.e., spoke less English) (17% vs. 3%). Caetano, Ramisetty-Mikler, Wallisch, McGrath, and Spence (2008), used the Acculturation Rating Scale for Mexican Americans-II (ARSMA-II) (Cuellar et al., 1995) to investigate alcohol use among Mexican Americans (n = 956) along the Texas-Mexico border. The ARSMA-II is a 30-item scale with two subscales that measure orientation to Mexican and Anglo culture, independently. Participants were characterized into five acculturation levels: (1) very Mexican oriented; (2) bicultural-Mexican, (3) bicultural-Anglo; (4) very Anglo; (5) and very assimilated-Anglicized. Results suggest that higher US acculturation levels were related to higher frequencies of heavy drinking (4 + drinks per occasion) in the past month among Mexican American women (Caetano, Ramisetty-Mikler, Wallisch, et al., 2008). It should be noted that in this study, US acculturation levels did not predict AUD. Nonetheless, collectively, these results seem to suggest that for Latinas who drink, US acculturation may contribute to harmful alcohol use.

Finally, increased consumption of alcohol may lead to alcohol-related problems, including alcohol abuse and dependence, and numerous studies have documented associations between higher US acculturation and various alcohol problems. For instance, Corbett and colleagues conducted a study to investigate the drinking patterns and alcohol problems among a sample of Mexican American couples in Northern California (Corbett, Mora, & Ames, 1991). Participants’ degree of US acculturation was determined via a composite scale that assessed language usage, ethnic identity, ethnicity of childhood neighborhood, ethnicity of friends, attitudes regarding intermarriage, and ease of relating to Anglos. This study found that more US acculturated women who drank were more likely to experience alcohol-related problems (vs. those less acculturated to the United States)
(Corbett et al., 1991). Alcohol-related problems were defined as negative impacts on social life, relationships with family and friends, marriage and family life, health, outlook on life, financial position, and work resulting from their drinking. A positive association between US acculturation and symptoms of alcohol dependence was also documented. Other researchers, using Caetano’s 1987 scale of US acculturation, have also reported links between higher US acculturation and alcohol-related problems and alcohol dependence in Latinas (Caetano & Mora, 1988; Cherpitel, 1999). Consistent findings across various studies linking US acculturation with problematic alcohol use among Latina women make it apparent that US acculturation is an important factor that may be contributing to alcohol-related problems in these women.
Acculturation and Alcohol Use Among Latino Men in the United States

The link between US acculturation and drinking is less clear among Latino men. In general, research on US acculturation among Latino males has yielded mixed results. Research studies have produced positive, protective, and null associations between US acculturation and alcohol outcomes. However, higher US acculturation has predicted drinking status (drinker vs. nondrinker) more consistently, compared to other alcohol outcomes, among Latino males. In terms of nationally representative findings, two studies conducted by Caetano and colleagues, which examined the effects of US acculturation among a sample of Latinos (n = 1,453) and a subsample of only Mexican Americans (n = 945) from the 1985 NAS, both produced positive associations between higher US acculturation and drinking status (Caetano, 1987b; Caetano & Mora, 1988). Higher US acculturated Latino and Mexican American males in these respective samples were more likely to be drinkers than their less US acculturated counterparts. Notably, statistically significant associations in these two studies continued to emerge in multivariate analyses. Similarly, using the 1995 version of the NAS study, Zemore (2005) found that the probability of drinking increased linearly as US acculturation increased in Latino men. However, after controlling for multiple sociodemographic characteristics, US acculturation was not statistically associated with drinking status (OR: 1.00; 95% CI: 0.97–1.03). Notably, all three of these studies used the same measure of US acculturation: Caetano’s 1987b composite scale of US acculturation (described previously). Further, using the 2005 NAS data, Karriker-Jaffe and Zemore (2009) conceptualized US acculturation by focusing on only the language-based questions of Caetano’s (1987b) 12-item scale of US acculturation. Findings suggest that Latino men who spoke more English were more likely to be drinkers (vs. men who spoke less English). This association was statistically significant in multivariate analyses only among drinkers with above-average incomes (Karriker-Jaffe & Zemore, 2009).

Numerous studies using community samples have generally found that US acculturation predicts drinking status among men. Polednak (1997), in his study of Latinos from the northeastern United States, found that Latino men’s odds of drinking increased with greater preference and usage of English by an OR of 1.29. Also, men who spoke both languages about equally were more likely to be drinkers compared to men who spoke mainly Spanish and men who spoke mainly English. Meanwhile, Hines & Caetano (1998), using Caetano’s (1987b) 12-item scale of US acculturation, found that Latino men in the high US acculturation group had 5.14 the odds of being drinkers than men in the low US acculturation group. Men in the medium US acculturated group were also more likely to be drinkers than their low US acculturated counterparts (OR = 1.91; 95% CI: 1.51–4.81) (Hines & Caetano, 1998). Similarly, Marin and Posner (1995), using a sample of Mexican- and Central American participants, found that speaking more English predicted drinking status among men. Mexican- and Central American men who spoke more English had 2.42 and 2.16 the odds, respectively, of being drinkers compared to those who spoke less
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English (Marín & Posner, 1995). Though some conflicting findings exist, overall, higher US acculturation and speaking more English seem to be positively associated with drinking status among Latino men.

How acculturation relates to other alcohol outcomes among Latino men is more ambiguous. Numerous studies, which have used Caetano’s (1987b) measure of US acculturation, have documented mixed associations between US acculturation and alcohol outcomes. For instance, Vaeth et al. (2012) examined US acculturation and alcohol consumption among a nationally representative sample of Latinos. Among Latino male drinkers, multivariate analyses showed that level of US acculturation was not associated with mean number of drinks consumed per week, binge drinking (in the past year or past month), or heavy drinking. Other factors, such as age and employment status, were stronger predictors of alcohol outcomes. Similarly, Zemore (2005), using survey data from the 1995 NAS, found that US acculturation was unrelated to average volume consumed and frequency of drunkenness among Latino male drinkers. However, among Latino male drinkers in the 2005 NAS survey, Karriker-Jaffe and Zemore (2009) found that those who spoke and preferred English and Spanish about equally (vs. those oriented strongly toward Spanish language use) were less likely to report higher frequency of drinking, volume of alcohol consumed, drinking to drunkenness, and alcohol dependence symptoms. Hines and Caetano (1998) also documented a protective effect of US acculturation on alcohol use. Higher US acculturated Latino male drinkers were less likely to drink heavily compared to less acculturated men (OR: 0.39; 95% CI: 0.18–0.87) (Hines & Caetano, 1998). Similarly, Caetano, Ramisetty-Mikler, Wallisch, et al. (2008) found that US acculturation was protective for AUD and heavy episodic drinking among Mexican men residing on the US side of the US-Mexico border. A handful of other studies using diverse composite measures have produced null associations between US acculturation and alcohol outcomes, or positive bivariate associations that do not emerge in multivariate analyses (Cherpitel, 1999; Corbett et al., 1991; Hines & Caetano, 1998; Otero-Sabogal, Sabogal, Perez-Stable, & Hiatt, 1995; Polednak, 1997). Overall, this body of evidence seems to suggest that other sociodemographic characteristics (i.e., income, age, education) might affect Latino men’s drinking level and problems more than US acculturation does.
Summary of Studies on US Acculturation and Alcohol Use Among Latinos

Overall, Latina women’s drinking behaviors seem to be strongly impacted by US acculturation. English language-based items in particular seem to be the strongest predictors of drinking status and alcohol outcomes, even among composite scales that measure several dimensions of US acculturation (Epstein, Botvin, & Diaz, 2000; Zemore, 2005, 2007). The impact of US acculturation on the alcohol consumption among men is less clear. Importantly, if US acculturation is a risk factor for drinking and alcohol problems, particularly among women, the opposite is also true. This body of research also suggests that being less acculturated to the United States might be protective against drinking and developing related problems. However, it is difficult to draw conclusions, as very little research has used a multidimensional measure of acculturation. It is unclear whether it is the loss of the native culture or the acquisition of US culture that is shaping alcohol use and related problems among Latinos. A study that uses a multidimensional measure of acculturation and that independently tests dimensions of both the native and US culture (e.g., US cultural orientation and identification, English language proficiency/usage, Mexican/Latino cultural orientation and identification, and Spanish language proficiency and usage) would shed light on what dimensions of acculturation are driving alcohol problems among Latinos, namely women. We intend to do this in the original analyses we provide later in this chapter.

How and Why Does Acculturation Influence Alcohol Use Among Latinos?

How and why US acculturation influences alcohol use is poorly understood. Two conflicting theoretical frameworks have been used explain why US acculturation might increase vulnerability to drinking and harmful use: the stress model and the normative model (Caetano, 1987a, 1987c; Ehlers et al., 2009; Lee et al., 2013; Zemore, 2005). The stress model of US acculturation posits that migrants turn to alcohol and drugs to cope with the daily stressors they encounter as they adapt to a foreign environment and culture. The normative model suggests that migrants may simply find themselves in environments where drinking is more acceptable and less stigmatizing than in their countries of origin. Migrants may be exposed to peers who drink and a more socially acceptable drinking culture, which may then impact their beliefs, attitudes, and norms toward drinking. As a result, migrants’ likelihood of drinking and increased drinking may simply be a product of normal adaptation to US drinking norms. Migrant Latinas may be especially impacted by US drinking norms given that it is much more acceptable for women to drink in the United States as compared to Mexico and Latin America (Alaniz, Treno, & Saltz, 1999; Caetano, Mills, et al., 2013). However, current research makes it
difficult to conclude which theory may best explain how and why acculturation might impact Latinos’ drinking behaviors.

Research suggests that US acculturation may be linked to poor mental health status, which then increases vulnerability to alcohol and substance use. Ortega et al., using a nationally represented sample of Latinos, found that US acculturation was associated with psychiatric disorders and greater risk for substance abuse across both genders (Ortega, Rosenheck, Alegria, & Desai, 2000). Kail et al. also found links between US acculturation, depression, and drinking among a sample of Latino men in New York City (Kail, Zayas, & Malgady, 2000). Using a path analytic approach, Kail and colleagues found that US acculturation was linked to greater symptoms of depression, which then predicted heavy drinking and alcohol-related problems. Similarly, Vaeth et al. (2012), using the 2006 HABLAS data, found that, after controlling for various sociodemographic characteristics, distress related to US acculturation was linked to consuming more than 12 drinks in a single day among Latino men. Associations between distress related to US acculturation and drinking outcomes among Latinas were null. Ehlers et al. also found a statistically significant association between US acculturation-related stressors and alcohol dependence among a sample of Mexican Americans (n = 240) living in San Diego, California (Ehlers et al., 2009). Analyses indicated that the following four items were significantly associated with alcohol dependence, across both genders: (1) “close family members and I have conflicting expectations about my future,” (2) “it is hard to express to my friends how I really feel,” (3) “I don’t feel at home,” and (4) “I have more barriers to overcome than most people.” Another study that tested a conceptual model among Latino male adolescents found that US acculturation led to less positive identification with family values, which then led to deviant behavior and subsequently to alcohol consumption (Gil et al., 2000). It should be noted that this model included only men, and may not be generalizable to women. Lastly, Lee et al. (2013) reported that acculturation-related stressors predicted alcohol problems among a sample of Latino heavy drinkers (Lee et al., 2013). However, a limitation of this study was its small sample size (n = 58); as a result, drawing conclusions from this study should be done with caution.

Other findings lend support to the normative model of US acculturation. Zemore’s (2005) national study of Latinos, which found that US acculturation predicted alcohol-related outcomes only among women, examined mediators that might explain this relationship. Results indicated that associations between acculturation and drinking outcomes were mediated by gender-specific drinking norms (e.g., attitudes regarding appropriate drinking levels for men and women of diverse ages in different settings such as at home, at a party, at bars, etc.). Among Latinas, more positive norms regarding drinking explained the association of acculturation with drinking status, and with frequency of drunkenness among those who drank. In that study, mental health variables did not explain the relationship between US acculturation and alcohol outcomes among women, which is inconsistent with the stress model of US acculturation. Similarly, Caetano (1987a), using a nationally representative sample of Latinos, found that higher US acculturation was related to more liberal norms and attitudes toward drinking, independent of gender and age. In another study, Caetano also reported that higher US
Acculturated Latinos were more likely to drink in diverse social settings (i.e., with friends, while having lunch at a restaurant, at bars, parties, or at home), and this pattern was especially prominent among women (Caetano, 1987c). Similarly, Des Rosier, Schwartz, Zamboanga, Ham, & Huang (2013) found that positive alcohol expectancies (e.g., “I would act more social”) partially mediated the relationship between acculturation and alcohol-related risk behaviors (e.g., binge drinking, riding with a drunk driver) among a sample of male and female Latinos ($N = 1,527$) in diverse regions of the United States. This body of data suggests that acquiring US cultural aspects has a general effect of liberalizing norms and attitudes toward drinking among Latinos, and especially women.

Overall, the current mixed evidence for both the stress and normative models of US acculturation makes it difficult to explain why and how US acculturation influences drinking among Latinos. Further research is needed to provide stronger evidence for either theory. Given that US acculturation affects women and men differently, it could be that women’s drinking might be more affected by US alcohol norms, whereas men’s drinking might be more affected by US acculturation stress. Further, it is unclear whether retaining native cultural aspects, while simultaneously acculturating to the United States, impacts alcohol use. Research suggests that migrants who maintain aspects of their native culture, including traditional roles and identities, may be at lower risk of various poor health outcomes, including substance use (Espinosa-Hernández & Lefkowitz, 2009; Marsiglia, Kulis, Hecht, & Sills, 2004; Ozer & Fernald, 2008; Pinedo, Campos, et al., 2014; Schwartz et al., 2011). More research is needed to determine what aspects of acculturation and the native culture influence alcohol use behaviors.
Environmental Contexts in Acculturation Research

Another important issue within the context of US acculturation is the role of the social and physical environment. The majority of the US acculturation and alcohol research has operated under the assumption that US acculturation is a homogeneous process for all Latinos. This may not necessarily be true, as has been suggested by other researchers (Berry, 1997, 2003; Schwartz et al., 2010). Cabassa (2003) delineates a framework of contextual factors influencing US acculturation to better understand this process in migrants. Among these factors, the social and physical environments where migrants settle are important to consider and can provide deeper understanding of how migrants adapt to new cultural environments (Cabassa, 2003). From this perspective, the US acculturation experiences of Latinos may depend on their social and physical environmental contexts. For example, Latinos may choose to live in ethnic enclaves, or communities where their ethnic group is the majority (e.g., East Los Angeles, Miami, and the South Bronx). Such environments may encourage retention of one’s native cultures and values (Portes & Rumbaut, 2006; Schwartz et al., 2006). Further, migrants living in ethnic enclaves may have limited exposure to and interaction with the receiving culture. Therefore, US acculturation in these settings may unfold differently than in other environmental contexts, and its impact on drinking may also differ. To fully comprehend the health implications of US acculturation, US acculturation must be examined within the context where it occurs. We explore this by examining the influence of acculturation on alcohol use using data collected simultaneously from two distinct social and physical environmental contexts, the US-Mexico border and the metropolitan city of San Antonio.

US-Mexico Border: Two Countries, One Culture

The US-Mexico border region is a unique physical and social environmental context that is distinct from the general United States. This region is distinguished by high levels of migration, population mobility, and intermixing of diverse populations (Oscar, 1994; Pinedo, Burgos, & Ojeda, 2014). The US-Mexico border encompasses more than 2,000 miles spanning from California to Texas. Texas makes up the largest proportion of the US-Mexico border region: approximately 64% of border counties are concentrated in Texas. Over 7.3 million persons reside in border communities on the US side (Wilson & Lee, 2013). Unsurprisingly, border residents are predominantly made up of Mexican-origin persons. For the millions of Mexican border residents, the close proximity of Mexico gives them facilitated access to their native country “just across the bridge.” Notably, cross-border mobility is pervasive. Persons from both sides of the border cross into the United States and Mexico legally every day for work, to visit family members, to shop, and to access medical services, among other reasons. More than 800,000 persons cross through the US-Mexico border daily, making it one of the busiest borders in the world (Pinedo,
Intermixing and interactions of persons from both sides of the border is commonplace. Border residents are commonly characterized as a “transnational population” that coexists between two countries (Loustauau & Bane, 1999; Moore & Pinderhughes, 1993). Culture, customs, social networks, politics, and language from both countries are central components of daily life (Oscar, 1994). Both US and Mexican influences are interconnected in this region. In sum, the US-Mexico border region is a unique space where two cultures and countries intersect and blend into one.

The US-Mexico border region is also a highly economically and socially disadvantaged region. Communities bordering Mexico are among the poorest in the country. For example, more than 29% of Texan border residents live below the federal poverty line. High rates of unemployment and low rates of educational attainment are prevalent in border communities (Office of the Border Health, Texas Department of State Health Services, 2011). Further, this region has experienced widespread violence and victimization, in part resulting from recent increases in drug trafficking and drug-related violence (Pinedo, Burgos, et al., 2014; Pinedo et al., 2015; Téllez, 2008). Though much of this violence has been largely concentrated on the Mexican side of the border, violence and related social harms have spilled over to the United States (Shirk, 2014). Alcohol and drug use at the border are also a growing concern (Cherpitel, Ye, Bond, et al., 2015; Pinedo, Burgos et al., 2014). The border can be characterized as a high-risk environment for substance use given specific environmental characteristics that increase access. Alcohol advertisements and alcohol outlets (i.e., bars, liquor stores) at the border are pervasive (Mills, Caetano, & Vaeth, 2013). Norms regarding alcohol use are also more favorable and liberal at the border compared to nonborder settings (Mills et al., 2013).

Third, the close proximity to Mexico increases accessibility to alcohol and possibly its use. On the Mexico side of the border, alcohol is ubiquitous and available at a lower cost compared to the United States. Border cities on the Mexico side have an established culture that promotes excessive alcohol use, especially to tourists and younger persons (Caetano et al., 2012; Timothy & Wachowiak, 2006). The lower legal drinking age in Mexico (18 years vs. 21 in the United States), lax regulation regarding alcohol use and underage drinking, lower cost of drinking, and perceived ease of getting drunk may encourage US-border residents to cross into Mexico for the purpose of consuming alcohol (Caetano, Mills, et al., 2013; Clapp, Voas, & Lange, 2001; Lange & Voas, 2000; Lange, Voas, & Johnson, 2002). These features of the local border environment, coupled with the vulnerable sociodemographic profile of border residents, may contribute to harmful and excessive alcohol use.

Consistent with the high-risk profile of the border, studies have documented a higher prevalence of alcohol abuse, alcohol dependence, and co-occurring use of harmful alcohol use and drugs at the border than what is commonly found nationally and in off-border cities (Caetano, Vaeth, et al., 2013; Cherpitel, Ye, Bond, et al., 2015; Pinedo, Burgos, et al., 2014). A recent 2012 study that compared a sample of Mexican border residents from all four US-bordering states to nonborder residents found a higher prevalence of past-year alcohol abuse and dependence among those living at (vs. off) the border (Caetano, Vaeth, et al., 2013). Wallisch and Spence, using a large probabilistic sample of Mexicans
Acculturation and Alcohol Use: The Role of Environmental Contexts

\( n = 1,200 \) residing in Texan border communities, found similar results. When compared to Texas census data, the data on border residents reported higher rates of alcohol abuse and dependence (Wallisch & Spence, 2006). This was true despite the fact that border communities displayed lower rates of alcohol use than in Texas as a whole. Some studies also suggest that living at the border may put women especially at risk for problematic alcohol use compared to men. Two studies found that Mexican women at the border were more likely to be current drinkers, to consume alcohol at higher volumes, and to report alcohol abuse and dependence than Mexican women in nonborder contexts (Caetano et al., 2012; Caetano, Vaeth, et al., 2013).

Factors unique to the US-Mexico border region may contribute to alcohol-related problems. Zemore et al. tested a conceptual model of alcohol problems using the UMSARC data from the United States. Among men at the border, environmental characteristics (i.e., favorable drinking norms and increased availability of drugs) and social factors (i.e., exposure to violence or crime, and low social support) were linked to coping and enhancement motives for drinking, which then led to heavy drinking and AUD (Zemore, Cherpetel, Yu, Borges, & Wallisch, 2015). Likewise, Cherpetel, Ye, Zemore, Bond, and Borges (2015) using only the sample of US border residents from the UMSARC data identified cross-border mobility as a risk factor for AUD, and co-occurring heavy drinking and drug use, especially among younger residents (ages 18–29) (Cherpitel, Ye, Zemore, et al., 2015). Reasons for crossing appear to play a critical role in relation to alcohol problems. Those who reported crossing into Mexico for the nightlife (i.e., drinking) had 7.68 the odds of reporting AUD as compared to border residents who did not cross into Mexico. Similarly, crossing to obtain prescription drugs strongly predicted co-use of heavy drinking and drugs (OR: 8.53) among younger border residents. These results align with other studies suggesting that those who cross the border into Mexico to consume alcohol may be more likely to engage in high-risk drinking practices (i.e., binge drinking, drinking and driving, and co-use of alcohol and drugs) and are at greater risk for AUD than those who do not cross into Mexico to drink (Borges et al., 2015; Caetano, Mills, et al., 2013; Cherpetel, Ye, Zemore, et al., 2015; Holck, Warren, Smith, & Rochat, 1984; Lange et al., 2002). Importantly, studies using the UMSARC data have yet to test relationships between US acculturation and alcohol outcomes, which we do in this chapter.

The process of acculturation may be different at the border as compared to the broader US, given the cultural uniqueness of this region. It also may be that acculturation’s influence on alcohol consumption may be different for border residents who reside in a high-risk environment. The association of acculturation and alcohol use at the border is severely understudied. We were able to identify only one study that examined the effects of acculturation on alcohol use at the border. Caetano, Ramisetty-Mikler, Wallisch, et al. (2008) found differential effects of acculturation on alcohol use by gender among a sample of Mexican-origin persons \( n = 1,000 \) living at the Texas-Mexico border (Caetano, Ramisetty-Mikler, Wallisch, et al., 2008). Acculturation was protective for AUD and heavy episodic drinking among Mexican men. However, higher acculturated women were more likely to report heavy episodic drinking. One limitation of this study is that it lacked an
off-border comparison group, which limited interpretation of findings regarding a border effect. Thus further research is needed to investigate the role of acculturation on alcohol use at the border, especially given the strong evidence suggesting that drinking at the border differs from both the general population in the United States, and Latinos nationally.

**Present Study**

The present study examines the association between acculturation and AUD in a sample of Mexican-origin persons living at and off the US-Mexico border. Importantly, this study uses a multidimensional measure of acculturation. We attempt to answer the questions we posed in the introduction. Based on the review of the literature we propose the following aims and accompanying hypotheses:

1. **Which US acculturation domains best predict AUD?**
   
   We examine independent associations between AUD and (1) US cultural involvement and identification and (2) English language proficiency and usage.
   
   **Hypothesis 1:** English proficiency will be the strongest predictor of AUD (compared to other acculturation measures).
   
   **Hypothesis 2:** English proficiency will be a stronger predictor of AUD among women than men.

2. **Does retaining aspects of Mexican culture protect against AUD?**
   
   We examine independent associations between AUD and (1) Mexican cultural involvement and identification and (2) Spanish language proficiency and usage.
   
   **Hypothesis 3:** Both Mexican cultural involvement and identification and Spanish language proficiency and usage will have protective effects against AUD.

3. **How and why does acculturation influence AUD?**
   
   We examine potential mediators that might explain the relationship between acculturation and AUD, including factors relevant to a stress-based model (i.e., symptoms of depression, symptoms of anxiety, coping motives for drinking) and factors relevant to a normative model (i.e., favorable drinking norms, enhancement motives for drinking).
   
   **Hypothesis 4:** The relationship between acculturation and AUD will be mediated by positive perceived norms regarding alcohol use and enhancement motives for drinking.
4. Do environmental contexts affect the influence of acculturation on AUD?

We compare the relationship between acculturation and AUD by border vs. non-border residence.

Hypothesis 5: Acculturation will have a stronger effect at the border (vs. off). Specifically, English proficiency will be a stronger predictor of AUD among women at the border (vs. off the border).

Methods

Study Design and Participants

Analyses presented in this chapter use data from the UMSARC (Borges et al., 2015; Cherpitel, Ye, Bond, et al., 2015). This study involved collecting data from 4,796 Mexican-origin participants residing on both sides of the US-Mexico border region. For the purpose of this analysis, we focus exclusively on the US-residing sample of Mexican Americans. From 2011 to 2013, a total of 2,336 Mexican Americans from two border cities and one nonborder city in Texas were recruited to complete structured questionnaires. The border sample consisted of participants from Laredo and McAllen/Brownsville; and the nonborder sample consisted of residents from San Antonio. Recruitment used a multistage area-probability sampling design, stratifying by city. Census block groups with ≥70% Latino population were identified as primary sampling units (PSU); blocks served as secondary sampling units (SSU). Three households per SSU were identified and approached a minimum of three times during diverse days and times of the week. Household members were screened for eligibility. Eligible participants were adults aged 18 to 65 years and of Mexican descent. The household member with the most recent birthday was chosen as the potential participant. Interviews took approximately 45 minutes to complete; a trained interviewer from the Public Policy Research Institute (PPRI) at Texas A&M University administered the questionnaire using computer-assisted personal interviewing. Informed consent was obtained from all eligible participants before starting the questionnaire. The cooperation rate for the US-based sample was 84%, and the response rate was 53%.

Measures

Sociodemographic Characteristics

Sociodemographic factors included gender, age, nativity, marital status, education, and annual household income.

Acculturation Variables

Acculturation was measured using the Multidimensional Acculturation Scale (MAS-II) (Rodriguez et al., 2007). This is a 22-item instrument composed of four subscales to independently assess US and Mexican involvement in and identification with each
culture, as well as English and Spanish proficiency and usage. Participants indicated their agreement with each item on a 6-point Likert scale ranging from (0) does not apply or (1) not at all to (6) very much. Totals are summed and averaged to create a score for US cultural identity, Mexican cultural identity, English proficiency and usage, and Spanish proficiency and usage. The scale has demonstrated internal reliability with Cronbach’s alphas for each subscale ranging from .78 to .93. Subscales also correlated (in the expected direction) with numerous markers of acculturation, including nativity, generation status, and length of residency in the United States (Rodriguez et al., 2007).

**Alcohol Use Variables**

Participants were characterized as current drinkers if they indicated consuming alcohol in the past year. The survey collected data on alcohol consumption and frequency of drinking using items from the National Alcohol Survey, which take into account types of alcohol, quantity, and frequency of use (Greenfield, Nayak, Bond, Ye, & Midanik, 2006). A dichotomous variable was created to account for binge drinking, defined as consuming 5 + standard drinks for men and 4 + standard drinks for women at least once a month in the past year. And AUD was assessed using the Alcohol Section of the Composite International Diagnostic Interview (CIDI) core (World Health Organization, 1993) to measure the 11 diagnostic criteria for an AUD as defined by the *Diagnostic and Statistical Manual* version 5 (DSM-5). Qualifying criteria for AUD include tolerance, withdrawal symptoms, drinking more than intended, craving, persistence or unsuccessful efforts to cut down on use, increased time spent trying to access alcohol or recover from the effects, continued use of alcohol despite failure to fulfill major role obligations (e.g., such as school or work) or negative effects, giving up activities due to alcohol use, continued use in hazardous settings, and continued use despite persistent social and interpersonal conflicts. Participants who reported two or more qualifying AUD symptoms were characterized as having an AUD.

**Perceived Drinking Norms**

Drinking norms were measured using a four-item scale adapted from Baer, Stacy, and Larimer (1991). Respondents rated the opinions of important people in their lives regarding acceptable drinking in terms of frequency and quantity during a special occasion, an ordinary occasion, and if planning to drive (Cronbach’s alpha = .76).

**Motives for Drinking**

Cooper’s 10-item scale was used to assess participants’ drinking motives (Cooper, 1994). Two subscales assessed drinking for enhancement motives (i.e., using alcohol for the feelings and excitement it can produce) and for coping motives (i.e., mood regulation and tension reduction), using five items each (Cronbach’s alpha = .76).

**Mental Health**

Mental health measures included past-month symptoms of depression and anxiety. Symptoms of depression were assessed using the Center for Epidemiologic Studies Short Depression Scale (CESD-10) (Andresen, Malmgren, Carter, & Patrick, 1994). The
CESD-10 is a 10-item screening instrument that has demonstrated high reliability and validity for identifying clinically significant symptoms of depression in adults, including Latinos (Heimer, Barbour, Palacios, Nichols, & Grau, 2014; Lum & Vanderaa, 2010; Ulibarri et al., 2013). Importantly, the Spanish version of this instrument has been validated and widely used in Mexico (Bojorquez Chapela & Salgado de Snyder, 2009; Salgado-De Snyder & Maldonado, 2013). A score ranging from 0 to 30 is calculated, with higher scores signifying greater depressive symptoms. Past month symptoms of anxiety were assessed via the Beck Anxiety Inventory (BAI) (Beck, Epstein, Brown, & Steer, 1988). This 21-item instrument is designed to measure common symptoms of anxiety in the past month. Scores range from 0 to 63, with higher scores indicating greater anxiety symptoms. Spanish versions have been previously validated (Familiar, Borges, Orozco, & Medina-Mora, 2011; Robles, Varella, Jurado, & Páez, 2001).

Analysis Plan

We first tested independent associations between each of the four subscales of the MAS-II and AUD. These analyses involved descriptive tests and logistic regressions modeling associations between AUD and US cultural identification and involvement, Mexican cultural identification and involvement, English language proficiency/usage, Spanish language proficiency/usage—by gender. Interactions were also tested between each acculturation variable, gender, and border residence in predicting AUD. Lastly, we conducted a logistic regression model that included all four acculturation measures, by gender, to determine independent associations between each acculturation dimension and AUD.

Next, a correlation matrix was computed among acculturation variables, alcohol outcomes, and variables selected as potential mediators for each gender. Based on the stress and normative models, we selected potential mediator variables aligned with each theory. Potential mediators included: positive perceived norms regarding drinking, coping motives for drinking, enhancement motives for drinking, symptoms of anxiety, and symptoms of depression. Potential mediators that were significantly correlated with both AUD and acculturation variables were retained as potential mediators in the main analyses (Baron & Kenny, 1986; MacKinnon et al., 2007. It is important to note that acculturation measures were not associated with AUD among men, and therefore our main analyses focus on women. Further, the only acculturation variable that predicted AUD among women was English language proficiency/usage. All other acculturation variables produced null effects (all p’s > .62). Even in a logistic regression that included all four acculturation domain variables (i.e., US cultural identification and involvement, Mexican cultural identification and involvement, English language proficiency and usage, Spanish language proficiency and usage) and AUDs, English language proficiency/usage was the only statistically significant association among women. Therefore subsequent analyses used English language proficiency/usage as the main acculturation measure.
Additionally, we characterized our sample population by conducting descriptive analyses for sociodemographic factors, alcohol outcomes, and mediators by border residence. In examining the relationship between English language proficiency/usage and AUD, we conducted multivariate logistic regression controlling for age, marital status, education, income, and study site. To test for mediation, a total of four models were conducted introducing English language proficiency/usage by itself and in combination with each mediator, with the last model (i.e., model 4) using all potential mediators that were significantly associated with AUD in bivariate analyses (Baron & Kenny, 1986; MacKinnon et al., 2007). These models were conducted for all Mexican women in the sample and by border residency (note: study site was removed as a control variable in our stratified analyses). All multivariate regression models were weighted to account for the multistage clustered sampling design (Borges et al., 2015; Cherpitel, Ye, Bond, et al., 2015). Lastly, we tested indirect effects between AUD, English proficiency and statistically significant mediator variables to confirm mediation at the multivariate level using Preacher and Hayes’s (2008) method.

Results

Sample Characteristics

Table 1 presents descriptive characteristics for the total sample and by border residency. The sample was almost evenly split by gender (49% male). On average, participants were 37.8 years of age. Half (52%) were married, 34% did not graduate from high school, and 30% reported total household incomes below $15,000. The majority (72%) of respondents were current drinkers, with 19% reporting hazardous alcohol use and 18% meeting DSM-5 criteria for AUD. Compared to nonborder participants, those living at the border were more likely to be foreign-born (34% vs. 22%), less likely to have graduated from high school (35% vs. 30%), and were less proficient in English (mean score: 3.83 vs. 4.27, on a 5-point scale). Within the context of acculturation, border participants reported less English proficiency and greater Spanish proficiency compared to off-border participants. Mexican and US cultural identity scores did not differ significantly by border versus nonborder residency. Those at the border were more likely to meet criteria for AUD (19% vs. 15%; \( p = 0.028 \)). Perceived norms regarding drinking were slightly more favorable off the border than on the border. Higher symptoms of anxiety and depression were reported among nonborder participants.
Table 1 Descriptive Characteristics Among Mexican-Origin Persons Residing on and off the US-Mexico border, 2011-2013, \(N = 2,336\).

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total</th>
<th>Nonborder</th>
<th>Border</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sociodemographics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender (male)</td>
<td>1151 (49%)</td>
<td>383 (50%)</td>
<td>768 (49%)</td>
<td>0.784</td>
</tr>
<tr>
<td>Mean age (SD)</td>
<td>37.8 (13.5)</td>
<td>38.7 (13.7)</td>
<td>37.5 (13.4)</td>
<td>0.840</td>
</tr>
<tr>
<td>Foreign-born</td>
<td>697 (30%)</td>
<td>167 (22%)</td>
<td>530 (34%)</td>
<td>≤0.001</td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>681 (29%)</td>
<td>227 (29%)</td>
<td>454 (29%)</td>
<td>0.015</td>
</tr>
<tr>
<td>Married</td>
<td>1224 (52%)</td>
<td>378 (49%)</td>
<td>846 (54%)</td>
<td></td>
</tr>
<tr>
<td>Separated/divorced/widowed</td>
<td>431 (18%)</td>
<td>166 (22%)</td>
<td>265 (17%)</td>
<td></td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did not graduate from HS</td>
<td>787 (34%)</td>
<td>234 (30%)</td>
<td>553 (35%)</td>
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</table>
## Acculturation and Alcohol Use: The Role of Environmental Contexts

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Count</th>
<th>Percentage</th>
<th>Count</th>
<th>Percentage</th>
<th>Count</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Graduated from HS</td>
<td>530</td>
<td>(23%)</td>
<td>173</td>
<td>(22%)</td>
<td>357</td>
<td>(23%)</td>
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<tr>
<td>Some college</td>
<td>678</td>
<td>(29%)</td>
<td>254</td>
<td>(33%)</td>
<td>424</td>
<td>(27%)</td>
</tr>
<tr>
<td>Graduated from college</td>
<td>339</td>
<td>(15%)</td>
<td>110</td>
<td>(14%)</td>
<td>229</td>
<td>(15%)</td>
</tr>
<tr>
<td>Total household income</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.009</td>
</tr>
<tr>
<td>Less than $15,000</td>
<td>690</td>
<td>(30%)</td>
<td>236</td>
<td>(31%)</td>
<td>454</td>
<td>(29%)</td>
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<td>$15,000–$29,000</td>
<td>786</td>
<td>(34%)</td>
<td>224</td>
<td>(29%)</td>
<td>562</td>
<td>(36%)</td>
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<tr>
<td>$30,000–$59,000</td>
<td>575</td>
<td>(25%)</td>
<td>207</td>
<td>(27%)</td>
<td>368</td>
<td>(24%)</td>
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<tr>
<td>≥$60,000</td>
<td>285</td>
<td>(12%)</td>
<td>104</td>
<td>(13%)</td>
<td>181</td>
<td>(12%)</td>
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### Acculturation Characteristics

<table>
<thead>
<tr>
<th>Multidimensional Acculturation Scale</th>
<th>Mean English proficiency score (SD)</th>
<th>SD</th>
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<tbody>
<tr>
<td></td>
<td>3.97 (1.15)</td>
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<td></td>
<td>4.27 (0.94)</td>
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</tr>
<tr>
<td></td>
<td>3.83 (1.21)</td>
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<tr>
<th></th>
<th>≤0.001</th>
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<tr>
<td>p-value</td>
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</table>
Acculturation and Alcohol Use: The Role of Environmental Contexts

<table>
<thead>
<tr>
<th></th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Spanish proficiency score (SD)</td>
<td>3.76 (0.93)</td>
<td>3.26 (1.02)</td>
<td>4.00 (0.78)</td>
<td>≤0.001</td>
</tr>
<tr>
<td>Mean Mexican cultural identity score (SD)</td>
<td>3.95 (0.86)</td>
<td>3.98 (0.83)</td>
<td>3.93 (0.88)</td>
<td>0.270</td>
</tr>
<tr>
<td>Mean American cultural identity score (SD)</td>
<td>4.21 (0.71)</td>
<td>4.24 (0.72)</td>
<td>4.20 (0.70)</td>
<td>0.124</td>
</tr>
</tbody>
</table>

**Alcohol Use Behaviors**

<table>
<thead>
<tr>
<th></th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current drinker</td>
<td>1690 (72%)</td>
<td>572 (74%)</td>
<td>1118 (71%)</td>
<td>0.162</td>
</tr>
<tr>
<td>Hazardous alcohol use</td>
<td>453 (19%)</td>
<td>156 (20%)</td>
<td>297 (19%)</td>
<td>0.470</td>
</tr>
<tr>
<td>Alcohol use disorder</td>
<td>409 (18%)</td>
<td>116 (15%)</td>
<td>293 (19%)</td>
<td>0.028</td>
</tr>
</tbody>
</table>

**Potential Mediators**

<table>
<thead>
<tr>
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<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive perceived drinking norms</td>
<td>1.62 (0.61)</td>
<td>1.67 (0.61)</td>
<td>1.59 (0.61)</td>
<td>≤0.001</td>
</tr>
</tbody>
</table>
### Coping motives for drinking

<table>
<thead>
<tr>
<th></th>
<th>Group 1 (Mean ± SD)</th>
<th>Group 2 (Mean ± SD)</th>
<th>Group 3 (Mean ± SD)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enhancement motives</td>
<td>2.00 (1.07)</td>
<td>1.98 (1.01)</td>
<td>2.01 (1.11)</td>
<td>0.515</td>
</tr>
<tr>
<td>Mean anxiety score</td>
<td>5.95 (8.18)</td>
<td>7.66 (9.44)</td>
<td>5.11 (7.35)</td>
<td>≤0.001</td>
</tr>
<tr>
<td>(BAI scale) (SD)</td>
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<tr>
<td>Mean depression score</td>
<td>8.12 (6.74)</td>
<td>9.50 (7.37)</td>
<td>7.44 (6.31)</td>
<td>≤0.001</td>
</tr>
<tr>
<td>(CESD10 scale) (SD)</td>
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</table>
Correlation Matrix of Associations Between Acculturation Variables, AUD, and Potential Mediators

A correlation matrix was used to test correlations between each of the four subscales of the MAS-II and potential mediators. Table 2 displays correlations between key variables among Mexican women in the sample. English proficiency and usage was the only US acculturation measure correlated with AUD. Mexican cultural identification and Spanish proficiency/usage were not statistically significantly associated with AUD. English proficiency/usage was also correlated with perceived norms regarding drinking, with enhancement motives for drinking, and with religiosity. These variables served as potential mediators in multivariate models. Anxiety and depression variables were unrelated to both US and Mexican cultural identification measures and the English and Spanish proficiency/usage variables. These results supported hypotheses 1 and 2, but did not support hypothesis 3.
Table 2 Correlation Matrix of Associations Between Acculturation Variables, AUD, and Potential Mediators Among Mexican Women, 2011–2013, N = 1,185.

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<tr>
<td>Spanish proficiency</td>
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<td>-0.3121*</td>
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<tr>
<td>Mexican cultural identity</td>
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<td>-0.1097*</td>
<td>0.3385*</td>
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<td>4</td>
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<td>5</td>
<td>Current drinker</td>
<td>0.2870</td>
<td>-0.0436</td>
<td>0.0226</td>
<td>0.0696</td>
<td>1.0000</td>
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<td>6</td>
<td>Hazardous alcohol use</td>
<td>0.1377</td>
<td>-0.0303</td>
<td>0.0147</td>
<td>0.0563</td>
<td>0.2705</td>
<td>1.0000</td>
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<tr>
<td>7</td>
<td>Alcohol use disorders</td>
<td>0.1179</td>
<td>-0.0117</td>
<td>-0.0026</td>
<td>0.0237</td>
<td>0.2471</td>
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<td>Perceived norms regarding drinking</td>
<td>0.273</td>
<td>-0.1466</td>
<td>0.0013</td>
<td>0.0891*</td>
<td>0.4434*</td>
<td>0.3346*</td>
<td>0.2647*</td>
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<tr>
<td>8</td>
<td>Coping motives for drinking</td>
<td>0.0169</td>
<td>-0.0882*</td>
<td>0.0001</td>
<td>0.0309</td>
<td>0.7495</td>
<td>0.3108*</td>
<td>0.3685*</td>
<td>0.2025*</td>
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<tr>
<td>9</td>
<td>Enhancement motives for drinking</td>
<td>0.2612*</td>
<td>-0.0520</td>
<td>0.0145</td>
<td>0.0856*</td>
<td>0.7318*</td>
<td>0.4795*</td>
<td>0.4700*</td>
<td>0.5521*</td>
<td>0.4461*</td>
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<tr>
<td>10</td>
<td>Anxiety</td>
<td>-0.0318</td>
<td>-0.1234*</td>
<td>0.0123</td>
<td>-0.0235</td>
<td>-0.0089</td>
<td>0.0132</td>
<td>0.1129*</td>
<td>0.0761*</td>
<td>0.1872*</td>
<td>0.0598*</td>
<td>1.0000</td>
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</tbody>
</table>
Acculturation and Alcohol Use: The Role of Environmental Contexts

<table>
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<th></th>
<th>Depressi</th>
<th>0.038</th>
<th>-0.15</th>
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<th>-0.03</th>
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<th>0.016</th>
<th>0.145</th>
<th>0.073</th>
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<tr>
<td>12</td>
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<td>9</td>
<td>65*</td>
<td>48</td>
<td>90</td>
<td>0</td>
<td>8</td>
<td>0*</td>
<td>7*</td>
<td>3*</td>
<td>6*</td>
<td>0*</td>
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</tbody>
</table>

(*) p ≤ 0.05,

(** p ≤ 0.01,

(***) p ≤ 0.001
Multivariate Logistic Regression Models Testing Associations Between AUD, English Proficiency and Mediators

We found that English proficiency/usage predicted AUD among women, after controlling for sociodemographic characteristics and study site. Testing for interaction between English proficiency/usage and border residence on AUD suggested that the association between AUD and English language proficiency/usage was stronger among women at (vs. off) the border. To further examine this finding, we desegregated our analyses by border residence (Table 3). Among nonborder Mexican women, English proficiency/usage was not associated with AUD. However, English proficiency/usage was statistically significant in predicting AUD among border women. Border women with higher English proficiency/usage had 1.63 the adjusted odds (95% CI: 1.29–2.05) of reporting AUD (model 1). When perceived norms regarding drinking (model 2) and enhancement motives for drinking (model 3) variables were examined separately with English proficiency, the effect of English proficiency decrease but remained significant. In model 4, which included both the perceived norms regarding drinking and enhancement motives for drinking variables, the association between English proficiency/usage and AUD remained statistically significant; the OR was reduced to 1.43 (95% CI: 1.06–1.35). Perceived norms regarding drinking and enhancement motives for drinking partially explained the association between English proficiency/usage and AUD among women at the border—both of which were statistically significant as mediators. Lastly, using Preacher and Hayes’s (2008) method to test for mediation we found a statistically significant indirect effect between English proficiency and each mediator. Results supported hypotheses 4 and 5.
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<table>
<thead>
<tr>
<th>Alcohol Use Disorders</th>
<th>Border</th>
<th>95% CI</th>
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<tbody>
<tr>
<td><strong>Model 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English proficiency</td>
<td>1.63</td>
<td>1.29–2.05***</td>
</tr>
<tr>
<td><strong>Model 2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English proficiency</td>
<td>1.39</td>
<td>1.08–1.80*</td>
</tr>
<tr>
<td>Perceived norms regarding drinking</td>
<td>6.00</td>
<td>3.91–9.20***</td>
</tr>
<tr>
<td><strong>Model 3</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English proficiency</td>
<td>1.47</td>
<td>1.0–1.96**</td>
</tr>
<tr>
<td>Enhancement motives for drinking</td>
<td>3.36</td>
<td>2.76–4.09***</td>
</tr>
<tr>
<td><strong>Model 4</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English proficiency</td>
<td>1.43</td>
<td>1.06–1.35*</td>
</tr>
<tr>
<td>Perceived norms regarding drinking</td>
<td>2.37</td>
<td>1.46–3.85***</td>
</tr>
<tr>
<td>Enhancement motives for drinking</td>
<td>2.85</td>
<td>2.33–3.49***</td>
</tr>
</tbody>
</table>

(a) Controlling for age, marital status, education, income

(*) p ≤ 0.05,

(**) p ≤ 0.01,

(***p ≤ 0.001
Discussion of Study Results

Findings from this analysis build on an extensive body of research examining the influence of US acculturation on drinking behaviors among Latinos. This study is among the few, to our knowledge, to use a multidimensional measure of acculturation to examine independent associations between domains of the dominant and native culture on AUD. This is also the first study to examine the role of acculturation on AUD by comparing two samples of Mexican Americans living at versus away from the US-Mexico border. A major finding of the analyses concerns the border effect on the association between English proficiency/usage and AUD among women. Women residing at the border that spoke and used more English were particularly at risk for AUD. This is a notable finding, as it suggests that the influence of US acculturation on Mexican American women’s drinking behaviors may vary across contexts and may be particularly harmful in high-risk contexts. Characteristics of the border environment may exacerbate alcohol-problems among more US acculturated women, which is a novel finding that has not been previously documented in the US context.

Our findings were aligned with the majority of our hypotheses. We found that English language proficiency/usage was the only acculturation variable that was associated with AUD. However, this association emerged only among women at the border. This finding coincides with past studies that have documented positive associations between linguistic acculturation and alcohol outcomes (Epstein et al., 2000; Polednak, 1997; Zemore, 2005). In particular, English language proficiency/usage has emerged as a strong predictor of alcohol use and alcohol-related problems among Latinas. Zemore (2005) tested various components of US acculturation in relation to alcohol outcomes among Latinas, including measures reflecting language use, attitudes, and social environment. Of these US acculturation domains, English language usage was the only measure that predicted a range of alcohol outcomes in women, including drinking status, volume intake, and frequency of drunkenness. Contrary to our hypothesis 3, we did not find any evidence that retaining (or losing) Mexican cultural identification and Spanish proficiency/usage influenced AUD. These null findings were consistent across both genders. This is interesting, given that other studies have found that identification with the native culture might be protective against health risk behaviors among Mexican Americans and Latinos in the United States (Espinosa-Hernández & Lefkowitz, 2009; Marsiglia et al., 2004; Ozer & Fernald, 2008; Pinedo, Campos, et al., 2014; Schwartz et al., 2011). Researchers have found that language is a powerful transmitter of culture (Ramírez-Esparza, Gosling, Benet-Martínez, Potter, & Pennebaker, 2006). It may be that speaking English is a strong marker for significant changes in attitudes and values, particularly in regard to drinking among Latina women.

In examining how US acculturation influences AUD among women, our findings lend support to the normative model. Positive norms toward drinking and drinking for enhancement motives partially mediated the relationship between English proficiency and AUD. Similar to other studies, results suggest that women who were more proficient
in English and used English more may be adapting to US cultural norms surrounding drinking behaviors (Caetano, 1987a, 1987c; Zemore, 2005). Gender-specific drinking norms differ between the United States and Mexico. In Mexico, perceptions regarding women’s drinking are much more conservative and stigmatizing than in the United States (Alaniz et al., 1999; Caetano, Mills, et al., 2013). As a result, women in Mexico drink significantly less and report fewer alcohol-related problems than men do (Medina-Mora et al., 2012). In the United States, Latinas might be more impacted by gender-specific drinking norms as they find themselves in an environment where drinking is much more acceptable. It is also worth mentioning that drinking norms surrounding men are comparable in both countries, and this might explain why acculturation may have less of an effect on males’ drinking behaviors. Additionally, we found no evidence to support the stress model. Importantly, the differential association between English proficiency/usage and AUD among women by border residence suggests this relationship may also be dependent on the context in which the person resides.

The US-Mexico border region is a high-risk environment for alcohol and substance use. As previously discussed, features of the border environment may foster harmful alcohol use (Caetano, Ramisetty-Mikler, Wallisch, et al., 2008; Cherpitel, Ye, Bond, et al., 2015; Zemore et al., 2015). Such environmental features include increased accessibility to alcohol and drugs, lax regulation, high concentration of alcohol outlets, violence, low social support, and crossing into Mexico to drink (Cherpitel, Ye, Bond, et al., 2015; Cherpitel, Ye, Zemore, et al., 2015; Mills et al., 2013; Mills, Caetano, & Vaeth, 2014; Zemore et al., 2015). Favorable drinking norms and drinking for enhancement reasons partially mediated this association between AUD and English proficiency/usage for women at the border. This suggests that the stressful border environment may facilitate alcohol use and ensuing problems and may pose greater AUD risk for more US acculturated women. In high-risk contexts, adaptation to US culture may carry harmful effects vis-à-vis problematic alcohol use among Mexican American women.

Limitations of the Presented Study

Findings from our analyses should be interpreted in the context of some limitations. The cross-sectional nature of the present analyses does not allow us to infer causality between acculturation and AUD. We also did not have environmental and contextual data to better characterize the border and nonborder region, which would have enhanced our understanding of critical environmental factors that might affect how acculturation influences drinking behaviors and vulnerability to AUD. These findings also might not be generalizable to all border regions, given the heterogeneity of the US-Mexico border region (Zemore et al., 2015). Despite these limitations, our findings provide a valuable contribution to the limited research on acculturation and effects on alcohol at the US-Mexico border region, a highly understudied context.
Overall Conclusions and Recommendations for Future Research

The review of the literature included in this chapter, coupled with our findings, suggests that associations of US acculturation with alcohol outcomes and related harms are complex and depend on various factors. Existing evidence that US acculturation adversely impacts the drinking behaviors of Latinos is more compelling among women. This may be largely due to women adopting US cultural drinking behaviors. However, we find that Latinas are not a homogeneous population and may be impacted differently depending on place of residency in the United States. Therefore, it is important for research investigating US acculturation and alcohol to take environmental contexts into account. The US acculturation experiences of Latinos, and migrants in general, should be investigated within the context of where they live. Fundamental differences may exist among those living in large urban cities versus rural settings, traditionally receiving migrant destinations versus new receiving migrant destinations, and ethnic enclave communities versus more ethnically diverse communities, among other contexts. U.S. acculturation experiences may differ for Latinos within each context and impact their alcohol use behaviors differently, which warrants further research. Within the contexts of interventions, it is critical that prevention and treatment programs and strategies consider the role of US acculturation. Targeting drinking norms and motives may be particularly beneficial for women who reside at the border.

Placing our findings in a global context, the US-Mexico border is similar to other international borders. International borders are unique environments and are commonly “hotspots” for drug trafficking and substance abuse (Asad & Harris, 2003; Bronfman, Leyva, Negroni, & Rueda, 2002; Brouwer et al., 2006; Çduyu, 2004; Goldenberg, Strathdee, Perez-Rosales, & Sued, 2012; Holroyd, Wong, Ling, & Gray, 2004; Martinez, 1994; Rachlis et al., 2007; Rhodes, Singer, Bourgois, Friedman, & Strathdee, 2005; Uribe-Salas, Conde-Glez, Juarez-Figueroa, & Hernandez-Castellanos, 2003; Wong & Yilin, 2003). If acculturation is a risk factor for alcohol problems, environments that are favorable to alcohol use may pose greater risk for migrants. As such, research at the US-Mexico border can inform research in other international border settings. Lastly, future research would benefit from deeper examination of how US acculturation operates in border contexts and its effect on alcohol use. Less importance is placed on a “dominant culture” in border environments. Therefore, being equally oriented to both cultures may be the most ideal adaptation strategy and may have protective effects on various health outcomes, including alcohol abuse (Nguyen & Benet-Martínez, 2012; Salas-Wright, Clark, Vaughn, & Córdova, 2015). Our study presented in this chapter tested independent associations between domains of US acculturation and the native culture and alcohol use, and did not assess interactions (i.e., biculturalism, bilingualism). Little is known
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regarding the relationship between acculturation, biculturalism, and alcohol use in border settings—this represents an important line of future research.

References


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**Notes:**

(1) For the purpose of this chapter we use the term "Mexican Americans" to refer to Mexicans living in the US. This, however, is not meant to denote citizenship and includes Mexicans that were born in the US, and are therefore US citizens, and foreign-born (i.e., Mexican immigrants).

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**Raul Caetano**  
Raul Caetano is Professor and Dean, UTSW School of Health Professions at the University of Texas Southwestern Medical Center.

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