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## Immigration Stress and Alcohol Use Severity among Recently Immigrated Hispanic Adults: Examining Moderating Effects of Gender, Immigration Status, and Social Support

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### Abstract

**Objective**—Identifying and understanding determinants of alcohol use behavior among Hispanic immigrants is an increasingly significant public health concern. Although prior research has examined associations of cultural stressors with alcohol use among Hispanics, few studies have tested these associations among recent adult immigrants. As such, this study aimed to (a) examine the association of immigration stress on alcohol use severity among recently immigrated Hispanic adults ( < 1 year in the U.S.); and (b) examine the moderating effects of gender, immigration status, and social support.

**Method**—A hierarchical multiple regression and moderation analyses were conducted on a sample of 527 participants in South Florida.

**Results**—Results indicated that after controlling for demographic variables, pre-immigration drinking behavior, and dimensions of social support, the association of higher immigration stress with higher alcohol use severity was statistically significant. Moderation analyses indicated that immigration stress had a statistically significant association with alcohol use severity among men, but not among women. Also, dimensions of social support consistently reduced the deleterious effect of immigration stress on alcohol use severity.

**Conclusion**—This study adds to the scarce literature on cultural stressors and alcohol use among recent Hispanic immigrants. Findings suggest that it may be important to design gender-specific interventions and that increasing levels of social support may offset the effects of immigration stress on alcohol use.

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## Keywords

alcohol; cultural stress; social support; gender; Hispanics

Approximately 37% of Hispanics in the United States (U.S.) are immigrants (Motel & Patten, 2013); and projections indicate that this understudied population will continue to grow (U.S. Census Bureau, 2015a). As such, identifying and understanding determinants of alcohol use behavior in this population is becoming an increasingly important public health issue. Moreover, some studies have reported that Hispanics (compared to non-Hispanic ethnic groups) are more likely to engage in heavy drinking (Field et al., 2015) and experience alcohol-related disparities that include higher rates of chronic liver disease and citations for driving under the influence of alcohol (National Institute on Alcohol Abuse and Alcoholism, 2013).

Most studies examining sociocultural determinants of alcohol use behavior among Hispanic populations have emphasized the potential impact of acculturation on alcohol use; however, scholars have repeatedly called for investigations to examine more clinically-modifiable factors that may explain such health risk behaviors (Cano, de Dios et al., 2015; Hunt, Schneider, & Comer, 2004; Lazarus, 1997; Viruell-Fuentes, 2007). Accordingly, the aims of the present study were to (a) examine the association of immigration stress with alcohol use severity among recently immigrated (< 1 year in the U.S.) Hispanic adults; and (b) examine the moderating effects of gender, immigration status, and social support.

## Immigration Stress

Elucidating the effects of sociocultural determinants may help improve the design and implementation of evidence-based clinical interventions for alcohol use among recent immigrants. One factor that may be particularly relevant to this population is cultural stress. Broadly, *cultural stress* has been described as a constellation of factors that contribute to the stress experience of being a Hispanic immigrant in the United States (Cano, Schwartz et al., 2015). Indicators of cultural stressors include, but are not limited to, acculturation stress and ethnic discrimination. Some conceptual models have proposed that exposure to cultural stressors may increase the risk of substance use, including alcohol use, among Hispanics (Cano, de Dios et al., 2015; Cervantes & Castro, 1985). Although the proposed link between cultural stress and alcohol use has been examined more extensively among adolescents (see review by Cano, Schwartz et al., 2015), empirical studies with adult Hispanics also indicate that cultural stressors such as acculturation stress (Ehlers, Gilder, Criado, & Caetano, 2009; Lee et al., 2013) and ethnic discrimination (Cano, de Dios et al., 2015) are associated with higher levels of alcohol use.

Most research on cultural stress and alcohol use has been conducted with combined Hispanic immigrant and non-immigrant samples, and investigations among recent adult Hispanic immigrants are scarce. This gap in the literature is significant because researchers have suggested that among Hispanics, recent immigrants experience higher levels of cultural stress compared to later generations or immigrants who have been in the U.S. for several years (Arellano-Morales et al., in press; Umaña-Taylor & Alfaro, 2009). Research in this

area may also advance by examining cultural stressors that are more specific to the experiences of recent Hispanic immigrants. One construct that may be especially relevant to this population is *immigration stress*, which encompasses traumatic events during the migration process, fear of being deported, family separations or limited contact with family due to migration, and discrimination due to both immigration status and Hispanic ethnicity (Borges et al., 2012; Cervantes, Padilla, & Salgado de Snyder, 1991).

Our review of the literature only identified two prior studies that examined the effects of immigration stress on alcohol use among Hispanic immigrants (Bacio, Moore, Karno, & Ray, 2014; Lounsbury & Kulbok, 2007). However, neither of those studies found statistically significant associations between immigration stress and alcohol use. These null findings may be explained in part because both studies included participants who had resided in the U.S. for several years (i.e., 18 years on average); thus, it is possible that some components of immigration stress diminished over time and the effects of immigration stress on alcohol use weakened.

## Gender and Immigration Status

A discussion of associations of cultural stress and alcohol use should consider the potential moderating effect of gender. Compared to Hispanic women, Hispanic men report experiencing some cultural stressors, such as ethnic discrimination, more frequently (Araújo & Borrell, 2006; Pérez, Fortuna, & Alegría, 2008). This may be explained in part because immigrant Hispanic men are more likely than women to seek employment, and thus be more exposed to the deleterious effect of discrimination in the workplace (Gorman, Read, & Krueger, 2010). To the best of our knowledge, no prior studies have examined if there are gender differences in levels of immigration stress or if the association between immigration stress and alcohol use varies across gender.

However, literature on other cultural stressors such as acculturation stress (Castillo et al., 2015; Piña-Watson, Dornhecker, & Salinas, 2015) and ethnic discrimination (Brondolo et al., 2015) has indicated that they have a stronger adverse effect on mental health and substance use behavior among men than women. One explanation for this differential effect is that Hispanic women may have larger and more diverse social networks (Alcántara, Molina, & Kawachi, 2015) and are more likely than men to use constructive coping strategies (e.g., seeking social support) that may buffer the adverse effects on health risk behaviors such as alcohol use (Araújo & Borrell, 2006). Immigration stress may also be associated with higher alcohol consumption among men because men are more likely to use alcohol to cope with stress (Eaton et al., 2012). Participants in our sample had resided in the U.S. for one year or less; thus, the association between immigration stress and alcohol use may be particularly pronounced among men because drinking norms for men in the U.S. and Latin America tend to be relatively similar; however, drinking norms for women are more conservative in Latin America compared to the U.S. (Caetano & Clark, 2003).

In addition to gender, sociopolitical factors such as *immigration status*, for instance, being a documented immigrant (authorized to enter and reside in the U.S.), or undocumented immigrant (not authorized to enter and reside in the U.S.), may influence levels of

immigration stress (Arbona et al., 2010). Perhaps the most notable reason being that undocumented immigrants experience heightened stress due to the possibility of being deported (Pérez, & Fortuna, 2005; Sullivan & Rehm, 2005). Immigration status may also limit access to health services for undocumented immigrants (Martinez et al., 2015); which in turn, may increase the use of maladaptive strategies (e.g., alcohol consumption) to cope with immigration stress. Given that immigration status can be a sensitive topic of discussion, research studies seldom inquire about it (Arbona et al., 2010); thus, little is known whether immigration status may modify the relationship between immigration stress and alcohol use. Finally, it should be noted that compared to other Hispanic immigrants, Cuban immigrants are less likely to be deported because they may seek political asylum once they enter the United States and can apply for resident status one year after immigrating (see Cuban Adjustment Act of 1966).

## Social Support

*Social support* is a multidimensional construct that refers to an individual's social network and the degree to which members of the social network serve particular functions (Cohen, 2004; Sherbourne & Stewart, 1991). One functional dimension of social support is *emotional support*, which provides empathetic understanding and promotes the expressions of feelings (Sherbourne & Stewart, 1991). Other functional dimensions are *informational support*, which provides advice, information, guidance or feedback; and *tangible support*, which includes the provision of material aid or behavioral assistance (Sherbourne & Stewart, 1991). Lastly, *positive social interaction support* is the availability of people to engage in social activities; and *affectionate support* is the availability of people that can provide affection (Sherbourne & Stewart, 1991).

Social support is a key component of the *Stress Buffering Model*, which proposes that higher levels of social support help an individual cope with stressors more effectively; thus, mitigating the effect of stress on maladaptive outcomes such as substance use (Cohen, 2004). Quantitatively, the Stress Buffering Model can be examined by testing the interaction between social support and stress (Cohen, 2004). Prior research suggests that enhancing social support among Hispanics may function as a protective factor against excessive alcohol use (De La Rosa, Holleran, Rugh, & MacMaster, 2005; De La Rosa & White, 2001). However, no prior studies have examined if social support *buffers* the effect of immigration stress on alcohol use behaviors.

## Present Study

Based on the body of work reviewed above, the following hypotheses were proposed. *Hypothesis one*, higher levels of immigration stress would be associated with higher alcohol use severity. *Hypothesis two*, gender, immigration status, and social support would moderate the association of immigration stress with alcohol use severity. Specifically, immigration stress would have a stronger adverse effect on men compared to women. Similarly, immigration stress would have a stronger adverse effect on undocumented immigrants compared to documented immigrants. Lastly, higher levels of social support would mitigate the adverse effect of immigration stress on alcohol use severity.

## Method

### Participants and Procedures

The sample consisted of 527 recent Hispanic immigrants living in Miami-Dade County. This study was approved by the institutional review board of Florida International University. Inclusion criteria were: (a) being between the ages of 18 and 34 years old; (b) self-identifying as Hispanic; (c) having immigrated to the U.S. from a Latin American country within one year prior to interview; (d) residing within Miami-Dade County; and (e) intending to stay in the U.S. for at least 3 years.

Most participants reported being male (54.2%). The sample had a mean age of 26.95 ( $SD = 4.98$ ) and had resided in the U.S. for 6.75 months ( $SD = 3.13$ ). With regard to country of origin, 42% of participants emigrated from Cuba, 17.6% from Colombia, 12.5% from Honduras, 8.7% from Nicaragua, and the remainder were from other Latin American countries. The sample included undocumented immigrants (30.4%); however, no Cuban immigrants in the sample were undocumented. Table 1 presents the means, standard deviations, and frequencies by gender for all variables used in subsequent analyses. Table 2 shows bivariate correlations for variables used in the regression analyses.

Respondent-driven sampling was the primary recruitment strategy. This technique is an effective strategy to recruit participants from difficult-to-reach populations (Salganik & Heckathorn, 2004). Each participant (*the seed*) was encouraged to refer three individuals from his or her egocentric social network who met eligibility criteria. Seeds were recruited with informational flyers posted in neighborhoods with a high proportion of Hispanic inhabitants, community health centers, and health fairs targeting Hispanics. This procedure was followed for a maximum of seven enrolled participants per seed.

Trained and supervised bilingual research staff obtained written consent from all participants and conducted all interviews in Spanish. All interviews were confidential and were completed at a location agreed upon by both the research staff and participant. Each interview required approximately one hour to complete. For their participation, participants received \$50.

### Measures

**Demographics**—Self-reported demographic information include age, months in the U.S., gender (dummy coded 0 = female, 1 = male), education level (0 = high school, 1 = more than high school), employment status (0 = not employed, 1 = employed), partner status (0 = has partner, 1 = no partner), and country of origin (0 = Cuba, 1 = non-Cuban).

A key demographic variable was immigration status. Prior to inquiring about immigration status, participants were informed/reminded that a certificate of confidentiality was obtained from the National Institutes of Health to further secure confidentiality. Participants were then asked to self-report their immigration status in the U.S. at the time of the assessment. A total of fourteen possible categories were provided, including temporary or permanent resident, temporary work visa; and undocumented or expired visa. These categories were then recoded into a dichotomous variable (0 = undocumented, 1 = documented).

**Language Proficiency**—English proficiency was assessed by asking participants, “How well do you speak English?” Similarly, Spanish proficiency was assessed by asking participants, “How well do you speak Spanish?” Response choices for both items were on a 5-point Likert-type scale ranging from 1 (*I don’t speak/understand*) to 5 (*I speak it very well*).

**Pre-immigration Alcohol Use**—Frequency and quantity of alcohol use prior to immigrating was documented using the Spanish version of the Timeline Follow-back Interview (Gil, Wagner, & Tubman, 2004; Sobell & Sobell, 1992). These data were obtained using a calendar format to provide temporal cues to facilitate recall of days when alcohol was consumed. Alcohol use frequency was calculated by summing the total number of days alcohol was consumed during the last 90 days prior to immigrating. Alcohol use quantity was calculated by the average number of standard drinks consumed on days of alcohol use during the last 90 days prior to immigrating.

**Social Support**—Dimensions of social support were measured using the Medical Outcomes Study Social Support Survey (Sherbourne & Stewart, 1991). This measure included four subscales: emotional/informational support, tangible support, affectionate support, and positive social interaction support. Response choices for all subscales were on a 5-point Likert-type scale ranging from 1 (*None of the time*) to 5 (*All of the time*). Mean scores indicated higher levels of social support for each respective subscale. *Emotional/informational support* is a seven-item subscale, and a sample item is: “Someone to confide in or talk to about yourself or your problems.” The reliability coefficient for emotional/informational support was ( $\alpha = .95$ ). *Tangible support* is a four-item subscale, and a sample item is: “Someone to take you to the doctor if you needed it.” The reliability coefficient for tangible support was ( $\alpha = .92$ ). *Affectionate support* is three-item subscale and a sample item is: “Someone who shows you love and affection.” The reliability coefficient for affectionate support was ( $\alpha = .90$ ). *Positive social interaction support* is a three-item subscale and sample item is: “Someone to do something enjoyable with.” The reliability coefficient for positive social interaction support was ( $\alpha = .90$ ).

**Immigration Stress:** Immigration stress was assessed with the corresponding scale of the Hispanic Stress Inventory, which consists of 18 self-reported items that have been validated in Spanish (Cervantes et al., 1991). In this scale, participants first indicated if they had or had not experienced a particular stressor (0 = no, 1 = yes). If a stressor was endorsed, then a follow-up question was asked to appraise how stressful that particular event was by responding on a 5-point Likert-type scale ranging from 1 (*Not at all worried/tense*) to 5 (*Extremely worried/tense*). Stress items that were reported as not occurring by participants were coded as “1” (*Not at all worried/tense*) for data analyses. Mean scores indicated higher levels of immigration stress. A sample item is; “I have felt that I will never regain the status and respect I had in my home country.” The reliability coefficient for the immigration stress scale was ( $\alpha = .92$ ).

**Alcohol Use Severity:** Alcohol use severity post-immigration was measured with the Alcohol Use Disorder Identification Test (AUDIT), which has been validated in Spanish



(Babor, Higgins-Biddle, Saunders, & Monteiro, 2001). The AUDIT consists of 10 self-reported items with varied response choices on a Likert-type scale ranging from 0 to 4. Summed scores range from 0 to 40 with higher scores indicating higher alcohol use severity. A sample item is: “Has a relative or friend or a doctor or another health worker been concerned about your drinking or suggested you cut down?” The reliability coefficient for the AUDIT was ( $\alpha = .81$ ).

**Analytic Plan**—The analytic plan included three steps. First, we computed descriptive statistics and correlations for all variables used in the regression analyses. Second, we estimated the association of immigration stress with alcohol use severity using hierarchical multiple regression (HMR). All variables were entered into the HMR model in a specified order so that each predictor contributed to the explanatory variance of the outcome variable (i.e., alcohol use severity) after controlling for the variance explained by the previous variables (Petrocelli, 2003). Predictor variables were grouped into three broad domains and entered in the following order: (a) *demographic variables* (i.e., age, gender, education level, employment status, partner status, country of origin, immigration status, Spanish proficiency, and English proficiency); (b) *pre-immigration alcohol use* (i.e., frequency and quantity of alcohol use in the last 90 days prior to immigrating); (c) dimensions of social support; and (d) immigration stress. Immigration stress was the last variable entered in the model to determine the extent to which it uniquely predicted alcohol use severity above and beyond the other predictors.

In the third step of the analytic plan, using PROCESS v2.13 (Hayes, 2013) we conducted moderation analyses to examine if gender, immigration status, and dimensions of social support influenced the direction and/or strength of the association of immigration stress with alcohol use severity. It should be noted that PROCESS only produces confidence intervals for unstandardized regression coefficients; therefore, standardized regression coefficients were estimated separately. All moderation analyses were conducted with 10,000 bootstrap iteration and controlled for the demographic variables used in the HMR, pre-immigration drinking behavior, and dimensions of social support not used in the interaction term.

## Results

Table 1 reports descriptive statistics by gender for all study variables and Table 2 shows bivariate correlations for all study variables.

### Hierarchical Multiple Regression

Table 3 presents the unstandardized ( $b$ ) and standardized ( $\beta$ ) regression coefficients from the HMR analysis. Results indicate that 53.1% of the variance of alcohol use severity was accounted for by all predictor variables entered in the regression model. The first block of the model included demographic variables that accounted for 18.3% of the variance of alcohol use severity,  $R^2 = 18.3$ ,  $F(10, 509) = 11.39$ ,  $p < .001$ . The second block added pre-immigration drinking behavior, which accounted for 31.3% of the variance of alcohol use severity,  $R^2 = 31.3$ ,  $F(2, 507) = 157.76$ ,  $p < .001$ . The third block introduced dimensions of social support, adding 2.2% of the explained variance of alcohol use severity  $R^2 = 2.2$ ,  $F(4, 503) = 5.78$ ,  $p < .001$ . After controlling for all other predictor variables in the regression

model, the fourth and final block added immigration stress, which accounted for 1.2% of the variance of alcohol use severity  $R^2 = 1.2, F(1, 502) = 13.27, p = .001$ .

Standardized beta coefficients from the final regression model showed that gender ( $\beta = .16, p = .001$ ), Spanish proficiency ( $\beta = -.08, p = .03$ ), number of drinking days prior to immigrating ( $\beta = .41, p = .001$ ), number of drinks prior to immigrating ( $\beta = .25, p = .001$ ), affectionate social support ( $\beta = -.22, p = .001$ ), and immigration stress ( $\beta = .15, p = .001$ ) had statistically significant associations with alcohol use severity. No other variables in the model were statistically significant.

### Moderation Analyses

The first moderation model indicated that gender moderated the association between immigration stress and alcohol use severity ( $\beta = .21, p = .002; b = .26, 95\% \text{ CI } [.10, .42]$ ) adding 1.0% to the explained variance above and beyond the HMR,  $R^2 = 1.0, F(1, 501) = 7.23, p = .01$ . Conditional effects indicated that higher levels of immigration stress had an adverse effect on alcohol use severity for men ( $\beta = .23, p = .001; b = .29, 95\% \text{ CI } [.17, .40]$ ), but not among women ( $\beta = .02, p > .05; b = .03, 95\% \text{ CI } [-.11, .17]$ ). The second moderation model indicated that immigration status did not moderate ( $\beta = -.06, p > .05; b = -.07, 95\% \text{ CI } [-.27, .11]$ ) the association between immigration stress and alcohol use severity; therefore, conditional effects could not be interpreted.

The following moderating effects were observed for dimensions of social support. Emotional/informational support moderated the association between immigration stress and alcohol use severity ( $\beta = -.08, p = .008; b = -.11, 95\% \text{ CI } [-.19, -.03]$ ), which added 1.0% to the explained variance above and beyond the HMR,  $R^2 = 1.0, F(1, 501) = 6.97, p = .01$ . Conditional effects indicated that the effect of immigration stress on alcohol use severity was lower at the mean level of emotional/informational support ( $\beta = .14, p = .001; b = .17, 95\% \text{ CI } [.08, .27]$ ), compared to lower levels (1 *SD* below the mean) of emotional/informational support ( $\beta = .23, p = .001; b = .28, 95\% \text{ CI } [.16, .40]$ ). There was no statistically significant effect detected at the upper level (1 *SD* above the mean) of emotional/informational support.

Tangible support moderated the association between immigration stress and alcohol use severity ( $\beta = -.08, p = .009; b = -.10, 95\% \text{ CI } [-.18, -.02]$ ) adding 1.0% to the explained variance above and beyond the HMR,  $R^2 = 1.0, F(1, 501) = 5.89, p = .02$ . Conditional effects indicated that higher levels of tangible support buffered the effect of immigration stress on alcohol use severity. For instance, the effect of immigration stress on alcohol use severity was ( $\beta = .23, p = .001; b = .26, 95\% \text{ CI } [.14, .38]$ ) at lower levels (1 *SD* below the mean) of tangible support. In turn, the effect of immigration stress was lower at the mean level of tangible support ( $\beta = .14, p = .001; b = .17, 95\% \text{ CI } [.07, .26]$ ), and the effect was lowest at the upper level (1 *SD* above the mean) of tangible support ( $\beta = .07, p = .05; b = .11, 95\% \text{ CI } [.01, .22]$ ).

Affectionate support moderated the association between immigration stress and alcohol use severity ( $\beta = -.10, p = .003; b = -.14, 95\% \text{ CI } [-.22, -.05]$ ) adding 1.0% to the explained variance above and beyond the HMR,  $R^2 = 1.0, F(1, 501) = 9.11, p = .01$ . Conditional effects indicated that higher levels of affectionate support reduced the effect of immigration



stress on alcohol use severity. The effect of immigration stress on alcohol use severity was ( $\beta = .24, p = .001; b = .29, 95\% \text{ CI } [.17, .41]$ ) at lower levels (1 *SD* below the mean) of affectionate support, ( $\beta = .14, p = .001; b = .17, 95\% \text{ CI } [.07, .26]$ ), at the mean level of affectionate support, and ( $\beta = .09, p = .05; b = .11, 95\% \text{ CI } [.01, .21]$ ) at the upper level (1 *SD* above the mean) of affectionate support.

Positive interaction support moderated the association between immigration stress and alcohol use severity ( $\beta = -.12, p = .001; b = -.16, 95\% \text{ CI } [-.24, -.08]$ ), which added 1.3% to the explained variance above and beyond the HMR,  $R^2 = 1.3, F(1, 501) = 14.58, p = .001$ . Conditional effects indicated that the effect of immigration stress on alcohol use severity was lower at the mean level of positive interaction support ( $\beta = .14, p = .001; b = .17, 95\% \text{ CI } [.07, .26]$ ), compared to lower levels (1 *SD* below the mean) of positive interaction support ( $\beta = .26, p = .001; b = .31, 95\% \text{ CI } [.20, .43]$ ). There was no statistically significant effect detected at the upper level (1 *SD* above the mean) of positive interaction support.

## Discussion

The present study advances in our understanding of the link between immigration stress and alcohol use in the understudied and underserved population of recent Hispanic immigrants. Findings may be of public health and clinical relevance because they suggest that: (a) higher immigration stress was associated with higher alcohol use severity; (b) immigration stress had a stronger effect on men, compared to women; (c) immigration status did not moderate the relation between immigration stress and alcohol use severity; (d) and social support mitigated the effect of immigration stress on alcohol use severity.

This study adds to the sparse literature on cultural stress, specifically immigration stress, and its association with substance use behavior among recent Hispanic immigrants. Based on these findings, we recommended that health service providers (e.g., nurses, physicians, social workers, and psychologists) working with Hispanic immigrants consider respectfully inquiring about their general experiences as immigrants; and if needed conduct or refer for a formal assessment of cultural stress (Cano, Castillo, Castro, de Dios, & Roncancio, 2014; Hovey & Magaña, 2002). Health service providers from various disciplines should be aware of the needs and barriers of this underserved population because immigrants may be more receptive to seeking help from general health providers than from mental health service providers (Hovey & Magaña, 2002). Further, access to these health services could be increased by developing community partnerships with sites (e.g., religious institutions) that are perceived as safe and familiar (Hovey & Magaña, 2002; Velásquez & Burton, 2004).

### The Role of Gender

Immigration stress may have had a stronger adverse effect on the alcohol use severity among men than women for several reasons. First, consistent with other research on cultural stressors (Araújo & Borrell, 2006; Pérez et al., 2008), men reported higher levels of immigration stress than women. Although differences in employment status have been cited as a factor that may explain why men report higher exposure to some cultural stressors (e.g., ethnic discrimination; Gorman et al., 2010), in our sample we did not find any statistically

significant gender differences in employment status. Yet, it has been suggested that independent of employment status, Hispanic men encounter cultural stressors more frequently in the U.S. because they may be perceived as threatening, whereas Hispanic women may be perceived as “exotic” (Bailey, 2013). Furthermore, exposure to some cultural stressors may affect men more negatively because they may threaten notions of masculinity and may lower self-perceptions of social status and power (Gorman et al., 2010; Kulis, Marsiglia, & Nieri, 2009). On the other hand, women may report less immigration stress because they may perceive advancement in social status after immigrating due to gains in independence and decision-making ability (Gorman et al., 2010). Another reason the link between immigration stress and alcohol use may have been stronger among men is that men are more likely to use alcohol to cope with stress while women are more likely to develop internalizing symptoms (Eaton et al., 2012). Thus, service providers may want to discuss gender-specific attitudes about alcohol and target alcohol use expectancies (e.g., drinking alcohol will help reduce stress), especially among men (Colon, 1998).

### **The Role of Immigration Status**

Immigration status did not moderate the association between immigration stress and alcohol use severity. This finding suggests immigration stress was associated with higher alcohol use severity regardless of immigration status. One explanation for this could be that the measure of immigration stress in this study was not limited to difficulties directly linked to immigration status (e.g., fear of deportation). It is also likely that *context* matters. Immigration stress might not have functioned as a moderator given the geographic location of the study. Miami-Dade County, unlike most counties in the United States, has a population that is 66.2% Hispanic and 51.3% of the people are immigrants (U.S. Census Bureau, 2015b). Furthermore, the city of Miami, located in Miami-Dade County, is considered a *sanctuary city*, meaning that there are no policies designed to prosecute undocumented immigrants. It may be the case that immigration status plays a stronger role in regard to immigration stress and alcohol use in cities (e.g., Phoenix, Arizona) that have laws (e.g., S.B. 1070) that are perceived as hostile toward undocumented immigrants. Perhaps the best strategy to examine the influence of geographic context is via a multisite study.

### **The Role of Social Support**

Consistent with the Stress Buffering Model, results from this study indicate that various dimensions of social support weaken the effect of immigration stress on alcohol use severity. Thus, health service providers working with recent Hispanic immigrants individually may encourage clients to increase and utilize their social support networks (Uchino, 2004), and individuals with small social networks in the U.S. may benefit from communicating with transnational social networks (Alcántara et al., 2015). Group interventions that aim to provide social support through the family may focus on “training” family members to be supportive (Uchino, 2004).

Other studies have indicated that higher levels of immigration stress were associated with lower levels of family cohesion (Dillon, De La Rosa, & Ibañez, 2013). This is worth noting because lower family cohesion may be linked to lower perceptions of social support (De La

Rosa & White, 2001). Thus, interventions that aim to improve family cohesion may in turn increase perceptions and/or availability of social support (Prado et al., 2010).

### Limitations

Some limitations should be considered when interpreting the findings of this study. First, due to the cross-sectional design, a causal or directional order of the associations found cannot be made. In our analyses we attempted to reduce this limitations by controlling for pre-immigration alcohol use behavior with the use of the Timeline Follow-back Interview. Second, our study utilized self-report measures that are vulnerable to participant misrepresentation and error. Nonetheless, self-reports of alcohol use tend to converge well with biological measures among the general population (Del Boca & Darkes, 2003) and Hispanics (Dillon, Turner, Robbins, & Szapocznik, 2005). Third, generalizability was limited because a non-probability sampling technique was used and all participants lived in South Florida; thus the distribution of immigrants by country of origin differed from other areas in the United States (e.g., larger percentage of Cubans in South Florida compared to larger percentage of Mexican Americans elsewhere). Therefore, additional studies are needed with more diverse participants that reflect the broader Hispanic population. Fourth, the parent study did not include measures of internalizing symptoms, which is a limitation because women may be more likely to develop internalizing symptoms than consume alcohol in response to stress. Lastly, the parent study did not include a validated measure of acculturation; thus, acculturation could not be examined in the present analyses. We attempted to reduce this limitation by including items of language proficiency and length of stay in the United States, both of which serve as proxy measures that correlate highly with validated measures of acculturation (Cruz, Marshall, Bowling, & Villaveces, 2008).

### Conclusion

Despite the limitations noted above, the present study adds to the limited literature on cultural stress, specifically immigration stress and alcohol use, among recently immigrated Hispanic adults. Results indicated that higher levels of immigration stress were associated with higher alcohol use severity. Findings from this study also highlight that the effects of immigration stress may vary across gender and that social support may play a role in buffering the adverse effects of immigration stress. Thus, the design of alcohol use interventions for recent Hispanic immigrants may be enhanced if they are gender-specific and help increase levels of social support.

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### References

Alcántara C, Molina KM, Kawachi I. Transnational, social, and neighborhood ties and smoking among Latino immigrants: Does gender matter. *American Journal of Public Health*. 2015; 105:741–749. doi:10.2105/AJPH.2014.301964. [PubMed: 25121808]

- Araújo BY, Borrell LN. Understanding the link between discrimination, mental health outcomes, and life chances among Latinos. *Hispanic Journal of Behavioral Sciences*. 2006; 28:245–266. doi: 10.1177/0739986305285825.
- Arbona C, Olvera N, Rodriguez N, Hagan J, Linares A, Wiesner M. Acculturative stress among documented and undocumented Latino immigrants in the United States. *Hispanic Journal of Behavioral Sciences*. 2010; 32:362–384. doi:10.1177/0739986310373210. [PubMed: 25484488]
- Arellano-Morales L, Roesch SC, Gallo LC, Emory KT, Molina KM, Gonzalez P, Brondolo E. Prevalence and correlates of perceived ethnic discrimination in the Hispanic Community Health Study/Study of Latinos Sociocultural Ancillary Study. *Journal of Latina/o Psychology*. in press. doi: 10.1037/lat0000040.
- Babor, TF., Higgins-Biddle, JC., Saunders, JB., Monteiro, MG. *The Alcohol Use Disorders Identification Test: Guidelines for use in primary health care*. 2nd. World Health Organization; Geneva, CH: 2001.
- Bacio G, Moore A, Karno M, Ray L. Determinants of problem drinking and depression among Latino day laborers. *Substance Use and Misuse*. 2014; 49:1039–1048. doi: 10.3109/10826084.2013.852577. [PubMed: 24779503]
- Bailey, EJ. *The new face of America: How the emerging multiracial, multiethnic majority is changing the United States*. Praeger; Santa Barbara, CA: 2013.
- Borges G, Rafful C, Benjet C, Tancredi DJ, Saito N, Aguilar-Gaxiola S, Breslau J. Mexican immigration to the U.S. and alcohol and drug use opportunities: Does it make a difference in alcohol and/or drug use. *Drug and Alcohol Dependence*. 2012; 125:S4–S11. doi:10.1016/j.drugalcdep.2012.05.007. [PubMed: 22658285]
- Brondolo E, Monge A, Agosta J, Tobin JN, Cassells A, Stanton C, Schwartz J. Perceived ethnic discrimination and cigarette smoking: Examining the moderating effects of race/ethnicity and gender in a sample of Black and Latino urban adults. *Journal of Behavioral Medicine*. 2015; 38:689–700. doi:10.1007/s10865-015-9645-2. [PubMed: 26054448]
- Cano MA, Castillo LG, Castro Y, de Dios MA, Roncancio AM. Acculturative stress and depressive symptomatology among Mexican and Mexican American students in the US: Examining associations with cultural incongruity and intragroup marginalization. *International Journal for the Advancement of Counselling*. 2014; 36:136–149. doi:10.1007/s10447-013-9196-6.
- Cano MA, de Dios MA, Castro Y, Vaughan EL, Castillo LG, Lorenzo-Blanco EI, Molleda LM. Alcohol use severity and depressive symptoms among late adolescent Hispanics: Testing associations of acculturation and enculturation in a bicultural transaction model. *Addictive Behaviors*. 2015; 49:78–82. doi:10.1016/j.addbeh.2015.06.002. [PubMed: 26092776]
- Cano MA, Schwartz SJ, Castillo LG, Romero AJ, Huang S, Lorenzo-Blanco EI, Szapocznik J. Depressive symptoms and externalizing behaviors among Hispanic immigrant adolescents: Examining longitudinal effects of cultural stress. *Journal of Adolescence*. 2015; 42:31–39. doi: 10.1016/j.adolescence.2015.03.017. [PubMed: 25899132]
- Castillo LG, Navarro RL, Walker JEO, Schwartz SJ, Zamboanga BL, Whitbourne SK, Caraway SJ. Gender matters: The influence of acculturation and acculturative stress on Latino college student depressive symptomatology. *Journal of Latina/o Psychology*. 2015; 3:40–55. doi:10.1037/lat0000030.
- Cervantes RC, Castro FG. Stress, coping, and Mexican American mental health: A systematic review. *Hispanic Journal of Behavioral Sciences*. 1985; 7:1–73. doi:10.1177/07399863850071001.
- Cervantes RC, Padilla AM, Salgado de Snyder N. The Hispanic Stress Inventory: A culturally relevant approach to psychosocial assessment. *Psychological Assessment: A Journal of Consulting and Clinical Psychology*. 1991; 3:438–447. doi:10.1037/1040-3590.3.3.438.
- Cohen S. Social relationships and health. *American Psychologist*. 2004; 59:676–684. doi: 10.1037/0003-066X.59.8.676. [PubMed: 15554821]
- Colon E. Alcohol use among Latino males: Implications for the development of culturally competent prevention and treatment services. *Alcoholism Treatment Quarterly*. 1998; 16:147–161. doi: 10.1300/J020v16n01\_09.

- Cruz TH, Marshall SW, Bowling JM, Villaveces A. The validity of a proxy acculturation scale among U.S. Hispanics. *Hispanic Journal of Behavioral Sciences*. 2008; 30:425–446. doi: 10.1177/0739986308323653.
- De La Rosa MR, Holleran LK, Rugh D, MacMaster SA. Substance abuse among U.S. Latinos: A review of the literature. *Journal of Social Work Practice in the Addictions*. 2005; 5:1–20. doi: 10.1300/J160v5n01\_01.
- De La Rosa M, White M. The role of social support systems in the drug use behavior of Hispanics revisited. *Journal of Psychoactive Drugs*. 2001; 33:233–241. doi: 10.1080/02791072.2001.10400570. [PubMed: 11718316]
- Del Boca FK, Darkes J. The validity of self-reports of alcohol consumption: state of the science and challenges for research. *Addiction*. 2003; 98:1–12. doi:10.1046/j.1359-6357.2003.00586.x.
- Dillon FR, De La Rosa M, Ibañez GE. Acculturative stress and diminishing family cohesion among recent Latino immigrants. *Journal of Immigrant and Minority Health*. 2013; 15:484–491. doi: 10.1007/s10903-012-9678-3. [PubMed: 22790880]
- Dillon FR, Turner CW, Robbins MS, Szapocznik J. Concordance among biological, interview, and self-report measures of drug use among African American and Hispanic adolescents referred for drug abuse treatment. *Psychology of Addictive Behaviors*. 2005; 19:404–413. doi: 10.1037/0893-164X.19.4.404. [PubMed: 16366812]
- Eaton NR, Keyes KM, Krueger RF, Balsis S, Skodol AE, Markon KE, Hasin DS. An invariant dimensional liability model of gender differences in mental disorder prevalence: Evidence from a national sample. *Journal of Abnormal Psychology*. 2012; 121:282–288. doi:10.1037/a0024780. [PubMed: 21842958]
- Ehlers CL, Gilder DA, Criado JR, Caetano R. Acculturation stress, anxiety disorders, and alcohol dependence in a select population of young adult Mexican Americans. *Journal of Addiction Medicine*. 2009; 3:227–433. doi:10.1097/ADM.0b013e3181ab6db7. [PubMed: 20161543]
- Field CA, Cabriaes JA, Woolard RH, Tyroch AH, Caetano R, Castro Y. Cultural adaptation of a brief motivational intervention for heavy drinking among Hispanics in a medical setting. *BMC Public Health*. 2015; 15:724. doi:0.1186/s12889-015-1984-y. [PubMed: 26223781]
- Gil AG, Wagner EF, Tubman JG. Culturally sensitive substance abuse intervention for Hispanic and African American adolescents: Empirical examples from the Alcohol Treatment Targeting Adolescents in Need (ATTAIN) Project. *Addiction*. 2004; 99:140–150. doi:10.1111/j.1360-0443.2004.00861.x. [PubMed: 15488112]
- Gorman BK, Read JNG, Krueger PM. Gender, acculturation, and health among Mexican Americans. *Journal of Health and Social Behavior*. 2010; 51:440–457. doi:10.1177/0022146510386792. [PubMed: 21131620]
- Hayes, AF. *Introduction to mediation, moderation, and conditional analysis: A regression-based approach*. The Guilford Press; New York, NY: 2013.
- Hovey JD, Magaña CG. Psychosocial predictors of anxiety among immigrant Mexican migrant farmworkers: Implications for prevention and treatment. *Cultural Diversity and Ethnic Minority Psychology*. 2002; 8:274–289. doi:10.1037/1099-9809.8.3.274. [PubMed: 12143104]
- Hunt LM, Schneider S, Comer B. Should acculturation be a variable in health research? A critical review of research on U.S. Hispanics. *Social Science and Medicine*. 2004; 59:973–986. doi: 10.1016/j.socscimed.2003.12.009. [PubMed: 15186898]
- Kulis S, Marsiglia FF, Nieri T. Perceived ethnic discrimination versus acculturation stress: Influences on substance use among Latino youth in the Southwest. *Journal of Health and Social Behavior*. 2009; 50:443–459. doi:10.1177/002214650905000405. [PubMed: 20099450]
- Lazarus RS. Acculturation isn't everything. *Applied Psychology*. 1997; 46:39–43. doi:10.1111/j.1464-0597.1997.tb01089.x.
- Lee CS, Colby SM, Rohsenow DJ, López SR, Hernández L, Caetano R. Acculturation stress and drinking problems among urban heavy drinking Latinos in the Northeast. *Journal of Ethnicity in Substance Abuse*. 2013; 12:308–320. doi:10.1080/15332640.2013.830942. [PubMed: 24215224]
- Loury S, Kulbok P. Correlates of alcohol and tobacco use among Mexican immigrants in rural North Carolina. *Family and Community Health*. 2007; 30:247–256. doi:10.1097/01.FCH.0000277767.00526.f1. [PubMed: 17563486]

- Martinez O, Wu E, Sandfort T, Dodge B, Carballo-Dieguez A, Pinto R, Chavez-Baray S. Evaluating the impact of immigration policies on health status among undocumented immigrants: A systematic review. *Journal of Immigrant and Minority Health*. 2015; 17:947–970. doi:10.1007/s10903-013-9968-4. [PubMed: 24375382]
- Motel S, Pattern E. Statistical portrait of Hispanics in the United States. 2013/2011 Retrieved July 24, 2015 <http://www.pewhispanic.org/2013/02/15/statistical-portrait-of-hispanics-in-the-united-states-2011>.
- National Institute on Alcohol Abuse and Alcoholism. Alcohol and the Hispanic community. 2013 Retrieved July 24, 2015 from <http://pubs.niaaa.nih.gov/publications/HispanicFact/HispanicFact.htm>.
- Pérez DJ, Fortuna L, Alegría M. Prevalence and correlates of everyday discrimination among U.S. Latinos. *Journal of Community Psychology*. 2008; 36:421–433. doi:10.1002/jcop.20221. [PubMed: 19960098]
- Pérez MC, Fortuna L. Psychosocial stressors, psychiatric diagnoses, and utilization of mental health services among undocumented immigrant Latinos. *Journal of Immigrant and Refugee Services*. 2005; 3:107–123. doi:10.1300/J191v03n01\_06.
- Petrocelli JV. Hierarchical multiple regression in counseling research: Common problems and possible remedies. *Measurement and Evaluation in Counseling and Development*. 2003; 36:9–22.
- Piña-Watson B, Dornhecker M, Salinas SR. The Impact of Bicultural Stress on Mexican American Adolescents' Depressive Symptoms and Suicidal Ideation Gender Matters. *Hispanic Journal of Behavioral Sciences*. 2015; 37:342–364. doi:10.1177/0739986315586788.
- Prado G, Huang S, Maldonado-Molina M, Bandiera F, Schwartz SJ, de la Vega P, Pantin H. An empirical test of ecodevelopmental theory in predicting HIV risk behaviors among Hispanic youth. *Health Education and Behavior*. 2010; 37:97–114. doi:10.1177/1090198109349218. [PubMed: 20130302]
- Salganik MJ, Heckathorn DD. Sampling and estimation in hidden populations using respondent-driven sampling. *Sociological Methodology*. 2004; 34:193–240. doi:10.1111/j.0081-1750.2004.00152.x.
- Sherbourne CD, Stewart AL. The MOS social support survey. *Social Science and Medicine*. 1991; 32:705–714. doi:10.1016/0277-9536(91)90150-B. [PubMed: 2035047]
- Sobell, LC., Sobell, MB. Timeline followback: A technique for assessing self-reported alcohol consumption. In: Litten, RZ., Allen, J., editors. *Measuring alcohol consumption: Psychosocial and biological methods*. Humana Press; Mahwah, NY: 1992. p. 41-72.
- Sullivan MM, Rehm R. Mental health of undocumented Mexican immigrants: A review of the literature. *Advances in Nursing Sciences*. 2005; 28:240–251.
- Uchino, BN. *Social support and physical health: Understanding the health consequences of relationships*. Yale University Press; New Haven, CT: 2004.
- Umaña-Taylor, AJ., Alfaro, EC. Acculturative stress and adaptation. In: Villarruel, FA, Carlo, G, Grau, JM, Azmitia, M, Cabrera, NJ., Chahin, TJ., editors. *Handbook of U.S. Latino psychology: Developmental and community-based perspectives*. Sage Publication, Inc.; Thousand Oaks, CA: 2009. p. 135-152.
- U.S. Census Bureau. 2014 National population projections: Summary tables. 2015a Retrieved July 24, 2015 from [www.census.gov/population/projections/data/national/2014.html](http://www.census.gov/population/projections/data/national/2014.html).
- U.S. Census Bureau. State and county quick facts: Miami-Dade County, Florida. 2015b Retrieved February 4, 2016 from <http://quickfacts.census.gov/qfd/states/12/12086.html>.
- Velásquez, RJ., Burton, MP. Psychotherapy of Chicano men. In: Velásquez, RJ, Arellano, LM., McNeill, BW., editors. *The handbook of Chicana/o psychology and mental health*. Lawrence Erlbaum Associates; Mahwah, NJ: 2004. p. 177-192.
- Viruell-Fuentes EA. Beyond acculturation: immigration, discrimination, and health research among Mexicans in the United States. *Social Science and Medicine*. 2007; 65:1524–1535. doi:10.1016/j.socscimed.2007.05.010. [PubMed: 17602812]



**Table 1**

## Descriptive Statistics for Study Variables

Variable	Women (n=239)	Men (n=288)	$\chi^2$
	n (%)	n (%)	
Employment Status			
Employed	105 (43.9)	146 (50.7)	2.39
Education Level			
> High School	148 (61.9)	131(45.5)	14.17***
Partner Status			
Single	147 (61.5)	200 (69.4)	3.66
Immigration Status			
Undocumented	56 (23.4)	104 (36.1)	9.93**
Country of Origin			
Cuba	106 (44.4)	116 (40.3)	1.18
	<i>M (SD)</i>	<i>M (SD)</i>	<i>t value</i>
Age	27.21 (5.07)	26.73 (4.90)	1.09
Months in the U.S.	6.75 (3.04)	6.76 (3.21)	-.04
Spanish Proficiency	3.74 (.45)	3.54 (.57)	4.58***
English Proficiency	1.73 (.71)	1.70 (.81)	.40
Emotional/Informational Support	4.31 (.89)	4.07 (1.02)	2.80**
Tangible Support	4.51 (.87)	4.37 (.99)	1.80
Affectionate Support	4.65 (.75)	4.46 (.96)	2.50**
Positive Social Interaction Support	4.36 (.90)	4.30 (.95)	.73
Immigration Stress	1.92 (.78)	2.08 (.92)	-2.11*
Drinking Days in the past 90 days Pre-immigration	3.95 (3.10)	9.01 (12.99)	-5.57***
Number of Drinks in the Past 90 Days Pre-immigration	1.86 (.70)	2.65 (1.41)	-7.11***
Alcohol Use Severity	3.51 (4.78)	7.52 (51)	-8.13***

\*  $p < .05$ ;\*\*  $p < .01$ ;\*\*\*  $p < .001$

Table 2

Bivariate Correlations for Variables Used in Regression Analyses (n = 527)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
1. Age	-																		
2. Gender	-.05	-																	
3. Employed Status	.10*	.07	-																
4. Education Level	.06	-.16**	.02	-															
5. Partner Status	-.21**	.08	.01	-.08	-														
6. Immigration Status	-.13**	-.14**	-.12**	.39**	-.11*	-													
7. Country of Origin	.17**	.05	.16**	-.28**	.10*	-.56**	-												
8. Months in U.S.	.09*	.00	.23**	-.03	-.06	-.04	.10*	-											
9. Spanish Proficiency	.04	-.19**	-.02	.29**	.02	.32**	-.11**	.02	-										
10. English Proficiency	.09	-.02	.03	.25**	.08	.21**	.08	.05	.31**	-									
11. Pre-immigration Drinking Days	.04	.16**	-.04	.06	.09*	.13**	.12**	.09*	.15**	.20**	-								
12. Pre-immigration Number of Drinks	.02	.18**	-.06	-.05	.10*	.02	.14**	.00	.06	.13**	.52**	-							
13. Emotional/Informational Support	.05	-.12**	-.02	.19**	-.08	.29**	-.25**	.00	.25**	.11**	-.05	-.06	-						
14. Tangible Support	-.10*	-.08	-.01	.25**	-.07	.33**	-.33**	.00	.22**	.09*	-.06	-.08	.71**	-					
15. Affection Support	.03	-.11*	-.03	.20**	-.07	.31**	-.30**	.03	.19**	.09*	.01	-.02	.72**	.77**	-				
16. Positive Social Interaction Support	.08	-.03	-.04	.23**	-.05	.33**	-.27**	.03	.22**	.13**	.06	.04	.73**	.68**	.74**	-			
17. Immigration Stress	.18**	.09*	.12**	-.03**	.07	-.54**	.44**	.11*	-.31**	-.29**	.01	.03	-.28**	-.28**	-.26**	-.27**	-		
18. Alcohol Use Severity	.01	.33**	.03	-.08	.16**	-.12**	.25**	.05	-.08	.08	.59**	.44**	-.20**	-.21**	-.23**	-.10*	.23**	-	

\*  $p < .05$ ;

\*\*  $p < .01$

**Table 3**

Regression Coefficients from the Final Model Predicting Alcohol Use Severity (n = 527)

Variable	<i>b</i>	<i>SE</i>	$\beta$
Block 1			
Age	-.07	.04	-.06
Gender	1.98	.41	.16***
Employment Status	.28	.40	.02
Education Level	.32	.44	.03
Partner Status	.57	.42	.04
Immigration Status	.03	.59	.00
Country of Origin	.76	.52	.06
Months in the U.S.	-.04	.06	-.02
Spanish Proficiency	-.92	.41	-.08*
English Proficiency	.22	.29	.03
Block 2			
Drinking Days in the past 90 days Pre-immigration	.15	.02	.41***
Number of Drinks in the past 90 days Pre-immigration	.01	.01	.25***
Block 3			
Emotional/Informational Support	.24	.33	.04
Tangible Support	.15	.35	.02
Affectionate Support	-1.56	.40	-.22***
Positive Social Interaction Support	.35	.34	.05
Block 4			
Immigration Stress	.18	.05	.15***

Note.  $R^2 = 18.3$  for Block 1;  $R^2 = 31.3$  for Block 2;  $R^2 = 2.2$  for Block 3;  $R^2 = 1.2$  for Block 4.

\*  $p < .05$ ;

\*\*  $p < .01$ ;

\*\*\*  $p < .001$