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Pre- to Post-Immigration Alcohol Use Trajectories among Recent Latino Immigrants

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Abstract

The escalation of alcohol use among some Latino immigrant groups as their time in the United States increases has been well-documented. Yet, little is known about the alcohol use behaviors of Latino immigrants prior to immigration. This prospective longitudinal study examines pre- to post-immigration alcohol use trajectories among a cohort of recent Latino immigrants. Retrospective pre-immigration data were collected at baseline from a sample of 455 Cuban, South American and Central American Latinos ages 18–34 who immigrated to the U.S. less than one year prior. Two follow-up assessments (12 months apart) reported on their post-immigration alcohol use in the past 90 days. We hypothesized (a) overall declines in pre- to post-immigration alcohol among recent Latino immigrants and (b) gender/documentation specific effects, with higher rates of alcohol use among males and undocumented participants compared to their female and documented counterparts. Growth curve analyses revealed males had higher levels of pre-immigration alcohol use with steeper declines in post-immigration alcohol use compared to females. Declines in alcohol use frequency were observed for documented, but not undocumented males. No changes in pre- to post-immigration alcohol use were found for documented or undocumented females. This study contributes to the limited knowledge of pre- to post-immigration alcohol use patterns among Latinos in the United States. Future research is needed to identify social determinants associated with the alcohol use trajectories of recent Latino immigrants, as it may inform prediction, prevention, and treatment of problem-drinking behaviors among the largest and fastest growing ethnic minority in the United States.

Keywords

Alcohol use; Timeline Followback; Latino; Immigration; Documentation status

As demographers have observed the rapid growth of the US Latino population, researchers have identified Latinos as being especially vulnerable to alcohol use related health disparities (Chartier & Caetano, 2010). Compared to non-Latino Whites, Latino men experience disproportionate rates of alcohol related consequences including intimate partner

violence, HIV/AIDS, incarceration, as well as the highest prevalence of daily heavy drinking and alcohol-related cirrhosis, of all ethnic or racial groups (Amaro, Arevalo, Gonzalez, Szapocznik, & Iguchi, 2006; Caetano & Clark, 2000; Chartier & Caetano, 2010; NIAAA, 2013). Latino women have historically exhibited lower rates of alcohol use than men. Recent evidence suggests a shift in cultural norms with young Latina women drinking as much or even more than their male counterparts (NIAAA, 2013). Young adult Latina women (18–29) have also emerged as a new risk group for driving under the influence (DUI) with past-year DUI rates more than tripling in size over a 10-year span (Chartier & Caetano, 2010).

The escalation of alcohol use among Latino immigrants as their time in the United States (US) increases is a well-documented phenomenon (Lara, Gamboa, Kahramanian, Morales, & Hayes Bautista, 2005). Acculturation, and in particular, acculturative stress, has consistently been linked with increased alcohol use among Latino women with weak or no relations among men (Mills & Caetano, 2012; Padilla & Borrero, 2006; Zemore, 2005). According to Caplan's (2007) 3 dimensional conceptual framework these are stressors associated with the acculturation process consisting of: a) *instrumental and/or environmental stressors* (e.g., lack of education, financial barriers); b) *social and/or interpersonal stressors* (e.g., loss of social network, loss of social status); and c) *societal stressors* (e.g., discrimination, documentation status).

Within this framework, it has been suggested that context of the immigrant receiving community could extensively impact recent immigrant's experience of acculturative stress and its related health behaviors such as alcohol use (Schwartz et al., 2010). Entering a receiving community without an established Latino immigrant population may exacerbate acculturative stress through a lack of available tangible and intangible supports, unavailability of culturally or linguistically congruent services, and increase the likelihood of discrimination (Schwartz et al., 2010). Conversely, arrival into a receiving community with the presence of a large and influential, Latino immigrant population such Miami-Dade County (site of the present study) where more than half (51%) of its residents are foreign born and 64% are Latinos—could serve to mitigate acculturative stressors and its associated health risks (Stepick & Stepick, 2003; US Census Bureau, 2011).

Despite widespread recognition of the cultural differences that exist between distinct Latino national groups, most previous research on alcohol use among Latino immigrants has been conducted exclusively with Mexican immigrant populations (Borges et al, 2011; Worby & Organista, 2013). Latinos are a very heterogeneous group, and these differences extend to their drinking patterns, which have been found to vastly differ by national origin (Vaeth, Caetano, & Rodriguez, 2012). The limited literature examining alcohol use patterns among Latino national origin groups have found higher rates of alcohol use among South and Central American Latina women compared to their Mexican counterparts (Chartier & Caetano, 2011). Conversely, Mexican men have been found to have higher levels of alcohol use and dependence than South and Central American and Caribbean Latinos (NIAAA, 2013). The documented subgroup differences in the alcohol use behaviors among Latinos, coupled with the paucity of existing research on Latinos immigrating to the US from a

variety of Latin American countries and regions (e.g., Cuba, South and Central America), underscores the need for such investigations.

Additionally, the majority of existing alcohol use investigations with Latino immigrants have been conducted with Latinos several years *after* immigration to the US (Vaeth et al., 2012). Little is known about the *pre-immigration* alcohol use of Latinos or how those behaviors change during the early post-immigration years. Gaining insight on differences in alcohol use patterns of Latino immigrants before and after immigration can provide a richer contextual understanding of how shifts from pre- to post-immigration contexts distinctly impact these behaviors among Latinos.

The present study examines the pre- to post-immigration alcohol use trajectories in a multi-ethnic sample of recent Latino immigrants residing in Miami-Dade County. The Recent Latino Immigrant Study (RLIS), an NIH funded prospective cohort study, was the first investigation to document the pre-immigration alcohol use behaviors in a sample of young adult recent Cuban, South American, and Central American Latino immigrants, as well as the underlying socio-cultural determinants contributing to the trajectories of such behaviors after immigration.

Preliminary study findings utilizing the present sample suggest that contrary to the well-documented escalation of alcohol use among Latino immigrants as their time in the US increases (Warner et al., 2006), immigration to the United States may have health-promoting effects for recent immigrants, at least within the context of certain receiving communities. When compared to national aggregate data, rates for regular, binge, and heavy drinking among this cohort were similar to those of US born Latinos and higher than foreign-born Latino immigrants living in the United States for at least 5-years (De La Rosa et al., 2012a; SAMHSA, 2010). A subsequent longitudinal investigation comparing baseline (T₁) and first follow-up data (T₂) confirmed a reduction in both binge drinking and heavy drinking from pre-immigration levels to two years post-immigration. However, Latino men showed higher rates of binge drinking than Latino women at T₂ (De La Rosa, Dillon, Sastre, & Babino, 2013).

In contrast to the previously aforementioned studies that measured regular, binge and heavy drinking in this sample, the present study examines distinct changes in the overall frequency and quantity of alcohol use overtime. Disaggregating alcohol use by quantity and frequency is important in that a person can potentially have drinking patterns consisting of a high frequency, yet low quantity of alcohol use (i.e., consuming a glass of wine with dinner is a common cultural practice among various Latino subgroups). Conversely, individuals may exhibit drinking patterns characterized by high quantity, and low frequency of alcohol use. For instance, studies have found binge weekend drinking to be prevalent among certain Latino males (i.e., Mexican males) (Caetano, Ramisetty-Mikler, & Rodriguez, 2009). Examining alcohol use in this manner will also allow for the detection of more subtle changes in alcohol use behaviors of recent Latino immigrants than would a categorical measure of problematic drinking behaviors.

The present prospective longitudinal study was conducted to elucidate the pre- to post-immigration alcohol use trajectories by documentation status and gender across the full 3-waves of study data. Based on our prior findings, we hypothesized (a) overall declines in pre- to post-immigration alcohol among recent Latino immigrants (across three time-points) and (b) gender/documentation specific effects, with higher rates of alcohol use among males and undocumented participants compared to their female and documented counterparts. Although measuring acculturation and acculturative stress was beyond the scope of this study, we examined various instrumental/environmental (educational level, annual income) and societal acculturative stressors (documentation status) based on Caplan's (2007) framework and previous literature that may influence alcohol use among recent Latino immigrants.

Method

Procedures

Three waves of data (baseline and two annual follow-ups) from the NIH funded Recent Latino Immigrant Study (RLIS), a longitudinal study examining sociocultural determinants of health among adult Latinos, was collected with approval from the institutional review board of a large university in Miami, FL. During the baseline assessment (ages 18–34; T₁), retrospective data were obtained. For instance, participants were asked to report on their alcohol use patterns in the 90 days prior to immigrating to the United States, highest level of education attained preceding arrival to the US, and personal income in 12 months before immigration. Two follow-up assessments (T₂ & T₃), 12 months apart, collected post-immigration data (i.e., alcohol use patterns in the past 90 days, current level of education, and personal income in the past 12 months).

Inclusion criteria were: being a Latino immigrant, 18–34 years old, who recently immigrated (within one year prior to baseline assessment) to the United States from a Latin American country with the intention of staying in the United States at least 2-years beyond baseline. Respondent-driven sampling was the primary recruitment strategy. This technique is an effective strategy in recruiting participants from difficult-to-reach populations (Salganik & Heckathorn, 2003). Given that approximately 25% of the US Latino population consists of undocumented immigrants (Passel & Cohn, 2008), and that 27% of the present study sample were undocumented immigrants, respondent driven sampling is the most appropriate sampling approach (De La Rosa, Babino, Rosario, Martinez, & Aijaz, 2012b). We asked each participant (*the seed*) to refer three individuals in his/her social network who met eligibility criteria. Seeds were recruited via flyers posted in Miami-Dade County neighborhoods with substantial Latino populations, during Latino health fairs in Miami-Dade County, and through Latino Community Health Centers. This procedure was followed for a maximum of seven legs per seed.

Trained bilingual research staff conducted the surveys. All surveys were conducted in Spanish and completed at a confidential, safe location agreed upon by both the interviewer and participant. Each survey required approximately 1-hour to complete. Participant payments were: \$50, \$30, and \$60 for T₁, T₂, and T₃ respectively.

Participants

The present study was conducted with a sample of (N=455) young adult recent Latino immigrants. Sample demographics are presented in Table 1. The sample was fairly representative of the Miami-Dade County Latino immigrant community, which is 52.7% Cuban, 16.8% South American, 13.1 % Central American, and 3.6% Other Caribbean. Present sample distributions by country/region of origin were as follows: 48.1% Cuban, 24.3% South American, 23.9% Central American, and 1.3% Other Caribbean. Although country/region of origin data for *recent* Latino immigrants in Miami-Dade County is not available, US Census data indicated recent population increases in Miami-Dade County ranging from 102% –117% among certain South American (e.g., Argentines and Venezuelans) and Central American (e.g., Hondurans and Guatemalans) Latino immigrant subgroups (US Census Bureau, 2010). This may explain the over-representation of South and Central Americans in the current study sample.

In regard to participants' documentation status, 82.9% of females and 65.6% of males were documented immigrants. Participants reported relatively high levels of education, with 48.4 % of males and 63.4% of females having at least some training/or college education or above. The mean annual income for females across each time point was (T₁= \$4,658; T₂= \$13,644; T₃=\$17,234). Males reported mean annual income as follows: (T₁= \$4,764; T₂= \$15,475; T₃=\$21,411).

At baseline (T₁), 527 young adult recent Latino immigrants were enrolled and assessed. At first follow-up (T₂), 412 participants were retained (78%). By second follow-up (T₃), 479 participants were assessed, yielding a 91% retention rate. The lower participation rate at T₂ was attributed to insufficient compensation (\$30), which was adjusted accordingly at T₃ (\$60). To assess for sampling bias introduced by attrition, we tested whether retained participants differed from non-retained participants on key pre-immigration demographic variables (immigration status at arrival to US, gender, annual income, education level) and alcohol use quantity and frequency at pre- and post-immigration (T₁ and T₂). A larger number of non-retained participants had undocumented immigration status (62% non-retained, undocumented participants versus 38% non-retained, documented participants), $\chi^2(1, N = 455) = 82.31, p < .001, \eta^2 = .18$. Non-retained participants also tended to be men [$\chi^2(1, N = 455) = 20.82, p < .001, \eta^2 = .06$] and reported lower levels of education, $F(1, 454) = 30.41, p < .001, \eta^2 = .06$. Finally, there were no significant differences in pre-immigration alcohol use frequency or quantity between retained and non-retained participants.

For the present study, we conducted analyses of alcohol use trajectories between documented and undocumented immigrants with participants whose immigration status had not changed from baseline (N=455). Therefore, immigration status was entered as an invaring covariate, allowing for assessment of within-subject changes over time. To assess for sampling bias between the present study sample (N=455) and the full baseline sample of the original study (N=527), Pearson's Chi-square tests were conducted, revealing no significant demographic differences (gender, documentation status, education level, annual income) between samples.

Measures

Sociodemographics—A demographics form assessed, in part, participants' time in the United States, education level (1 = *less than high school*, 2 = *high school*, 3 = *some training / college after high school*, 4 = *bachelor's degree*, 5 = *graduate / professional studies*), and annual income 12 months prior to assessment.

Documentation status—US documentation status was measured by fourteen possible categories (e.g., temporary or permanent resident, temporary work visa, undocumented or expired visa). These categories were recoded into a dichotomous variable: documented=1 or undocumented=0.

Alcohol use—The Timeline Follow-back Interview (TLFB; Sobell & Sobell, 1992) was used to document participants' frequency and quantity of alcohol use in the past 90 days. Alcohol use quantity information was collected using a calendar format to provide temporal cues (e.g., holidays, special occurrences) to assist in recall of days when alcohol was used. Daily alcohol use was measured in number of standard drinks per day. The widely acclaimed standardized Spanish version of the TLFB with documented reliability and validity was used (Gil, Wagner, & Tubman, 2004; Dillon, Turner, Robbins, & Szapocznik, 2005). Alcohol use frequency was calculated by summing the total number of days alcohol was consumed in the past 90 days. Alcohol use quantity was calculated by the average number of standard drinks consumed on days of alcohol use during the past 90 days.

Data Analytic Plan

Initial data analyses included: (a) descriptive statistics across time points for all variables and (b) examining distribution properties of continuous variables to correct skews which violated the assumption of normality following Kline's (2005) suggested cutoffs of absolute values of 3.0 and 8.0 for skewness and kurtosis, respectively.

Identified covariates were gender, documentation status, education level, and annual income. Spearman's rho and Pearson correlations were used to analyze binary covariates (gender and documentation status) and continuous covariate (annual income) respectively. One-way ANOVA was used to evaluate the potential influence of the categorical education variable.

Next, we used latent growth curve modeling techniques (Bollen & Curran, 2006) to represent changes in pre- to post-immigration alcohol use frequency and quantity over time. Trajectories for alcohol frequency and quantity were modeled separately using latent intercept and slopes to represent longitudinal changes through MPlus Version 6 (Muthén & Muthén, 2010). We tested for the moderating effect of gender and documentation status on the slopes and intercepts of the outcome variables to identify whether subsequent analyses should be disaggregated by gender and documentation status. Significant interaction effects between gender and documentation status were found and thus a series of subsequent growth curves were conducted to examine alcohol use trajectories by subgroup: (a) documented males, (b) undocumented males, (c) documented females, and (d) undocumented females.

Lastly, a third tier of growth curve models compared the aforementioned subgroups for significant gender and documentation status effects on pre- to post-immigration alcohol use trajectories.

Structural equation modeling fit indices were used to evaluate the fit of the growth curve models to the data (Kline, 2005). These included: overall chi-square test of model fit (should be statistically non-significant), the Root Mean Square Error of Approximation (RMSEA; < 0.08 to declare satisfactory fit), the Comparative Fit Index (CFI; > 0.95), the Tucker Lewis Index (TLI; > 0.95) and the standardized root mean square residual (< 0.05). Missing data was handled in growth curve models through the use of multiple imputation with 100 data sets (Barnard & Rubin, 1999).

Results

Preliminary analyses

Table 2 summarizes the descriptive statistics for variables per time point along with the skew-corrected square-root transformed values for alcohol use frequency and alcohol use quantity that were used in subsequent analyses.

Analyses for potential covariates indicated significant correlation between gender and alcohol use outcomes whereby males reported higher rates of alcohol use quantity at T_1 ($r = .33, p < .001$), T_2 ($r = .29, p < .001$), and T_3 ($r = .15, p < .01$) and higher alcohol use frequency at T_1 ($r = .23, p < .001$) and T_2 ($r = .23, p < .001$) but not T_3 ($r = .05, p = .28$). Documented immigrants reported higher pre-immigration alcohol use frequency ($r = .13, p < .01$), but no other significant correlations between the alcohol use outcomes and documentation status were observed. Latino immigrants with lower levels of education reported higher alcohol use frequency at T_1 $F(4, 454) = 3.48, p = .01$, but not at T_2 or T_3 . At T_1 , participants with higher income report higher rates of alcohol use frequency ($r = .21, p < .001$) and alcohol use quantity ($r = .14, p < .01$), but not at T_2 or T_3 .

Primary Analyses

Growth curve models for frequency and quantity of alcohol use—First, unconditional growth curve models testing pre- to post-immigration alcohol use trajectories in the overall sample were conducted. Model fit indices for alcohol use frequency [$\chi^2(1) = 1.25, p = .26$, RMSEA = 0.02, CFI = 1.00, TLI = 1.00, SRMR = .01] and alcohol use quantity [$\chi^2(1) = 0.75, p = 0.39$, RMSEA = 0.00, CFI = 1.00, TLI = 1.01, SRMR = .01] indicated excellent fit. Results revealed significant intercepts in both models, indicating differences between participants on their pre-immigration levels of alcohol use frequency ($B = 2.36, p < .001$) and alcohol use quantity ($B = 1.58, p < .001$). Decreases in pre- to post-immigration alcohol use frequency ($B = -0.19, p = .002$) and alcohol use quantity ($B = -0.17, p < .001$) were found in the overall sample.

Next, conditional models with gender, documentation status, education, and income as covariates were examined for alcohol use frequency and alcohol use quantity. Results are presented in Table 3. Model fit indices for alcohol use frequency [$\chi^2(10) = 9.16, p = .52$, RMSEA = 0.00, CFI = 1.00, TLI = 1.01, SRMR = .03] and alcohol use quantity [$\chi^2(10) =$

3.91, $p = .95$, RMSEA = 0.00, CFI = 1.00, TLI = 1.08, SRMR = .02] indicated excellent fit. As seen in Table 3, significant differences in the levels of pre-immigration alcohol use quantity (i.e., intercept), but not frequency, were observed. In contrast to the unconditional models which indicated significant decreases in pre- to post-immigration alcohol use frequency and quantity, results revealed significant increases in alcohol use frequency once the aforementioned covariates were included in the model, with no changes in alcohol use quantity over time. Males reported higher pre-immigration frequency and quantity of alcohol use compared to females. Significant gender effects were found in the trajectory of alcohol use frequency and quantity with males having steeper declines than females in pre- to post-immigration alcohol use.

In regard to documentation status, documented recent immigrants reported higher alcohol use frequency prior to immigration. However, no differences were found in quantity of alcohol use at pre-immigration between documented and undocumented immigrants. There were no differences in rates of change over time for frequency or quantity of alcohol use by documentation status. However, significant interaction effects between gender and documentation status indicated that being male coupled with having documented immigration status predicted faster declines in alcohol use frequency over time. As such, subsequent analyses were conducted on disaggregated subgroups by gender and documentation status. Due to the particularly small sample sizes in some subgroup categories (i.e., $n=35$ undocumented females), it was not feasible to include education and income as covariates in the disaggregated subgroup analyses. Given the marginal associations between income and education in the overall alcohol use quantity and frequency models, the exclusion of the covariates in the subsequent analyses appears to be of minor concern.

Male recent Latino immigrant growth curve models by documentation status

—Next, growth curve modeling was conducted to examine pre- to post-immigration alcohol use among documented and undocumented males. Model fit indices indicated good fit for alcohol use frequency [$\chi^2(2) = .27$, $p = .87$, RMSEA = .00, CFI = 1.00, TLI = 1.07, SRMR = .01] and alcohol use quantity [$\chi^2(2) = .23$, $p = .89$, RMSEA = .00, CFI = 1.00, TLI = 1.10, SRMR = .01] models. As shown in Figure 1 and Table 4, significant decreases in the frequency of alcohol use were reported by documented males. Results indicated no changes in alcohol use frequency over time for undocumented males. Documented and undocumented Latino males reported significant decreases in alcohol use quantity from pre- to post-immigration (see Figure 2). As seen in Table 4, levels of pre-immigration alcohol use frequency varied among documented and undocumented males, respectively. Variations in levels of pre-immigration alcohol use quantity were also evident among documented and undocumented males.

Female recent Latino immigrant growth curve models by documentation status

—Growth curve models tested pre- to post-immigration alcohol use frequency for documented and undocumented female immigrants. Only the alcohol use quantity model indicated good model fit [$\chi^2(2) = 2.18$, $p = .34$, RMSEA = .03, CFI = 1.00, TLI = .99, SRMR = .03]. As shown in Table 4, levels of pre-immigration alcohol use quantity varied

significantly among documented as well as undocumented females. No significant changes in pre- to post-immigration alcohol use quantity among documented or undocumented females were found.

Post hoc analyses: Documented male vs. undocumented male recent Latino immigrants—

Exploratory post hoc analyses was conducted to compare socio-demographic factors among documented and undocumented males that may have driven the observed differences in pre- to post-immigration alcohol use frequency found between both these groups. In particular, the effects of education, income, residency status and national origin were examined.

The data indicated higher education levels among documented males in comparison to undocumented males, $\chi^2(4)=85.32, p < .001$. Subsequent growth curve analysis grouping males by documentation status examined the effects of education on alcohol use patterns. Model fit indices indicated good fit for alcohol use frequency [$\chi^2(4) = .46, p = .98$, RMSEA = .00, CFI = 1.00, TLI=1.14, SRMR = .01] and alcohol use quantity [$\chi^2(4) = 1.47, p = .83$, RMSEA = .00, CFI = 1.00, TLI=1.15, SRMR = .02]. As seen in Table 5, no associations were found between education and the pre- to post-immigration alcohol use of documented or undocumented males.

Next, differences in annual income between documented and undocumented Latino immigrants were examined. As previously noted, income was measured as personal income in the past 12 month. At T₁, participants were asked to report their income in the 12 months prior to immigration in the value of US dollars. Repeated measures ANOVA revealed no significant income differences between documented and undocumented males. The inclusion of income into the model indicated adequate model fit for alcohol use frequency [$\chi^2(16) = 11.39, p = .96$, RMSEA = .00, CFI = 1.00, TLI=1.11, SRMR = .06] and quantity [$\chi^2(16) = 7.60, p = .96$, RMSEA = .00, CFI = 1.00, TLI=1.32, SRMR = .05]. After immigrating to the US, higher income was associated with decreases in the frequency and quantity of alcohol use among undocumented males. Conversely, prior to immigration, higher income was associated with greater alcohol use frequency and quantity among documented males (see Table 5).

Post-hoc analyses were conducted to explore if residency status was associated with distinct drinking patterns among documented males ($n=42$ permanent resident; $n=122$ temporary resident). Growth curve models indicated good model fit for alcohol use frequency [$\chi^2(2) = 2.36, p = .31$, RMSEA = .05, CFI = 1.00, TLI=.99, SRMR = .03] and quantity [$\chi^2(2) = .36, p = .84$, RMSEA = .00, CFI = 1.00, TLI=1.13, SRMR = .02]. Results revealed Latino immigrant males with permanent residency had no significant changes in pre- to post-immigration alcohol use frequency/quantity, while those with temporary residency status decreased in both frequency and quantity of alcohol use.

As previously mentioned, distinct drinking patterns among Latinos have been found by national origin. Studies have consistently found Cubans to have the lowest rates of alcohol use when compared to Latinos of other national origin (Caetano, Ramisetty-Mikler & Rodriguez, 2009). Particularly relevant to the present findings is the unique documentation

status held by Cubans in the US. Under the Cuban Adjustment Act of 1966 Cubans are granted automatic refugee status upon arrival (US Department of Homeland Security, 2011). Unlike other Latino immigrants that have extended waiting periods for visas or cross the border illegally, Cubans are fast-tracked to legal residency, with a clear path to citizenship.

Lastly, post-hoc analyses were conducted in an effort to begin to disaggregate the influence of national origin on the distinct alcohol use trajectories between documented and undocumented males found in the present study. As anticipated, immigration status varied by national origin among males with documented immigration status reported by 100% of Cubans, 85.1% of South Americans, and 9% of Central Americans. Because only one male participant reported “Other Caribbean” as their national origin, this group was excluded from the analyses.

A series of growth curve models testing changes in alcohol use frequency/quantity by grouping and subsequently covarying national origin all indicated good model fit. Growth curve models indicated adequate model fit for alcohol use frequency [$\chi^2(3) = 2.73, p = .43$, RMSEA = .00, CFI=1.00, TLI=1.01, SRMR =.04] and quantity [$\chi^2(3) = 4.78, p = .19$, RMSEA = .085, CFI=.96, TLI=.89, SRMR =.05]. As presented in Table 5, declines in pre- to post-immigration alcohol use quantity were found across all three groups with no significant slope differences between groups. Cubans and South Americans reported decreases in alcohol frequency after immigration, while no changes over time were found among Central Americans. Slope differences in alcohol use frequency were found between groups with South American males reporting steeper declines than Cubans, while Cubans had steeper declines compared to Central Americans. In regard to pre-immigration alcohol use, South American males had greater frequency and quantity of alcohol use than Cubans. Compared to Cuban males, Central Americans reported marginally lower rates in alcohol use frequency, with no differences in pre-immigration alcohol use quantity.

Discussion

This is the first longitudinal study to examine patterns of pre- to post-immigration alcohol use among recent Latino immigrants across their first three years in the US. Specifically, we obtained data on recent Latino immigrants’ frequency and quantity of alcohol use 90 days prior to immigration and at two follow-up assessments post-immigration (one-year apart) to elucidate their trajectories of alcohol use by gender and documentation status. As hypothesized, overall declines in pre- to post-immigration alcohol among recent Latino immigrants were found. The anticipated gender and documentation effects, (higher rates of alcohol use among males and undocumented participants compared to their female and documented counterparts), were only partially supported by the data. Males did have higher levels of pre-immigration alcohol use in comparison to females. However, no distinct patterns in alcohol use trajectories by documentation status were found in the overall sample.

With respect to Latino women, no significant changes in pre- to post-immigration alcohol use were evident. The literature suggests that the effects of acculturation lead to a closing of the gap in alcohol use between genders (Lara et al., 2005). Although levels of acculturation

were not measured in the present study, we suspect the recency of immigration may have influenced the lack of significant changes in trajectory among women and that alcohol use rates among Latino immigrant women could potentially escalate as their time in the US increases.

Our findings suggest that for some subsets of Latino immigrants, the well-documented rise in alcohol use as their time in the United States increases may not hold. For example, results show that pre-immigration alcohol use exceeds use at post-immigration among men regardless of documentation status. Thus, perhaps a rethinking of Sam and Berry's (2010) "healthy immigrant effect," (as it specifically pertains to alcohol use) among recent Latino immigrant men, is needed. The healthy immigrant effect, which refers to first generation immigrants, suggests that healthier members of the country of origin may be more likely to immigrate, and that their health declines to match that of many US residents—perhaps because of stressors involved in the acculturative process.

It may be that Latino immigrant men come to the United States with optimistic expectations of beginning a new life with a host of opportunities for themselves and their families. Perhaps this hope for prosperity and well-being also brings a decrease in health compromising behaviors (e.g., alcohol use) that were part of the lives immigrants left behind. For immigrants willing to go through the stressors involved in immigration, the desire to engage in alcohol abuse may be curbed by the prospect of new beginnings.

Current findings may also be related to issues of social control. Stringent societal laws in the United States (e.g., prohibition of driving under the influence) may not exist in the country/region of origin and could serve as a way of monitoring and directing behaviors to be in-line with what is considered acceptable by the host society (De La Rosa et al., 2012a). It is also possible that, compared to their US born counterparts, recent immigrants could be more cognizant of not drawing attention to themselves for alcohol use related behaviors, especially undocumented immigrants and/or those that have not established permanent US residency status.

Our findings also suggest that certain demographic factors may be linked with changes in pre- to post-immigration alcohol use in this population. For instance, post hoc analyses indicated that for recent Latino immigrant men entering receiving communities with dense Latino ethnic enclaves, demographic characteristics such as income, residency status and national origin were associated with distinct drinking patterns after immigration.

In particular, the heterogeneity in drinking trends of Latinos by national origin should be considered when interpreting the results of the present study. Previous studies examining alcohol use patterns among Latino immigrants by country of origin have utilized combined frequency/quantity measures. These national studies have also combined South and Central American immigrants into one group. Similar to previous studies, we found higher rates of alcohol use frequency and quantity among males, compared to females. Past investigations utilizing combined frequency/quantity measures have found fairly similar alcohol use rates among Cuban (8.4 average drinks per week) and South/Central American (8.9 average drinks per week) males (Ramisetty-Mikler, Caetano, Rodriguez, 2010). However, in

utilizing discrete measures of alcohol use frequency and quantity and examining South and Central American immigrant males separately, distinct trajectories in drinking patterns between groups were found. Specifically, Central American males had little to no change in their pre- to post-immigration drinking patterns when compared to Cuban and South American males.

In disaggregating South and Central Americans, our findings contribute to prior knowledge by suggesting distinct pre- to post-immigration alcohol use trajectories between these two groups. Thus, future studies assessing alcohol use among Latinos by national origin should consider examining South and Central Americans separately in an effort to elucidate any divergent pattern between these two subgroups. Moreover, Central American males in the sample were largely undocumented (90.9%). Although outside the scope of this study, future investigations are needed to partial out the role that national origin versus immigration status may have on the particularly steep decreases in alcohol use among documented versus undocumented males found in the present study.

Another factor to be considered when interpreting results from the present study is the context of the receiving community. With Latino immigrants from a large variety of Caribbean, South and Central American countries, today Miami is home to the most diverse Latino population of any US city (Schwartz et al., 2014). Miami has a highly bicultural environment that is equally supportive of US and Latino cultural practices (Stepick & Stepick, 2002). Latinos in this area tend to enjoy more political and economic advantages compared to other cities (Stepick & Stepick, 2002). It is possible that well-established Latino immigrant receiving communities with dense ethnic enclaves, such as those in Miami, may provide increased availability to culturally and linguistically congruent services, tangible and intangible support systems, and lower levels of discrimination that may impact decreases in acculturative stress levels and associated health compromising behaviors such as alcohol use.

Due to Miami's unique cultural context, it is important to replicate the present study in areas such as the Southwest and Northeast, where specific recent Latino immigrant groups not well represented in the current sample comprise the majority of Latino residents (e.g., Mexicans or Dominicans). The concentration (or lack thereof) of Latinos in the receiving community may also be important to consider—suggesting that immigrant communities that are not well-established may provide very different results compared to those found in the present study (Schwartz et al., 2014).

Limitations

Our findings should be evaluated in the context of several limitations. First, although respondent driven sampling is a preferred method to recruit hidden populations such as undocumented immigrants, who make up 22% of the US Latino population, it does not ensure a representative sample (Passel & Cohn, 2008). Second, although high levels of participant retention were maintained in the present study, certain findings (or lack thereof), could have been influenced by attrition bias. For instance we found no changes in pre- to post-immigration alcohol use among groups that were especially difficult to retain (i.e., undocumented, less educated men). Third, pre-immigration alcohol use data were collected

retrospectively, making this information susceptible to errors in recollection. However, because well-established timeline followback procedures were employed (Sobell et al., 2001), this is an unlikely issue. Fourth, baseline participant's time in US ranged from 1 to 12 months. Although growth curve analysis allows for unequally spaced time points, it should be noted that the span from T_1 to T_2 did substantially vary between participants. As such, alcohol use reports may refer to 9–12 months earlier for some participants, while only 1–3 months earlier for others. Fifth, it may also be possible that pre-immigration alcohol use behaviors were not indicative of average prior alcohol use. Latino men could have increased their alcohol use behaviors just prior to immigration in association with family gatherings, festivities, and/or stresses related to the immigration process and then returned to their baseline alcohol consumption after arrival in the US. Sixth, income was measured as personal rather than household income in the past 12 months, which may not necessarily have gauged participant's actual income levels. Seventh, the present study utilizes three time points to examine pre- to post-immigration alcohol use trajectories. Growth curve models require a minimum of three time points for proper estimation, yet four or more time points are preferable as this allows for estimation of complex trajectories (Curran & Muthen, 1999). Similarly, the growth curve analysis covers a span of less than three years, which could possibly reflect ephemeral shifts in reports of alcohol use. Lastly, acculturation has been vastly cited in the literature to account for changes in alcohol use behaviors of Latinos, examining this construct was outside of the scope of our investigation and thus not measured in the present study. Given that the sample consisted of recent Latino immigrants that had been in the US for approximately 3 years, we can assume that acculturations levels were relatively low across the sample.

Despite its limitations, this study casts light on the pre- to post-immigration alcohol use patterns of recent Latino immigrants in the United States. The early stages of acclimating to a new country often involve particular challenges and stresses that test coping skills, exacerbate pre-existing difficulties, and, at least for some subsets of Latinos, may contribute to the manifestation of health compromising behaviors that may have been sub-threshold prior to immigration. As such, this transition period may offer a key point in time for prevention-oriented intervention. Yet, few behavioral intervention and treatments have been specifically developed for recent Latino immigrants (Wagner, 2003). As a consequence, there is insufficient empirical research to inform service providers of the appropriate issues to target in prevention/intervention programs with this population (Alegria et al., 2008).

The present study also addresses a fundamental gap in the literature regarding the drinking patterns of Cuban, and South and Central American immigrants—Latino subgroups that have been vastly understudied in the literature, but are quickly becoming representative of the US Latino population (Pew Hispanic Center, 2013). Given the growing number of Latinos in the United States, challenges in understanding the service needs of this population have never been greater (Alegria et al., 2006). Future research is needed to identify individual and social determinants associated with the alcohol use trajectories of documented and undocumented Latino immigrants as they acculturate to the United States. Such knowledge is of high public health significance, as it may inform prediction, prevention, and treatment of problem-drinking behaviors among the largest and fastest growing ethnic minority in the United States.

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Figure 1.

Alcohol frequency growth curve models by gender and documentation status

Note. Pre- to post-immigration alcohol frequency trajectory for Females not shown as growth curve indicated poor model fit.

Figure 2.
Alcohol quantity growth curve models by gender and documentation status

Table 1

Sample Demographics

Variables	N	%
Gender		
Female	205	45.1
Male	250	54.9
Documentation Status		
Documented	334	73.4
Undocumented	121	26.6
Country of Origin Education		
High school diploma	127	27.9
Some training/college	166	36.5
Bachelor's (4–5 years	71	15.6
Graduate/Professional	14	3.1
	Mean(SD)	Range
Age	26.84 (5.0)	18–34
Annual Income (T ₁)	\$4,717 (10,557)	0–140,000
(T ₂)	\$14,547	0–160,000
(T ₃)	\$19,501	0–80,000

Table 2

Descriptive Statistics for Key Outcomes Variables

Variables	Time	Mean (SD)	Skew. (Trans.)	Kurtosis (Trans.)	Gender		Doc. Status	
					Males	Females	Doc.	UnDoc.
Alcohol Quant.	T ₁	4.71 (8.12)	5.25 (1.12)	39.28 (2.84)	6.68 (10.18)	2.29 (3.09)	3.96 (5.42)	6.76 (12.73)
	T ₂	3.26 (4.79)	4.21 (0.70)	28.96 (0.98)	4.52 (5.90)	2.04 (2.91)	3.14 (4.72)	6.76 (5.12)
	T ₃	3.03 (4.08)	2.40 (0.49)	9.11 (-0.52)	3.74 (4.77)	2.20 (2.86)	2.76 (3.26)	3.87 (5.88)
Alcohol Freq.	T ₁	10.93 (16.51)	2.45 (0.84)	7.23 (0.12)	13.10 (17.18)	8.29 (15.27)	12.32 (17.99)	7.09 (10.66)
	T ₂	8.64 (13.31)	2.87 (0.86)	11.35 (0.42)	11.40 (14.93)	5.96 (10.90)	8.90 (13.51)	7.32 (12.29)
	T ₃	8.34 (12.95)	3.13 (0.80)	14.42 (0.24)	8.37 (11.49)	8.31 (14.52)	8.78 (13.15)	7.00 (12.27)

Note

^aNon-transformed mean and standard deviation values are presented;^bTrans=square root transformation value.

Table 3

Results of Conditional Growth Curve Models Testing Pre- to Post-Immigration Alcohol Use Trajectories, N=455.

Parameter	Alcohol Frequency	Alcohol Quantity
Average intercept	0.33	0.89***
Average slope	0.58*	0.10
Gender → Intercept	1.20***	0.99***
Gender → Slope	-0.37**	-0.28***
Doc. status → Intercept	0.64*	-0.13
Doc. status → Slope	-0.23	0.03
Gender × Doc. → Intercept	0.39	-0.31
Gender × Doc. → Slope	-0.82**	-0.14
Education → Intercept	0.20	0.02
Education → Slope	0.01	0.03
Income T ₁ → T ₁ Alcohol Use	0.01***	.004***
Income T ₂ → T ₂ Alcohol Use	< .01	< .001
Income T ₃ → T ₃ Alcohol Use	< .01	-.002

Note.

^a * = $p < .05$;

** = $p < .01$

*** = $p < .01$;

^b 0 = undocumented, 1 = documented;

^c 0 = female, 1 = male; income entered into conditional model as a time-varying covariate.

Table 4

Results of Growth Curve Models for Alcohol Use Outcomes by Gender/Documentation Status Subgroups

	Alcohol Frequency		Alcohol Quantity	
	Intercept	Slope	Intercept	Slope
Documented Males ($n = 164$)	3.21***	-0.56***	1.98***	-0.31***
Undocumented Males ($n = 86$)	2.11***	.01	2.20***	-0.34**
Documented Females ($n = 155$)	<i>n/a</i>	<i>n/a</i>	1.11***	-.02
Undocumented Females ($n = 35$)	<i>n/a</i>	<i>n/a</i>	0.90***	-.11

*Note.***
= $p < .01$;***
= $p < .001$;*n/a*=parameter estimates not available as model indicated poor model fit.

Table 5.

Results of Post-Hoc Analyses Testing Demographic Differences in Pre- to Post-Immigration Alcohol Use Trajectories among Documented and Undocumented Latino Males.

Parameter	Alcohol Frequency		Alcohol Quantity	
	Intercept	Slope	Intercept	Slope
Documented males				
Education	.01	-.03	-.05	.08
Income T ₁	.008 [*]	<i>n/a</i>	.005 ^{**}	<i>n/a</i>
Income T ₂	.001	<i>n/a</i>	.001	<i>n/a</i>
Income T ₃	-.002	<i>n/a</i>	<.001	<i>n/a</i>
Permanent residents	2.98 ^{***}	-.26	1.95 ^{***}	-.19
Temporary residents	3.23 ^{***}	-.64 ^{***}	2.00 ^{***}	-.37 ^{***}
Undocumented males				
Education	.41	.03	.20	-.20
Income T ₁	.004	<i>n/a</i>	.003	<i>n/a</i>
Income T ₂	-.011 [*]	<i>n/a</i>	-.007 [*]	<i>n/a</i>
Income T ₃	-.018 [*]	<i>n/a</i>	-.010 [*]	<i>n/a</i>
Cuban males	2.75 ^{***}	-.47 ^{***}	1.78 ^{***}	-.27 ^{**}
South American males	4.34 ^{**}	-.90 ^{***}	2.27 ^{***}	-.41 ^{**}
Central American males	2.03 ^{**}	.03	2.19 ^{***}	-.34 ^{**}

Note.

^a ^{*} = $p < .05$;

^{**} = $p < .01$

^{***} = $p < .001$;

^b *n/a*=slopes not available for income as it was entered into conditional model as a time-varying covariate.