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## Mental Health and Exposure to the United States: Key Correlates from the Hispanic Community Health Study of Latinos

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### Abstract

We examined the association between exposure to the U.S. and symptoms of poor mental health among adult Hispanic/Latinos (N=15,004) overall and by Hispanic/Latino background. Using data from the Hispanic Community Health Study of Latinos (HCHS/SOL), we estimated logistic regressions to model the risk of moderate to severe symptoms of psychological distress, depression, and anxiety as a function of years in the U.S. and 6 key psychosocial risk and protective factors. In unadjusted models, increased time in the U.S. was associated with higher risk of poor mental health. After adjustment for just 3 key factors – perceived discrimination, perceived U.S. social standing, and the size of close social networks, differences in the odds of poor mental health by years in the U.S. became insignificant for Hispanics/Latinos overall. However, analyses by Hispanic/Latino background revealed different patterns of association with exposure to the U.S. that could not be fully explained.

### Keywords

Latino; Hispanic; Immigrant; depression; anxiety; acculturation

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## INTRODUCTION

Studies typically find that foreign-born Hispanics/Latinos have lower morbidity and mortality than U.S.-born Hispanics/Latinos (Abraido-Lanza et al. 1999). Recent studies focused on mental health also find lower rates of psychological disorders among foreign-born Hispanics/Latinos compared to US-born Hispanics/Latinos (Alegria et al. 2008; Cook et al. 2009; Vega et al. 2004). These lower rates of mental health problems among the foreign-born puzzle public health researchers given that Hispanic/Latino immigrants typically have low socio-economic backgrounds and are exposed to stressful conditions during and after their migration to the U.S., two factors associated with poorer mental health (Cook et al. 2009; Vega et al. 2004; Ornelas & Perreira 2011).

Several hypotheses have been offered to explain this puzzle, sometimes referred to as the epidemiological paradox. First, the paradox could result from selection effects. Immigrants to the U.S. may be a healthier subset of the populations from their countries of origin and immigrants who return to their home countries may be less healthy than immigrants remaining in the U.S. (Abraido-Lanza et al. 2009; Van Hook & Zhang 2011). Second, immigrants to the U.S. may change their health behaviors and adopt less-healthy behaviors with exposure to U.S. norms and cultural practices (Abraido-Lanza et al. 2005; Vega & Amaro 1994). Third, immigrants may become exposed to more harmful and more stressful conditions the longer they live in the U.S. and at the same time may lose some of the protective social and cultural resources that help create resiliency in individuals (Cook et al. 2009; Vega & Amaro 1994).

In this study, we focus on the third explanation for the epidemiological paradox and evaluate how mental health varies with years in the U.S, a measure of the length of time one is exposed to potentially deleterious or salubrious conditions. The HCHS study does not contain information (e.g., country-of-origin data or return migration data) needed to evaluate selection effects. Using data from HCHS/SOL, changes in health behaviors such as physical activity or diet that could be associated with mental health outcomes have been examined elsewhere (Daviglius et al. 2012).

We expect mental health to decline with time such that U.S.-born Hispanics/Latinos will have poorer mental health than foreign-born Hispanics/Latinos, especially compared to the most recent arrivals. Similarly, we expect that foreign-born Hispanics/Latinos who migrated at older ages will have better mental health than those who migrated at younger ages or who were U.S.-born.

We then evaluate how 6 factors – perceived discrimination, language and social acculturation, ethnic and family identity, social networks, and perceived U.S. social standing, -- vary with years in the U.S. and account for the negative association between years in the U.S. and mental health. Previous studies have focused on discrimination as a primary source of stress in immigrants and have linked discrimination to poor mental health (Finch et al. 2000; Torres et al. 2012; Viruell-Fuentes 2007). However, contrary to expectations, Hispanic/Latino immigrants frequently report less discrimination than their U.S.-born counterparts. At the same time, immigrants experience lower social standing in

the U.S. than their U.S.-born counterparts and perceptions of low social standing can be associated with stress and poor mental health (Alcántara et al. 2014; Alder et al. 2000). Thus, the negative mental health consequences of increased discrimination with time in the U.S. may be offset by the positive mental health consequences of improved social standing with time in the U.S.

Though acculturation and its measurement are highly contested, previous studies have also linked greater acculturation to the U.S. to poorer mental health (Koneru et al. 2007). When defined by English language acquisition and greater social contacts with U.S.-born Americans, commonly used measures of acculturation presume that acculturation is accompanied by the loss of Spanish language skills and the weakening of social and cultural affiliations with countries of origin. Consequently, a common hypothesis is that language and social acculturation will increase with years in the U.S. and be associated with poorer mental health.

However, acculturation to the U.S. does not have to be accompanied by the loss of ethnic cultural identities and practices (Sam & Berry 2010). Individuals can adapt to the cultural norms and behaviors in the U.S. while selectively maintaining their ethnic cultural norms, practices, and behaviors. Using measures of acculturation that allow for biculturalism, researchers have found that biculturalism best promotes sociocultural adaptation and health among Latinos (Coatsworth et al. 2005; Marin & Gamba 1996). In addition, researchers have examined the potential for the maintenance of ethnic and family identities to protect the mental health of immigrants by shielding them from negative or stressful experiences (Kiang et al. 2006; Perez & Cruess 2014; Telzer et al. 2014). In contrast to race/ethnic self-identification, ethnic identity reflects a sense of ethnic group membership, pride, and participation in ethnic behaviors or activities (Roberts 1999). Family identity, sometimes referred to as familism in the literature on Hispanic/Latino populations, is a second component of social identity that reflects several factors including a sense of family loyalty or honor and an obligation for family members to support one another in the present and future (Kiang & Fuligni 2009; Calzada et al. 2013). Although family support can be positively associated with mental health, sometimes intense family bonds or loyalty can become a source of family conflict and strain which can result in poorer mental health for individuals (Calzada et al. 2013). Thus, some aspects of family identity can positively affect mental health while others can have a negative influence.

Like ethnic and family identity, close social networks can also protect immigrants from the stresses of migration and promote mental health (Smith & Cristakis 2008). But, time and distance can erode immigrants' social networks. As a result, we expect that immigrants with more time in the U.S. may have smaller close social networks and the erosion of these close social networks may partially explain the negative association between years in the U.S. and mental health.

With a large population-based sample of diverse foreign-born Hispanics/Latinos, the Hispanic Community Health Study of Latinos (HCHS/SOL) provides a unique opportunity to evaluate differences in mental health by exposure to the U.S. Moreover, we are able to examine these associations for several different Hispanic/Latinos backgrounds. Most

previous research has been limited to much smaller samples of Hispanic/Latino adults with mostly foreign-born Mexicans and has not examined differences in the association of exposure to the U.S. by Hispanic/Latino background (e.g., Cook et al. 2009; Vega & Amaro 1994).

## METHODS

### Sample

Between 2008–11, the HCHS/SOL enrolled 16,415 non-institutionalized and self-identified Hispanic/Latino adults ages 18–74 (see Lavange et al. 2010 and Sorlie et al. 2010 for details). Participants were recruited from 2010 Census block groups in the Bronx, Chicago, Miami, and San Diego using a two-stage household probability design that oversampled adults ages 45–74. Sampling weights were generated to reflect the probabilities of selection and non-response. At least 4,000 adults from each community participated in the initial interview and physical examination conducted at a local clinic in these locations. After excluding participants with missing observations on the dependent (N=521) and independent variables (N=890), the analytic sample for this study consisted of 15,004 Hispanics/Latinos.

HCHS/SOL contained a large sample of foreign-born participants from a variety of Hispanic/Latino backgrounds, making it ideal for this analysis. Only 23% were U.S.-born; 24% had lived in the U.S. over 20 years; 14% had lived in the U.S. 15–20 years; 12% had lived in the U.S. 10–14 years; and 27% had lived in the U.S. 0–9 years. The majority (52%) had migrated to the U.S. in adulthood at age 20 or older. The sample included Mexicans (39%), other Central Americans (7%), Dominicans (10%), Puerto Ricans (16%), Cubans (19%), and other Hispanics/Latinos with mixed (4%) or South American backgrounds (5%). The majority of foreign-born were either Mexican (38%) or Cuban (23%). The majority of U.S.-born were either Mexican (39%) or Puerto-Rican (33%). Seventy-four percent of the HCHS/SOL study cohort completed the baseline interview in Spanish.

### Measures

Our analysis focused on three different measures of mental health and the effects of exposure to the U.S. on mental health. We also considered six factors – perceived discrimination, language and social acculturation, ethnic and family identity, social networks and perceived U.S. social standing – that may partially explain associations between exposure to the U.S. and mental health.

**Outcomes**—The dependent variables of interest were self-reported measures of general psychological well-being, depressive symptoms, and anxiety. First, we measure psychological well-being using the mental component summary (MCS) score of the SF-12 version 2, a well-validated instrument for both English and Spanish speakers (Ware 1996; Gandek 1998). Scores are computed and normalized with a standard algorithm, such that they are representative of the general U.S. population with a mean of 50, a standard deviation of 10, and a range of 0 to 100 (Ware 1996). In our study, we used a cutpoint of  $\leq 40$  to denote moderate to severe symptoms of psychological distress (Ware 1996). Second, we measured depressive symptoms using the 10-item form of the Center for

Epidemiological Studies Depression Scale, CESD-10. A shortened version of the original 20-item scale, the CESD-10 indicates depressive symptoms but does not provide a diagnosis of depression. Based on previous research (Andresen 1994; Wassertheil-Smoller et al., in press), we used a cutpoint of  $\geq 10$  to indicate that a participant is at risk of depression and should be evaluated by a mental health professional. The scale, ranging from 0 to 30, had a high internal reliability in HCHS/SOL ( $\alpha=.83$ ). Third, we used a 10-item version of the Spielberger Trait Anxiety Inventory (STAI, Form Y-2; Spielberger et al. 1983; Devito & Kubis 1983) which measures Trait Anxiety with a high internal consistency in HCHS/SOL ( $\alpha=.82$ ). Values on these anxiety items were summed to produce a raw score ranging from 10 to 40. We use a cutpoint of  $\geq 20$ , the top quartile of our distribution, to indicate risk for anxiety disorders.

**Exposure to the Mainland U.S.**—We measure exposure to the mainland U.S. based on U.S. nativity combined with years in the U.S. among the foreign-born. This measure results in a 4-category variable: U.S.-born, foreign-born with 21 or more years in the U.S., foreign-born with 10–20 years in the U.S., and foreign-born with 0–9 years in the U.S. Though Puerto Ricans are U.S.-born citizens, we classify Puerto Ricans born outside of the mainland U.S. as foreign-born and consider their exposure to the mainland U.S.

**Perceived Discrimination**—The HCHS/SOL included two questions on perceived discrimination adapted from Finch et al. (2001). One asked participants, “How often have you seen friends treated unfairly because they are Hispanic/Latino” The second asked, “How often do people treat you unfairly because you are Hispanic or Latino”. Given their strong association (nearly 70% of those who witnessed discrimination also experienced discrimination; 92% of those who experienced discrimination also witnessed discrimination), we combined these to indicate whether a participant had ever witnessed or experienced discrimination (1=yes) if individuals reported witnessing or experiencing unfair treatment sometimes, often, or always. Otherwise, perceived discrimination was coded as zero.

**Acculturation**—Acculturation was assessed using the language use and social relations subscales of the Short Acculturation Scale for Hispanics (SASH; Marin 1987). These subscales had high internal consistencies ( $\alpha_{\text{language}}=.93$ ,  $\alpha_{\text{social}}=.77$ ) in this sample with scores ranging from 1 (low U.S. acculturation) to 5 (high U.S. acculturation).

**Ethnic and Family Identity**—Participants responded to two questions taken from the Multigroup Ethnic Identity Measure (MEIM) regarding ethnic identity: (1) I have a strong sense of belonging to my own ethnic group, and (2) I have pride in my ethnic group (Roberts et al. 1999). Labeled ethnic belonging and ethnic pride, values range from 1 (Strongly Disagree) to 4 (Strongly Agree). Participants responded to 6 statements regarding family identity. Three items pertained to family loyalty and honor (e.g., “Much of what a son or daughter does should be done to please parents.”) and had an internal consistency of  $\alpha=.51$  in this sample (Sabogal et al. 1987). Three others pertained to family support or obligation (e.g., “Aging parents should live with relatives.”) and had an internal consistency of  $\alpha=.60$  in this sample (Sabogal et al. 1987; Lugo Steidel & Contreras 2003). The internal

consistency of these measures varied by language preference, with higher internal consistency among Spanish speakers ( $\alpha_{loyalty}=.54$ ,  $\alpha_{support}=.63$ ). To account for potential differences in associations by language, we included interactions between these measures and language preference.

**Social Network Size**—Following Cohen et al. (1997), we measured the size of participants' close social networks based on the presence of a spouse/partner, the number of children spoken with at least once every 2 weeks, the number of living parents spoken with at least once every 2 weeks, the number of in-laws spoken with at least once every 2 weeks, and the number of other relatives that participants reported feeling close to. Values ranged from 0 to 19.

**Perceived U.S. Social Standing**—We measured perceived social standing using the 10-rung SES ladder from the MacArthur Scale of Subjective Social Status, available in English and Spanish (Alder et al. 1994, Alder et al. 2000). Higher values indicated that participants feel better off, with more money, education, and respected jobs, than participants who placed themselves lower on the SES ladder. This scale has been validated with a national multiethnic sample and has shown adequate test-retest reliability ( $p=.62$ ) (Operario et al. 2004). In HCHS/SOL, participants utilized the full range of the scale though the distribution had a slight positive skew with a mode of 5.0. Twenty-five percent of the sample reported a value of 3 or less but only ten percent of the sample reported a value of 7 or more.

**Control Variables**—We controlled for Hispanic/Latino background (Mexican, Other Central American, Dominican, Puerto Rican, Cuban, and other Hispanic/Latino or South American), sex, age, education, employment, marital status, current health insurance status, and language preference at the baseline interview.

## Analysis

We first evaluated differences in the percentage of the cohort at risk for psychological distress, depression, and anxiety by years in the U.S. and Hispanic/Latino background. We then evaluated differences in perceived discrimination, ethnic and family identity, language and social acculturation, the size of close social networks, and perceived U.S. social standing by U.S. nativity and years of U.S. residence. P-values for means and proportions were computed using Student-Newman-Keuls adjustments (a 2-tailed test) for multiple comparisons.

We used survey logistic regression to model the risk for psychological distress, depression, and anxiety as a function of years in the U.S., perceived discrimination, language and social acculturation, ethnic and family identity, size of close social networks, and perceived U.S. social standing. Unadjusted odds ratios (ORs) were computed to show the bivariate associations of mental health with each explanatory variable and without controlling for any other covariates. Adjusted odds ratios (AORs) were calculated from the fully adjusted model to show associations after including each explanatory variable and all of our control variables. Lastly, we estimated separate multivariable adjusted logistic regressions among the foreign-born participants by Hispanic/Latino background. This enabled us to identify

how the association between exposure to the U.S. and mental health outcomes varied by Hispanic/Latino background.

All analyses were performed using SAS version 9.3 and SUDAAN release 11.0. All analyses used survey design procedures accounting for sampling weights and clustering.

## RESULTS

As hypothesized, descriptive analyses of mental health by exposure to the U.S. showed a greater burden of psychological distress, depressive symptomatology, and anxiety with both duration of residence and younger age at migration (Table 1). Mean scores on the SF-12 MCS, CESD-10, and STAI-10 were 49.2, 6.9, and 17.0, respectively. Compared to Hispanic/Latino immigrants who had lived in the U.S. for less than 10 years, immigrants with 21 or more years in the U.S. had higher rates of moderate to severe symptoms of psychological distress (25% vs. 18%), depression (31% vs. 23%), and anxiety (30% vs. 23%).

Among the foreign-born participants (Table 1), rates of psychological distress, depressive symptoms, and anxiety varied by Hispanic/Latino background. Puerto Ricans had the highest rates of moderate to severe symptoms of psychological distress (29%), depression (39%), and anxiety (37%). Other Central Americans had the lowest rates of psychological distress (17%); Mexicans had the lowest rates of depressive symptoms (22%); and Cubans had the lowest rates of anxiety symptoms (22%). Among U.S. born participants, we detected few differences in mental health by Hispanic/Latino background (results not shown). Compared to U.S.-born Mexicans, Puerto Ricans born on the U.S. mainland had higher rates of moderate to severe symptoms of psychological distress (25% vs. 15%), depressive symptoms (37% vs. 21%), and anxiety (38% vs. 31%); Dominicans had higher rates of moderate to severe symptoms of psychological distress (28% vs. 15%).

Higher rates of psychological distress, depressive symptoms, and anxiety among immigrants with greater exposure to the U.S. can potentially be explained by exposure to stressors such as discrimination and low social standing, and the depletion of protective resources such as ethnic and family identities and social networks. In Table 2, we show that reports of either witnessing or experiencing discrimination were lowest among Hispanic/Latino immigrants who have the least exposure to the U.S. At the same time, Hispanic/Latino immigrants experienced the lowest social standing. Perceived social standing was highest among U.S.-born Hispanics/Latinos. Sixty-three percent of Hispanic immigrants with 9 or fewer years of U.S. residence reported witnessing or experiencing discrimination; 74% of U.S.-born Hispanics/Latinos reported witnessing or experiencing discrimination. On average, Hispanics placed themselves in the middle of the SES ladder at 4.4 on a scale of 1–10. U.S.-born Hispanics placed themselves at 4.7 and foreign-born Hispanics with fewer than 10 years of U.S. residence placed themselves at 4.2 on the scale.

In Table 2, we also show that both language and social acculturation to the U.S. increased with exposure to the U.S. Concomitantly, Hispanics' sense of ethnic belonging and ethnic pride declined. With one exception, our measures of family identity (i.e. family loyalty and

support) showed little variation with years in the U.S. Among Spanish speakers, we found that the foreign-born, regardless of years in the U.S., had a stronger sense of family loyalty. With between 7.4–8.1 close social contacts, the foreign-born also had larger close social networks than the U.S.-born who had between 6.6–7.0 close social contacts.

Unadjusted for these explanatory variables, Hispanic/Latino immigrants with 21 or more years of U.S. residency had significantly higher odds of psychological distress (OR=1.34, 95% CI=1.14–1.57) compared to the U.S.-born (Table 3, panel A). Immigrants with fewer than 10 years of residency had significantly lower odds of depressive (OR=.75, 95% CI=.64–.87) or anxiety (OR=.60, 95% CI=.51–.70) symptoms compared to the U.S.-born. These associations remained stable after adjustment for only our control variables (results not shown).

After adjusting for our key explanatory (i.e. discrimination, SASH subscales, ethnic and family identity, social networks, and social standing) and control variables, we found that almost no significant mental health differences by nativity and years in the U.S. remained (Table 3, panel B). We found strong positive associations between perceived discrimination and the likelihood of moderate to severe symptoms of psychological distress, depression, and anxiety. We also found strong negative associations of social network size and U.S. social standing with each of our mental health outcomes. As the size of close social networks and U.S. social standing increased, the odds of poor mental health declined. The associations between family identity and mental health outcomes varied by language preference. Among both English- and Spanish-language users, we found positive associations between family loyalty and all measures of poor mental health. Among English-language users, we found a significant negative association between family support and anxiety symptoms only. Among Spanish-language users, we found a significant negative association between family support and depressive symptoms only. Though ethnic pride and belonging were both positively associated with mental health in unadjusted bivariate relationships, neither was associated with mental health outcomes in the adjusted models. In addition, except for a weakly negative association between social acculturation and depressive symptoms, neither language nor social acculturation contributed significantly to our models of mental health.

In our last set of analyses, we explored variation in the association between duration of residence in the U.S. and mental health by Hispanic/Latino background. Unadjusted ORs indicated that years in the U.S. was associated with poorer mental health for foreign-born Hispanics overall as well as Cuban, Dominican, Puerto Rican, and other or South American foreign-born Hispanics/Latinos (Table 4). The positive association between years in the U.S. and depression was particularly strong for Puerto Ricans born outside of the U.S. mainland. The positive association between years in the U.S. and anxiety was also strong for Cubans. Among foreign-born Mexicans, we found no significant association between years in the U.S. and mental health. After adjusting for each of our explanatory and control variables, no significant associations between years in the U.S. and depression remained for Puerto Ricans and no significant association between years in the U.S. and anxiety remained for Cubans. In contrast, the adjusted models revealed a significant positive association between years in the U.S. and anxiety among foreign-born Dominicans. In addition, time in the U.S.



was associated with improved mental health (i.e. lower risk of depression or anxiety symptoms) among other Central Americans. These results clearly demonstrate that the relationship between exposure to the U.S. and mental health varies by Hispanic/Latino background.

## DISCUSSION

This analysis complements recent research from the National Latino and Asian American Survey (NLASS). In comparison with U.S. born adult Hispanics/Latinos, NLAAS found that Hispanic/Latino adult immigrants have a lower lifetime prevalence of psychiatric disorder (25% vs. 37%) and depressive disorder (15% vs. 20%), and anxiety disorder (15% vs. 19%) (Alegria et al. 2008). Differences in perceived discrimination, family conflict, and perceived U.S. social standing by exposure to the U.S. accounted for most of the nativity differences in these disorders (Cook et al. 2009).

Similarly, using data from the HCHS/SOL, we found higher rates of moderate to severe symptoms of psychological distress, depression, and anxiety with longer exposure to the U.S. We also found variation in this association by Hispanic/Latino background. We found evidence of the epidemiological paradox for Puerto Ricans, Cubans, Dominicans, and other Hispanics/Latinos; but found no evidence of the epidemiological paradox among other Central Americans. In fact, the mental health of other Central Americans may have improved with time in the U.S. Many Central Americans have immigrated from war torn areas of Guatemala and El Salvador and areas damaged by earthquakes and hurricanes (Davy 2006; Gammage 2007). While relatively few were officially granted refugee or asylee status in the U.S., many of these Central Americans have received Temporary Protected Status (TPS) allowing them to live and work in the U.S. legally (Davy 2006). Thus, their perspectives and experiences can differ from other Hispanic/Latino immigrant populations.

Associations between exposure to the U.S. and mental health were primarily explained by three of our six explanatory variables – perceived discrimination, perceived U.S. social standing, and social networks. Perceived discrimination increased with duration of residence in the U.S. and the size of close social networks shrank. Both increased discrimination and smaller close social networks were associated with higher odds of mental health problems. In contrast to these generally negative consequences of increasing duration of residence in the U.S., perceived social standing improved with years in the U.S. and was associated with lower odds of mental health problems.

With a cohort of 16,415 Hispanic/Latino adults, the HCHS/SOL is the largest study of the health of adult Hispanics/Latinos in the United States and includes a sufficiently large sample of foreign-born participants to conduct subgroup analyses on exposure to the U.S. and mental health. At the same time, HCHS/SOL data were collected primarily to evaluate cardiovascular health and contain some notable limitations for evaluating mental health. First, mental health measures in the HCHS/SOL do not provide information on clinical diagnoses and thus cannot be used to calculate the prevalence of psychiatric disorders. Our results provide only an indication of what factors are associated with a risk of moderate to severe symptoms of psychological distress, depression, and anxiety. Second, the

HCHS/SOL contains limited measures of discrimination, ethnic identity, and family identity. Researchers focused on these topics recommend the use of more complex multi-item scales with internal consistencies of at least .60, a generally accepted threshold for a high-quality scale (Krieger et al. 2005; Roberts et al. 1999; Nunnally & Bernstein 1994). Though family identity was measured with two multi-item scales, the internal consistency of the family loyalty and honor scale available in HCHS/SOL is below .60 and differs by language preference. Moreover, other dimensions of the family, such as levels of family conflict or family cohesion, not currently available in the HCHS/SOL may have stronger associations with mental health (Cook et al. 2009; Chung et al. 2009). Due to concerns about hindering participation, the HCHS/SOL study also chose not to collect data on U.S. citizenship or other aspects of legal status. Researchers who have collected these data show that immigrants without citizenship, and especially those without legal status in the U.S., face significantly greater stress associated with migration and are at higher risk of mental health problems (Arbona et al. 2010; Ornelas & Perreira 2011; Perreira & Ornelas 2013). Finally, our analyses are cross-sectional and both immigrants with greater duration of residence in the U.S. and U.S.-born Hispanics/Latinos may differ in unmeasured ways from those with shorter duration of residence in the U.S. Thus, causality cannot be determined.

Nevertheless, our results strongly suggest that immigrants become exposed to more stressful conditions, such as discrimination, with longer residence in the U.S. and at the same time may lose some of the protective social and cultural resources, such as close social networks, that help create resiliency in individuals. These increases in exposure to stressors combined with a loss of social and cultural resources place immigrants with more years of U.S. residence at higher risk of mental health problems. U.S.-born Hispanic/Latino adults who have experienced a lifetime of higher exposure to discrimination with fewer social and cultural resources to protect them experience the highest risk of mental health problems. This is true even though they have a higher perceived social standing than their foreign-born counterparts.

## CONCLUSION

Our results suggest that future research on the mental health of Hispanics/Latinos should focus on how to protect U.S. and foreign-born Hispanic populations from the stress of discrimination and low U.S. social standing while promoting the development and maintenance of close social networks. Public health and mental health professionals should recognize the importance of social determinates of mental health and promote policies and resources that reduce exposure to discrimination and buttress resilience in individuals (Brittian et al. 2013; Brondolo et al. 2009; Smedley & Syme 2001). Additionally, resources can be developed to foster close social networks within communities and the use of these networks in promoting well-being (Centola 2010; Hawe & Sheill 2000; Smedley & Syme 2001). Many community-based organizations have led the way in developing innovative practices to help immigrants build social networks and a sense of community, to provide training to help health and human service providers better understand the background and experiences of immigrant clients, to provide translation and interpretation services for immigrants, and to offer immigrants English language classes and other resources that help them to navigate their lives in the United States (Yoshikawa et al. 2014). It is through their

efforts and others that we can build communities where all immigrants and their children can thrive.

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## References

- Abraído-Lanza AF, Chao MT, Florez KR. Do healthy behaviors decline with greater acculturation?: Implications for the Latino mortality paradox. *Social Science & Medicine*. 2005; 61:1243–1255. [PubMed: 15970234]
- Abraído-Lanza AF, Dohrenwend BP, Ng-Mak DS, Turner JB. The Latino mortality paradox: A test of the “salmon bias” and healthy migrant hypotheses. *American Journal of Public Health*. 1999; 89(10):1543–1548. [PubMed: 10511837]
- Adler NE, Boyce T, Chesney MA, Cohen S, Folkman S, Kahn RL, Syme SL. Socioeconomic status and health: The challenge of the gradient. *American Psychologist*. 1994; 49:15–24. [PubMed: 8122813]
- Adler NE, Epel ES, Castellazzo G, Ickovics JR. Relationship of subjective and objective social status with psychological and physiological functioning: Preliminary data in healthy White women. *Health Psychology*. 2000; 19(6):586–592. [PubMed: 11129362]
- Alcántara C, Chen C, Alegría M. Do post-migration perceptions of social mobility matter for Latino immigrant health? *Social Science & Medicine*. 2014; 101:94–106. [PubMed: 24560229]
- Alegría M, Canino G, Shrout PE, Woo M, Duan N, Vila D, Meng XL. Prevalence of mental illness in immigrant and non-immigrant U.S. Latino groups. *American Journal of Psychiatry*. 2008; 165(3): 359–69. [PubMed: 18245178]
- Andresen EM, Malmgren JA, Carter WB, Patrick DL. Screening for depression in well older adults: Evaluation of a short form of the CES-D (Center for Epidemiologic Studies Depression Scale). *American journal of preventive medicine*. 1994; 10(2):77–84. [PubMed: 8037935]
- 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(3):362–384. [PubMed: 25484488]
- Brittian AS, Toomey RB, Gonzales NA, Dumka LE. Perceived discrimination, coping strategies, and Mexican origin adolescents’ internalizing and externalizing behaviors: Examining the moderating role of gender and cultural orientation. *Applied Developmental Science*. 2013; 17(1):4–19. [PubMed: 23833550]
- Brondolo E, Brady ver Halen N, Pencille M, Beatty D, Contrada RJ. Coping with racism: A selective review of the literature and a theoretical and methodological critique. *Journal of Behavioral Medicine*. 2009; 32:64–88. [PubMed: 19127420]
- Calzada EJ, Tamis-LeMonda CS, Yoshikawa H. Familismo in Mexican and Dominican families from low-income, urban communities. *Journal of Family Issues*. 2013; 34(12):1696–1724.
- Centola D. The Spread of behavior in an online social network experiment. *Science*. 2010; 329(5996): 1194–1197. [PubMed: 20813952]

- Chung GH, Flook L, Fuligni AJ. Daily family conflict and emotional distress among adolescents from Latin American, Asian, and European backgrounds. *Developmental Psychology*. 2009; 45(5): 1406. [PubMed: 19702401]
- Coatsworth JD, Maldonado-Molina M, Pantin H, Szapocznik J. A person-centered and ecological investigation of acculturation strategies in Hispanic immigrant youth. *Journal of Community Psychology*. 2005; 33(2):157–174. [PubMed: 16799699]
- Cohen S, Doyle WJ, Skoner DP, Rabin BS, Gwaltney JM Jr. Social ties and susceptibility to the common cold. *Journal of the American Medical Association*. 1997; 277:1940–1944. [PubMed: 9200634]
- Cook B, Alegria M, Lin JY, Guo J. Pathways and correlates connecting Latinos' mental health with exposure to the United States. *American Journal of Public Health*. 2009; 99(12):2247–2254. [PubMed: 19834004]
- Daviglus ML, Talavera GA, Avilés-Santa L, Allison M, Cai J, Criqui MH, Stamler J. Prevalence of Major Cardiovascular Risk Factors and Cardiovascular Diseases among Hispanics/Latinos of Diverse National Backgrounds in the US. *Journal of the American Medical Association*. 2012; 308(17):1775–1784. [PubMed: 23117778]
- Davy, M. The Central American Foreign Born in the United States. Migration Policy Institute Spotlight; 2006. at <http://www.migrationpolicy.org/article/central-american-foreign-born-united-states> [Accessed September 13, 2014]
- Devito AJ, Kubis JF. Alternate forms of the State-Trait anxiety inventory. *Educational and Psychological Measurement*. 1983; 43:729–34.
- Finch BK, Hummer RA, Kolody B, Vega WA. The role of discrimination and acculturative stress in the physical health of Mexican-origin adults. *Hispanic Journal of Behavioral Sciences*. 2001; 23(4):399–429.
- Finch BK, Kolody B, Vega WA. Perceived discrimination and depression among Mexican-origin adults in California. *Journal of Health and Social Behavior*. 2000; 41:295–313. [PubMed: 11011506]
- Fuligni AJ, Yip T, Tseng V. The impact of family obligation on the daily behavior and psychological well-being of Chinese American adolescents. *Child Development*. 2002; 73:306–318.
- Gammage, S. El Salvador: Despite end to civil war, emigration continues. Migration Policy Institute Profile; 2007. at <http://www.migrationpolicy.org/article/el-salvador-despite-end-civil-war-emigration-continues> [Accessed September 13, 2014]
- Gandek B, Ware JE, Aaronson NK, Apolone G, Bjomer JB, Brazier JE, Sullivan M. Cross-validation of item selection and scoring for the SF-12 Health Survey in nine countries: Results from the IQOLA Project. *International Quality of Life Assessment. Journal of Clinical Epidemiology*. 1998; 51(11):1171–8. [PubMed: 9817135]
- Hawe P, Shiell A. Social capital and health promotion: A review. *Social Science and Medicine*. 2000; 51:871–885. [PubMed: 10972431]
- Kiang L, Fuligni AJ. Ethnic identity and family processes among adolescents from Latin American, Asian, and European backgrounds. *Journal of Youth and Adolescence*. 2009; 38:228–241. [PubMed: 19636720]
- Kiang L, Yip T, Gonzales-Backen M, Witkow M, Fuligni AJ. Ethnic identity and the daily psychological well being of adolescents with Chinese and Mexican backgrounds. *Child Development*. 2006; 27:1338–1350. [PubMed: 16999802]
- Koneru VK, Weisman de Mamania AG, Flynn PM, Betancourt H. Acculturation and mental health: Current findings and recommendations for future research. *Applied and Preventive Psychology*. 2007; 12:76–96.
- Krieger N, Smith K, Naishadham D, Hartman C, Barbeau EM. Experiences of discrimination: Validity and reliability of a self-report measure for population health research on racism and health. *Social Science and Medicine*. 2005; 61:1576–1596. [PubMed: 16005789]
- Lavage LM, Kalsbeek WD, Sorlie PD, Avilés-Santa LM, Kaplan RC, Barnhart J, Elder JP. Sample design and cohort selection in the Hispanic Community Health Study/Study of Latinos. *Annals of Epidemiology*. 2010; 20(8):642–9. [PubMed: 20609344]

- Lugo Steidel AG, Contreras JM. A new familism scale for use with Latino populations. *Hispanic Journal of Behavioral Sciences*. 2003; 25:312–330.
- Marín G, Sabogal F, VanOss Marín B, Otero-Sabogal F, Pérez-Stable EJ. Development of a short acculturation scale for Hispanics. *Hispanic Journal of Behavioral Sciences*. 1987; 9:183–205.
- Marín G, Gamba RJ. A measurement of acculturation in Hispanics: The Bidimensional Acculturation Scale for Hispanics (BAS). *Hispanic Journal of Behavioral Sciences*. 1996; 18:297–316.
- Nunnally, J.; Bernstein, I. *Psychometric Theory*. New York: MacGraw Hill; 1994.
- Operario D, Adler NE, Williams DR. Subjective social status: Reliability and predictive utility for global health. *Psychology & Health*. 2004; 19(2):237.
- Ornelas IJ, Perreira KM. The role of migration in the development of depressive symptoms among Latino immigrant parents in the USA. *Social Science and Medicine*. 2011; 73(8):1169–1177. [PubMed: 21908089]
- Perez GK, Cruess D. The impact of familism on physical and mental health among Hispanics in the United States. *Health Psychology Review*. 2014; 8(1):95–127. [PubMed: 25053010]
- Perreira KM, Ornelas IJ. Painful passages: Traumatic experiences and post-traumatic stress among immigrant Latino adolescents and their primary caregivers. *International Migration Review*. 2013; 47(4)10.1111/imre.12050
- Roberts R, Phinney J, Masse L, Chen Y, Roberts C, Romero A. The structure of ethnic identity in young adolescents from diverse ethnocultural groups. *Journal of Early Adolescence*. 1999; 19:301–322.
- Rumbaut RG. Ages, Life Stages, and Generational Cohorts: Decomposing the Immigrant First and Second Generations in the United States. *International Migration Review*. 2004; 38(3):1160–1205.
- Sabogal F, Marin G, Otero-Sabogal R, Marin BV, Perez-Stable EJ. Hispanic familism and acculturation: What changes and what doesn't? *Hispanic Journal of Behavioral Sciences*. 1987; 9:397–412.
- Sam DL, Berry JW. Acculturation: When individuals and groups of different cultural backgrounds meet. *Perspectives on Psychological Science*. 2010; 5(4):472–481. [PubMed: 26162193]
- Smedley BD, Syme L. Committee on Capitalizing on Social Science, Behavioral Research to Improve the Public's Health Division of Health Promotion, Disease Prevention Institute of Medicine. Promoting health: intervention strategies from social and behavioral research. *American Journal of Health Promotion*. 2001; 15(3):149–166. [PubMed: 11265579]
- Smith KP, Christakis NA. Social networks and health. *Annual Review of Sociology*. 2008; 34:405–429.
- Sorlie PD, Avilés-Santa LM, Wassertheil-Smoller S, Kaplan RC, Daviglius ML, Giachello AL, Heiss G. Design and implementation of the Hispanic Community Health Study/Study of Latinos. *Annals of Epidemiology*. 2010; 20(8):629–41. [PubMed: 20609343]
- Spielberger, CD.; Gorsuch, RL.; Lushene, R.; Vagg, PR.; Jacobs, GA. *Manual for the State-Trait Anxiety Inventory*. Palo Alto: Consulting Psychologists Press, Inc; 1983.
- Telzer EH, Gonzales N, Fuligni AJ. Family obligation values and family assistance behaviors: Protective and risk factors for Mexican-American adolescents' substance use. *Journal of Youth and Adolescence*. 2014; 43(2):270–83. [PubMed: 23532598]
- Torres L, Driscoll MW, Voell M. Discrimination, acculturation, acculturative stress, and Latino psychological distress: A moderated mediational model. *Cultural Diversity Ethnic Minority Psychology*. 2012; 18(1):17–25. [PubMed: 22250895]
- Van Hook J, Zhang W. Who stays? Who goes? Selective emigration among the foreign-born. *Population Research and Policy Review*. 2011; 30:1–24. [PubMed: 22679341]
- Vega WA, Amaro H. Latino outlook: Good health, uncertain prognosis. *Annual Review of Public Health*. 1994; 15:39–67.
- Vega WA, Sribney W, Aguilar-Gaxiola S, Kolody B. 12-month prevalence of DSM-III-R psychiatric disorders among Mexican Americans: Nativity, social assimilation, and age determinants. *The Journal of Nervous and Mental Disease*. 2004; 192(8):532–541. [PubMed: 15387155]
- Viruell-Fuentes EA. Beyond acculturation: Immigration, discrimination, and health research among Mexicans in the United States. *Social Science and Medicine*. 2007; 65(7):1524–1535. [PubMed: 17602812]

- Ware J Jr, Kosinski M, Keller SD. A 12-Item short-form health survey: Construction of scales and preliminary tests of reliability and validity. *Medical Care*. 1996; 34(3):220–33. [PubMed: 8628042]
- Wassertheil-Smoller S, Arredondo EM, Avilés-Santa LM, Cai J, Choca JP, Jung M, Zee PC. Depression, anxiety, antidepressant use, and cardiovascular disease among Hispanic men and women of different ethnic backgrounds: results from the Hispanic Community Health Study/Study of Latinos (HCHS/SOL). *Annals of Epidemiology*. 2014; 24(11):822–830. [PubMed: 25439033]
- Yoshikawa, H.; Weiland, C.; Ulvestad, K.; Fortuny, K.; Perreira, K.; Crosnoe, R. [Accessed March 27, 2015] Improving access of low-income immigrant families to health and human services: The role of community-based organizations. 2014. at <http://www.urban.org/UploadedPDF/2000011-Improving-Access-of-Low-Income-Immigrant-Families-to-Health-and-Human-Services.pdf>

**Table 1**  
Prevalence of Psychological Distress, by Nativity, Years in U.S, Age and Migration, and Hispanic Background

	Full Sample		Psychological Distress		Depression		Anxiety	
	N	%	SF-12 MCS (Score <=40)	Mean Score = 49.18	CESD-10 (Score >=10)	Mean Score = 6.91	STAI-10 (Score >=20)	Mean Score = 17.00
<b>All</b>	15004	100	---	20.78 (19.72, 21.89)	26.63 (25.43, 27.86)	28.02 (26.84, 29.24)		
<b>Years Lived in US</b>								
US-Born (ref)	2675	23.23	(21.70, 24.83)	19.86 (17.72, 22.19)	28.51 (25.96, 31.22)	33.68 (31.00, 36.47)		
Foreign Born								
21+ years	4958	23.83	(22.58, 25.12)	24.93 (22.74, 27.26) ***	30.61 (28.53, 32.77)	30.32 (28.25, 32.48) *		
15-20 years	2156	13.82	(12.95, 14.73)	20.79 (18.17, 23.67)	25.51 (22.75, 28.49)	25.78 (23.05, 28.70) ***		
10-14 years	1756	11.76	(10.93, 12.65)	19.77 (17.32, 22.47)	24.79 (22.05, 27.76)	25.92 (23.26, 28.78) ***		
0-9 years	3459	27.37	(25.54, 29.27)	18.40 (16.78, 20.13)	22.91 (21.01, 24.93) ***	23.25 (21.34, 25.27) ***		
<b>Hispanic Background</b>								
US-Born	2675	23.23	(21.70, 24.83)	19.86 (17.72, 22.19)	28.51 (25.96, 31.22) ***	33.68 (31.00, 36.47) ***		
Foreign Born								
Mexican (ref)	5120	29.53	(27.04, 32.16)	19.72 (17.73, 21.88)	22.06 (20.14, 24.11)	26.28 (24.29, 28.37)		
Central American-Non-Mexican	1489	6.77	(5.78, 7.91)	17.40 (15.10, 19.97)	24.64 (22.13, 27.34)	26.32 (23.36, 29.51)		
Dominican	1209	8.22	(7.09, 9.51)	22.53 (19.75, 25.57)	25.87 (23.19, 28.75) *	27.25 (24.35, 30.36)		
Puerto Rican	1447	8.12	(7.22, 9.14)	29.14 (25.10, 33.54) ***	38.82 (34.44, 43.38) ***	37.38 (33.35, 41.61) ***		
Cuban	1933	17.72	(14.79, 21.08)	21.29 (19.40, 23.32)	27.45 (24.98, 30.07) **	21.86 (19.71, 24.17) **		
Other Hispanic/South American	1131	6.41	(5.71, 7.19)	18.35 (14.70, 22.66)	26.18 (21.57, 31.37)	23.50 (18.86, 28.88)		

\* p<=.05,

\*\* p <=.01,

\*\*\* p<=.001

Note: All estimates are weighted to adjust sampling probabilities for non-response and age-standardized to the year 2010 Census population in each data collection location. Standard errors are adjusted for clustering by location. The foreign-born include U.S. citizens born in the Puerto Rican Islands rather than the U.S. mainland.

**Table 2**

Means/Percentages of Explanatory Variables, by Nativity and Years in the US

	Full Sample		US-Born (ref)		Foreign-born 21+ years in US		Foreign-born 10-20 years in US		Foreign-born 0-9 years in US	
	M/%	(95% CI)	M/%	(95% CI)	M/%	(95% CI)	M/%	(95% CI)	M/%	(95% CI)
<b>Discrimination</b>										
Any Discrimination	70.49	(68.88, 72.05)	74.24	(71.82, 76.51)	73.24	(71.16, 75.22)	72.95	(70.59, 75.19)	62.62	(59.66, 65.48)
<b>Acculturation</b>										
SASH-language	2.14	(2.09, 2.19)	3.57	(3.53, 3.62)	2.07	(2.01, 2.13)	1.70	(1.66, 1.74)	1.41	(1.38, 1.44)
SASH-social	2.05	(2.03, 2.08)	2.46	(2.42, 2.49)	2.11	(2.07, 2.15)	1.93	(1.89, 1.97)	1.78	(1.74, 1.81)
<b>Ethnic Identity</b>										
Belonging	3.05	(3.03, 3.07)	2.96	(2.92, 3.00)	3.07	(3.03, 3.10)	3.05	(3.02, 3.09)	3.12	(3.09, 3.15)
Pride	3.33	(3.31, 3.34)	3.25	(3.22, 3.27)	3.33	(3.30, 3.36)	3.35	(3.32, 3.38)	3.37	(3.35, 3.40)
<b>Family Identity</b>										
Family loyalty (English)	2.77	(2.73, 2.80)	2.74	(2.71, 2.78)	2.87	(2.77, 2.98)	2.74	(2.63, 2.85)	2.70	(2.42, 2.98)
Family loyalty (Spanish)	3.10	(3.07, 3.12)	2.84	(2.75, 2.92)	3.16	(3.12, 3.20)	3.11	(3.07, 3.15)	3.09	(3.05, 3.14)
Family support (English)	4.10	(4.07, 4.13)	4.11	(4.08, 4.15)	4.03	(3.95, 4.12)	4.15	(4.07, 4.23)	4.08	(3.89, 4.26)
Family support (Spanish)	4.25	(4.24, 4.27)	4.19	(4.11, 4.26)	4.23	(4.20, 4.26)	4.26	(4.24, 4.29)	4.27	(4.24, 4.29)
<b>Social Network</b>										
Close Contacts	7.53	(7.43, 7.63)	6.78	(6.60, 6.97)	7.53	(7.37, 7.70)	7.92	(7.75, 8.09)	7.80	(7.60, 8.00)
US Social Standing	4.40	(4.33, 4.47)	4.69	(4.59, 4.79)	4.41	(4.32, 4.50)	4.35	(4.26, 4.44)	4.19	(4.07, 4.32)
Sample Size (N)	15004		2675		4958		3912		3459	

\* p<=.05,

\*\* p <=.01,

\*\*\* p<=.001

Note: All estimates are weighted to adjust sampling probabilities for non-response and age-standardized to the year 2010 Census population in each data collection location. Standard errors are adjusted for clustering by location.



Unadjusted and Adjusted Odds of Moderate to Severe Symptoms of Psychological Distress, Depression, or Anxiety (N=15004)

Table 3

Panel A. Unadjusted Odds Ratios	Psychological Distress		Depression		Anxiety	
	SF-12 MCS (Score <=40)	(95% CI)	CESD-10 (Score >=10)	(95% CI)	STAI-10 (Score >=20)	(95% CI)
<b>Years in the US</b>						
US-Born	REF		REF		REF	
Foreign Born						
21+ years	1.34	(1.14, 1.57) ***	1.11	(0.95, 1.29)	0.86	(0.74, 1.00) *
10-20 years	1.03	(0.85, 1.25)	0.84	(0.71, 1.00)	0.69	(0.58, 0.81) ***
0-9 years	0.91	(0.77, 1.08)	0.75	(0.64, 0.87) ***	0.60	(0.51, 0.70) ***
<b>Panel B. Adjusted Odds Ratios</b>						
<b>Years in the US</b>						
US-Born	REF		REF		REF	
Foreign Born						
21+ years	1.14	(0.89, 1.46)	0.84	(0.67, 1.05)	0.92	(0.73, 1.15)
10-20 years	0.94	(0.73, 1.22)	0.81	(0.63, 1.05)	0.81	(0.63, 1.05)
0-9 years	0.87	(0.67, 1.14)	0.77	(0.60, 0.99) *	0.79	(0.61, 1.02)
<b>Explanatory Variables</b>						
<b>Discrimination</b>						
Any Discrimination	1.75	(1.53, 2.01) ***	1.80	(1.59, 2.04) ***	1.65	(1.45, 1.88) ***
<b>Acculturation</b>						
SASH-language	0.97	(0.85, 1.10)	1.07	(0.96, 1.20)	1.07	(0.95, 1.19)
SASH-social	0.95	(0.83, 1.07)	0.89	(0.80, 0.99) *	0.91	(0.83, 1.00)
<b>Ethnic Identity</b>						
Belonging	0.95	(0.85, 1.06)	0.96	(0.88, 1.05)	0.97	(0.88, 1.07)
Pride	0.98	(0.87, 1.11)	1.02	(0.92, 1.14)	0.98	(0.87, 1.09)
<b>Family Identity</b>						
Family loyalty (English)	1.21	(1.02, 1.44) *	1.22	(1.02, 1.46) *	1.41	(1.19, 1.67) ***

	Psychological Distress			Depression		Anxiety	
	SF-12 MCS (Score <=40)	CESD-10 (Score <=10)	STAI-10 (Score >=10)	CESD-10 (Score >=10)	STAI-10 (Score >=20)	STAI-10 (Score >=20)	STAI-10 (Score >=20)
Family loyalty (Spanish)	1.12 (1.03, 1.22) *	1.18 (1.08, 1.29) ***	1.28 (1.17, 1.39) ***	0.84 (0.66, 1.07)	0.70 (0.56, 0.88) **	0.70 (0.56, 0.88) **	1.00 (0.89, 1.13)
Family support (English)	0.84 (0.66, 1.07)	0.80 (0.63, 1.01)	0.70 (0.56, 0.88) **	0.89 (0.79, 1.00) *	1.00 (0.89, 1.13)	1.00 (0.89, 1.13)	1.00 (0.89, 1.13)
Family support (Spanish)	0.95 (0.85, 1.07)	0.89 (0.79, 1.00) *	1.00 (0.89, 1.13)	0.93 (0.91, 0.95) ***	0.92 (0.90, 0.94) ***	0.92 (0.90, 0.94) ***	0.92 (0.90, 0.94) ***
Social Network							
Close Contacts	0.92 (0.90, 0.94) ***	0.93 (0.91, 0.95) ***	0.92 (0.90, 0.94) ***	0.90 (0.87, 0.92) ***	0.86 (0.83, 0.89) ***	0.86 (0.83, 0.89) ***	0.86 (0.83, 0.89) ***
US Social Standing	0.88 (0.85, 0.92) ***	0.90 (0.87, 0.92) ***	0.86 (0.83, 0.89) ***	0.90 (0.87, 0.92) ***	0.86 (0.83, 0.89) ***	0.86 (0.83, 0.89) ***	0.86 (0.83, 0.89) ***

\* p<=.05,

\*\* p <=.01,

\*\*\* p<=.001

Note: Estimates in panel B are adjusted for Hispanic background, sex, age, education, employment, marital status, health insurance, and language preference at the baseline survey. Estimates are also weighted to adjust sampling probabilities for non-responders and age-standardized to the year 2010 Census population in each data collection location. Standard errors are adjusted for clustering by location.

**Table 4**  
Unadjusted and Adjusted Odds Ratios for Mental Health Outcomes among the Foreign-Born, by Hispanic Background

		Unadjusted Models			Adjusted Models		
		0-9 years	10-20 years	21+ years	0-9 years	10-20 years	21+ years
<b>Panel A. Psychological Distress</b>							
	N						
All Foreign Born	12329	REF	1.13 (0.97, 1.33)	1.47 (1.25, 1.74)***	REF	1.06 (0.89, 1.26)	1.27 (1.05, 1.54) *
Hispanic Background							
Mexican	5120	REF	1.08 (0.82, 1.42)	1.14 (0.88, 1.48)	REF	1.08 (0.82, 1.42)	1.34 (0.98, 1.83)
Other Central American	1489	REF	0.71 (0.51, 0.98) *	0.70 (0.48, 1.04)	REF	0.86 (0.58, 1.26)	0.90 (0.56, 1.44)
Dominican	1209	REF	1.20 (0.69, 2.09)	1.71 (1.00, 2.90) *	REF	1.41 (0.84, 2.37)	2.66 (1.56, 4.54) ****
Puerto Rican	1447	REF	1.22 (0.59, 2.53)	1.66 (0.81, 3.41)	REF	1.04 (0.48, 2.28)	1.09 (0.50, 2.35)
Cuban	1933	REF	1.27 (0.91, 1.78)	1.62 (1.20, 2.18) **	REF	1.27 (0.89, 1.80)	1.41 (1.00, 1.99) *
Other Hispanic	1131	REF	1.49 (0.85, 2.60)	2.27 (1.07, 4.80) *	REF	1.31 (0.74, 2.32)	1.69 (0.87, 3.28)
<b>Panel B. Depressive Symptoms</b>							
	N						
All Foreign Born	12329	REF	1.13 (0.97, 1.32)	1.48 (1.28, 1.72) ***	REF	1.01 (0.86, 1.19)	1.05 (0.88, 1.26)
Hispanic Background							
Mexican	5120	REF	1.03 (0.77, 1.38)	1.22 (0.94, 1.59)	REF	1.01 (0.76, 1.35)	1.35 (0.98, 1.87)
Other Central American	1489	REF	0.67 (0.49, 0.92) *	0.70 (0.50, 0.99) *	REF	0.70 (0.48, 1.02)	0.64 (0.42, 0.97) *
Dominican	1209	REF	1.31 (0.87, 1.96)	1.48 (0.98, 2.25)	REF	0.96 (0.61, 1.51)	1.12 (0.69, 1.82)
Puerto Rican	1447	REF	2.38 (1.21, 4.68) *	3.18 (1.72, 5.87) ***	REF	1.93 (0.95, 3.92)	1.78 (0.94, 3.39)
Cuban	1933	REF	1.42 (1.05, 1.92) *	1.44 (1.03, 2.01) *	REF	1.41 (1.02, 1.95) *	1.18 (0.81, 1.74)
Other Hispanic	1131	REF	1.31 (0.82, 2.09)	1.58 (0.83, 3.02)	REF	1.40 (0.86, 2.26)	1.51 (0.84, 2.70)
<b>Panel C. Anxiety</b>							
	N						
All Foreign Born	12329	REF	1.15 (0.98, 1.35)	1.44 (1.24, 1.67) ***	REF	1.05 (0.89, 1.24)	1.22 (1.01, 1.48) *
Hispanic Background							
Mexican	5120	REF	1.06 (0.83, 1.36)	1.10 (0.87, 1.39)	REF	1.05 (0.81, 1.38)	1.31 (0.94, 1.82)

Panel C. Anxiety	N	Unadjusted Models				Adjusted Models					
		0-9 years		10-20 years		0-9 years		10-20 years		21+ years	
		OR	(95% CI)	OR	(95% CI)	AOR	(95% CI)	AOR	(95% CI)	AOR	(95% CI)
Other Central American	1489	REF	0.77 (0.53, 1.12)	0.70	(0.47, 1.03)	REF	0.67	(0.42, 1.07)	0.57	(0.33, 0.99) *	
Dominican	1209	REF	1.20 (0.77, 1.85)	1.40	(0.94, 2.09)	REF	1.34	(0.82, 2.21)	1.91	(1.18, 3.10) **	
Puerto Rican	1447	REF	1.24 (0.66, 2.33)	1.70	(0.98, 2.96)	REF	0.95	(0.46, 1.97)	1.01	(0.51, 1.98)	
Cuban	1933	REF	1.35 (0.97, 1.87)	1.48	(1.04, 2.10) *	REF	1.34	(0.96, 1.87)	1.37	(0.86, 2.17)	
Other Hispanic	1131	REF	0.99 (0.60, 1.65)	1.62	(0.83, 3.16)	REF	0.97	(0.57, 1.64)	1.48	(0.75, 2.94)	

Note: Adjusted Models are adjusted for all explanatory and control variables included in adjusted models in Table 3, Panel B. Estimates are also weighted to adjust sampling probabilities for non-repose and age-standardized to the year 2010 Census population in each data collection location. Standard errors are adjusted for clustering by location.