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A longitudinal analysis of cross-border ties and depression for Latino adults

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Abstract

Recent scholarship suggests a significant association between cross-border ties, or ties maintained with family and friends in countries and communities of origin, and the mental health of immigrants and their descendants. To date, this research has been exclusively cross-sectional, precluding conclusions about a causal association between cross-border ties and mental health outcomes. In the present study we undertake a longitudinal analysis of the relationship between cross-border ties and depression measured over a ten-year period for a sample of immigrant and U.S.-born Latinos. Data are from the Sacramento Area Latino Study on Aging (1998-2008), a population-based, prospective study of Latin American-origin adults 60 years and older. We find that cross-border ties reported at baseline were significantly associated with depression in subsequent study waves, even after controlling for the presence of depression at baseline, albeit with substantial differences by gender and nativity. Specifically, communication with family and friends in Latin America and travel to Latin America at baseline were each significantly associated with greater odds of depression for immigrant women, but with lower odds of depression for U.S.-born Latina women over the study period. Travel to Latin America at baseline was significantly associated with lower odds of depression for Latino men across the study. Across all models we control for depressive symptomatology at baseline to account for the reciprocal nature of depressive symptoms and engagement with social ties, including cross-border ties. Our findings suggest that cross-border ties may represent a unique source of both resilience and risk for the long-term mental health of immigrant Latinos and their descendants.

Keywords

Social ties; cross-border ties; transnationalism; Latinos; depressive symptoms

INTRODUCTION

There is a long history of scholarship linking social relationships to depressive symptoms (Turner & Turner, 2013). While social relationships are generally found to be protective of mental health, social ties may also have countervailing adverse impacts through mechanisms of social stress and burden (Thoits, 2011). Little is known, however, about whether the *proximity* of social ties matters for adult mental health outcomes. Ties to individuals living in close proximity may contribute to greater instrumental support (Seeman & Berkman, 1988), which may in turn be linked to fewer depressive symptoms. On the other hand, even long-distance contact with family and friends may be positively associated with perceived emotional support (Seeman & Berkman, 1988).

Among immigrants, ties to family and friends in communities of origin may have a unique impact on depressive symptoms, above and beyond the impact of local ties (Alcántara et al., 2015; Jin et al., 2012). While there has been extensive study of the impact of family and other social relationships on the mental health of Latino populations in the U.S. (Almeida et al., 2011; Mulvaney-Day et al., 2007), there is seldom information on the location of these ties. Nevertheless, national data from the 2008 Pew Hispanic Survey indicate that over 40% of immigrant Latinos living in the U.S. make at least weekly phone calls to family and friends in countries of origin while twenty-percent reported past-year travel to their country of origin (Soehl & Waldinger, 2010). Even limited cross-border contact can have significant meaning for strengthened ethnic identity, a sense of belonging within a broader ethno-national community, and overall well being, including for the U.S.-born children of immigrants (Levitt & Waters, 2002; J. M. Torres, 2013; Trieu et al., 2015).

The impact of cross-border ties on the mental health of immigrants and their family members is of particular interest: immigrants to the U.S. tend to have declining mental health outcomes with greater time spent in the U.S. (Cook et al., 2009) and some groups, including older Latina immigrants, appear to be at particular risk for high levels of depressive symptoms (González et al., 2001). Prior cross-sectional research suggests that cross-border ties may be an important determinant of mental health outcomes (Alcántara et al., 2015), although no studies to date have tested this association longitudinally. Longitudinal analyses are critical to establishing a causal relationship between cross-border ties and mental health, given the reciprocal nature of these ties with mental health outcomes (Thoits, 2011). That is, while social ties, including cross-border ties, might contribute to mental health outcomes, one's mental health status also contributes to engagement with social ties: more depressed individuals may withdraw from family and friends or may conversely become more connected during periods of increased depression or anxiety. Understanding the causal nature of social ties is of particular importance if these ties are to be leveraged as part of clinical or population-level interventions (Turner & Turner, 2013). In the present study, we improve on prior research by undertaking an analysis of the association

between indicators of cross-border ties at one point in time and depressive symptomatology at several follow-up points, controlling for baseline levels of depressive symptoms in order to account for the likely reciprocal association between cross-border ties and mental well being.

Cross-Border Ties

Social scientists have long observed the continued connections that migrants maintain with family and friends in countries and communities of origin by exchanging letters, phone calls and, increasingly, connecting through social media and mobile devices; actual return visits for annual celebrations or family events; and through the exchange of money and information (Smith, 2006; Waldinger, 2015). These cross-border social and economic ties have been described under the umbrella of transnationalism, which refers to the dual involvement of migrants in social life, religious and cultural practices, health-care and social service systems, and political activities and entrepreneurial ventures across nation-state boundaries (Glick-Schiller et al., 1995; Levitt & Jaworsky, 2007; Portes & Rumbaut, 2014).

The broader field of transnationalism as well as the specific inquiry into cross-border ties within familial and other social networks runs counter to theories of ‘straight-line’ assimilation (Portes & Rumbaut, 2014). The latter perspective assumes migrants integrate into ‘destination’ societies in a linear and uni-directional manner, gradually eschewing the cultural practices of their society of origin in favor of those practices common to their new places of residence. In contrast, observers of migrants’ continued cross-border engagement suggest that migrants may, to varying degrees, maintain ‘dual lives’ that involve social, economic, and other dimensions in both origin and destination contexts (Portes & Rumbaut, 2014; Waldinger, 2015). In fact, greater economic and civic integration within destination societies may actually facilitate continued cross-border involvement, given that migrants who have accrued sufficient earnings through employment in the U.S. and those who have become naturalized citizens will have greater ease affording the high costs of international airfare, and face no legal restrictions to re-entry to the U.S. (Portes & Rumbaut, 2014; J. M. Torres & Waldinger, 2015). While ties to family and friends abroad might be more prevalent among recently arrived immigrants, cross-border engagement continues to be compatible with greater integration into U.S. society among those who have spent more time in the U.S.

Studies of generational differences in cross-border social integration generally suggest that cross-border connection is less common among members of the second generation (U.S.-born children of immigrants), and that family and friends living abroad may constitute weaker ties within their overall social networks (Viruell-Fuentes & Schulz, 2009; Waldinger, 2015). Nevertheless, scholars have documented a non-trivial degree of cross-border engagement among those in the second-generation, particularly for those who are proficient in the language of their parents’ country of origin, and who face limited geographic and economic barriers (e.g. among Mexican-American individuals living close to the U.S.-Mexico border). Even limited cross-border engagement may have substantial meaning for the second and subsequent generations (Levitt & Waters, 2002; Trieu et al., 2015), contributing to a stronger sense of ethnic identity and feelings of belonging within a broader cross-national family community.

Cross-Border Ties and Mental Health

Scholars have only recently begun to make links between cross-border engagement and health outcomes for migrants and their descendants. Researchers have uncovered significant cross-sectional associations between migrant ties to communities of origin and mental health (Alcántara et al., 2015; Jin et al., 2012), as well as overall well being (J. M. Torres, 2013), and health behaviors (Alcántara et al., 2014b) although no studies have linked cross-border social ties to long-term health outcomes.

Theoretically, researchers have suggested that cross-border ties to family and friends abroad may have a unique impact on the mental health of immigrants and their descendants, above and beyond the effects of local ties (Acevedo-Garcia et al., 2012; Viruell-Fuentes & Schulz, 2009). Moreover, cross-border ties may have both positive and negative implications for mental health (Supplemental Figure A). One of the primary mechanisms linking cross-border ties to improved mental health outcomes relates to the potential for these ties to facilitate a sense of belonging within a broader family and ethno-national community (Viruell-Fuentes & Schulz, 2009). This sense of belonging may have a positive impact on mental wellbeing particularly for members of marginalized groups, including migrants and racial or ethnic minorities who experience social isolation and discrimination in the U.S. Moreover, even infrequent cross-border connections may contribute to a strengthened sense of ethnic identity, which has been show to have a protective effect on self-esteem for Latino adults, with important implications for mental health outcomes (L. Torres & Ong, 2010). Finally, those who maintain cross-border ties may continue to use family and friends abroad as their point of social reference, and may therefore perceive their quality of life and socio-economic standing in the U.S. to be relatively high compared to family members living abroad; greater perceived socio-economic status may in turn have positive implications for mental health (Alcántara et al., 2014a; Jin et al., 2012).

Cross-border ties may also have countervailing adverse impacts on mental health. For one, cross-border ties may involve long-term family separation (Menjívar, 2002) given the cost and difficulty of international travel which may contribute to greater depressive symptoms (Miranda et al., 2005). Furthermore, maintaining cross-border ties may entail financial burden if they come with the expectation to send remittances or pay for costly trips abroad. In fact, in a national study of immigrant Latinos, visits to countries of origin were found to be significantly associated with greater odds of major depression (Alcántara et al., 2015).

Cross-border ties may also have a reciprocal association with the maintenance of ancestral language: immigrants and their children who continue to speak the language native to their communities of origin may be more inclined to keep up these ties, and continued cross-border connection facilitates continued linguistic proficiency (Portes & Rumbaut, 2014). Cross-border ties might also facilitate other dimensions of enculturation among immigrants and their U.S.-born children as the conduits for ‘cultural remittances’ between those living in communities of origin and those settled in destination communities (Levitt & Jaworsky, 2007). Previous studies have found evidence of both positive and negative associations between enculturation and depressive symptoms for immigrant and U.S.-born Latinos (Black et al., 1998; Gerst et al., 2010; González et al., 2001; Swenson et al., 2000).

The aim of the present study was to examine the effects of cross-border ties on trajectories of depression for a prospective cohort of immigrant and U.S.-born Latino adults. We hypothesize that, on balance, cross-border ties will be associated with lower odds of depression across repeated measures, although we acknowledge the potentially countervailing adverse impacts of these cross-border ties on mental health such that null or negative effects might be observed. We further hypothesize that the association between cross border ties and depression will differ by nativity. Specifically, we expect that cross-border ties might be associated with poorer mental health outcomes for foreign-born individuals compared to those born in the U.S. (but with foreign-born parents or grandparents) given that these ties might entail cross-border separation from close family members and come with additional expectations of remittance sending or other familial obligations for foreign-born respondents.

METHODS

Participants

The Sacramento Area Latino Study on Aging (SALSA) is a population-based, prospective study of foreign and U.S.-born Latino respondents living in one of six counties in the Central Valley region of Northern California (Haan et al., 2003). Respondents were 60 years and older at baseline and are primarily of Mexican origin; 6% of the sample was born in Central America. Surveys were completed every 12 to 15 months between 1998 and 2008 for up to seven follow-up waves. Census tracts in five contiguous counties in the Sacramento Valley of California were identified based on the percentage of eligible residents (i.e. ≥ 60 years and Latino). Tracts with at least 5% eligible were selected, and all individuals with Latino surnames ≥ 60 years were contacted by mail, phone, or door-to-door. Among those contacted, 85% completed the initial survey.

From the baseline sample of 1789 respondents, we excluded a total of 519 respondents missing on any of the baseline measures and without at least one value on the dependent variable across study waves, for a total analytic sample of 1270 (735 women and 535 men). Over half of those excluded (287 cases or 56%) were missing on measures of local social relationships. These measures were captured as part of a follow-up telephone interview conducted between waves 1 and 2. Overall, participants excluded from the analytic sample were more likely to have died during the study, had slightly more baseline depressive symptoms on average, and reported lower levels of local social ties, but no significant differences on measures of cross-border ties.

Measures

Depression—The outcome measure is the 20-item Centers for Epidemiologic Studies Depression (CES-D) scale (Radloff, 1977). This scale has been widely used to assess depressive symptoms in community settings among older Latino populations; (Casillas et al., 2012; Gerst et al., 2010) the reliability coefficient is $\alpha = 0.89$ for the present sample. Depression was defined as a CES-D score of 16 or greater.

Cross-border ties—Respondents reported frequency of talking to family or friends in Latin America at baseline. We contrasted those who reported talking “often”, “always”, or “almost never” with those who reported “never” talking to family or friends abroad, given findings from previous research that even limited cross-border connection may be influential for health outcomes (J. M. Torres, 2013). We additionally include a measure of how frequently respondents reported traveling to Latin America as a potential proxy for cross-border ties, although we acknowledge that travel might be for reasons other than visiting family and friends, such as tourism or travel for healthcare. We contrast those who reported *any* travel Latin America (i.e. ‘often’, ‘all of the time’, ‘almost never’) with those who reported ‘never’ traveling.

Potential Confounders and Mediators: We controlled for baseline indictors of ‘local’ social ties given the possibility that individuals who were engaged in cross-border ties were also highly engaged in local social networks (and vice versa), with potentially significant implications for mental health. We considered the following measures as reflective of local ties: 1) how often respondents met with or talked to family and friends, contrasting those who ‘always’ met/talked with family and friends compared to those who talked or met ‘a lot of the time’, ‘some of the time’, or ‘never’ and 2) how often respondents saw the person with whom they had the most contact, contrasting those who reported daily contact with those who report less than daily contact (i.e. between ‘a few times a week’ and ‘never’). The cut-off points for each of these measures were based on the fact that the majority of respondents indicated ‘always’ meeting or talking to family and friends (69%), and seeing their closest contact daily (43%). We also included respondent marital status (married or living with someone as a spouse versus divorced, separated, single or widowed), a commonly used indicator of social relationships (Seeman, 1996).

We control for respondent age in years (a squared term for age did not improve model fit), and respondent nativity. Nativity has also been found to be significantly associated with depressive symptoms among Latino adults (Black et al., 1998; González et al., 2001; Swenson et al., 2000). Given the small number of Central American-born respondents remaining in the analytic sample (n=71), we are not able to stratify by country of origin among immigrant respondents. Models are stratified by gender given previous literature on differences in cross-border ties and health for men and women (Alcántara et al., 2015; Alcántara et al., 2014b).

We also control for respondent's monthly income, using a cut-off at the mean level of monthly income for the sample ($1500 or less compared to more than $1500). Financial resources may confound the relationship between travel to Latin America and depressive symptoms, since travel to Latin America depends on financial means to do so. We additionally control for respondents’ self-reported need for assistance with any activity of daily living (ADL) or instrumental activity of daily living (IADL). Respondents with any need for assistance may be less likely to be able to travel to Latin America, and may also rely more on local-level ties for instrumental support with care needs.

Finally, we control for acute and chronic conditions including diabetes, hypertension, angina, stroke, heart failure, and myocardial infarction. Respondents were categorized as

having diabetes if they self-reported a physician diagnosis of diabetes, took anti-diabetic medication, or had a measured fasting glucose level of ≥ 126 mg/dL. Respondents were categorized as having hypertension if they self-reported a physician diagnosis of hypertension, took anti-hypertensive medication, or had measured systolic blood pressure of ≥ 140 mm Hg or diastolic blood pressure ≥ 90 mm Hg. Other cardiovascular conditions are based on self-report of doctor diagnosis.

Statistical Analyses

We first present descriptive statistics, and then estimate a series of hierarchical generalized linear models with a binary outcome of CES-D scores ≥ 16. These are logistic regression models, but take into account the non-independence of repeated measures of depression over all waves of data collection with a subject-specific random-intercept (Rabe-Hesketh & Skrondal, 2012). The exponentiated odds for these models are therefore interpreted as conditional or subject-specific odds ratios. We note that across all models we control for whether or not respondents reported depression at baseline in order to account for the possibility that baseline depressive symptoms might be driving baseline reports of cross-border connection.

We first estimate the main effect association between baseline cross-border social ties and depression from waves two through seven, controlling for depression at baseline and additional demographic and health-related covariates. Subsequent models test interaction terms between each of the two cross-border ties measures and nativity. We utilize inverse probability weights to account for possible biases due to missing data across all models. The weights were constructed by taking the inverse of the probabilities generated from a logistic regression model predicting whether or not respondents were missing from the analysis.

Sensitivity Analyses—We conducted sensitivity analyses 1) using alternative specifications of cross-border ties measures (i.e. contrasting those who report travel and/or talking to family and friends “often” or “all of the time” with those who report “never” or “almost never”), and 2) testing a time-varying measure of travel to Latin America. Finally, given the importance of understanding the social determinants of sub-sydromal depression, we estimated models with a continuous outcome of depressive symptoms using a multi-level mixed model with a random intercept as well as a random slope that allowed for varying trajectories of depressive symptoms across individuals. All models were estimated in STATA v. 14.

RESULTS

The sample characteristics are shown in Table 1. At baseline, respondents were about 70 years old on average, and about half were born in Latin America. Over two-thirds of respondents reported always meeting or talking to friends, and over 40% reported daily contact with their closest social tie. About 44% of respondents reported any communication with family and friends in Latin America while about 50% reported any travel to Latin America. Differences in cross-border ties by nativity and gender are shown in Figure 1.

The associations between cross-border ties and depression are shown in Table 2 for women and Table 3 for men. For women, there are no significant main effects associations between cross-border ties reported at baseline on the subsequent odds of high depressive symptoms over the study period. There were significant interaction terms between cross-border ties and nativity for female respondents. Specifically, the odds of depression for Latina immigrant respondents were significantly greater if they reported talking to family and friends in Latin America at baseline relative to the reference category of U.S.-born female respondents who reported never talking to family or friends in Latin America at baseline (OR: 2.37, 95% CI: 1.23, 4.55). Similarly, the odds of depression for Latina immigrant respondents were significantly greater if they reported any travel to Latin America (OR: 2.29, 95% CI: 1.29, 4.05) relative to the reference category of U.S.-born female respondents to reported never traveling to Latin America. In Figures 2 and 3 we present the marginal predicted probabilities of depression across the study period by nativity and the respective cross-border ties measures (Supplemental Figures B and C show trends by age).

Among male respondents there was no significant association between communication with family and friends in Latin America and subsequent depression. However, reporting any travel to Latin America was significantly associated with lower odds of depression for older Latino male (OR: 0.68, 95% CI: 0.47, 0.97). Figure 4 shows the marginal predicted probabilities of depression by whether or not male respondents report any travel to Latin America by baseline (Supplemental Figure D show trends by age). There were no significant interaction effects between cross-border ties and nativity for male respondents. Results of sensitivity analyses are reported in the Supplemental Appendix.

DISCUSSION

Our findings suggest that indicators of cross-border ties are significantly associated with depression for a prospective cohort of Latinos of Mexican and Central American origin. These results build on prior cross-sectional analyses, which have not been able to tease apart the reciprocal associations between cross-border social ties and mental health outcomes. Our findings contribute evidence regarding the potentially causal impact of cross-border ties on long-term depression trajectories, above and beyond the impact of local social ties, for immigrants and their descendants.

In addition to uncovering significant longitudinal associations between cross-border ties and depression, we discovered substantial differences in these associations by gender and nativity. Contrary to our hypothesized link between cross-border ties and lower odds of depression, we found that any communication with family and friends in Latin America and any travel to Latin America were each associated with *greater* odds of depression for immigrant women. This finding may reflect the fact that cross-border ties may entail emotional burden for immigrant women in particular. Qualitative research suggests that cross-border ties often entail continued obligations around caregiving and the provision of emotional support. These expectations are heavily gendered, whereby immigrant women are expected to continue providing cross-border care to sick relatives as well as children who remain in countries of origin (Viruell-Fuentes, 2006; Viruell-Fuentes & Schulz, 2009). It may be that travel abroad is motivated by the need to provide care or respond to family

emergencies in communities of origin for immigrant women in particular, which may in turn contribute to higher depressive symptomatology.

The finding that cross-border ties are associated with greater odds of depression may also be explained by previous research observing a significant association between low levels of acculturation and more depressive symptoms among older Latina women (Black et al., 1998; González et al., 2001; Swenson et al., 2000). It may be that cross-border contact serves as a proxy for acculturation, whereby those who have greater cross-border contact are more likely to be monolingual Spanish-speaking, face greater social and linguistic isolation, and lower levels of social capital in U.S. communities (Valencia-Garcia et al., 2012), with adverse consequences for mental health. We note, however, that in sensitivity analyses we controlled for measures of Spanish language proficiency and social ties to non-Latino whites as potential measures of acculturation, and our results were unchanged. Future research might expand on the current study by examining whether or not the meaning of cross-border ties for mental health outcomes varies across contextual factors that might reflect linguistic isolation, such as neighborhood ethnic density, or density of Spanish speakers.

While cross-border engagement is significantly associated with greater odds of depression for immigrant women, travel to Latin America was significantly associated with *lower* odds of depression for older Latino men. Finding of gender differences in the relationship between cross-border ties and depression trajectories might be understood in light of theoretical perspectives found in the broader scholarship on gender, migration, and transnationalism. For example, the gendered geographies of power framework (Mahler & Pessar, 2001) has been used to describe the ways in which migration and continued cross-border engagement positions men and women in “transnational spaces” that entail multiple gender hierarchies, and both losses and gains in power, status, and privilege. For example, scholars have suggested that migration may lead to a certain degree of status loss for men relative to what they enjoyed in their communities of origin, particularly if they labor in low-wage jobs and are otherwise marginalized as racial or ethnic minorities in the U.S. (Itzigsohn & Giorguli-Saucedo, 2005). Continued cross-border contact may mitigate this declining sense of power and status experienced in the U.S. by reaffirming men's position of power within their communities of origin. Cross-border ties may therefore be associated with positive mental health outcomes for men if it helps reaffirm their place in a transnational gender hierarchy (Mahler & Pessar, 2001), and enhances their relative socio-economic position in communities of origin (Gonzalez Vazquez et al., 2007).

In contrast, scholars have suggested that immigrant women may experience relative status gains as the result of migration – particularly if employment in the U.S. coupled with greater institutional protections afford women increased socio-economic equality. Continued cross-border engagement with communities of origin that normalize more asymmetric power relationships between men and women might therefore undermine these gains in status, with negative impacts on mental health (Itzigsohn & Giorguli-Saucedo, 2005; Mahler & Pessar, 2001). On the other hand, immigrant women may not experience homogeneous improvements in status improvements as the result of migration; in fact, experiences of social isolation and marginalization might be particularly acute for immigrant women who face occupational exploitation or hold precarious legal statuses (Hagan, 1998). The strain of

cross-border family separation and/or the burden of cross-border familial obligations may compound some of adverse experiences of social isolation both among working immigrant women in mid-life and older women who migrate in late-life in particular, with adverse consequences for mental health.

Contrary to findings for immigrant women, our results suggest protective effects of cross-border ties for U.S.-born Latina women. This might reflect findings from qualitative analyses indicating that women in the second generation may derive benefits from cross-border ties, including a strengthened sense of ethnic identity and belonging, without the countervailing emotional strain resulting from cross-border caregiving obligations that are common among first generation women (Viruell-Fuentes, 2006). Second generation women may also have a greater sense of their status as racial and ethnic minorities in the U.S. (Viruell-Fuentes, 2006), and cross-border social engagement – affording a sense of belonging within a broader familial network and ethno-national community -- may help buffer the adverse mental health impacts of negative social exposures related to minority status in the U.S., including discrimination (Viruell-Fuentes, 2006).

Limitations

There are several limitations to keep in mind when interpreting these results. For one, our indicators of social integration do not illuminate the specific source and function of referenced social ties: family and friends abroad may range from weak ties (acquaintances or extended family members) to close family members. None of the indicators of social integration refer to support of any kind, including emotional, instrumental, or informational support, or conversely to the possible strain or burden associated with social ties. Our measure of travel to Latin America also lacks desired specificity in terms of social versus other motivation: is possible that travel to Latin America is motivated by cross-border healthcare utilization or tourism. Nevertheless, talking to family and friends in Latin America is highly predictive of travel to Latin America, indicating that on average travel might be related to continued connection with family members and friends. Additional, more specific measures of both proximal and cross-border social ties would ideally specify which family members or friends are referenced, their specific function, as well as further detail about the motivations for travel and kinds of exchanges made across borders (e.g. social, financial). Despite these limitations, this is the only data source to our knowledge that has collected measures of cross-border ties for U.S. immigrants in addition to repeated measures of depressive symptoms. Of the few cross-sectional data sources that include measures of cross-border ties and health, none to our knowledge ask respondents to specify the family members that they connect with abroad, highlighting the need for more specific data collection on cross-border ties, including cross-border separation and support (J. M. Torres, 2013).

We also note that we were limited in assessing differences in the association between cross-border ties and depressive symptoms by country-of-origin, given the small size of the Central American-born sample. Central American-born respondents were more likely to report talking to family and friends in countries of origin compared to Mexican-born respondents (33% compared to 16% of Mexican-born respondents). However, we note that

rates of travel across borders were similar for Mexican versus Central American-born respondents (15% for both groups). Future research might take into account heterogeneity in associations between cross-border ties and health outcomes, particularly given the diverse political and economic conditions across origin countries and the varying conditions of migration across these contexts (e.g. motivated by civil war, labor, or family reunification).

Finally, we note that our findings may be particular to the characteristics of the sample, both in terms of geographic specificity and average age. The sample was primarily of Mexican origin and respondents were located in the northern counties of California's Sacramento Valley. Given the distance to the U.S.-Mexico border, cross-border travel may be much less common among respondents compared to residents in border towns, but more common than for residents of the northwestern or northeastern U.S., or for individuals who would need to afford costly international air travel in order to maintain cross-border activity.

Furthermore, while previous studies have focused on cross-border ties and health outcomes for adults in young or mid-adulthood, participants in the present study were 60 years and older at baseline. We might expect that the associations between cross-border ties and mental health may be unique for older adults, given the importance of face-to-face social and instrumental support for older adult health (Seeman & Berkman, 1988). In addition, social ties in general may represent a greater source of burden for older adults, given that family members and friends close in age may face increased need for emotional and instrumental support due to illness and decline in functioning (Seeman & Berkman, 1988). It may be that the ability of older adults to continue to engage in cross-border social networks, particularly through international travel, declines with age and changes in health and functioning, which is less of a concern for younger migrants and their family members. In particular, there may be reciprocal effects between depressive symptoms and cross-border social integration for older adults: while social integration may influence depressive symptoms, depressive symptoms and other health conditions may also contribute to increased social isolation (Luo et al., 2012) and decreased cross-border social integration. While we address this concern about these reverse causal effects by controlling for depression (and other measures of physical health and functioning) at baseline, we note the potential for continued reciprocal effects across the study waves.

One final limitation is that we do not have information on respondents' legal status. Immigrants who are undocumented or hold other 'precarious' legal statuses (e.g. temporary protective status) face particularly high barriers to cross-border travel given the formidable risks associated with undocumented migration. The strain of cross-border separation may be particularly acute for individuals who are undocumented, and may face substantial social isolation, fear, and stigma in the communities in the U.S. (Abrego, 2011). On the other hand, we expect that few respondents in this cohort of older adults were undocumented at the time of the survey. Foreign-born respondents migrated to the U.S. an average of 30 years before the study was initiated (in 1998), and would have therefore benefited from the Immigration Reform and Control Act of 1986, which granted amnesty to then-undocumented individuals in the U.S.

Conclusion

Overall, our results suggest that cross-border ties might be an important social determinant of mental health for an increasingly multi-cultural and connected U.S. population. In our analyses of data from a population-based, prospective study of older Latino adults living in California, we found that even relatively limited cross-border connection was predictive of depression across a ten-year time frame in both negative and positive directions. These results held even after controlling for baseline depressive symptoms to account for the reciprocal nature of mental health and social ties, including cross-border social ties. However, we found important differences in these associations by gender and nativity. In particular, engagement with cross-border ties was associated with greater odds of depression for Latina immigrant women, but lower odds of depression for U.S.-born Latina women and Latino men. While cross-border ties may provide a sense of belonging, strengthened ethnic identity, and serve as a source of support, they may also be indicative of cross-border separation with adverse consequences for mental health outcomes.

Overall, these findings suggest that cross-border social integration –and separation-should be taken seriously as a contributor to health outcomes across the life-course, including among older adults. For older immigrants and some members of the second generation, social networks might be spread across international borders, and family members both in the U.S. and abroad may be considered sources of emotional and instrumental support. Efforts to enhance social integration and to reduce loneliness among immigrants and their descendants should consider the role of both local social ties and cross-border social ties. For example, mental health clinicians might consider the role of family members living across borders in cognitive behavioral therapy aimed at reducing subjective feelings of loneliness and enhancing social skills among first and second-generation immigrants (Masi et al., 2011). Efforts to enhance feelings of social support increasingly draw on mobile phone and Internet technologies. Although the impact of these technologies on social isolation in the general population is unclear (Masi et al., 2011), improved access to these technologies may be particularly important for immigrants and their family members if it facilitates connection with broader cross-border network otherwise separated by long distances and international borders (Bacigalupe & Cámara, 2012).

Clinicians and social workers working with immigrant families might also recognize the potential burden of cross-border caregiving, including obligations to provide emotional, logistic, and financial support – with potentially more acute effects on immigrant women. For older adults, key family members may be dispersed both in the U.S. and abroad; social workers might therefore consider all members of one's cross-border family when making plans for long-term care and medical treatment (Lunt, 2008).

Despite this important step in estimating the longitudinal association between cross-border integration and mental health, further research examining the study of cross-border social networks and the health of immigrants and their family members is warranted, including qualitative research to examine the conditions under which cross-border ties persist across the life-course and into older adulthood and to illuminate the range of mechanisms linking local and cross-border ties to health outcomes. . In addition, further empirical work should extend research on cross-border social ties and depression to examine the potential influence

of these ties on other, co-morbid mental health conditions and cognitive outcomes, as well as how the mental health impacts of cross-border social integration may get “under the skin” to impact physical health outcomes. Moreover, this future research might expand to investigate the potential for heterogeneous relationships between cross-border ties and health by differing levels of socioeconomic status, legal status, and experiences of marginalization among immigrants and their family members in the U.S.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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- We use longitudinal data on cross-border ties and depression for older Latino adults
- Baseline cross-border ties are significantly associated with depression at follow-up
- The direction of the associations differ by gender and nativity
- Cross-border social ties may be both a risk and protective factor for mental health

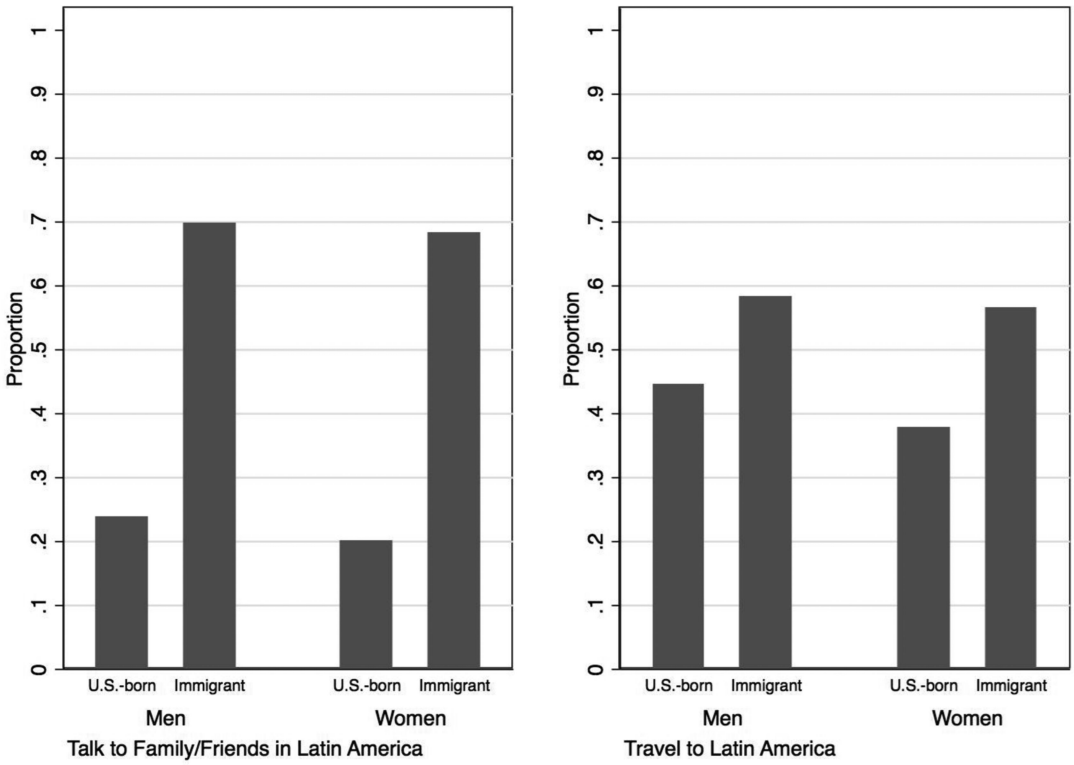

Figure 1.

Percentage of Respondents Reporting Cross-border Ties at Baseline by Nativity and Gender, Sacramento Area Latino Study on Aging (n=1270)

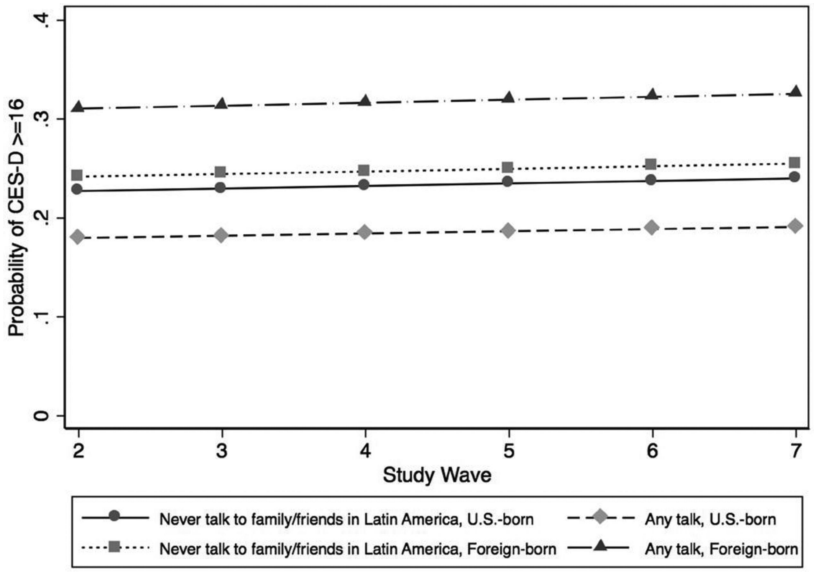

Figure 2.

Predicted Marginal Probabilities of Depression (CES-D ≥ 16) by Cross-border Ties and Nativity for Older Latina Women (n=735)

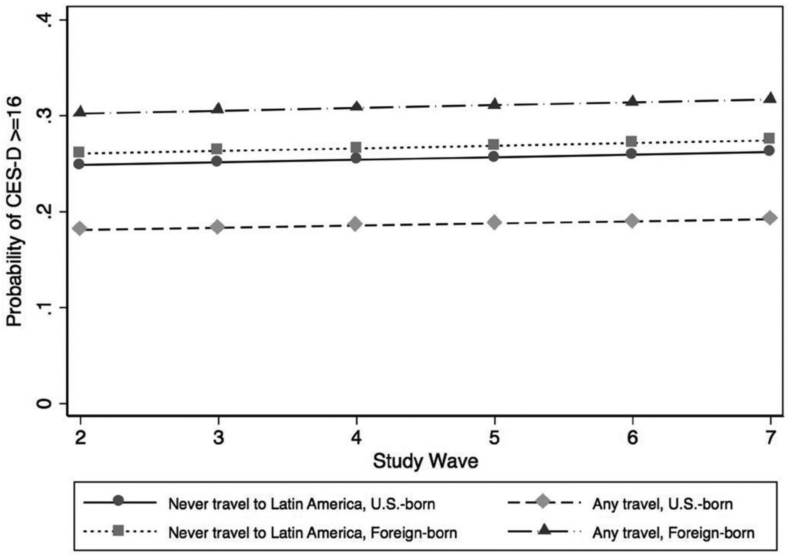

Figure 3.

Predicted Marginal Probabilities of Depression (CES-D ≥ 16) by Cross-border Ties and Nativity for Older Latina Women (n=735)

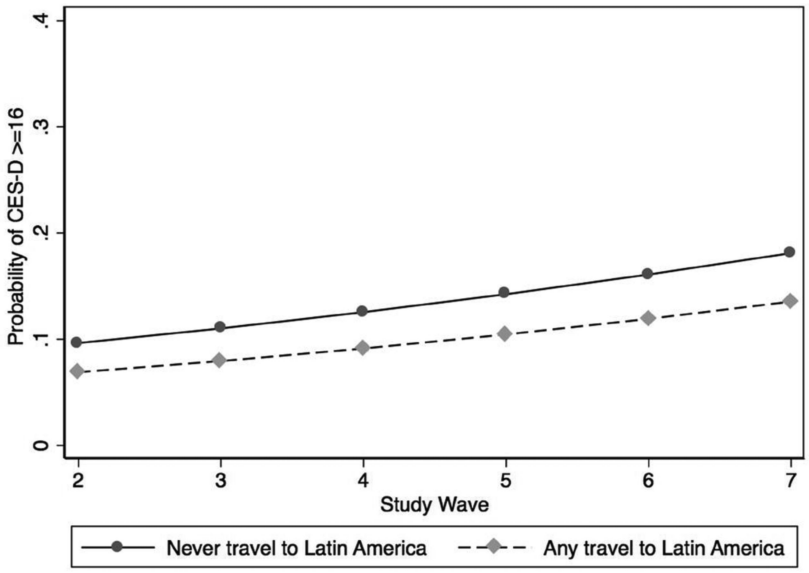

Figure 4.

Predicted Marginal Probabilities of Depression (CES-D ≥ 16) by Cross-border Ties and Nativity for Older Latino Men (n=535)

Table 1

Descriptive statistics for sample of Latino adults 60 years and older, 1998-2008 (n=1270)

	Women (n=735)		Men (n=535)	
	N	*(%)*	*n*	*(%)*
Baseline Depression (CES-D ≥ 16)	234	31.8	79	14.8
Baseline Covariates				
Cross-Border Ties	*n*	*(%)*	*n*	*(%)*
Talk to family and friends in Mexico	328	(44.5)	240	(44.9)
Travel to Mexico	348	(47.4)	272	(50.8)
Local Ties				
Always meet or talk to family/friends	609	(82.9)	452	(84.5)
Daily contact with closest contact	397	(54.0)	266	(49.7)
Married	354	(48.2)	428	(80.0)
Demographics				
Age, mean (sd)	70.2 (6.7)		70.2 (7.2)	
Foreign-born	373	(50.8)	245	(45.8)
Monthly household income ≥ $1500	203	(27.6)	278	(52.0)
Additional Health Measures				
Any ADL or IADL	593	(80.7)	343	(64.1)
Diabetic	220	(29.9)	183	(34.2)
Hypertension	493	(67.1)	376	(70.3)
History of stroke	60	(8.2)	49	(9.2)
History of heart failure	*19*	*(2.6)*	*15*	*(2.8)*
History of angina	63	(8.6)	44	(8.2)
History of myocardial infarction	50	(6.8)	55	(10.3)
Died during study	242	(23.0)	222	*(29.0)*

Source: Sacramento Area Longitudinal Study on Aging (SALSA)

Table 2

Random-intercept logistic regression models of depression (CES-D ≥ 16) on baseline cross-border ties for Latina women, Sacramento Area Latino Study on Aging (n=735).

	Model 1			Model 2			Model 3		
	OR	**95% CI**		**OR**	**95% CI**		**OR**	**95% CI**	
Depression, baseline	7.39	(5.45, 10.01)	***	7.28	(5.38, 9.84)	***	7.49	(5.38, 9.84)	***
Cross-border ties									
Talk to family/friends in Latin America	1.16	(0.83, 1.62)		0.68	(0.40, 1.15)		1.12	(0.80, 1.57)	
Travel to Latin America	0.93	(0.68, 1.26)		0.92	(0.68, 1.24)		0.58	(0.37, 0.91)	*
Local ties									
Always meet or talk to family/friends	0.62	(0.43, 0.90)	*	0.62	(0.43, 0.88)	**	0.61	(0.42, 0.87)	**
See closest contact daily	0.91	(0.69, 1.21)		0.91	(0.69, 1.21)		0.94	(0.71, 1.24)	
Married	1.36	(1.01, 1.82)	*	1.40	(1.05, 1.88)	*	1.40	(1.04, 1.88)	*
Demographics									
Age	1.03	(1.00, 1.05)	*	1.03	(1.01, 1.05)	*	1.03	(1.01, 1.05)	*
Immigrant (ref=U.S. born)	1.55	(1.12, 2.14)	**	1.12	(0.74, 1.67)		1.09	(0.73, 1.63)	
Monthly household income ≥ $1500	0.41	(0.29, 0.59)	***	0.42	(0.30, 0.61)	***	0.43	(0.30, 0.61)	***
Health and functioning									
Any ADL or IADL	2.80	(1.89, 4.14)	***	2.78	(1.88, 4.10)	***	2.83	(1.91, 4.18)	***
Diabetic	1.54	(1.13, 2.08)	**	1.55	(1.14, 2.10)	**	1.55	(1.14, 2.10)	**
Hypertension	0.84	(0.61, 1.14)		0.83	(0.61, 1.13)		0.84	(0.62, 1.15)	
Stroke	1.72	(1.05, 2.84)	**	1.74	(1.06, 2.87)	*	1.68	(1.02, 2.76)	*
Heart failure	1.56	(0.65, 3.78)		1.71	(0.71, 4.11)		1.57	(0.65, 3.78)	
Angina	1.07	(0.64, 1.80)		1.07	(0.64, 1.78)		1.07	(0.64, 1.79)	
MI	0.97	(0.54, 1.73)		0.98	(0.55, 1.75)		1.00	(0.56, 1.79)	
Interaction Terms									
Talk to family/friends in Latin America*Immigrant				2.37	(1.23, 4.55)	*			
Travel to Latin America*Immigrant							2.29	(1.29, 4.05)	**

	Model 1		Model 2		Model 3	
	OR	95% CI	OR	95% CI	OR	95% CI
Wald Chi-Squared	316.4	***	322.7	***	321.2	***

Source: Sacramento Longiudinal Study on Aging (SALSA)

* p<0.05

** p<0.01

*** p<0.001

Table 3

Random-intercept logistic regression models of depression (CES-D ≥ 16) on baseline cross-border ties for Latino men in the Sacramento Area Latino Study on Aging (n=535).

	Model 1			Model 2			Model 3		
	OR	**95% CI**		**OR**	**95% CI**		**OR**	**95% CI**	
Depression, baseline	3.76	(2.41, 5.85)	***	3.76	(2.42, 5.86)	***	3.84	(2.46, 5.99)	***
Cross-border ties									
Talk to family/friends in Latin America	0.98	(0.65, 1.48)		1.11	(0.62, 1.97)		0.97	(0.65, 1.47)	
Travel to Latin America	0.68	(0.47, 0.97)	*	0.67	(0.47, 0.97)	*	0.80	(0.49, 1.32)	
Local ties									
Always meet or talk to family/friends	0.95	(0.59, 1.54)		0.95	(0.59, 1.54)		0.96	(0.59, 1.55)	
See closest contact daily	1.16	(0.81, 1.66)		1.17	(0.82, 1.68)		1.17	(0.82, 1.67)	
Married	0.54	(0.36, 0.82)	**	0.54	(0.36, 0.82)	**	0.55	(0.36, 0.83)	**
Demographics									
Age	1.05	(1.02, 1.07)	**	1.05	(1.02, 1.07)	**	1.05	(1.01, 1.05)	**
Immigrant (ref=U.S. born)	0.89	(0.59, 1.36)		0.99	(0.58, 1.68)		1.05	(0.62, 1.78)	
Monthly household income ≥ $1500	0.62	(0.42, 0.92)	*	0.62	(0.42, 0.91)	*	0.62	(0.42, 0.91)	*
Health and functioning									
Any ADL or IADL	2.31	(1.53, 3.48)	***	2.29	(1.52, 3.46)	***	2.30	(1.53, 3.46)	***
Diabetic	1.77	(1.22, 2.57)	**	1.77	(1.22, 2.57)	**	1.76	(1.22, 2.56)	**
Hypertension	1.34	(0.89, 2.03)		1.34	(0.89, 2.03)		1.35	(0.89, 2.04)	
Stroke	1.57	(0.91, 2.71)		1.57	(0.91, 2.71)		1.56	(0.90, 2.69)	
Heart failure	1.15	(0.44, 2.99)		1.15	(0.44, 2.98)		1.17	(0.45, 3.04)	
Angina	1.12	(0.59, 2.12)		1.11	(0.58, 2.10)		1.11	(0.59, 2.11)	
MI	1.18	(0.67, 2.08)		1.20	(0.68, 2.12)		1.17	(0.66, 2.07)	
Interaction Terms									
Talk to family/friends in Latin America*Foreign-born				0.79	(0.37, 1.71)				
Travel to Latin America*Foreign-born							0.70	(0.35, 1.40)	
Wald Chi-Squared	135.3	***		132.3	***		137.2	***	

Source: Sacramento Longitudinal Study on Aging (SALSA)

* $p<0.05$

** $p<0.01$

*** $p<0.001$