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Connectivity to home behaviors and their influence on depression among Legal Permanent Residents: Evidence from the New Immigrant Survey

By

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Degree to be awarded: MPH

Global Health

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2010

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An abstract of
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Abstract

Connectivity to home behaviors and their influence on depression among Legal Permanent Residents: Evidence from the New Immigrant Survey

By Phillippa Chadd

Background: In the past, immigrants were thought to have better health outcomes across most conditions, including mental health. Recent studies have found that health status of immigrants in fact depends on a much wider range of factors; from the length of time the immigrant has lived in the country, to how difficult their pre-immigration experience was, to their region of origin, among others.

Objective: This study identifies connectivity to home covariates that are most strongly associated with self-reported depression among recent legal permanent resident status recipients in the United States.

Methods: Data for this research study were drawn from the 2003 New Immigrant Survey (NIS), which is a multi-cohort prospective-retrospective panel study of new legal immigrants and their children to the United States. Using logistic regression, I measured relationships between depression (respondent self-reported feeling sad, blue, or depressed for two weeks or more in a row during the last year) and a series of connectivity to home variables including: family unification, financial remittances/transfers, plans to visit home country in the next year, and possession of one or more assets/liabilities in the home country. In addition, a depression severity index was created, and linear regression was used to analyze its relationship to the same connectivity to home covariates. I controlled for demographic characteristics, such as age, gender, education, and region of origin in both models.

Results: The connectivity to home covariates that were significantly related to depression include: travel plans to home country in the next year, whether or not the respondent's spouse lived with him/her, engagement in financial transfers with at least one immediate family member in the home country, and age at first departure from country of origin. No connectivity covariates were significantly related to depression severity, although age and gender were significant.

Discussion: Maintaining connections to home through certain behaviors can be a risk factor for depression. These findings are useful for public health practitioners who design mental health interventions for immigrants and refugees in the United States.

Connectivity to home behaviors and their influence on depression among Legal Permanent Residents: Evidence from the New Immigrant Survey

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Definition of terms

NIS	New Immigrant Survey
LPR	Legal Permanent Resident
CDC	Centers for Disease Control and Prevention
SCHIP	State Children's Health Insurance Program
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders
NHIS	National Health Interview Study
NLAAS	National Latino and Asian American Study
CMI	Cornell Medical Index
NIH	National Institutes of Health
NICHD	National Institute of Child Health and Human Development
NIA	National Institute on Aging
OBSSR	Office of Behavioral and Social Science Research
NSF	National Science Foundation
USCIS	U.S. Citizenship and Immigration Services
OIS	Office of Immigration Statistics
ASPE	Office of the Assistant Secretary for Planning and Evaluation

INTRODUCTION

Immigration to the United States has shaped our country for more than four centuries. Global migration has significantly increased in recent years and with it, the United States has become a nation of countless diverse cultures and peoples, all with unique stories and experiences. The foreign-born population currently accounts for 12.7% of the current U.S. population (U.S. Census Bureau, 2012), and a higher percentage are second and third generation immigrants.

As technology continues to advance, it will become even easier to constantly maintain connections all around the world. Cell phone technology has reached even the smallest villages in Africa, which means that any person in the world can be contacted instantaneously with a number and a calling card. Skype and other video chatting software have revolutionized how we stay in touch with loved ones as well as the ease of conducting business remotely. However, there is still the human aspect of family and friend connections that cannot be replicated using technology. The physical distinctiveness of one's home country will always be unique and can't be felt thousands of miles away.

Mental health among recent immigrants has been investigated by numerous researchers, and is often compared to the general U.S. population as a reference. The majority of the research has found that immigrants generally have better mental health than the host population when they first arrive, with the exception of refugees. While often the actual process of immigration is not highly stressful, the disruption of a person's usual coping mechanisms is what can cause mental distress (Kemp, 2004).

While acculturation, assimilation, transnationalism, and other concepts have been extensively explored in the literature, there are very few studies looking at what is the impact of maintaining (or not maintaining) connections to one's home country on the mental health of immigrants. While it would seem intuitive that maintaining strong connections to one's home would be valuable for psychosocial support, it can in fact work in the opposite direction and cause loneliness. The most significant risk factors for newly arrived immigrants need to be examined further.

The purpose of this project is to examine the specific characteristics and behaviors in the connectivity to home realm that are most strongly associated with self-reported depression in recent legal permanent resident status recipients. Among those who reported depression, the researcher analyzes what specific connectivity to home covariates predicted a higher severity of depression.

Research Objective: To discover which connectivity to home behaviors are significantly associated with depression among recent receivers of Legal Permanent Resident status in the United States.

- **Specific Aim 1:** Use the 2003 New Immigrant Survey to find surveyed behaviors that fit in the connectivity to home realm.
- **Specific Aim 2:** Use linear and logistic regression to model the relationship between connectivity to home behaviors again the outcomes: a) depression and b) severity of depression.

This research is important because it can potentially shape the way that we understand how immigrants experience cross-border connections and what the implications are for their mental health. The findings from this project can also provide a guide for health care providers in helping immigrants to overcome depression, and what specific connectivity behaviors to look for in a patient. Although each immigrant and the region that they come from have unique cultural manifestations of mental health issues, it is critical to understand the broad behaviors that are indicative of possible depression across all immigrant groups.

REVIEW OF THE LITERATURE

International Immigration to the United States

International immigration has played a tremendous role in shaping the United States as a country. The designation as "a nation of immigrants" has strong evidence in historical census records. Like many other settler societies, the United States originally relied on the flow of newcomers from abroad to populate its relatively open and undisturbed lands (Diner, 2008). Immigration was instrumental in making America's development possible and also in shaping the basic nature of the society that exists today. Its history falls into five distinct time periods, each of which experienced varying rates of immigration from different regions of the world.

Early Settlers and the beginning of the Open Door Policy (1607-1815)

The first, and longest, era in the immigration history of the United States stretched from the 17th century through the early 19th century (Diner, 2008). Immigrants during this period came from a range of places, although the majority tended to hail from the British Isles, with English, Scottish, Welsh, and Ulster Irish each traveling to different colonies (later states) and regions. (Diner, 2008).

These immigrants mostly gravitated towards farming, with the promise of cheap land a major draw for the relatively impoverished Northern and Western Europeans (Diner, 2008). During this era, considerable numbers of women and men came as indentured servants, and their experience can help us understand the forces impelling migration. They entered into contracts with employers who specified the time and conditions of

labor in exchange for passage to the New World. While they endured harsh conditions during their time of service, at the end of their contracts, they acquired ownership of small pieces of land (Diner, 2008).

Mass Migration (1815-1881)

The end of the Napoleonic Wars in 1815 saw a migration of unprecedented magnitude, which continued relatively unchecked until the outbreak of World War I. Between 1815 and 1914 a total of thirty-five million people entered the United States, which was far more than the entire American population at the time of the first census in 1790. Nearly all of the newcomers who came during the years 1815-1860 came from Northern and Western Europe, and were driven mostly by economic reasons: the pressure of population growth, the increase in large-scale farming, and the emergence of the Industrial Revolution (Kroes, 1979). Many of these settlers made their way to the Midwest and Northeast for agriculture, while others flocked to cities such as New York, Philadelphia, Boston, and Baltimore (Diner, 2008).

Even then, immigrants tended to cluster together with people from their home countries in particular neighborhoods, cities, and regions. The Irish congregated most thickly in the cities, and a high proportion of immigrants from Sweden, Norway, Denmark, and various regions of Germany took up farming in the Midwest (Kroes, 1979). This period also witnessed the first arrival of small numbers of Chinese men to the American West to work on the railroads and the mines, in particular during the Gold Rush of 1848 (Cieslik, Felsen, & Kalaitzidis, 2009). Native-born Americans reacted intensely and negatively to their arrival, which lead to the passage of the only piece of U.S. immigration legislation

that targeted a specific ethnic group for a restrictive policy, the Chinese Exclusion Act of 1882 (Diner, 2008).

A Wave Becomes a Flood (1881-1920)

In the decades after the Civil War, immigration soared to undreamt-of levels, only waning in the 1890s when the United States suffered several major economic crises. This wave of migration, considered the third in United States History, ushered in a total number of well over 26 million newcomers between the years of 1865 and 1914 (Kroes, 1979). Up until that time, immigrants originated predominantly from Northern and Western Europe, but in 1890, there was a dramatic increase in immigrants from Southern and Eastern Europe, particularly Italy, Austria-Hungary, and Russia. While this main stream of immigration was coming across the Atlantic, another smaller one was trickling across the Pacific, consisting first of Chinese, then of Japanese and Filipinos (Kroes, 1979). Also significant during this time were the first sizable overland movements from within the Western Hemisphere, both from Mexico and Canada (Kroes, 1979).

Similarly to the immigrants of the earlier period, young people predominated among the newcomers (Kroes, 1979), a pattern that is still seen today. There were comparatively fewer families and more single men than women. The new immigrants came on their own accord, and an estimated 40 to 65 percent traveled on tickets prepaid by friends and relatives in the United States or bought with remittances received from them (Kroes, 1979).

Legislating Immigration (1920-1965)

Until late in the 19th century few questioned the wisdom of a liberal immigration policy. From the 1880s onward, however, attitudes began to change as the frontier receded. Many Americans, particularly the well-off, white, native-born, began to consider immigration a serious danger to the nation's health and security. This structured xenophobia formally began in 1893 when a group called the Immigration Restriction League formed and began to press Congress for severe curtailment of foreign immigration. Restriction proceeded relatively piecemeal through World War I (1914-1918) and only in the early 1920s did Congress begin to change the nation's basic policy about immigration. The National Origins Act in 1921 (and its final form in 1924) restricted the number of immigrants who could enter the United States by allocating quotas based on national origins. It essentially gave preference to immigrants from Northern and Western Europe, severely limited the numbers from Eastern and Southern Europe, and completely banned all immigration from Asia (Diner, 2008). As these new immigration policies went into effect, the Great Depression further repressed immigration levels and, for the first time in U.S. history, the level of return migration to Europe surpassed new arrivals (Martin, 2011).

The 1920s ushered in the penultimate era in U.S. immigration history. Immigrants could enter quite freely from Mexico, the Caribbean, and other parts of Central and South America, while immigration from Asia was still prohibited (Diner, 2008). Low levels of permanent immigrant and refugee admissions persisted throughout the 1940s, but with U.S. admission into World War II, temporary workers from Mexico were admitted due to manual labor shortage. This program operated until 1964, employing between 4 and 5 million Mexicans during the 22 year period (Martin, 2011). The national origin quota

system remained the basis of immigration policy until 1965. During this period, the United States began to admit limited numbers of refugees. Jewish refugees from Nazi Germany before World War II, Holocaust survivors after the war, and Cubans after the 1960 revolution were admitted to the U.S., but the basic quota-based immigration law remained in place until 1965 (Diner, 2008).

The Hart-Celler Act was passed in 1965, which abolished the quota system and instead gave priority to relatives of American citizens and to people with particular skills, while continuing to limit numbers of immigrants arriving every year. This amendment to the Immigration and Nationality Act was a by-product of the civil rights revolution and one of President Lyndon Johnson's Great Society programs (Diner, 2008). While it had not intended to do so, there was a dramatic increase in the number of immigrants from Asia, the Middle East, Africa, and other developing regions as fewer Europeans were able or willing to immigrate. Also unintentional, the 1965 act accelerated the beginning of the 'brain drain' of highly skilled professionals from poorer countries to the United States (Kroes, 1979).

Modern Immigration (1965—present)

The United States is in the midst of its fifth major throng of immigration. The present wave is the largest in terms of absolute numbers, but not as a proportion of the total population. Unlike in previous eras, today's immigrants come from every inhabited continent and represent just about every country (Martin, 2011). Similar to previous waves, there is a profound ambivalence about immigration among the American public.

This ambivalence has made immigration policy one of the most difficult on the U.S. political agenda (Martin, 2011).

Today's notions and patterns of immigration may be the most complex of all. At the same time, the apparently insatiable demand for labor has led to a tolerance of large-scale undocumented immigration and a proliferation of temporary worker programs (Martin, 2011). A series of federal laws have restricted the rights of immigrants (for example, to public welfare benefits and due process of law) as their numbers have increased substantially (Martin, 2011).

Immigrants' motivations for coming to the U.S. have not varied greatly in the nearly four centuries since the first permanent European settlers. Immigrants have historically moved because they were poor, discontented or oppressed, or restless. All the evidence suggests that economic considerations, the urge to get ahead, accounted in most cases for the decision to leave home (Kroes, 1979).

Legal Immigration to the United States

There are multiple avenues for a person to legally immigrate to the United States. The government gives priority to foreign nationals who have a close family relationship with a U.S. citizen or legal permanent resident, have needed job skills, are refugees or asylees, or who are from countries with relatively low levels of immigration to the U.S. (Monger & Yankay, 2011). If the person is abroad at the time of application for legal permanent resident (LPR) status, then they apply for an immigrant visa at a consular office of the Department of State. Upon entry to the U.S., the foreign national may become an LPR when admitted at a port of entry. Persons who are in the United States at the time of

application for LPR status must file an application for adjustment of status and an application for permission to work (Monger & Yankay, 2011).

The leading regions of birth of new LPRs in 2010 were Asia (41 percent) and other North America (32 percent) (Monger & Yankay, 2011). The highest numbers of LPRs were born in Mexico, followed by China, India, the Philippines, and the Dominican Republic. New LPRs are generally younger than the age average of the native population, and the median age of LPRs in 2010 was 31 (Monger & Yankay, 2011). They are also more likely to be female and married; 55 percent of persons granted LPR status in 2010 were female and 57 percent were married (compared with 38 percent of the native population) (Monger & Yankay, 2011).

Health of immigrants in the United States

Data from the nationally representative 1998-2003 National Health Interview Surveys (NHIS) shows that the foreign-born population was younger, less likely to have a high school diploma, and more likely to be poor in comparison with their U.S.-born counterparts. They also tended to be heavily concentrated in cities and metropolitan areas, and more likely to live in large families (Dey & Lucas, 2006). Dey and Lucas, researchers at the Centers for Disease Control (CDC), found that Hispanic immigrants were the least likely to have health insurance (37% uninsured) or to have a usual source of health care compared with other immigrant groups (Dey & Lucas, 2006). Black and Hispanic adults, regardless of nativity, were more likely to be obese than non-Hispanic white and Asian adults. On the contrary, black and Hispanic immigrant

adults were significantly less likely to be obese than their U.S.-born counterparts (Dey & Lucas, 2006).

Immigrants in the United States often face institutional barriers when trying to secure health care coverage, resulting in lower insurance coverage overall. All immigrants, including legal permanent residents, have less access to employer-sponsored insurance than U.S.-born citizens due to the types of jobs they generally fill (Kaiser Family Foundation, 2006). They also face tighter restrictions on their eligibility for Medicaid and State Children's Health Insurance Program (SCHIP), the nation's major public health coverage programs for low-income children and families (Kaiser Family Foundation, 2006). Legal permanent residents are only eligible for Medicaid or SCHIP after their first five years in the U.S. if they meet the programs' other eligibility requirements. However, refugees and other humanitarian immigrants are eligible for Medicaid and SCHIP as soon as they are admitted to the U.S., and undocumented immigrants are never eligible (Kaiser Family Foundation, 2006). Not having health insurance can lead to disparities in care, which can lead to worse health outcomes for any type of immigrant.

The longer the length of time the immigrant had lived in the United States, the higher the likelihood of obesity, especially for Hispanics (Dey & Lucas, 2006). Overall, 64% of U.S.-born adults rated their health as *excellent* or *very good* in comparison with 61% of foreign-born, which is not a large difference (Dey & Lucas, 2006). The prevalence of smoking, hypertension, and cardiovascular diseases has also been found to be higher among U.S.-born adults than their immigrant counterparts (Dey & Lucas, 2006).

These findings reflect other results from published literature on the health status of immigrants living in the U.S. Diabetes prevalence was found to increase with immigrant's years of residence in the U.S. in a study also using NHIS data (Oza-Frank, Stephenson, & Narayan, 2011). Differences in the length of stay in the U.S. on immigrant health suggest that the role of acculturation in understanding immigrant health is complex, and is different according to the region of origin of the immigrant. Evidence from the 2003 New Immigrant Survey shows that the prevalence of obesity (BMI $\geq$ 30 kg/m^2) among immigrants who recently received Legal Permanent Resident status is 12.5% (J. Choi, 2011), which is significantly lower than the U.S. national average for that year of 32.9% (Ogden & Carroll, 2010).

The overall hypothesis that immigrants experience better health is referred to as the "Healthy Immigrant" hypothesis and is supported by the literature describing the health selectivity of immigrants (Akresh & Frank, 2008). Immigration itself is not an easy process, both physically and mentally, therefore only those who are relatively fit and healthy are able to make the journey. There are also legal barriers against those with poor health (S. H. Choi, 2012). Immigrants might self-report lower health status, but direct health measures such as chronic disease prevalence clearly show that the foreign-born are better off than their U.S. born counterparts (Jasso, Massey, Rosenzweig, & Smith, 2004). Using the National Vital Statistics System and the National Health Interview Study, Singh & Miller found that immigrants had about a three year longer life expectancy than the US-born comparison group (Singh & Miller, 2004). Interestingly, compared to the US-born, black immigrant men and women had, respectively, 9.4 and 7.8 years longer life expectancy, but Chinese, Japanese, and Filipino immigrants had

lower life expectancy (Singh & Miller, 2004). Almost all immigrant groups had a lower risk of infant mortality than the US-born, with the exceptions being Puerto Ricans and non-Hispanic blacks (Singh & Miller, 2004).

Mental health of immigrants in the United States

There have been relatively few studies that include mental health among the myriad number of immigrant health studies. Among the studies that do exist, there is contradictory evidence as to whether or not foreign birth is a protective factor for mental illness.

A study conducted by Alegría et al. found that overall, the risk of most psychiatric disorders was lower for Latino subjects than for non-Latino white subjects, without stratifying by country of birth or adjusting for demographic and socioeconomic differences between the groups (Alegría et al., 2008). Just looking at depressive symptoms in a different dataset, a similar group of researchers found that foreign-born Latino women had lower odds of depressive symptoms (using the DSM-IV[1]) than foreign-born Latino men, and together all foreign-born Latinos had lower odds of depression than their U.S.-born counterparts (Alegría et al., 2007).

In the same CDC study that was mentioned above, researchers found that foreign-born black and Hispanic immigrant adults experienced fewer symptoms of serious psychological distress in comparison with their U.S.-born counterparts (Dey & Lucas,

[1] The Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV), is the standard classification of mental disorders used by mental health professionals in the United States. It is intended to be applicable in a wide array of contexts and used by clinicians and researchers (American Psychiatric Association, 2012).

2006). Reportedly unmet mental health needs[2] were about the same for U.S.-born and foreign-born adults overall, with a higher percentage among the U.S.-born (1.9 versus 1.4) (Dey & Lucas, 2006).

Migration and mental health

Migration by itself does not represent a threat to mental health; the social context and the heterogeneous conditions under which the migration takes place are what can cause issues. Many refugees are at high risk for mental health problems as a direct result of the refugee experience, especially war/trauma experience and displacement (Bhugra, 2003). Immigrants who have a difficult or dangerous journey to the receiving country or who live in poverty are also at risk for subsequent mental health problems (Bhugra, 2004). All immigrants, even those from the most Westernized countries, experience stressors specific to immigrants, such as culture change, language change, family disruption, lack of social support, and sometimes superficial relationships with people native to the host country (Kemp, 2004).

Stress, defined as an unbalance between life challenges and usual coping mechanisms, is a central concept in the study of migration and mental health (Bhugra, 2004). If one assumes that migration leads to stress, either by increased stressors and/or by a weakening of coping resources, then it seems logical that the risk of mental health problems increases (Kemp, 2004). However, there are two opposite viewpoints of immigrant's psychological health in the literature. The first one predicts higher

[2] Based on the question "During the last 12 months, was there any time when you needed mental care or counseling, but didn't get it because you couldn't afford it?" in the National Health Interview Survey.

psychological distress among immigrants and refugees, and the other argues that immigrants have better psychological health than natives.

Age, gender and country of origin

It is known that young adults are more likely to migrate and are also more likely to be at the risk of developing mental disorders (Bhugra, 2004). On the other hand, they tend to be more flexible to adjustment, making the interaction more complex. Studies have shown that incidence of mental disorders was higher in females (Gu, 2010; Ödegaard, 1932). Bhugra et al. demonstrated that older Asian females had high rates of broad schizophrenia in their sample which included native whites, African-Caribbean, and Asian immigrants. It was also found that the incidence rate for broad schizophrenia was significantly higher for African-Caribbeans than for whites, and Asians only showed a high rate among people age 30 and over, and particularly women (Bhugra et al., 1997).

In a study conducted on mental and physical disabilities among a working age (ages 18-64) immigrant population who had lived in the U.S. for fewer than 10 years, it was found that almost all immigrants reported less mental disability than their U.S.-born counterparts (Huang et al., 2011). The respondents from Western Europe had the lowest odds for self-reported mental disability compared to the U.S.-born reference group, followed by East Asia, then Africa. The rest of the regions fell in to the following order for increased odds of mental disability: Canada, Other regions (all low-represented regions), South Asia, Middle East, Mexico, Central/South America, and Eastern Europe. The only region to have a higher odds ratio than the reference group was Southeast Asia, with an 11% increase in odds compared to native-born Americans (Huang, et al., 2011).

Connectivity to home

Acculturation

Acculturation is an anthropological term described by Redfield, Linton and Herskovitch which "comprehends those phenomena which result when groups of individuals having different cultures come into continuous, first hand, contact with subsequent changes in the original culture of either or both groups" (Redfield, Linton, & Herskovits, 1936). Acculturation has been widely studied in the social sciences and is considered to be a cause of stress-related mental health symptoms. Two models have been developed out of the study of acculturation.

Unidimensional model

Developed from the ecological school of thought, the unidimensional approach considers a linear and directional model that leads to marginalization of immigrants (Park, 1928). It includes following three domains: 1) adaptation to technical culture of the host country, 2) acculturation process into the local social organization, including use of the host country's language, social contacts (communication with home country, friends among ethnic group or not, etc.), religious participation, similarity of diet, and 3) cultural values (beliefs in ethnic identity) (Park, 1928).

Bidimensional model

The bidimensional model adds group level indicators, taking into account the fact that all immigrants interact with some sort of social group. The factors included

at the group level are the sociocultural and political characteristics of country of origin (e.g. an individualistic or collectivistic society), and those of the receiving country's culture, and how each influences acculturation as a group (Berry, 1997). The two types of variables that are examined at the individual level in this model are sociocultural indicators of the immigrant before and during acculturation process (Berry, 1997).

Transnationalism

Transnationalism is another concept that has been discussed extensively in the literature, with some debate as to the definition of a 'transnational migrant.' The anthropologists Nina Glick Schiller, Linda Basch, and Cristina Blanc-Szanton introduced the idea of a separate group labeled 'transmigrants,' which develop and maintain multiple types of cross-border relations (familial, economic, social, organizational, religious, and political) (Glick Schiller, Basch, & Blanc-Szanton, 1992). They attempted to develop a "transnational analytical framework," and further define transnationalism as "the processes by which immigrants forge and sustain multi-stranded social relations that link together their societies of origin and settlement" (Glick Schiller, et al., 1992). Essentially, this concept creates a special type of migrant that maintains formal connections to their home country of origin.

Portes later joined the discussion of transnationalism, but he argued that all migrants have at least some degree of cross-border connection, and that it was not useful to separate 'transmigrants' from all other migrants (Waldinger, 2009). By delineating the 'transmigrants' from the much larger migrant group, it is possible to miss the pervasive

nature of the everyday cross-border activities entailed in travel, communication and remittance-sending (Waldinger, 2009). These periodic exchanges strengthen the market, lowering the cost and increasing the convenience of maintaining home society ties and providing the infrastructure on which any 'transmigrant' can exist (Waldinger, 2009). Other researchers have now instead shifted the focus to transnational practices, rather than transnationalism as a condition (Levitt, 2001).

Using data from the Pew Hispanic Center's 2006 National Survey of Latinos, Soehl and Waldinger studied routine transnational activities of travel, remittance sending and telephone communication among Latin American immigrants in the U.S (Soehl & Waldinger, 2010). They found that most migrants continue at least some degree of home-country connectedness, with a few immigrants maintaining very high and very low degrees of intensity.

In their study, Soehl and Waldinger operationalized 'settlement' in the new host country with two variables: the place of residence of respondents' children and property ownership in the country of origin. They created variables that indicate whether the respondent has any children living in the home country and an indicator for persons owning property in the country of origin. This was the only such indicator that was encountered in the literature covering property ownership in the country of origin, which is examined in our study.

Waldinger summarizes the move towards possible transnationalism with the following quote:

> Whereas ties to home and host country were previously seen as mutually exclusive, today's political and ideological environment appears more relaxed, as

> the shift from melting pot to multiculturalism legitimates the expression of and organization around home country loyalties (Waldinger, 2009).

Globalization has allowed family and social networks to dynamically cross national boundaries at a much faster pace, making it much easier for immigrants to stay connected to their home country.

Assimilation

Initially, transnationalism was posed as an alternative to assimilation. Assimilation has been defined as the abandonment of one's first culture in favor of a second culture (Korzenny, 1998). It has also been noted, however, that increased integration in to the host country's society (e.g. citizenship) could lead to more possible avenues for transnational activities (such as bringing one's family to the United States) (Soehl & Waldinger, 2010). The technological changes of the current age of mass migration are also making it easier for immigrants to stay in contact with their friends and families back home, through cheap international calling cards and widespread internet access.

Remittances

Remittances, defined as money earned by immigrants working abroad that is sent back home, constitute the monetary and most visible aspect of the non-stop circulation between migrants and their countries of origin (Taborga, 2008). The World Bank estimated that worldwide remittance flows exceeded $414 billion in 2009, of which $307 billion (74%) was sent to developing countries (Ratha, Mohapatra, & Silwal, 2010). The actual size is believed to be significantly larger due to the informal nature of many remittance channels. Based only on formal records, the total worldwide remittance estimate is more than twice as large as all official foreign aid. The United States is by far

the largest source of remittances, with $46 billion in recorded outward flows in 2008 (Ratha, et al., 2010).

The literature on remittances and immigration mainly focuses on the socioeconomic process and not the behavior as a risk factor for mental health issues. Thus far, there have been no studies conducted on the influence of remittances on immigrant mental health. A research project that analyzed the effects of remittances on the family members who were left behind found that remittances were less of an issue compared to the family disruption and reduced social support. Remittances were helpful in covering the family's financial needs, but adults left behind still suffered from stress-related health conditions and loss of psychological support (Lu, 2012). Further research should examine remittances and other financial transfers as a perceived link of social support among families and other social networks.

Family unification

Particularly among refugee youth who have grown up in conflict settings, family connectedness is a key determinant of positive resettlement outcomes. Although it can be a struggle with changing family dynamics during the immigration and settlement process in a new culture, family support has shown to be crucial in the facilitation of mental and physical health (McMichael, Gifford, & Correa-Velez, 2011).

An analysis using a similar self-rated mental health dependent variable to our study found that family support among Latino immigrants was strongly associated with mental health, after controlling for language, education, income and other demographic measures (Mulvaney-Day, Alegria, & Sribney, 2007). Family support was measured by the

following three items to assess the respondent's family support: how often the respondent talks on the phone or gets together with relatives, how much they can rely on relatives for emotional support, and how much the respondent can open up to family and talk about their problems (Mulvaney-Day, et al., 2007). The sample for this analysis was taken from the nationally representative National Latino and Asian American Study (NLAAS). Another study using the NLAAS self-reported mental health index found that self-rated mental health had highly significant association with family cohesion (family togetherness, closeness and enjoy spending time together), relative support (using same three indicators from previous study), and friend support (same measurements as family, but replaced by friends) (Zhang & Ta, 2009).

On the other hand, immigrating as a young, single person has also been shown to influence positive outcomes. A study among Vietnamese refugees in Seattle found that the single refugees without any relatives in the U.S. fared the best out of the family types (other types included: small, nuclear families, extended family units, and divorced single mothers) (Lin, Tazuma, & Masuda, 1979). The measurement tool for this study was the Cornell Medical Index (CMI), which was an instrument to indicate physical, psychological, and psychophysiological problems[3]. The authors speculated that the single refugees had the best scores because they benefited from "less responsibility and had more free energy to adapt to this [American] highly individualistic, often fast-changing society" (Lin, et al., 1979). Something else that came out of this study was that they found that those receiving public assistance had a higher CMI score. Lack of employment

[3] As of July 2001, the CMI is no longer used. It is available only for historical purposes and for research not involving human subjects.

and English language proficiency were not associated with a higher CMI score (Lin, et al., 1979).

Acculturation and depression

Consensus is not seen in the literature as to whether or not acculturation and assimilation are protective or can cause stress related mental disorders, although most scholars agree that they are linked in some way. On the individual level, protective variables during the acculturation process could include length of stay in the host country, financial security, bilingualism, family solidarity and support, living in an ethnic-dense neighborhood, and feeling comfortable with both home and host cultures (preventing alienation and marginalization) (Madianos, 2010). The acquisition of U.S. national identity, English language proficiency, and U.S. cultural competency (high acculturation level) appear to be critical for immigrants to feel connected and accepted in mainstream society (Yoon, Goh, & Lee, 2008).

In a secondary analysis of post-partum Mexican women, researchers attempted to identify the most useful acculturative indicator for examining depressive symptoms. Exposure to the United States in childhood, a poor sense of mastery (of one's future), and dissatisfaction with life were more related to depressive symptom experience than childbearing status or demographic variables such as age, income, or education (Heilemann, Frutos, Lee, & Kury, 2004). This study was open to all women of Mexican descent however, and not just immigrant women. The fact that the women were also in the peri-natal stage also might have resulted in different outcomes than the general population.

Qualitative research conducted by Ahmad et al. found that mental health was only a concern for female South Asian immigrants after they had immigrated (Ahmad et al., 2004). The stress-inducing factors that the women listed in the focus groups included: loss of social support, economic uncertainties, downward social mobility, mechanistic lifestyle, barriers in accessing health services, and climatic and food changes (Ahmad, et al., 2004).

Another qualitative study with Indian immigrant men living in New York City examined the way that social capital influences social networking and acculturative stress (Bhattacharya, 2011). Bhattacharya found that within-group social networks in their adopted country are linked to lower depression and feelings of loneliness among immigrants. Participants of low socioeconomic status, especially those unemployed or temporarily employed, shared that the lack of control over their employment status and job stress significantly contributed to their feelings of depression and frustration (Bhattacharya, 2011). A social capital analysis found that contacts with social networks back at home were extremely important in the post-immigration adjustment process (Bhattacharya, 2011).

Summary

Immigration and mental health is a complex topic that is often difficult to measure. Up to this point, the literature supports the general consensus that immigrants, as a whole, are healthier than their U.S. born counterparts upon arrival in the United States. However, the longer they live in the U.S., the gap between the two groups becomes smaller as

immigrants acculturate and take on American habits and diets. Mental health follows the same pattern, with the exception of refugees, who are seen to have high levels of mental stress upon immigration. Connectivity to home has been examined across multiple acculturation and transnationalism studies, with the majority concluding that acculturation and family support networks are often beneficial to an immigrants' mental health. Recent technological advancements have made it relatively cheap and easy to maintain connections to home, which makes it possible to maintain a transnational identity. Globalization has blurred the line and the need for immigrants to choose to either uphold their country of origin's culture or take on the American way of life.

This study adds to the literature in the way that it treats all immigrants as possible 'transmigrants,' capable of both initiating and receiving global connections to the country of origin. There are many acculturation and assimilation studies; however, very few look at individual indicators as opposed to aggregating them as concepts. This study is unique in the way that it looks at what specific connectivity to home behaviors or characteristics are the strongest predictors of an immigrant's self-report of depression. It attempts to address the gaps in knowledge of what effect connectivity to home has on mental health among legal permanent residents in the United States.

METHODS

New Immigrant Survey Study Design

Data for this research study were collected from the 2003 New Immigrant Survey (NIS). The basic design of the NIS is a multi-cohort prospective-retrospective panel study of new legal immigrants and their children to the United States. As a nationally representative, longitudinal study, the main objective of the NIS was to provide a public use database on new legal immigrants to the United States that will be useful for addressing scientific and policy questions about migration behavior and the impacts of migration. The first full cohort (NIS-2003) sampled immigrants in the period of May to November 2003. The baseline survey was conducted from June 2003 to June 2004. A survey pilot project was carried out in 1996 to inform the fielding and design of the full NIS, and a follow-up was performed in the summer of 2007, for which data has not yet been released. The survey collected information on topics such as demographics, schooling, migration history, health, marriage and family, financial transfers, economic indicators, English language skills, housing environment, and more.

The NIS is supported by the National Institutes of Health (NIH), the National Institute of Child Health and Human Development (NICHD), the National Institute on Aging (NIA), and the Office of Behavioral and Social Science Research (OBSSR). The National Science Foundation (NSF) and the U.S. Government (via, formerly, the U.S. Immigration and Naturalization Service (INS) and now its successor agencies, the U.S. Citizenship and Immigration Services (USCIS) and the Office of Immigration Statistics (OIS)) are also contributors. Additional support was provided by the Office of the Assistant

Secretary for Planning and Evaluation (ASPE) and the Pew Charitable Trusts. The NIS is a collaborative research project implemented by the following four institutions: The RAND Corporation, Princeton University, New York University, and Yale University.

The final design of the NIS was refined in discussions by immigration researchers and policymakers over a period of many years. Integral to the design was to collect both retrospective and prospective data and include child assessments as well as information on extended family members. Table 1 lists the significant actors that were involved in the design of the NIS.

Table 1. Public and private panels which contributed to the design of the New Immigrant Survey

Select Commission on Immigration and Refugee Policy, 1981
NAS-NRC Panel on Immigration Statistics, 1985
Rockefeller/Sloan Workshop on Immigration, 1985
IUSSP Workshop on Migration, 1987
NIH Workshop on Immigration, 1993
NAS-NRC Workshop on Immigrant Children and Families, 1994
NAS-NRC Panel on Impacts of Immigration, 1997
Binational Study of U.S.-Mexico Migration, 1997

Source: Immigration Research and Statistics Service workshop on longitudinal surveys and cross-cultural survey design Workshop proceedings

Sampling Design

The NIS sampling design included two samples, an Adult Sample and a Child Sample. In addition to interviews with the sampled adult and parent of the sampled child, the NIS includes interviews with their spouses. For the purposes of this research project, only the Adult sample was used. The Adult sample frame was 12,500 with a target response rate of 70 percent, which would yield a sample size of 8,750. The baseline round of the first

full cohort of the NIS (NIS-2003) completed interviews with 8,573 respondents (response rate of 68.6 percent). The sample population consisted of adult immigrants admitted to lawful permanent residence during the seven month period of May to November of 2003. The contact information was collected from administrative records of new immigrants by the United States Citizenship and Immigration Services.

The sampling frame included all new arrival immigrants 18 years of age or older who arrived in the United States with legal immigration documents acquired abroad and adjustee immigrants. Adjustee immigrants are those who are already in the United States and who possess a temporary nonimmigrant visa (or, in some cases, have no documentation) and adjust to lawful permanent residence. Visa types thus include: spouse of U.S. citizen, spouse of permanent resident, employment of several kinds, refugee or asylee, and winners of the diversity visa lottery. The Adult sample was stratified by visa categories in order to obtain reliable information for comparing characteristics across the categories of major interest (see Table 2 below). The NIS excludes from the sampling frame accompanying adult offspring, and other accompanying non-spouse/non-child relatives; these are covered as household members of sampled immigrants in the Adult Sample.

Table 2. NIS sampling strata by class of admission

Adult Sample		
Stratum 1: Spouses of U.S. citizens	2,064	16.5%
Stratum 2: Employment	2,064	16.5%
Stratum 3: Diversity	1,688	13.5%
Stratum 4: Others	6,684	53.5%

Source: Immigration Research and Statistics Service workshop on longitudinal surveys and cross-cultural survey design Workshop proceedings

Immigrants display substantial geographic clustering, which made the design of the geographic aspect of the NIS significantly simpler. The immigrants were sampled from administrative records containing the address to which they had requested the hard-copy green card –the paper documentation of legal permanent residence – to be mailed; this is the best possible address for locating sampled immigrants. The geographic sampling design included all top 85 Metropolitan Statistical Areas (MSAs) and the top represented 38 counties. It also incorporated selection of a random sample of 10 MSAs from among the rest of the MSAs and a random sample of 15 county pairs from among the rest of the counties. The segment of the cohort with an initial overseas address was originally included, but they proved too difficult to locate and were subsequently excluded. However, respondents with a non-overseas address in the administrative record who were overseas during the field period were interviewed. A key element of the design is that interviews for the baseline round were conducted as soon as possible after admission to lawful permanent residence (LPR).

Language Considerations

Another key element of the survey design is that immigrants were interviewed in the language of their choice. The NIS research team classified languages into several tiers and designated a treatment for each tier in order to best utilize valuable resources. The language classification was based on (1) the expected country of origin distribution, (2) the expected native-language distribution, and (3) the expected preferred languages by country. The major origin countries were identified by using U.S. government data from the immigrant cohorts of FY 1996-2000. Next, using information from the NIS Pilot on native languages and preferred languages, the languages were classified into tiers

estimating the expected volume of requests for interview in each language. Tier 0 was English, Tier 1 was Spanish, and Tier 2 comprised the next six languages expected to be most often requested—Chinese, Korean, Polish, Russian, Tagalog, and Vietnamese. Tier 3 included the next nine languages expected to be the most requested, and Tier 4 included all other languages. For Tier 1 and Tier 2 languages, the instruments were translated. For Tier 3 languages, a set of key concepts was translated. Interviews for Tier 1 and Tier 2 languages, plus Amharic, French, and Haitian Creole, were conducted by bilingual interviewers. Interviews in all other languages were conducted by an interviewer and interpreter together. Also, if a language was on the list for bilingual interviewer treatment and a bilingual interviewer was not available at the time, interviewer-interpreter pairs conducted the interviews.

Survey Procedure

There were three steps involved in the procedure for selecting the sample. First, the U.S. Government Office of Immigration Statistics prepared an electronic file with the immigrant records for all new legal immigrants whose records were entered in the specified period (for example, May 1-15, 2003) and sent it to the Principal Investigators (PIs). Second, the PIs selected the Adult and Child Samples according to the specifications described above. Third, the PIs sent the Samples to the survey organization, the National Opinion Research Center (NORC), affiliated with the University of Chicago. The PIs selected the sample selection using a random-number statistical routine, so that each immigrant in the sampling frame received a sampling number and then the first x cases in each stratum were chosen. 60 percent of the Adult Sample interviews were administered by phone; the remainder was administered in-

person. Immigrants were interviewed as soon as possible after admission to lawful permanent residence.

Table 3. Country of Birth of Adult Sample Immigrants (n=8,573)

Countries in data	**Unweighted**	**Weighted**
Mexico	13.6%	17.5%
India	9.0%	7.3%
El Salvador	5.7%	6.1%
Philippines	6.0%	5.5%
China	5.6%	5.4%
Vietnam	2.6%	3.1%
Guatemala	2.2%	2.4%
Dominican Republic	2.0%	2.3%
Colombia	1.6%	2.1%
Haiti	1.8%	2.0%
Cuba	1.7%	1.8%
Jamaica	1.4%	1.7%
Poland	2.3%	1.6%
Nigeria	2.0%	1.5%
Korea	1.7%	1.5%
Russia	1.4%	1.4%
Peru	1.3%	1.4%
Ethiopia	2.3%	1.3%
Canada	1.2%	1.3%
Ukraine	1.7%	1.3%
United Kingdom	1.2%	1.1%
Country total	68.0%	69.5%
Additional countries in regions		
Latin America & the Caribbean	5.8%	6.9%
Europe & Central Asia	9.6%	8.3%
East & South Asia & the Pacific Middle	6.9%	6.4%
East & North Africa	4.6%	4.4%
Sub-Saharan Africa	4.6%	3.7%
Oceania	0.4%	0.4%
Unknown	0.2%	0.2%
Region total	32.0%	30.5%
Overall total	100%	100%

Source: The U.S. New Immigrant Survey: Overview and Preliminary Results Based on the New-Immigrant Cohorts of 1996 and 2003.

Methods

The sample used for this research project consisted of a subset of the NIS sample. Once all of the following variables were cleaned and recoded, all observations that contained missing data were deleted. The dataset used for the analysis of the dichotomous outcome variable had a sample size of 2,973 and the dataset used for the continuous mental health index outcome variable had 135 observations.

Control Variables

The researcher chose to control for certain variables that could affect the experimental results. The control variables were age, region of origin, respondent and spouse education, military status, marital status, number of children, employment, health insurance coverage, health status, physical activity level, and whether or not the respondent received federal financial assistance.

Age of respondent was categorized by five year intervals starting with 18-22 and then combining the older age group as everyone above the age of 63 years old. The categories for the region of origin variable were kept the same as those provided in the questionnaire, which included the following: (1) Europe & Central Asia, (2) East Asia, South Asia & the Pacific, (3) Other North America (Canada & Mexico), (4) Latin America & the Caribbean, (5) Sub-Saharan Africa, and (6) Middle East and North Africa. Marital status of the respondent was narrowed down from the NIS-established categories to three basic categories: married, never married (and not living with someone in a marriage-like relationship), and all others (to include divorced, widowed, separated or

living together in marriage-like relationship but not married). The researcher also controlled for the total number of the respondent's children.

Respondent's education was dichotomously characterized as more or less than 12 years, using the equivalent of a high school education as a benchmark. For the spouse's education variable, responses were coded as 0 if the respondent was not married, 1 if they were married and the spouse's education level was less than 12 years, and 2 if they were married and the spouse's education level was greater than 12 years. The military status and spouse's military status were coded in a similar manner to the education variables. The respondent's military experience was dichotomously defined as ever having served in the military (in any country) or not, and the spouse's experience was the same, with the added third category for the respondent not being married. Employment status of the respondent was restricted to whether or not the respondent was currently employed.

Similarly, health insurance coverage was recorded as yes if the respondent had insurance at the time of the interview, and no if the respondent did not have insurance. Lastly, receipt of federal assistance was defined positively if the respondent received any of the following: unemployment compensation in the last twelve months from the U.S. government because he/she was unemployed or out of work, workman's compensation for an injury at work, income from the U.S. Social Security program, income from Supplemental Security Income (SSI)[4] program, other disability payments, income from welfare payments, or income from veterans benefits or a military pension.

[4] SSI is a program administered by the Social Security Administration which makes assistance payments to low income, blind, disabled, and aged persons. A person may be receiving either or both SSI and Social Security checks.

General health status was assessed using a self-reported five point scale, which required the respondent to rate their current health condition as excellent, very good, good, fair, or poor. Physical activity was dichotomously defined as 'active' if the respondent participated in vigorous activity more than once per week or 'inactive' if they did not.

Connectivity variables

The researcher was interested in examining the effect of connectivity to home on mental health outcomes among immigrants. The key covariates in the connectivity domain were compromised of the following variables.

A continuous variable was created from the migration history dataset to compute how many times the respondent had moved since leaving his/her home country and coming to the United States (counting the first move to the U.S. as the final move if they subsequently relocated within the U.S.). The survey asked the respondent what was the month and year that they first left their home country to live in another country for at least 60 days. The next question asked when the respondent left that country to live in another country, and so on until their most recent move. The respondents who did not answer the U.S. as their most recent move were excluded from the analysis because it was indeterminable if they actually moved to the U.S. Another variable was created from the same data to count how many times the respondent had moved anywhere (including within the same country) for more than 60 days at a time.

Another continuous variable was calculated for the length of time that the respondent had resided in the United States. Since some of the respondents were receiving their lawful permanent residence through adjustee immigrant status, there was a considerable range in

how many years the respondents had resided in the U.S. If the respondent had moved to the U.S. in the past, then moved away, and then returned to the U.S., their most recent move to the U.S. was considered their final move to the U.S. To calculate this value, the calendar year that the respondent moved to the U.S. was subtracted from the year that the survey was conducted (2003 or 2004). Using the same migration history questionnaire, a continuous variable was created to determine the age of the respondent when he/she left their country of origin for the first time. This was calculated by subtracting the year that the respondent was born from the year that they first left their country of origin.

Adoption of the English language is part of the integration process, and its absence could suggest stronger connectivity to home. Three dichotomous variables were created for whether or not English is at least one of the languages spoken at home, at work, or with friends (when not at home). Socializing and sharing religious services with people from one's country of origin was also of interest to the researcher. A categorical variable was adapted from a previously continuous estimate of the percentage of people at the respondent's place of religious worship that were from the same country of origin. Labeled as less than 50 percent, more than 50 percent, or does not attend religious services, the percentages were an estimate by the respondent. The same was done for the percent at the respondent's place of worship who speak the same native language. Respondents were asked if they attended any type of religious gathering, and if they did, to estimate the percentage of people who spoke their same language. The variable was further categorized to less than 50 percent or more than 50 percent, and no religious service attendance.

Other key covariates of interest were whether or not the respondent voted in his/her country of origin while living in the United States and if he/she has travel plans to their home country in the next 12 months. Respondents were also asked how similar their current diet is to what they used to eat in their home country, using a scale of 1 to 10; 1 representing a completely different diet to 10 signifying exactly the same. It was not possible to trace back the exact country where a respondent's pension originated, but a variable was created for whether or not he/she received a pension from a foreign government.

Family unification was included as a possible predictor for mental health status. Variables were created for the following: at least one biological child living with respondent, spouse living with respondent, father living with respondent, mother living with respondent, or another relative living with respondent. The data for these indicators were compiled from household rosters and the section dedicated to the children of respondents.

Finally, assets and liabilities held in the respondent's home county and financial transfers were variables of interest in relation to connectivity to home. Two variables were created to analyze the effect of still having assets or liabilities in one's home country. One was a continuous count of the number of assets and liabilities; the other a dichotomous variable of whether or not the respondent had any number of assets and liabilities in their home county or not. Assets were defined as possessing any of the following: a second home, other real estate, a farm, a business, bonds, bank accounts, or a transportation vehicle. Liabilities included any debts or loans.

An index for financial transfers was created for the behaviors of (1) sending a remittance, (2) receiving a financial transfer, (3) both sending and receiving, or (4) not engaging in financial transfers. Sending a remittance consisted of a financial transfer of any kind to someone when the person had not been living in the same household during the last 12 months. Furthermore, that person was required to be living in the respondent's home country. The same criteria was applied to receiving a financial transfer; the person that sent the transfer to the respondent had not lived in the same household in the past 12 months and was currently residing in the respondent's home country. These data came from the household roster and the financial transfers dataset.

Outcome variables

Two outcome variables were created to examine the effect of connectivity to home on an immigrant's mental health. Within the health dataset, there are fifteen questions that pertain to mental health issues.

The dichotomous outcome of depression was taken from a survey question asking if the respondent had felt sad, blue, or depressed for two weeks or more in a row during the period of the last 12 months. If the respondent responded positively, then they were classified as being depressed (for the purposes of this research study) and were asked follow up questions. The follow up questions were combined to create a continuous index of severity of depression. The index consisted of the total number of the following conditions that the respondent experienced during the two weeks or more of depressed feelings: lost interest, felt tired, suppressed appetite, had trouble falling asleep, had trouble concentrating, felt down on self, or thought about death.

Data Analysis

The data were analyzed using SAS 9.2 (Cary, NC). Significant data cleaning and recoding of variables was required before analysis could begin. Simple frequencies and means among the sample population were examined by stratifying by sex. Bivariate relationships between the dichotomous depressed dependent variable and the categorical independent variables were assessed using the Mantel-Haenszel chi square test. For the continuous variables, the unpooled Satterthwaite t-test was applied due to the disparity in sample size across the two groups (depressed n=385, not depressed n=2588). A logistic regression model was built containing only the significant (α=0.05) variables from the bivariate analysis and the stepwise selection method. The cutoff p-value to enter or remove a variable from the model was set to 0.1.

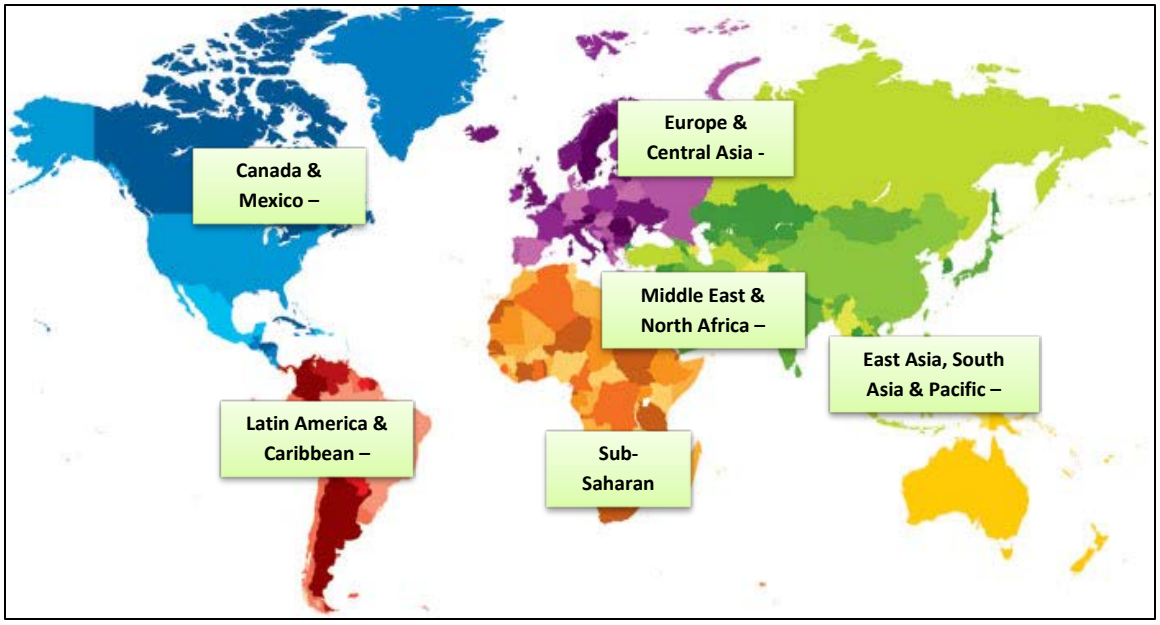
Bivariate analysis of the dependent variable and the categorical independent variables was executed using pooled and unpooled t-tests, depending on the distribution of the sample. The Analysis of Variance (ANOVA) method was used for the bivariate analysis of the continuous variables and the dependent variable. Simple linear regression was used to assess the relationship between the continuous dependent variable with all significant (at the α=0.05 level) independent variables. In order to identify the independent risk factors associated with the outcome, the insignificant variables were removed from the regression model and the smaller associative model was regressed. A regression model was constructed using the stepwise selection method. The cutoff p-value to enter or remove a variable from the model was also set to 0.1. Both models were assessed for goodness of fit using the Hosmer-Lemeshow Goodness of Fit Test.

RESULTS

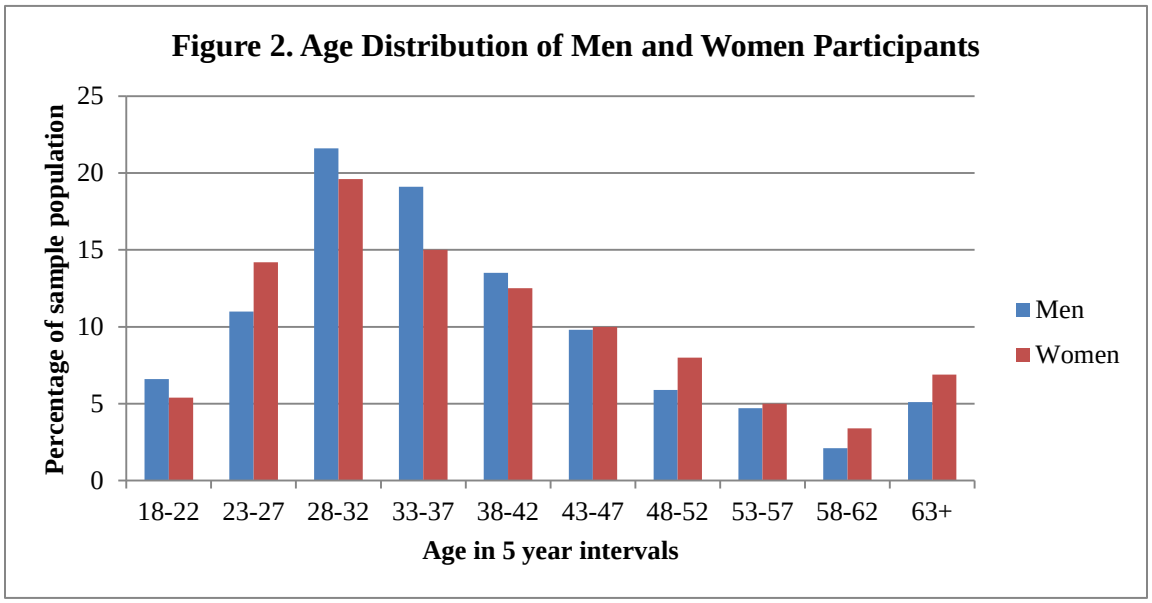
Description of sample

A total of 2,973 lawful permanent residents (LPRs) were included in the final analysis, with an almost equal distribution of 1,516 men and 1,457 women. More than half of the participants (56%) were under the age of 37 at the time of the survey, and the largest cohort (36%) migrated to the United States from other countries in the Americas. The next largest group (32%) came from the region of East Asia, South Asia and the Pacific.

Figure 1. Distribution of sending countries among sample population, by percent



Women had a slightly lower education level than the men; 50% had completed less than twelve years of schooling compared to 43% of men. Not surprisingly, many more men than women had ever served in the military; 19% compared to about 1%. About 70 percent of all participants were married and only 40 percent had health insurance



coverage. Overall, the average number of children was 1.7. More than half of the sample (65%) self-rated their health as excellent or very good and 31 percent reported that they participated in vigorous exercise more than once per week.

Connectivity to home

In terms of the connectivity to home indicators, the distribution was relatively similar across males and females. The move to the United States was the first one for most participants (mean = 1.34). An average of 5 years had been spent in the U.S. prior to the survey, and the average age for leaving the host country of origin for the first time was around 31 years old.

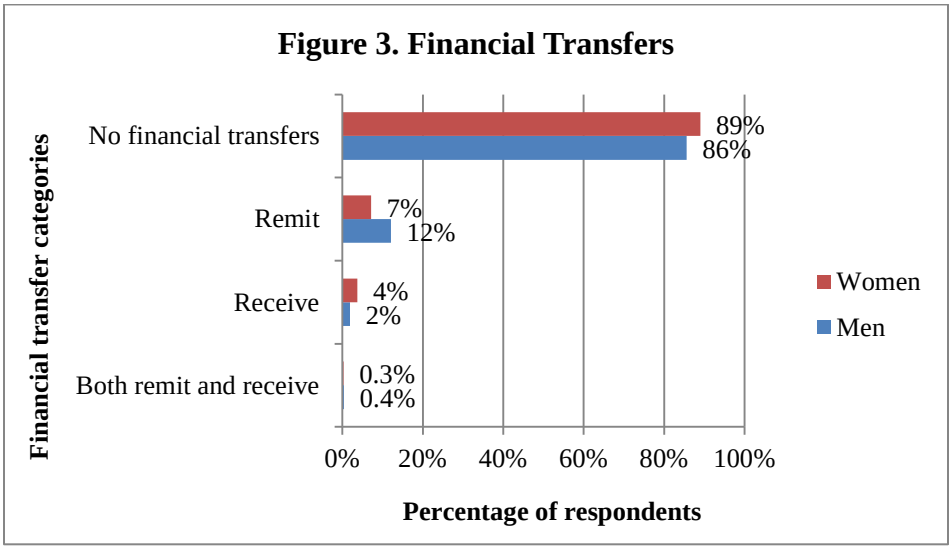
Table 1. Demographic background of participants

Variable	Men N=1516	Women N=1457	Total N=2973
Age in 5 year intervals N(%)			
18-22	101 (6.6%)	79 (5.4%)	180 (6.1%)
23-27	167 (11.0%)	207 (14.2%)	374 (12.6%)
28-32	328 (21.6%)	286 (19.6%)	614 (20.5%)
33-37	289 (19.1%)	219 (15.0%)	508 (17.1%)
38-42	205 (13.5%)	182 (12.5%)	387 (13.0%)
43-47	148 (9.8%)	145 (10.0%)	293 (9.9%)
48-52	89 (5.9%)	117 (8.0%)	206 (6.9%)
53-57	71 (4.7%)	72 (5.0%)	143 (4.8%)
58-62	31 (2.1%)	49 (3.4%)	80 (2.7%)
63+	87 (5.7%)	101 (6.9%)	188 (6.3%)
Region of Origin N(%)			
Europe & Central Asia	252 (16.6%)	248 (17.0%)	500 (16.8%)
East Asia, South Asia & the Pacific	484 (31.9%)	506 (34.7%)	990 (33.3%)
Other North America (Canada & Mexico)	183 (12.1%)	233 (16.0%)	416 (14.0%)
Latin America & the Caribbean	332 (21.9%)	324 (22.3%)	656 (22.0%)
Sub-Saharan Africa	171 (11.3%)	99 (6.8%)	270 (9.1%)
Middle East and North Africa	94 (6.2%)	47 (3.2%)	141 (4.7%)
Education N(%) <12 years	658 (43.4%)	726 (49.8%)	1384 (46.6%)
Spouse education N(%)			
<12 years	365 (24.1%)	364 (25.0%)	729 (24.5%)
Not married or don't know	598 (39.5%)	560 (38.4%)	1158 (40.0%)
Ever served in military N(%)	291 (19.2%)	13 (0.9%)	304 (10.2%)
Spouse ever served in military N(%)	5 (0.3%)	221 (15.2%)	226 (7.6%)
Not married	453 (29.9%)	448 (30.8%)	901 (30.3%)
Marital status N(%)			
Married	1061 (70.0%)	1004 (68.9%)	2065 (69.5%)
Never married, not living with someone in marriage-like relationship	344 (22.7%)	250 (17.2%)	594 (20.0%)
Currently employed N(%)	1188 (78.4%)	728 (50.0%)	1916 (64.5%)
Have health insurance N(%)	573 (37.8%)	570 (39.1%)	1143 (38.5%)
Receive welfare/federal assistance N(%)	34 (1.1%)	25 (0.8%)	59 (1.9%)
No. of children Mean (SD)	1.53 (1.89)	1.87 (1.98)	1.69 (1.94)
Self-rated health condition			
Excellent	611 (40.3%)	439 (30.1%)	1050 (35.3%)
Very good	463 (30.5%)	442 (30.4%)	905 (30.4%)
Good	328 (21.6%)	445 (30.5%)	773 (26.0%)
Fair	100 (6.6%)	116 (8.0%)	216 (7.3%)
Poor	14 (0.9%)	15 (1.0%)	29 (1.0%)
Physical Activity			
Active	578 (38.1%)	338 (23.2%)	916 (30.8%)

Table 2. Connectivity to home and migration indicators			
Variable	**Men N=1516**	**Women N=1457**	**Total N=2973**
Migration			
What number move it was for respondent upon arrival in US	1.36 (1.07)	1.32 (0.98)	1.34 (1.03)
Years respondent has lived in the US	5.75 (6.67)	4.92 (6.22)	5.33 (6.46)
Number of times respondent has moved	1.36 (6.21)	1.32 (0.98)	1.34 (1.03)
Age of respondent when left country of origin for the first time	30.70 (13.75)	32.66 (14.59)	31. 68 (14.19)
Connectivity to Home			
Travel plans to country or origin in the next 12 months	635 (41.9%)	568 (39.0%)	1203 (40.5%)
Voted in country of origin while living in the US	78 (5.2%)	53 (3.6%)	131 (4.4%)
At least 1 biological child living with respondent	691 (45.6%)	783 (53.7%)	1474 (49.6%)
Spouse living with respondent	962 (63.5%)	932 (64.0%)	1894 (63.7%)
Father living with respondent	74 (4.9%)	64 (4.4%)	138 (4.6%)
Mother living with respondent	114 (7.5%)	117 (8.0%)	231 (7.8%)
Other relative living with respondent	963 (63.5%)	1001 (68.8%)	1964 (66.1%)
English is at least one of the languages spoken at home	690 (45.5%)	621 (42.6%)	1311 (44.1%)
English is at least one of the languages spoken at work	1115 (73.6%)	850 (58.3%)	1965 (66.1%)
English is at least one of the languages spoken with friends	847 (55.9%)	662 (45.4%)	1509 (50.8%)
>50% of fellow church members from country of origin Do not attend church	407 (26.9%) 848 (55.9%)	449 (30.8%) 749 (51.4%)	856 (28.8%) 1597 (53.7%)
>50% of fellow church members speak same language Do not attend church	497 (32.8%) 814 (53.7%)	563 (38.6%) 697 (47.8%)	1060 (35.7%) 1511 (50.8%)
Took English classes in the last 12 months	220 (14.5%)	282 (19.4%)	502 (16.9%)
Receive pension from foreign government only	10 (0.7%)	2 (0.1%)	12 (0.4%)
Financial transfers with at least one of the following: spouse, parents, children (biological, adoptive, stepchildren) Remit Receive Both remit and receive No financial transfers	 183 (12.1%) 29 (1.9%) 6 (0.4%) 1298 (85.6%)	 103 (7.1%) 54 (3.7%) 4 (0.3%) 1296 (89.0%)	 286 (9.6%) 83 (2.8%) 10 (0.3%) 2594 (87.3%)
At least one asset or liability in country of origin	186 (12.3%)	135 (9.3%)	321 (10.8%)
Number of assets or liabilities in country of origin	0.17 (0.53)	0.12 (0.41)	0.15 (0.48)
Similarity of respondent's diet to home country Ranges from 1 (completely different) to 10 (exactly the same)	5.63 (3.07)	5.79 (3.21)	5.71 (3.14)

A high percentage (40%) of the survey respondents were planning to visit their country of origin in the next year, but a very low percentage (4%) had voted in their country of origin while living in the U.S. Most people had a family member living with them, with the highest percentage being a spouse (64%). English is at least one of the languages spoken at work for 66 percent of participants, and about 30 percent attended religious services with people from their home country who also spoke the native language. Barely

anyone in the sample population receives a pension from a foreign government only (0.4%). About 10 percent of respondents sent money to someone in their country of origin and still have at least one asset or liability there.



Significantly more women (15%) than men (11%) felt sad, blue or depressed for two weeks or more in a row in the last year (classification of depressed outcome henceforward), and the mean severity of the depression was also slightly higher among women (4.95 vs. 4.34). Results of note for the depressed outcome distribution across regions are that 20 percent of immigrants coming from Latin America and the Caribbean reported being depressed versus only 8.8 percent from Europe and Central Asia.

Table 3. Mental health outcome distribution

Variable	Men N=1516	Women N=1457	Total N=2973
Mental Health Outcome Variables			
Felt sad, blue or depressed for two weeks or more in a row in the last 12 months	162 (10.7%)	223 (15.3%)	385(13.0%)
Index 1-7: The number of the following conditions experienced during those two weeks (lost interest, felt tired, lost appetite, trouble falling asleep, trouble concentrating, felt down on self, thought about death)	4.34 (1.70)	4.95 (1.61)	4.71 (1.67)

Bivariate Analysis Results

Table 4. Bivariate analysis of demographics with depressed outcome					
Variable	**Overall N=2973**	**Depressed**		**Chi square statistic**	**p-value**
		YES N=385	**NO N=2588**		
Female	1457 (49.0%)	223 (15.3%)	1234 (84.7%)	14.059	0.0002*
Age in 5 year intervals N(%)					
18-22	180 (6.1%)	29 (16.1%)	151 (83.9%)	0.0968	0.7557
23-27	374 (12.6%)	47 (12.6%)	327 (87.4%)		
28-32	614 (20.5%)	74 (12.1%)	540 (88.0%)		
33-37	508 (17.1%)	64 (12.6%)	444 (87.4%)		
38-42	387 (13.0%)	47 (12.1%)	340 (87.9%)		
43-47	293 (9.9%)	39 (13.3%)	254 (86.7%)		
48-52	206 (6.9%)	33(16.0%)	173 (84.0%)		
53-57	143 (4.8%)	28 (19.6%)	115 (80.4%)		
58-62	80 (2.7%)	7 (8.8%)	73 (91.3%)		
63+	188 (6.3%)	17(9.0%)	171 (91.0%)		
Region of Origin N(%)					
Europe & Central Asia	500 (16.8%)	44 (8.8%)	456 (91.2%)	23.439	<.0001*
East Asia, South Asia & the Pacific	990 (33.3%)	96 (9.7%)	894 (90.3%)		
Other North America (Canada & Mexico)	416 (14.0%)	66 (15.9%)	350 (84.1%)		
Latin America & the Caribbean	656 (22.0%)	131 (20.0%)	525 (80.0%)		
Sub-Saharan Africa	270 (9.1%)	27 (10.0%)	243 (90.0%)		
Middle East and North Africa	141 (4.7%)	21 (15.0%)	120 (85.1%)		
Marital status N(%)					
Married	2065 (69.5%)	242 (11.7%)	1823 (88.3%)	1.2752	0.2588
Never married, not living with someone in marriage-like relationship	594 (20.0%)	84 (14.1%)	510 (85.9%)		
Education N(%)					
<12 years	1384 (46.6%)	213 (15.4%)	1171 (84.6%)	13.6744	0.0002*
Spouse education N(%)					
<12 years	729 (24.5%)	108 (14.8%)	621 (85.2%)	13.156	0.0003*
Not married	1158 (40.0%)	172 (14.9%)	986 (85.1%)		
Ever served in military N(%)	304 (10.2%)	27 (8.9%)	277 (91.1%)	4.9701	0.0258*
Spouse ever served in military	226 (7.6%)	36 (15.9%)	190 (84.1%)	11.9321	0.0006*
Not married **N(%)**	901 (30.3%)	142 (15.8%)	759 (84.2%)		
Currently employed N(%)	1916 (64.5%)	228 (11.9%)	1688 (88.1%)	5.2697	0.0217*
Have health insurance N(%)	1143 (38.5%)	145 (12.7%)	998 (87.3%)	0.1147	0.7348
Receive welfare/federal assistance N(%)	59 (2.0%)	16 (27.1%)	43 (72.9%)	10.7198	0.0011*
Self-rated health condition					
Excellent	1050 (35.3%)	108 (10.3%)	942 (89.7%)	56.5580	<.0001*
Very good	905 (30.4%)	81 (9.0%)	824 (91.1%)		
Good	773 (26.0%)	129 (16.7%)	644 (83.3%)		
Fair	216 (7.3%)	54 (25.0%)	162 (75.0%)		
Poor	29 (1.0%)	13 (44.8%)	16 (55.2%)		
Physical Activity					
Active	916 (30.8%)	100 (10.9%)	816 (89.1%)	4.8516	0.0276*
Inactive	2057 (69.2%)	285 (13.9%)	1772 (86.1%)		

A substantial number of the demographic variables were significantly (α=0.05) related to the dichotomous depressed outcome. Region of origin of the respondent was very highly

correlated ($p<.0001$), as was sex ($p=0.0002$). Education level and military status for both the respondent and their spouse was significant (education: $p=0.0002$, $p=0.0003$, military: $p=0.0258$, $p=0.0006$). Whether or not the respondent was currently employed was a strong predictors of depression ($p=0.0217$), and the receipt of federal monetary assistance also proved important ($p=0.0011$). Lastly, physical activity was signficantly associated with depression ($p=0.0276$).

The key connectivity covariates that were found to be significantly associated with the dichotomous depressed outcome include: travel plans to country of origin in the next year ($p<.0001$), whether or not the respondent's spouse was living with them ($p=0.0009$), whether or not the respondent's mother was living with them ($p=0.0237$), and if English is at least one of the languages spoken at work or with friends ($p=0.0439$ and $p=0.0105$). Also found to be significant predictors at the $\alpha=0.05$ level were whether or not the respondent took English classes in the last year ($p=0.0056$), engagement in financial transfers ($p=0.0007$), the years that respondent had lived in the U.S. ($p=0.0059$), age of respondent when he/she left country of origin for the first time ($p=0.0421$), and the similarity of the respondent's diet to home country ($p=0.0007$).

For the continuous severity of depression outcome, no connectivity covariates were found to be significant. Only the demographic variables of sex, age, and respondent education were found to be significantly associated with the outcome ($p=0.0367$, $p=0.0008$, $p=0.05$, respectively).

Table 5. Bivariate analysis of connectivity covariates with depressed outcome					
Variable	**Overall N=2973**	**Depressed**		**Chi square statistic**	**p-value**
		YES N=385	**NO N=2588**		
Voted in country of origin while living in the US	131 (4.4%)	21 (16.0%)	110 (84.0%)	1.1533	0.2829
At least 1 biological child living with respondent	1474 (49.6%)	189 (12.8%)	1285 (87.2%)	0.0422	0.8372
Spouse living with respondent	1894 (63.7%)	216 (11.4%)	1678 (88.6%)	11.053	0.0009**
Father living with respondent	138 (4.6%)	15 (10.9%)	123 (89.1%)	0.5554	0.4561
Mother living with respondent	231 (7.8%)	41 (17.8%)	190 (82.3%)	5.1152	0.0237**
Other relative living with respondent	1964 (66.1%)	263 (13.4%)	1701 (88.6%)	0.9987	0.3176
English is at least one of the languages spoken at home	1311 (44.1%)	166 (12.7%)	1145 (87.3%)	0.1722	0.6781
English is at least one of the languages spoken at work	1965 (66.1%)	237 (12.1%)	1728 (87.9%)	4.0601	0.0439**
English is at least one of the languages spoken with friends	1509 (50.8%)	172 (11.4%)	1337 (88.6%)	6.5422	0.0105**
>50% of fellow church members from country of origin Do not attend church	856 (28.8%) 1597 (53.7%)	100 (11.7%) 209 (13.1%)	756 (88.3%) 1388 (86.9%)	0.6649	0.4148
>50% of fellow church members speak same language Do not attend church	1060 (35.7%) 1511 (50.8%)	155 (14.6%) 186 (12.3%)	905 (85.4%) 1325 (87.7%)	2.6611	0.1028
Took English classes in the last 12 months	502 (16.9%)	84 (16.7%)	418 (83.3%)	7.6658	0.0056**
Receive pension from foreign government only	12 (0.4%)	2 (16.7%)	10 (83.3%)	0.1476	0.7008
Financial transfers with at least one of the following: spouse, parents, children (biological, adoptive, stepchildren) Remit Receive Both remit and receive No financial transfers	 286 (9.6%) 83 (2.8%) 10 (0.3%) 2594 (87.3%)	 42 (14.7%) 20 (24.1%) 3 (30.0%) 320 (12.3%)	 244 (85.3%) 63 (75.9%) 7 (70.0%) 2274 (87.7%)	11.5014	0.0007**
At least one asset or liability in country of origin	321 (10.8%)	47 (14.6%)	274 (85.4%)	0.9134	0.3392
				t-statistic	**p-value**
No. of children Mean (SD)	1.69 (1.94)	1.83 (2.12)	1.68 (1.91)	-1.35	0.1768
What number move it was for respondent upon arrival in US	1.34 (1.03)	1.37 (1.15)	1.34 (1.01)	-0.62	0.5369
Years respondent has lived in the US	5.33 (6.46)	6.29 (7.31)	5.20 (6.32)	-2.76	0.0059**
Number of times respondent has moved	1.34 (1.03)	1.38 (1.16)	1.34 (1.01)	-0.66	0.5072
Age of respondent when left country of origin for the first time	31. 68 (14.19)	30.29 (14.20)	31.87 (14.19)	2.04	0.0421**
Number of assets or liabilities in country of origin	0.15 (0.48)	0.17 (0.54)	0.14 (0.47)	-1.00	0.3180
Similarity of respondent's diet to home country Ranges from 1 (completely different) to 10 (exactly the same)	5.71 (3.14)	5.16 (3.42)	5.79 (3.09)	3.42	0.0007**

**Significant at the α=0.05 level

Multivariate Analysis Results

Logisitc Regression

A logistic regression model was built using the stepwise method starting with the significant (α=0.05) covariates only.

The final logistic model is:

$$\text{logit}\,(p) = \ln\left(\frac{p}{1-p}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + \beta_{13} X_{13} + \beta_{14} X_{14} + \beta_{15} X_{15} + \beta_{16} X_{17} + \beta_{18} X_{18} + \beta_{19} X_{19} + \varepsilon$$

Where:

Y=Depression status
X_1 = Sex, where 0 is male and 1 is female
X_2 = Region of origin – Europe & Central Asia
X_3 = Region of origin – East + South Asia, the Pacific and Oceania
X_4 = Region of origin – Other North America (Mexico and Canada)
X_5 = Region of origin – Latin America and the Caribbean
X_6 = Region of origin – Sub-Saharan Africa
X_7 = Employment status
X_8 = Receive welfare/ federal assistance
X_9 = Self rated health condition – Very Good
X_{10} = Self rated health condition – Good
X_{11} = Self rated health condition – Fair
X_{12} = Self rated health condition – Poor
X_{13} = Travel plans to home country next 12 months
X_{14} = Spouse living with respondent
X_{15} = Took English classes in the last 12 months
X_{16} = Financial transfers – Remit only
X_{17} = Financial transfers – Receive only
X_{18} = Financial transfers – Both remit and receive
X_{19} = Age of respondent when left country of origin for the first time

The estimate of the model is: logit $(p) = \ln\left(\frac{p}{1-p}\right)$ = -1.0448 + (0.3238)X_1 + (-0.6564)X_2 + (-0.4411)X_3 + (-0.2989)X_4 + (0.2114)X_5 + (-0.3754)X_6 + (-0.2731)X_7 + (0.7332)X_8 + (0.1250)X_9 + (0.5687)X_{10} + (1.0684)X_{11} + (2.0762)X_{12} + (0.5361)X_{13} + (-0.3102)X_{14} + (0.2866)X_{15} + (-0.6062)X_{16} + (-0.5310)X_{17} + (0.1547)X_{18} + (-0.0145)X_{19} + ε

Demographic covariates

As seen from the results, the odds of depression are about 1.4 times higher for women than men, controlling for the other covariates. Immigrants coming from Europe and Central are half as likely to be depressed at those coming from the Middle East and North Africa (OR=0.519, 95% CI: 0.289,0.932). The only group to have higher odds of depression compared to the Middle East and North Africa is the immigrant pool from Latin America and the Caribbean; their odds of depression are 1.2 times as high. Another significant result of note is that being employed seemed to have a protective effect against depression; employed immigrants had 24% less odds of being depressed than their peers who were not employed (OR=0.761, 95% CI: 0.587,0.987). Receiving welfare or federal assistance proved to be a strong predictor of reported depression, with the odds of being depressed and on welfare almost 3 times as high as those who did not receive assistance.

It is clear from the results that general health status has an effect on mental health. Those who responded that their health was ‘poor’ have more than eight times the odds of being depressed as the repsondents who said their health was ‘excellent’. Subsequently, for the immigrants who reported ‘fair’ health, the odds of depression are about three times higher

than the ‘excellent’ health reference group. Following the same pattern, even the group who reported ‘good’ health had about twice the odds of depression than those with ‘excellent’ health status.

Connectivity to home covariates

The covariates of interest in the connectivity to home realm that were significantly associated with depression were whether or not the immigrant had travel plans to their home country in the next year, if the spouse lived with respondent, if they took English classes in the last year, if they sent or received money to or from their home country, and their age when they left their country of origin for the first time. People with plans to visit their home country in the next year had 1.7 times the odds of depression than those who did not. Living with a spouse had a proctive effect for odds of depression, represented by a 27% reduction in odds (OR=0.733, 95% CI: 0.581, 0.925). Participating in an activity such as attending English classed in the last year surprisingly increased the odds of depression among the respondents; those who took classes had 1.3 times higher odds of depression.

Table 5. Depression: Odds ratio estimates	
Variable	**OR (95% CI)**
Female	1.382 (1.089, 1.756)
Region	
Europe & Central Asia	0.519 (0.289, 0.932)
East Asia, South Asia, the Pacific & Oceania	0.643 (0.376, 1.102)
Other North America including Mexico & Canada	0.742 (0.419, 1.311)
Latin America & Caribbean	1.235 (0.726, 2.103)
Sub-Saharan Africa	0.687 (0.365, 1.295)
Middle East & North Africa	*(Reference group)*
Employed	0.761 (0.587, 0.987)
Receive welfare/federal assistance	2.082 (1.103, 3.930)
Self-rated health condition	
Excellent	*(Reference group)*
Very good	0.882 (0.647, 1.204)
Good	1.766 (1.322, 2.358)
Fair	2.911 (1.963, 4.315)
Poor	7.974 (3.539, 17.968)
Travel plans to home country next 12 months	1.709 (1.355, 2.156)
Spouse living with respondent	0.733 (0.581, 0.925)
Took English classes in the last 12 months	1.332 (1.009, 1.758)
Financial transfers with at least one of the following: spouse, parents, children (biological, adoptive, stepchildren)	
Nothing	(Reference group)
Remit only	0.545 (0.128, 2.327)
Receive only	0.588 (0.134, 2.586)
Both remit and receive	1.167 (0.251, 5.428)
Age of respondent when left country of origin for the first time	0.986 (0.977, 0.994)

The covariate containing the behaviors of sending or receiving financial transfers produced some interesting results. The odds of depression among those who sent financial remittances to a spouse, parent or child in their home country were about 45% less than the odds of depression among those that did not engage in financial transfers at all. However, among the group that only received financial transfers, the odds of depression were also about 41% less than those who did not send or receive money. Interestingly, for those who both sent and received financial transfers from their home country, the odds of depression were 1.2 times higher than the odds of depression. The odds of depression are about 15% less for a respondent who is ten years older than another respondent when they are identical on all other covariates. A one year age increase is associated with a 1.5% decrease in the odds of depression.

Linear Regression

A linear regression model was built to assess the continuous outcome, depression severity, using the stepwise method starting with the significant (α=0.05) covariates only.

The final linear regression model is:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2$$

Where:

Y=Depression severity index
X_1 = Sex, where 0 is male and 1 is female
X_2 = Years of education, where 0 is >12 years, 1 is <12 years

The estimate of the model is $Y = 4.621 + (0.536)X + (-4.480)X + \varepsilon$

While no connectivity covariates were significantly related to depression severity, it was interesting to see that sex and education were significant at the α=0.05 level. Using the results, we could predict an average depression severity score of 4.62 among men with less than 12 years of schooling. Compared to men with the same level of schooling , we would expect female respondents to have a 0.54 increase in their depression severity score. Among respondents of the same sex, those who have more than twelve years of schooling will have a predicted 0.48 decrease in their severity of depression score.

Table 6. Depression severity coefficients

Variables	β (SE)
Female	0.536 (0.291)
Education (<12 years)	-0.480 (0.285)

DISCUSSION

This study examined connectivity to home covariates that are most strongly associated with self-reported depression (respondent self-reported feeling sad, blue, or depressed for two weeks or more in a row during the last year) among recent legal permanent resident status recipients in the U.S. using data from the 2003 New Immigrant Survey. Two dependent variables were examined: a dichotomous depression or no depression outcome, and a depression severity index, with seven different depressive behaviors included. Using logistic regression, I modeled relationships between depression and a series of connectivity to home variables including: family unification, financial remittances/transfers, plans to visit home country in the next year, and possession of one or more assets/liabilities in the home country. Linear regression was used to analyze the relationship between the depression severity outcome and the same connectivity to home covariates. I controlled for demographic characteristics, such as age, gender, education, and region of origin in both models.

The results showed that there were specific behaviors within the connectivity to home realm that were significantly related to depression. The connectivity covariates that were significantly related to depression were whether or not the immigrant had travel plans to their home country in the next year, if the spouse lived with respondent, if they took English classes in the last year, if they sent or received money to or from their home country, and their age when they left their country of origin for the first time. However, no connectivity covariates were significantly related to depression severity, leading the

researcher to conclude that certain connective behaviors can predict depression, but not its severity.

Plans to travel home in the next year represent a strong connection to the home country, although it is unknown if the travel plans were for a business or personal purpose. The behavior could be indicative of loneliness and homesickness, which would explain why it is significantly related to depression among the sample population. While visiting one's country of origin could lower stress due to home environment exposure, it is possible that it actually increases stress because of the distress of having to leave (loved ones, friends, etc.) at the end of the trip again. It could also be confounded by the fact that an immigrant would need financial and health stability in order to make travel plans home. This behavior has not been addressed in any other studies.

Family unification has been extensively addressed in other immigration studies, although there is no consensus as to whether or not immigrating with one's family is beneficial for mental health stability. This study supports the findings by the majority of research that found that having strong family connectedness and familial support was associated with improved mental health outcomes during and after the immigration process (McMichael et al., 2011; Mulvaney-Day et al., 2007; Zhang & Ta, 2009). Having a spouse living with the respondent was in fact associated with lower odds of depression, showing that it is a protective risk factor. This finding is unique, however, in that it singled out specific family members and which ones were living with the respondent at the time of the interview, as opposed to referring to the family as a whole. It is interesting to see that children and parents were not significantly related to depression among the immigrant sample. This result could be supported by the fact that it is stressful to move with your

whole family, both financially and emotionally. It is much easier just to worry about your own survival, as opposed to having to take care of others. However, having a spouse might be beneficial because the couple could pool resources and also most likely both be able to work to contribute to the household.

English language ability has been shown to be a good proxy indicator for successful acculturation and integration in to American society (Soehl & Waldinger, 2010; Yoon et al., 2008). Thus, the finding that participating in an activity such as attending English classes in the last year increased the odds of depression among the respondents was surprising, and has not been seen in previous studies. Lin et al. found that English language proficiency was not associated with depression (Lin et al., 1979). Although it is difficult to pinpoint exactly what is causing the increased odds of depression due to taking English classes, factors such as frustration with learning a new language might be mediating the effect. Another potential reason for this outcome could be the lack of social support from others who speak the same native language, which could force the new immigrant to feel the need to take English classes. It is also possible that they might feel down because of an inability to effectively communicate in English, or that they do not fit in in their new country due to the language barrier.

The behavior of sending or receiving financial transfers produced interesting results. The odds of depression among those who sent financial remittances to a relative in their home country were less than those that did not engage in financial transfers at all. This could be influenced by the sending party's ability to remit, which generally could mean greater financial security and therefore less stress in their life. Many people migrate in pursuit of improved financial status, therefore if an immigrant is able to remit, they would be

happier for achieving their goal. Receiving financial transfers could also be protective because one's basic needs are being met with financial support from abroad. While there is no literature in support or opposition of these findings, remittances are not the solution to the stress of missing a family member (Lu, 2012). This could help explain why those respondents who engaged in both sending and receiving financial transfers had a higher odds of depression. Something stressful might be happening in their lives that dictates the need for both behaviors at the same time. Also, keeping track of both sending and receiving money would be a stressor by itself, which could lead to a greater odds of depression.

Lastly, age at the time of time of departure from home country for the first time was found to be significantly associated with increased odds of depression. The odds of depression are about 15% less for a respondent who is ten years older than another respondent when they are identical on all other covariates. While this is contradictory to the literature that posits that younger migrants are more readily able to adapt (Lin et al. 1979), this variable doesn't represent how old they were when they arrived in the United States, but rather how old they were when they left home for the first time. Therefore, the ones who left home when they were young might have had to move around a lot with their parents, which could have affected their mental health stability. It is also possible that the younger immigrants did not have much choice in their decision to migrate—could have been out of immediate need—whereas someone older could have immigrated on more stable financial terms. Likewise, older immigrants were able to attend more schooling (and potentially pursue higher education) in their home country, which could mean that they are in a better position to immigrate on their own merit for a highly

specialized job. This would also mean that they are more stable financially and have a job waiting for them in the United States.

Among the demographic variables that were significantly related to the outcomes, the gender of the respondent was the only one that was significant for both outcomes. This finding supports the literature that immigrant women tend to experience a higher prevalence of depression and mental health conditions (Gu, 2010; Ödegaard, 1932; Bhugra et al., 1997). Women, across cultures, tend to feel more responsibility for the family's well-being, and could experience greater stress due to separation from children or having to help the children integrate at the same time as they are learning the ways of a new country. Rigid gender roles in some cultures could also restrict women from exploring and integrating in to their new country. Historically, young men have been the drivers of international migration, but with the recent wave of women entering the immigration, these findings are important for understanding the needs of female immigrants after they arrive in the United States.

The effect of region of origin on immigrant's depression was also found to be significant, but with different results to those found in the 2000 U.S. Census by Huang et al. The regions were not defined in the same way, which explains some of the variation. However, the most significant finding was that the Latin American and Caribbean immigrants had the highest odds of depression, compared to the Huang et al. conclusion that immigrants from Eastern Europe and Southeast Asia reported the highest risk of mental disability (Huang et al., 2011). In order to effectively compare the effect of region of origin it is necessary to use the same definition of each region. However, it is clear that an immigrant's region of origin does have an effect on their mental health status. In the

case of our study (and other large survey-based tools) we relied on self-report of depression, which would be viewed differently by each culture, leading to bias in the results.

Each culture has different manifestations and explanations of mental health and depression, which could lead the respondents to report a variety of feelings. It might be culturally unacceptable for people from a certain country to ever admit that they felt down for two weeks in a row; on the other hand, there are also cultures that are very open and share all feelings, good or bad. These results could also be a function of the survey translation in that mental health issues are not represented by the same words across cultures. Although the New Immigrant Survey was pretested and the translations were checked, we can never be totally sure that the right concept was being asked, or if the interpreters were entirely accurate.

In summary, there was no overall trend in which kinds of connectivity to home covariates influenced depression. For example, out of all family members living with respondent, only the spouse living with the respondent had an effect. Still being personally or financially invested in the home country of origin (own assets/liabilities, vote in home country, or receive pension from home country) was only seen to be related to depression if the respondent had plans to go home in the next year. It is also interesting that the only acculturative type covariate out of the multiple English language indicators and fellow ethnic religious service attendees was whether or not the respondent had taken English classes. This could show that acculturation is not as important of a factor for depressive feelings as remittance behavior or travel plans to the home country. However, it is

possible to infer that maintaining connections to home through certain behaviors can be a risk factor for depression.

This study has certain limitations. As mentioned above, the fact that depression was measured from one survey question that asked immigrants to self-report depressive symptoms in the last year can be problematic. Respondents might not feel comfortable sharing sensitive information like that with the interviewer, or possibly weren't sure if they fit the description. The severity of depression was an improved indicator of depression since there were seven explicit behaviors that were included, but it was still not perfect. Additionally, since only the people who reported having depressive symptoms in the last year were asked the follow-up questions about specific behaviors, the sample size was drastically reduced from 2,973 to 135. This made it difficult to analyze statistically and to draw any strong conclusions about what connectivity factors were related to the severity of depression.

Including an evidence-based depression diagnostic test, such as the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV), to diagnose depression in the sample population would be the gold standard. While this would add significant cost and labor investment to complete, it would provide a more accurate diagnosis of depression among immigrants, leading to a better understanding of its relationship to the connectivity indicators. This type of study design would not be possible in a large survey setting such as the New Immigrant Survey (NIS), but it could be performed on a smaller scale with a rigorously-selected representative sample.

Another point of interest would be to look longitudinally at the effects of acculturation and assimilation on depression within the same study population. It would be interesting to compare the current 2003 NIS-1 data with the follow-up data that was collected in the summer of 2007 and to see how depression and severity of depression changed over time. Assuming that similar questions were included in the 2007 follow-up, future research could also examine the connectivity to home behaviors and characteristics and how they had changed since the first survey, and how this affects mental health. The literature supports the hypothesis that the longer immigrants reside in the U.S., the less of a health advantage they have over their U.S.-born counterparts (Dey & Lucas, 2006; Oza-Frank, Stephenson & Narayan, 2011). Using existing research as a guide, it would be useful to examine the NIS data for the same trend, specifically in the context of sustained or reduced connectivity to home behaviors.

Improvements to the New Immigrant Survey could start with using a more standardized measurement of mental health, as well as expanding this section even more. It would also be useful to ask questions directly about what the immigrant thought was their main source of stress during the immigration and acculturation experience. The following question is the only one on the current NIS survey that explicitly connects a behavior or experience to depression; “During the past 12 months, have you ever felt sad, blue, or depressed because of the process of becoming a permanent resident alien?” Even though each person’s experience is different, it would be useful to gather information about what the immigrants themselves perceive as their greatest stressors.

The findings from this research study provide support for possible improvements in the legal permanent resident process and for public health programming targeting this

population. Although it would be difficult to advise people not to immigrate with their spouse or to not remit and receive financial transfers, other recommendations for policy can be made. First, immigration officials and other health service provides could receive more cultural competency training on which sending regions are at a higher risk for mental health issues and to know how to appropriately provide help in certain situations. The same would also be true for female immigrants, in that service providers could be more aware of their higher odds of depression.

Secondly, immigrant and refugee counseling services could also benefit from the results. Counselors could provide increased support for unemployed persons and also provide guidance as immigrants settle in to their new country, make plans to travel to their home country, and also when they return from trips home. While it is not conclusive why those respondents who attended English class have higher odds of depression, this provides evidence that the quality of the classes needs to be improved. More supportive learning environments are needed, with teachers who can also help guide the introductory period into the United States.

Conclusion

While there are many factors that can cause depression in immigrant populations, this research provides a foundation with which to examine specific connectedness to home behaviors in relation to depression. These findings could be useful to public health professionals when designing programs to target immigrants for mental health interventions in the United States. Similarly, mental health care providers can also use this information when treating a patient.

A highly politically charged subject, immigration continues to enflame much debate in the United States. Questions about the value that immigrants add to society and whether or not they are filling jobs that qualified Americans need are countered with the opinion that immigrants contribute essential labor that sustains our current way of life. Either way, immigration needs to be re-examined and addressed in a way in which all people are treated humanely. We must remember that almost all of us are immigrants or descendants of immigrants, and it is important to address the mental and health care needs of everyone in the country in order to sustain a productive society.

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