



Associations Between Gender, Migration and Integration Stressors, and Health in an Indigenous Mixteco Migrant Community

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ASSOCIATIONS BETWEEN GENDER,
MIGRATION AND INTEGRATION STRESSORS, AND HEALTH
IN AN INDIGENOUS MIXTECO MIGRANT COMMUNITY

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A Dissertation Submitted to the Faculty of
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ABSTRACT

This dissertation explores the relationships between gender, migration and integration stressors, depressive symptomology, and alcohol and tobacco use within a binational indigenous Mixteco migrant community. The idea of the Mexican immigrant has become homogenized and ignores the heterogeneity of this population. Mexican society consists of a wide range of demographic, ethnic, economic, and political variations; those who emigrate take with them the same social structures and hierarchies. Mexican indigenous people face the double burden of being discriminated against by other Mexicans and by the broader U.S. society.

Chapter 2 examines the association between gender and stressors experienced during migration and integration. Using a series of ordinal logistic regression models, we find that the odds of men experiencing more migration and integration stressors are higher than women. Chapter 3 assesses the association between migration and integration stressors and depressive symptomology, by gender. Several ordinal logistic regression models were fit, and we found that migration stressors and integration stressors predict depressive symptomology. Gender was significant for the relationship between integration stressors and depressive symptomology. Chapter 4 explores the association between migration and integration stressors and substance use, by gender. Logistic regression models were fit, and we found no association between stressors and substance use, except in one model, which shows those who experience more integration stressors are less likely to smoke. Gender was strongly associated with substance use

as the odds of men smoking or drinking were 3-4 times that of women. This dissertation is a first step in understanding how gender and ethnicity play a role in the migration experiences of Mexican immigrants. Understanding how this intersectionality drives patterns of health and illness for indigenous migrants is of utmost importance in an era of heightened xenophobia. In paraphrasing social epidemiologist Nancy Krieger, the purpose of studying the effects of discrimination is not to show that oppression is bad; depriving people of human rights, dignity, and love is, by definition, wrong. The purpose is to enable full accountability and to produce knowledge that will be used to guide policies and actions to reduce injustices (Krieger, 2000).

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Chapter 1: Introduction

The Context of Indigenous Migration

With the rise of nation-states, indigenous peoples have been one of the most affected populations in the world. Issues of citizenship, land rights, education, health, and identity are among the prominent issues facing indigenous peoples. In 2007, the United Nations adopted the “Declaration on the Rights of Indigenous Peoples,” which outlines how indigenous populations are to be treated by the nation-states in which they reside. Although relations between indigenous peoples and the state are not new, this report brings into question issues about the roles and responsibilities of the state with regard to indigenous populations. Anthropologist John Bodley argues “Indigenous people have been engaged in a political struggle to defend themselves and their resources against encroaching states for at least the past 6,000 years, since states first appeared” (2008). In the context of Mexico, these issues have been at play as indigenous peoples attempt to gain inclusion into Mexican society, and as they migrate to the U.S.

Indigenous Peoples in Mexico

Settled indigenous populations in present-day Mexico have been dated to 7,000 BC in the Tehuacan Valley (Vigil, 1997). However, the colonial period saw a restructuring of social relations as indigenous populations in Mexico lost most of their lands, which were redistributed between European and Mestizo elite. Mestizo is a colonial-era racial/ethnic category used to identify individuals with mixed Spanish and Native American ancestry. Today, Mestizos compose the largest racial/ethnic category in Mexico with estimates between 50% and 75% of the Mexican population (Encyclopedia Britannica, 2018). It was not until the Mexican revolution of the 1910s that indigenous peoples attempted to regain their lands—many joining the revolution under the rallying cry of *tierra y libertad* (Hammentt, 2006; Meyer, Sherman, & Deeds, 2006).

Soon after the revolution, land, and land rights were distributed among indigenous peoples, however, these grants consisted of land in remote mountainous terrain that was not fertile for agriculture (Pastor, 1987; Vigil, 1997; Meyer, Sherman, & Deeds, 2006). It was not until the 1930s that large-scale land redistribution occurred under President Lázaro Cárdenas. Nepotism resulted in a redistribution of land that disadvantaged indigenous peoples by giving the more fertile lands to individuals connected to local politicians—those who did receive grants usually got remote, eroded, and insufficient plots (Pastor, 1987).

Today, indigenous Mexicans continue to live on the margins of Mexican society. The most underdeveloped areas of Mexico are in the southern states of Guerrero, Oaxaca, and Chiapas—the three states with the largest indigenous populations (Cohen, 2004). Land ownership in these states continues to be in the hands of the Mestizo elite, the same group in control of regional politics (Cohen, 2004; Meyer, Sherman, & Deeds, 2006). Indigenous peoples are excluded from state and national politics and suffer extreme social and racial discrimination by non-indigenous Mexicans and Mexican officials.

Figure 1: Map of Mexico



Source: Google maps (2018)

La Mixteca Region

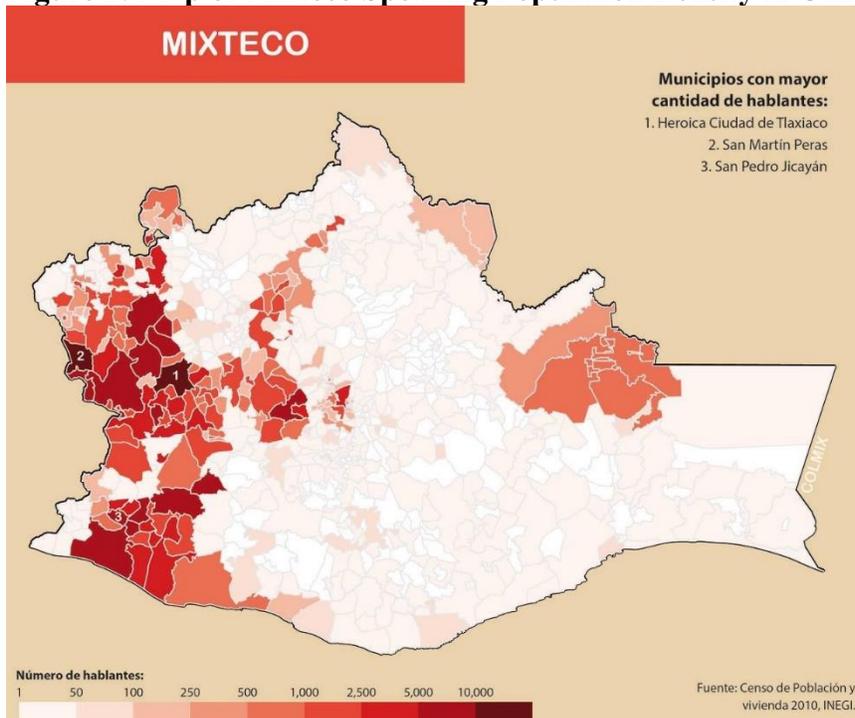
Oaxaca is Mexico's most culturally diverse state, with 16 officially-recognized indigenous groups. It is also one of Mexico's poorest states, with over 75% of residents lacking access to necessities such as potable water, education, or formal healthcare services (Cohen, 2004; FitzGerald, Hernandez Diaz, & Keyes, 2013; Cornelius, FitzGerald, Hernandez-Diaz, & Borger, 2009). The state's per capita income is the lowest in the country and is worse among its indigenous peoples. Yearly, 150,000 leave the state to seek employment and 1 in 4 adults have migrated at least once in their lifetime (FitzGerald, Hernandez Diaz, & Keyes, 2013; Cohen, 2004).

The Mixteca is a region located in the southern Mexican states of Oaxaca and Guerrero and is comprised of three zones: Mixteca Baja, Mixteca Alta, and Mixteca de la Costa. The Mixteca is one of Oaxaca's poorest regions with extremely high levels of emigration (Cornelius, FitzGerald, Hernandez-Diaz, & Borger, 2009). Over 40% had some migration experience, with 30% currently residing outside of the region—primarily in Southern California (FitzGerald, Hernandez Diaz, & Keyes, 2013; Cornelius, FitzGerald, Hernandez-Diaz, & Borger, 2009). This emigration is due to a combination of ecological, political, and economic factors. For example, the topography of the region with its rugged and mountainous terrain and the over-population of the area have led to a depletion of fertile land—making subsistence farming a risky endeavor (Nagengast, Stavenhagen, & Kearney, 1992; FitzGerald, Hernandez Diaz, & Keyes, 2013). In addition, economic and political marginalization by the federal government has hindered attempts at infrastructure development in the region. These factors have resulted in mass emigration as individuals move north in search of better living conditions.

Topography varies between regions but is mostly (85%) mountainous and hilly terrain in the

Mixteca Alta and Baja, with the coastal Mixteca having sea-level elevations in the immediate coastal regions but becoming hilly and mountainous within 5-10 miles inland. Elevations average between 1,800 and 2,300 meters above sea level. Due to economic and technological changes in the past decades, in addition to government hesitation to build needed infrastructure, the Mixteca has suffered extreme ecological deterioration (Cornelius, FitzGerald, Hernandez-Diaz, & Borger, 2009). Close to 25% of topsoil has deteriorated irreversibly, with 20% being destroyed rapidly—any attempt at commercial farming is rendered risky. In addition to the ecological deterioration of the land, international agreements like The North American Free Trade Agreement (NAFTA) have discouraged commercial farming due to the low prices of imported goods.

Figure 2: Map of Mixteco Speaking Population Density in Oaxaca, by municipality



Source: Mexican National Institute of Statistics and Geography (2010)

Emigration from the Mexican Mixteca

There has been a long history of migration from the Mixteca with individuals migrating to other agricultural areas in Mexico, to large cities, and to the United States (Fox & Rivera-Salgado, 2004; Nagengast, Stavenhagen, & Kearney, 1992; Cornelius, FitzGerald, Hernandez-Diaz, & Borger, 2009; Castañeda & Saldivar, 2001; Velasco Ortiz, 2002). Mixtecos have been migrating internally as laborers prior to 1900 when individuals would go work in the Veracruz sugarcane industry. This migration was seasonal, with migrants leaving for short periods of time that were usually no more than a year (Nagengast, Stavenhagen, & Kearney, 1992). What distinguishes this early migration is the fact that migrants did not establish permanent residences in the host locations.

Migration patterns began to change in the 1950s and 1960s as Mexico began investing in new technologies for agribusiness during the Green Revolution. This resulted in a need for agricultural labor in the northern states of Sinaloa and Baja California, states where agribusiness is more prominent and where new technologies allowed for the more efficient use of land year-round. Mixtecos arrived in these regions and created their enclaves. In addition to migrating to the agricultural north, large numbers of Mixtecos moved into large cities, predominantly Mexico City. It has been estimated that tens of thousands of Mixtecos live in Mexico City, although exact counts are not available in census records (Butterworth, 1970; Nagengast, Stavenhagen, & Kearney, 1992).

A third wave of migration occurred in the 1970s when Mexico's economy experienced a collapse. Mixtecos created large enclaves in the border cities of Tijuana and Mexicali, which became nodes in their international migration networks. In addition to the enclaves established in the northern border cities, Mixtecos began entering the United States in large numbers during the

1970s, mainly into California. Again, ethnic enclaves were established in the agricultural regions of southern California (in north San Diego County), central California (around the city of Madera), and California's central coast (around the city of Santa Maria). In these areas, Mixtecos make up a large part of the informal agricultural worker sector.

Mixteco Social Integration

Mixteco migration consists of movement into urban and agricultural areas where unskilled labor is needed. This usually consisted of low-income settlements that include shantytowns in large cities or labor camps in industrial agriculture areas. During the 1950s and 1960s, Mexico experienced a large rural-to-urban migration as peasants could no longer sustain their families with their agriculture yields. Mixtecos migrated into Mexico City where they took jobs in the bottom ranks of the unskilled labor sector (Nagengast, Stavenhagen, & Kearney, 1992).

Mixteco migrants settled in the shantytowns of Mexico City where lack of social services is common (Butterworth, 1970). Fundamental public health needs like potable water and sewage systems were not put in place due to the government not acknowledging these new squatter villages as legitimate neighborhoods. These issues are exacerbated in areas where the Mexican population is predominantly non-indigenous Mestizos. As indigenous peoples established enclaves, they experienced backlash from their non-indigenous counterparts.

Mixtecos who migrate to agriculture regions experience similar issues to those who migrate to urban areas, although their living in rural enclaves proves more isolating. Mixtecos began migrating to the agriculture-rich regions of northern Mexico and California in the 1950s and 1960s where they lived in migrant labor camps. Living conditions included crowded housing, limited clean water and sewage systems, and high rates of mortality and morbidity.

In addition to substandard living conditions, Mixteco farmworkers today are at higher risk for

occupational injuries and illness, with two prominent issues being the pervasive exposure to pesticides and a failure on the part of employers to provide safe working conditions. Migrants are constantly being exposed to pesticides used on the fields surrounding the labor camps, and public health literature has documented that pesticide exposure is correlated with higher rates of certain chronic disease like asthma, lung cancer, and skin diseases (Mamane et al., 2015; Wunschel and Pool, 2016; van der Plaat et al., 2018; Skolarczyk et al., 2017).

Contextualizing San Miguel Tlacotepec

Data for this study comes from the Mexican Migration Field Research Project, housed in the Center for Comparative Immigration Studies at the University of California, San Diego. From January to March 2011, 901 indigenous Mixteco participants from the high-emigrating town of San Miguel Tlacotepec (Tlacotepec) in the southern Mexican state of Oaxaca completed structured questionnaires. Questionnaires were completed during a two-week period in January, during which domestic and international migrants return to partake in the holidays, local festivities, and to visit family members. From February to March, cross-sectional data was collected from Tlacotepec's satellite communities in the U.S. cities of San Marcos, Vista, and northern San Diego County, California.

Tlacotepec is an indigenous community of moderate economic marginalization in its second generation of mass migration to the U.S. (FitzGerald et al., 2013; Cornelius et al., 2009). Set in a valley within the Sierra Madre Sur mountain range of the Mixteca, *Tlacotepec* means “place among hills” in the Nahuatl language (FitzGerald et al., 2013). The total population of the municipality is 3,220, including 1,621 in the municipal seat (INEGI, 2010). The town has lost nearly 10% of its population since 1990, mainly due to migration, and is overrepresented by young and old. People from Tlacotepec identify as Mixtecos with 17% of people speaking the

Mixteco language (FitzGerald et al., 2013).

Emigration from Tlacotepec can be dated back to the 1950s when individuals would migrate to the state of Veracruz to work in the sugar cane industry, or to Mexico City. Shortly after, other families began emigrating to other parts of Mexico and eventually to the U.S. (FitzGerald et al., 2013; Cornelius et al., 2009). In the beginning, migration followed a circular pattern as individuals migrated north during the harvest season and returned to Tlacotepec during the off-season. This pattern has changed to unidirectional and permanent due to three main reasons. First, the 1986 Immigration Reform and Control Act (IRCA) gave legal status to undocumented immigrants in the U.S. This allowed many Tlacotepec migrants to become residents of the U.S. and establish roots. A second factor in the change of migration patterns includes the migration networks that were strengthened as individuals began establishing permanent residency. As Arturo, a Tlacotepense migrant living in the U.S. for 20 years stated: "I had a brother in the city of Vista, California. When I arrived there, I realized it was a sanctuary of many Tlacotepenses. There were already many people [from Tlacotepec] living [in Vista] I liked it from the day I arrived there, and I didn't leave" (FitzGerald et al., 2013). Third, the increase in border enforcement measures has made the border crossing experience a more dangerous and expensive endeavor (FitzGerald et al., 2013). For this reason, many individuals who successfully reach the U.S. decide to stay for longer periods of time.

Socio-demographic Characteristics of San Miguel Tlacotepec

The socio-demographic profiles of Tlacotepec's migrants and non-migrants vary widely (see Table 1). Those who stayed were on average five years younger than current or return migrants. Non-migrants were married at lower rates (51%) compared to current or return migrants (68%) and were less likely to have children, compared to current or return migrants (58% vs. 72%).

Non-migrants have, on average, more years of formal schooling (7.5) compared to return or current migrants (6.7). With regards to civic participation, current or return migrants were more likely to be part of a hometown organization (43%) compared to non-migrants (32%).

Hometown organizations are immigrant organizations based on a common hometown or “organizations that allow immigrants from the same city or region to maintain ties with and materially support their place of origin” (Somerville et al., 2008). However, non-migrants were more likely to attend hometown fiestas (78%) compared to current or return migrants (47%).

There were also significant differences in occupation as most migrants worked blue-collar jobs (54%) while the largest occupation category for non-migrants is homemaker (38%).

Table 1: Descriptive statistics of Tlacotepenses, by migrant status

Characteristics	Non-Migrants N = 477	Migrants (Current and Return) N = 289	p-value
Age, M (SD)	34.62 (15.63)	39.52 (12.67)	<0.001*
Country currently live, n (%)			
U.S.	3 (0.6)	178 (61.6)	<0.001*
Mexico	474 (99.4)	111 (38.4)	
Documented, n (%)			
Yes	10 (2.1)	99 (34.3)	<0.001*
No	467 (97.9)	190 (65.7)	
Married, n (%)			
Yes	245 (51.4)	196 (67.8)	<0.001*
No	232 (48.6)	93 (32.2)	
Children, n (%)			
Yes	275 (57.7)	209 (72.3)	<0.001*
No	202 (42.3)	80 (27.7)	
Education (Years), M (SD)	7.53 (5.05)	6.70 (4.13)	0.03*
English speaker, n (%)			
Yes	62 (13.0)	145 (50.2)	<0.001*
No	415 (87.0)	144 (49.8)	
Home organization participation, n (%)			
Yes	154 (32.3)	123 (42.6)	0.005*
No	323 (67.7)	166 (57.4)	
Attended fiestas			
Yes	373 (78.2)	135 (46.7)	<0.001*
No	104 (21.8)	154 (53.3)	
Religion frequency, M (SD)	2.14 (2.88)	1.60 (3.49)	<0.001*
Occupation, n (%)			
Blue collar	94 (19.7)	156 (54.0)	< 0.001*
Homemaker	180 (37.7)	37 (12.8)	
Professional	82 (17.2)	59 (20.4)	
Unemployed / Retired	22 (4.6)	17 (5.9)	
Other	99 (20.8)	20 (6.9)	
Material Resources, M (SD)	7.15 (2.26)	8.45 (2.47)	<0.001*
Migration Stress, M (SD)	0.13 (0.34)	1.83 (1.37)	<0.001*
Integration Stress, M (SD)	0.62 (0.82)	1.49 (1.46)	<0.001*

Note: M = mean and SD = standard deviation. Note *p < 0.05

Study Aims

Gender matters for health. In order to understand how and why, we must be clear in the way we operationalize gender and sex in the context of social research. Krieger (2003) argues that gender is a social construct that is distinct from, not interchangeable with, the biological construct of sex. The relevance of gender relations and sex-linked biology to health outcomes is an empirical question that requires “clarity of concepts, and attention to both gender relations and sex-linked biology” in order to have valid scientific research on population health (Krieger, 2003). The categorical thinking of gender/sex that has historically been part of scientific research fails to account for the fact that gender is a “relation involving multiple people and categories, linking bodies and institutions” (Connell 2012, 1677). However, this categorical thinking can be made more sophisticated by framing it within an intersectional lens that classifies gender categories with categories of race, ethnicity, class, and other socio-demographic and socio-economic variables (Connell, 2012).

Gender has a substantial effect on health behaviors and access to health care. Hawkes and Buse (2013) argue that "in some settings, women suffer more ill health, but globally males have a higher burden of disease and lower life expectancy than females," and global health policies and programs focused on men's needs are absent. Men face particular problems due to the social relations between masculinity and behavior, where men are socialized to engage in more risky behavior than women (Doyal, 2001). Men are more likely to be murdered or die as a result of accidents or dangerous activities (Doyal, 2001). However, there are also no societies in which women are treated as equals to men, and this inevitably affects women's health. Domestic violence and sexual violence comprise 19% of the total disease burden among women aged 15-44 (Doyal 2001).

The objective of this study is to understand the associations between gender, migration and integration stressors, and health within an indigenous Mexican migrant community. To our knowledge, this will be the first study to quantitatively measure the associations between negative migration and integration events and health among indigenous Mexican immigrants. This study will allow us to understand the gendered differences in the experience of crossing the U.S.-Mexico border and integrating into the U.S. receiving community. Furthermore, the literature on migration and gender among Mexican migrants has predominantly focused on non-indigenous migrants. We are interested in exploring if the same patterns found among non-indigenous migrants exist in our sample of indigenous Mexican migrants. Our central hypothesis is that the negative experiences of migration and integration (stressors) predict health outcomes and health behaviors. Furthermore, these associations differ for men and women.

Aims:

Aim 1: In Chapter 2 we explore the associations between gender and migration and integration stressors in a sample of indigenous Mexican immigrants. *Hypothesis 1:* Men and women have significantly different amounts of migration and integration stressors. *Hypothesis 2:* migrants and return migrants have significantly different amounts of migration and integration stressors.

Aim 2: Chapter 3 explores the associations between migration and integration stressors and depression symptoms, by gender. *Hypothesis 2a:* There is a positive association between migration and integration stressors and depressive symptomology. *Hypothesis 2b:* The association between stressors and depressive symptomology varies by gender.

Aim 3: In Chapter 4 we explore the associations between migration and integration stressors and substance use (alcohol and tobacco). *Hypothesis 3a:* There is a positive association between

migration and integration stressors and substance use. *Hypothesis 3b*: The association between stressors and substance use varies by gender.

Chapter 2: The Relationship Between Gender and Migration/Integration Stressors in an Indigenous Mixteco Migrant Community

INTRODUCTION

Evidence on the relationship between migration and health has been growing in the last two decades and provides us with a broader understanding of how the experience of migration and integration influence health behaviors and outcomes. What is less known is how these experiences differ within migrant groups. This paper adds to this void by focusing on gendered differences in migration and integration stressors within an indigenous Mixteco migrant community in California.

In the past two decades, there has been a shift in Mexican emigration patterns as southern Mexican states began overtaking central and northern Mexico in the number of immigrants to the U.S. (Terrazas, 2010). Included in this rise are the Mixtecos: indigenous peoples from the Mixteca region of Oaxaca. Mixtecos have settled in large numbers in three agricultural regions of California: North San Diego County, Ventura County, and Madera County, with an estimated population of 165,000 (Mines et al., 2010).

The Mixteca is a region with extremely high levels of emigration, with over 40% of its natives having some migration experience in their lifetime and 30% currently residing outside of the region—primarily in California (FitzGerald, Hernandez Diaz, & Keyes, 2013; Cornelius, FitzGerald, Hernandez-Diaz, & Borger, 2009). The primary reasons for emigration include ecological, political, and economic factors. For example, the topography of the region with its rugged and mountainous terrain and its over-population have led to a depletion of fertile lands (FitzGerald et al., 2013). This, combined with the economic and political marginalization of the region, makes a living in the Mixteca increasingly challenging (Nagengast et al., 1992;

FitzGerald et al., 2013).

Indigenous Mexicans face discrimination and disadvantages both in Mexico and the United States. In Mexico, they are, on average, poorer, less educated, and have poorer health than their non-indigenous (Mestizo) counterparts (Mines et al., 2010). In the U.S., indigenous immigrants have lower incomes and experience worse working conditions than non-indigenous immigrants (Mines et al., 2010). Indigenous immigrants also experience a dual burden of discrimination, as Mestizo immigrants perceive them as not Mexican while mainstream society in the U.S. considers them part of the larger Mexican immigrant population. The normative perceptions of both groups have led to racially and culturally based discrimination against indigenous Mexicans (Nagengast et al., 1992; Holmes, 2013). A growing amount of evidence has shown that the connection between discrimination and health is becoming clearer, and understanding the context in which marginalized populations experience discrimination is essential (Pascoe and Richman, 2009; Williams et al., 2003; Krieger et al., 2011).

Globally, indigenous women experience multiple forms of discrimination, higher rates of poverty, and are disproportionately subjected to violence such as domestic violence and sexual abuse (UN Briefing Notes 2009). The United Nations Permanent Forum on Indigenous Issues states that globalization presents additional challenges around the world as indigenous women's roles erode due to the compounding factors of loss of the natural environment, their transformation into cash economies, changes in social structures, and their lack of political status within States (UN Forum on Indigenous Issues, 2004). In the context of indigenous Mexican immigrants, Cohen et al., (2008) found migration outcomes differ between indigenous immigrant men and women in three key ways. Men outnumber women as migrants to the U.S.; women migrate as daughters to support their natal homes while men migrate as heads of households to

support their newly established home. Further, while men remit more money to their native homes, women remit money more consistently, with only 2% ever failing to send monthly remittance compared to 14% of men (Cohen et al., 2008). Women are also more likely to migrate only once, with no more than three sojourns in total, and have shorter stays in the U.S. with an average of two years compared to eight years for men (Cohen et al., 2008). Settlement patterns also differ as women stay mainly with family members upon arrival while men have a wider network consisting of family, friends, and co-villagers (Cohen et al., 2008). Women also took on dual roles as wage workers outside the home and domestic worker within the household, resulting in many finding this too stressful and returning to Oaxaca within a year (Cohen et al., 2008). Speed (2016) finds that indigenous women migrants experience human rights violations at every phase of the migration experience and indigenous women often flee violence in the home and community. She argues that Mexico currently suffers "violence that ranges from intra-familial to generalized insecurity, through armed youth gangs, organized crime, and warring drug cartels, to state police and military violence, permeating every part of society but particularly affecting the poor and women" (Speed 2016, 285). This socially organized violence also affects indigenous women on their trek to the U.S. due to indigenous people being distinguishable from other migrants, making them more vulnerable to racism and predatory behavior. Furthermore, language barriers can add to the vulnerability by preventing indigenous women from understanding what is happening or from communicating about it (Speed, 2016). The literature on gender and migration among indigenous Mexican immigrants is limited but points to gendered differences in the experiences of migration and integration.

Gender matters for health. In order to understand how and why, we must be clear in the way we operationalize gender and sex in the context of social research. Krieger (2003) argues that

gender is a social construct that is distinct from, not interchangeable with, the biological construct of sex. The relevance of gender relations and sex-linked biology to health outcomes is an empirical question that requires “clarity of concepts, and attention to both gender relations and sex-linked biology” in order to have valid scientific research on population health (Krieger, 2003). The categorical thinking of gender/sex that has historically been part of scientific research fails to account for the fact that gender is a “relation involving multiple people and categories, linking bodies and institutions” (Connell 2012, 1677). However, this categorical thinking can be made more sophisticated by framing it within an intersectional lens that classifies gender categories with categories of race, ethnicity, class, and other socio-demographic and socio-economic variables (Connell, 2012).

Gender has a substantial effect on health behaviors and access to health care. Hawkes and Buse (2013) argue that "in some settings, women suffer more ill health, but globally males have a higher burden of disease and lower life expectancy than females," and global health policies and programs focused on men's needs are absent. Men face particular problems due to the social relations between masculinity and behavior, where men are socialized to engage in more risky behavior than women (Doyal, 2001). Men are more likely to be murdered or die as a result of accidents or dangerous activities (Doyal, 2001). However, there are also no societies in which women are treated as equals to men, and this inevitably affects women's health—19% of the total disease burden of women aged 15-44 in developed countries is the result of domestic violence and sexual violence (Doyal, 2001).

The objective of this study is to explore the association between gender and migration/integration stressors within a binational sample of indigenous Mixteco migrants from Oaxaca, Mexico. Because of differences in gender relations and differences in the lived

migration experiences between Mixteco immigrant men and women, it is hypothesized that migration and integration stressors differ by gender.

METHODS

Data Collection

From January to March 2011, 901 indigenous Mixteco participants from the high-emigrating town of San Miguel Tlacotepec (“Tlacotepec”) in the southern Mexican state of Oaxaca completed structured questionnaires. Questionnaires were completed during a two-week period in January, during which domestic and international migrants return to partake in the holidays, local festivities, and to visit family members. From February to March, cross-sectional data was collected from Tlacotepec’s satellite communities in the cities of San Marcos, Vista, and northern San Diego County, California. This study was reviewed and approved by the University of California, San Diego Human Research Protection Program.

Eligible participants were adults aged 18-65 years, and were either born in or had at least one parent/grandparent from Tlacotepec. Potential participants were approached at their place of residence or in a public area: eligible individuals were invited to participate. U.S.-based recruitment relied on a modified "snowball" sample of migrants from Tlacotepec; a sampling approach that has been successfully used by project investigators to recruit binational migrant samples (Cornelius et al., 2009; Cornelius et al., 2007; Cornelius et al., 2009). The refusal rate for participation in the study was 12%.

Unique identifiers were assigned to each participant to protect confidentiality. Participants completed a 179-item survey administered by an interviewer from the field research team. Trained bilingual (Spanish/English) and bicultural researchers from the Universidad Autónoma Benito Juárez de Oaxaca (UABJO) and the University of California, San Diego (UCSD)

administered the survey in a private location of the participant's choosing. The survey covered socio-demographic characteristics, language, migration history, and health.

Variables (outcome)

The primary outcomes of interest consist of two indices that measure migration and integration stressors, respectively. The migration stressors index measures stressors experienced while crossing the border ranging from 0 – 8, with a higher score indicative of a greater number of negative experiences. One point was given for each of the following occurrences: witnessing violence, experiencing violence, personally knowing someone who died while crossing, being caught or detained by officials, unsuccessful border crossing attempt, crossing the border through the wilderness, never being able to cross the border, and paid a bribe to officials. The integration stressors index measures stressors experienced by individuals as they incorporate into the U.S. receiving community ranging from 0 – 10, with a higher score indicative of a greater number of negative experiences. One point was given for each of the following: someone from the participant's household was deported, the participant had been deported, the participant had been stopped by police at least once in the last 5 years, the participant reported poor treatment of migrants by the police in their current city of residence, the participant was forced to return to Mexico because they were unable to find work in the U.S., the participant reported poor treatment by U.S. people in their current city of residence, the participant was a victim of crime in the U.S., the participant witnessed a crime in the U.S., the participant knew of any raids in their current city in the U.S., and the participant had a family member or close friend arrested during a raid.

Variables (predictor)

Gender was researcher-assigned and categorized as man/woman. Age at the time of the

survey was calculated from the reported year of birth. Participants were labeled as a return migrant if they lived in Mexico when surveyed, and as a migrant if they lived in the United States. Individuals were said to be documented if they had a green card, were a U.S. citizen, or used legal papers to cross or attempt to cross the U.S./Mexico border. Participants were said to be married if they were currently married, and not married if they were never married, divorced or separated. Having children was coded as a dichotomous variable with participants either having one or more children or none. Education level was made continuous and is the reported number of years spent in school. A continuous religion frequency variable was created from the reported number of times a participant had attended religious services in the past month. A material resources score was used as a measurement of wealth and was calculated as the number of household items present in their current residence. Four indicator variables were created as a measure of resources. They indicated whether the participant had been part of a hometown organization in the last 5 years, had relatives living in the U.S., attended hometown fiestas and whether the participant could speak English.

Statistical Analysis

Statistical analyses were conducted using Stata 15 and R version 3.4.3. We generated descriptive statistics for sample characteristics, which were stratified by gender (men and women) and tested for significant differences. Because higher stressors scores were indicative of a higher number of negative experiences, ordinal logistic regression models were fit to predict the association between gender and the outcomes (migration stressors and integration stressors).

Model 1 is the age-adjusted model, with gender and age the only predictors. Model 2 adds the migration variables to Model 1, which include residency (U.S./Mexico) and legal status (documented/undocumented). Model 3 adds sociodemographic variables to Model 2, including

marital status and having children. Model 4 adds socioeconomic variables to Model 3, including years of education and material resources. Model 5 adds social resource variables to Model 4, including religious frequency and the four resources indicator variables defined above.

RESULTS

Of the 901 participants who completed the survey, 318 qualified as migrants or return migrants and are included in these analyses. Seventeen participants were removed due to missing responses needed to calculate stressor indices outcomes. An additional 12 individuals were excluded due to missing gender, documented status, material resources score, job occupation, or current country of residence. This resulted in a final sample size of 289 individuals that included 92 women and 197 men. A significantly greater percentage of women had children compared to men, with 84% and 67% respectively. Men had significantly higher education levels than women with 7.1 and 5.7 years of completed schooling, respectively. Men had higher migration and integration stressors index scores than women, with scores 2.0 and 1.6, compared to 1.5 and 1.3, respectively; a significant difference at the 0.05 alpha level (see Table 2).

With regards to the outcomes of interest, men scored higher on both migration (2.0) and integration (1.6) indices than women, who had scores of 1.5 and 1.3, respectively. This difference was significant at the 0.05 alpha level. Within the migration stressors index, we found that, when compared to women, men witnessed more violence; were more likely to be victims of violence; and were more likely to pay bribes to Mexican officials. Within the integration stressors index, we found that, when compared to women, men were deported more; were stopped by the police more frequently; and that women were more likely to report poor treatment from U.S. citizens.

Table 2: Descriptive statistics for all variables used in the analyses, by gender

Characteristics	Sample N = 289	Gender		p-value
		Women n = 92 (31.8%)	Men n = 197 (68.2%)	
Age, M (SD)	39.52 (12.67)	40.18 (12.68)	39.22 (12.69)	0.547
Return Migrant, n (%)				
Yes	178 (61.6)	53 (57.6)	125 (63.5)	0.411
No	111 (38.4)	39 (42.4)	72 (37.5)	
Documented, n (%)				
Yes	99 (34.3)	34 (37.0)	65 (33.0)	0.560
No	190 (65.7)	58 (63.0)	132 (67.0)	
Married, n (%)				
Yes	196 (67.8)	62 (67.4)	134 (68.0)	0.998
No	93 (32.2)	30 (32.6)	63 (32.0)	
Children, n (%)				
Yes	209 (72.3)	77 (83.7)	132 (67.0)	0.005*
No	80 (27.7)	15 (16.3)	65 (33.0)	
Education (Years), M (SD)	6.70 (4.13)	5.7 (4.0)	7.1 (4.1)	0.010*
Religion frequency, M (SD)	1.60 (3.49)	2.20 (5.44)	1.32 (1.97)	0.290
Occupation, n (%)				
Blue collar	156 (54.0)	25 (27.2)	131 (66.5)	< 0.001*
Homemaker	37 (12.8)	36 (39.1)	1 (0.5)	
Professional	59 (20.4)	20 (21.7)	39 (19.8)	
Unemployed / Retired	17 (5.9)	2 (2.2)	15 (7.6)	
Other	20 (6.9)	9 (9.8)	11 (5.6)	
Material Resources, M (SD)	8.45 (2.47)	8.2 (2.6)	8.6 (2.4)	0.261
Migration Stress, M (SD)	1.83 (1.37)	1.5 (1.13)	2.0 (1.44)	0.005*
Integration Stressors, M (SD)	1.49 (1.46)	1.3 (1.46)	1.6 (1.45)	0.038*

Note that N represents the total sample size, n represents sample size stratified by gender, M = mean and SD = standard deviation. P-values were calculated using t-tests, chi-squared tests, and Wilcoxon rank sum tests, and * indicates a p-value that is statistically significant at the 0.05 alpha level.

Table 3: Descriptive statistics for migration stressors index items, by gender

	Women	Men	p-value
Migration Stressors, n (%)			
Witnessed violence			
Yes	4 (4)	49 (25)	< 0.001*
No	88 (96)	148 (75)	
Victim of violence			
Yes	5 (5)	39 (20)	0.002*
No	87 (95)	158 (80)	
Knew someone who died crossing			
Yes	11 (12)	25 (13)	0.999
No	81 (88)	175 (87)	
Unsuccessful border crossing attempt			
Yes	71 (77)	161 (82)	0.366
No	21 (23)	36 (18)	
Caught trying to cross the border			
Yes	19 (21)	62 (31)	0.053
No	73 (79)	135 (69)	
Crossing the border through wilderness			
Yes	22 (24)	28 (14)	0.073
No	70 (76)	169 (86)	
Never being able to cross the border			
Yes	4 (4)	6 (3)	0.811
No	88 (96)	191 (97)	
Paying a bribe to Mexican police to cross border			
Yes	1 (1)	22 (11)	0.005*
No	91 (99)	175 (89)	

Note that N represents the total sample size, n represents sample size stratified by gender. P-values were calculated using chi-squared tests and * indicates a p-value that is statistically significant at the 0.05 alpha level.

Table 4: Descriptive statistics for integration stressors index items, by gender

Integration Stressors, n (%)	Women	Men	p-value
Someone in household deported			
Yes	9 (10)	25 (13)	0.478
No	83 (90)	172 (87)	
Participant deported			
Yes	1 (1)	21 (11)	0.005*
No	91 (99)	176 (89)	
Stopped by police			
Yes	10 (11)	65 (33)	< 0.001*
No	82 (89)	132 (67)	
Treated poorly by police			
Yes	23 (25)	45 (23)	0.755
No	69 (75)	152 (77)	
Returned to Mexico due to inability to find work			
Yes	15 (16)	40 (20)	0.552
No	77 (84)	157 (80)	
Treated poorly by U.S. citizens			
Yes	12 (13)	10 (5)	0.030*
No	80 (87)	187 (95)	
Victim of crime in U.S.			
Yes	1 (1)	12 (6)	0.113
No	91 (99)	185 (94)	
Witnessed crime in U.S.			
Yes	3 (3)	6 (3)	0.811
No	89 (97)	191 (97)	
Knew of raids nearby			
Yes	19 (20)	34 (17)	0.635
No	73 (80)	163 (83)	
Had a family member or close friend involved in a raid			
Yes	25 (27)	55 (28)	0.999
No	67 (73)	142 (72)	

Note that N represents the total sample size, n represents sample size stratified by gender. P-values were calculated using chi-squared tests and * indicates a p-value that is statistically significant at the 0.05 alpha level.

Factors Associated with Migration stressors

Table 4 shows the odds ratios for the association between gender and migration stressors. In Model 1, the age-adjusted model, men had higher odds of experiencing more migration stressors than women. When migration variables were added in the second model we see that the relationship between gender and migration stressors was reduced but retained significance. Furthermore, those living in the U.S. had lower odds of experiencing more migration stressors than return migrants. Those with legal documentation to be in the U.S. had lower odds of experiencing migration stressors than those without legal documentation.

With the addition of social demographic variables in the third model, the odds for men experiencing more migration stressors were higher compared to women. Those with children had higher odds of experiencing more migration stressors than those without children. Living in the U.S. and being documented remained significant.

Model 4 adds socioeconomic variables to Model 3. The relationship between gender and migration stressors remains significant. None of the added variables have a significant association with the outcome in Model 4. The associations between living in the U.S., being documented, having children, and the outcome remained significant as did being documented.

Model 5 adds social resources to Model 4. The relationship between gender and the outcome is reduced but remains significant. The associations between living in the U.S., being documented, having children, and the outcome remained significant.

Table 5. Unstandardized regression coefficients and standard errors for the association between gender and migration stressors.

Predictor	OR (95% CI)				
	Model 1	Model 2	Model 3	Model 4	Model 5
Men	1.86** (1.19, 2.90)	1.75* (1.11, 2.74)	2.13** (1.32, 3.42)	2.02** (1.25, 3.29)	1.92* (1.16, 3.16)
Age	0.992 (0.98, 1.01)	0.99 (0.98, 1.01)	0.98 (0.96, 1.00)	0.98 (0.96, 1.01)	0.99 (0.97, 1.01)
Migration					
Reside in U.S.		0.46** (0.27, 0.77)	0.46** (0.27, 0.77)	0.40** (0.21, 0.74)	0.35** (0.17, 0.70)
Documented		0.27*** (0.15, 0.48)	0.29*** (0.16, 0.52)	0.27*** (0.15, 0.49)	0.25*** (0.14, 0.47)
Socio-demographic					
Married			0.66 (0.36, 1.21)	0.67 (0.36, 1.23)	0.61 (0.33, 1.13)
Children			2.91** (1.43, 5.91)	3.01** (1.47, 6.14)	2.96** (1.44, 6.07)
SES					
Education				1.02 (0.95, 1.09)	1.01 (0.94, 1.08)
Material Resources				1.05 (0.93, 1.18)	1.01 (0.89, 1.14)
Resources					
Religious frequency					1.02 (0.96, 1.08)
Speaks English					1.70 (1.00, 2.89)
Belong to Hometown org.					1.50 (0.96, 2.34)
Attend Fiestas					0.89 (0.53, 1.50)
Relatives in U.S.					1.15 (0.72, 1.85)

Note: OR = odds ratio; CI = confidence interval. *p<0.05, **p<0.01, ***p<0.001.

Factors Associated with Integration stressors

Table 6 shows the odds ratios for the association between gender and integration stressors. In Model 1, the age-adjusted model, men had higher odds of experiencing more integration stressors than women. Age was significant as older individuals had lower odds of experiencing more integration stressors than younger individuals. When migration variables were added in Model 2, the relationship between gender and integration stressors remained significant. Those living in the U.S. had higher odds of experiencing more integration stressors than return migrants. The coefficient for age remained significant.

Model 3 adds socio-demographic variables to Model 2. Being a man remained significantly associated with higher odds of experiencing more integration stressors compared to women. Neither having children or marital status was significantly associated with the outcome in Model 3. The coefficients for age and living in the U.S. remained significant.

Model 4 adds social economic variables to Model 3. The coefficient for gender loses its significance. None of the added variables are significantly associated with the outcome. Age remains significantly associated with integration stressors while living in the U.S. lost its significance.

Model 5 adds social resources to Model 4. The coefficient for gender is not significant. Those who spoke some English had higher odds of experiencing integration stressors than those who spoke no English, and those who were members of a hometown organization had higher odds of experiencing more integration stressors compared to those who did not belong to one.

Table 6. Unstandardized regression coefficients and standard errors for the association between gender and integration stressors.

Predictor	OR (95% CI)				
	Model 1	Model 2	Model 3	Model 4	Model 5
Men	1.58* (1.01, 2.49)	1.65* (1.05, 2.61)	1.69* (1.06, 2.71)	1.52 (0.94, 2.45)	1.20 (0.73, 1.97)
Age	0.97*** (0.95, 0.98)	0.97*** (0.95, 0.98)	0.97** (0.95, 0.99)	0.97* (0.95, 0.99)	0.98 (0.96, 1.00)
Migration					
Reside in USA		1.72** (1.03, 2.88)	1.72* (1.03, 2.89)	1.28 (0.60, 2.36)	1.04 (0.53, 2.04)
Documented		1.28 (0.76, 2.18)	1.29 (0.76, 2.19)	1.05 (0.60, 1.84)	1.11 (0.63, 1.97)
Socio-demographic					
Married			0.85 (0.46, 1.55)	0.88 (0.48, 1.60)	0.78 (0.42, 1.45)
Children			1.10 (0.55, 2.19)	1.17 (0.58, 2.35)	1.13 (0.55, 2.32)
SES					
Education				1.04 (0.97, 1.12)	1.04 (0.96, 1.12)
Material Resources				1.12 (0.99, 1.26)	1.09 (0.96, 1.23)
Social Resources					
Religious frequency					0.93 (0.86, 1.01)
Speaks English					1.81* (1.06, 3.08)
Belong to Hometown org.					2.01** (1.28, 3.14)
Attend fiestas					0.91 (0.54, 1.53)
Relatives in U.S.					0.93 (0.58, 1.51)

Note: OR = odds ratio; CI = confidence interval. *p<0.05, **p<0.01, ***p<0.001.

DISCUSSION

This study yields new information on the experiences of migration and integration of indigenous Mexican migrants who migrate to the U.S. Our findings add to the limited evidence base regarding the gendered differences in indigenous migration experiences and their impacts on the experiences of crossing the border and integrating into U.S. society. This study suggests that within a community of Mixteco migrants, there exist significant gender differences in the stressors experienced while crossing the border and while integrating into U.S. receiving communities. This is the first study, to our knowledge, to investigate the gendered differences in migration and integration stressors within a community of indigenous Mexican migrants. This is important given that indigenous Mexican immigrants experience a disproportionate burden of discrimination and social marginalization.

Migration

Consistent with previous research, our findings suggest an association between gender and migration where men and women experience the migration process differently. However, contrary to the literature, we found that men experience a significantly higher number of stressors compared to women—even after controlling for migration, socio-demographics, socio-economics, and social ties. One possible explanation is that men and women in this community have different routes and modes of crossing the border. The literature on integration shows that indigenous immigrant men's migration networks are broader than women's and include family members, friends, and co-villagers while women's networks consist mostly of close family (Cohen et al., 2008). This same pattern could affect how men and women cross the border; men's crossing networks are likely broader and include non-family members—making their experience riskier than women's. Another possible explanation is that the index measuring

migration stressors does a better job of capturing male-specific experiences. However, if women experience different types of stressors not accounted for in the survey, there might be a bias in the theoretical construction of the indices, and this can explain the differences in migration stressors between men and women. It is possible that we are not capturing the stressors that negatively affect women. Taylor (2015) proposes the *cost-of-caring hypothesis* which posits gender roles and expectations place women at greater risk for psychological distress (Taylor, 2015). Taylor argues, "women's social roles result in their exposure to a greater number of network events compared to men [and] women and men differ in the type and amount of stress exposure that they experience" (2015:50). Furthermore, greater demand from others for nurturance underlies women's increased vulnerability to stress exposure (Taylor, 2015). Jackson and Williams (2006) find that for African American women, the benefits of receiving social support do not outweigh the costs of providing social support. African American women are twice as likely to give support and resources to friends and family than they are to receive support from them when compared to white women (Jackson and Williams, 2006). Cohen et al., (2008) found that many indigenous immigrant women returned to Mexico after finding the double burden of paid labor outside the home and unpaid labor inside the home unsustainable. In this same study, Cohen found women were more consistent in sending remittances to their families in Mexico (2008). In the context of indigenous Mixteco migrant women, stressors not captured in our study might include the double duty of paid work and domestic duties; concern and stress regarding problems with children adapting to a new society and navigating discrimination in the community and school environments; expectations of women rearing children; and pressure to care for family's emotional and material needs. Research measures that

are more nuanced and able to capture the full experience of migration stressors for both men and women are needed to better understand this relationship.

In addition to the main predictor and outcome relationship, other findings deserve attention. One unexpected factor that was significantly associated with the outcome was having children. Having children was positively associated with migration stress, compared to those without children, even after controlling for marital status. The reasons for this relationship is unclear and additional research is needed to better understand the context in which this population migrates in relation to children. Our data was limited to the total number of children individuals had— with data on the age, location, and gender of the children, or if the child migrated with the parent, not being collected. This information could have given us a better understanding of why and how having children is related to more migration stressors.

Two findings that were expected, and well documented in the literature include the association between being documented and migration stressors and the association between being a return migrant and migration stressors. We found that being documented was associated with lower migration stressors. This finding is expected, as individuals who have documents will not face the perils of crossing through the wilderness, with fake documents, or hidden in vehicles. Having the legal authorization to enter the U.S. means that individuals' risk for experiencing negative migration stressors is substantially lower than those without the legal authorization. The second finding showed a negative relationship between currently living in the U.S. and migration stressors, indicating that return migrants had significantly more migration stressors. This finding is in line with the literature that posits migrants are more likely to return home if they have more negative experiences in the migration and integration process (Palloni and Arias 2004). In the context of our findings, it is possible that the migration experience of

return migrants was so overwhelming that they preferred to return to their place of birth. Another explanation, one that merits empirical testing, is that forced deportation played a significant role and can explain this difference.

Integration

In integrating within the receiving community, we found that men experience more stressors than women. However, this relationship became non-significant after accounting for SES and social resources. This is consistent with the literature on masculinity as the role immigrant men play as primary bread winners can lead to higher likelihood of them being outside the home where they can encounter the various stressors captured in our index. Our data are in line with these findings as a significantly greater percent of men work blue-collar jobs than women while a significantly greater percent of women are homemakers compared to men. These behaviors and occupational patterns can help explain the differences in integration stressors as men are potentially at greater risk of exposure to the items included in the integration index.

As with the migration models, there were significant relationships between secondary predictors and *integration stressors* that merit attention. Two unexpected findings include the association between being a migrant and integration stressors; the association between speaking English and experiencing a greater number of integration stressors; and the positive association between belonging to a hometown organization and integration stressors. One possible explanation to the associations between language, social involvement, and integrations stressors is the role that social support, networks, and cohesion play in the wellbeing of an individual (Kawachi and Berkman, 2000; Berkman and Glass, 2000). This study documents the migration and integration experiences of an indigenous migrant community, however, it could be that we are capturing the effects of social cohesion and social networks on immigrant integration as our

sample comes from one single community. This makes sense in a broader context as indigenous Mexican immigrants experience a double burden of discrimination by non-indigenous Mexican immigrants who view them as second-class Mexicans and by the broader U.S. society that does not distinguish them from other Mexican immigrants. Therefore, individuals with stronger ties to their indigenous community may be more aware of what is going on in their community—explaining why belonging to a hometown organization is associated with more integration stressors.

Limitations

Due to the cross-sectional design of the study, causality cannot be inferred, thus limiting our interpretations. Furthermore, the generalizability of these findings is limited because they describe the migration and integration experiences of one bound community of indigenous Mixteco migrants. Lastly, sampling strategy in the U.S. might have limited the sample of U.S.-residing migrants by giving us a biased insight into those who are closer to the nodes of this migration network. Challenges to recruiting more U.S.-residing migrants include fear of detection by government officials and social isolation from the Tlacotepec community.

CONCLUSION

This analysis represents an early step toward understanding the relationship between gender and the experiences of migration and integration among indigenous Mexican migrants. Despite the fact that causality cannot be attributed, this study suggests that gender matters to understanding migration and integration. In most of our models, men are at significantly higher odds of experiencing negative migration and integration stressors than women. As such, this research contributes to the larger body of knowledge regarding gender, migration, and ethnicity in the context of Mexico-U.S. migration. Understanding who is affected, and how, during the

migration process can help policymakers and community members target resources to help those most vulnerable. In this case, the patterned differences in gender can help inform public health and clinical interventions aimed at addressing the negative health impact of migration experiences. Further research that looks at variation within gender is needed to get a more nuanced understanding of these relationships. Additionally, a longitudinal study design would allow us to better assess the directionality and temporality of migration and integration stressors.

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Chapter 3: The Relationship Between Migration/Integration Stressors and Depression in an Indigenous Mixteco Community

INTRODUCTION

Newly arrived Latino immigrants have substantially better overall health than groups with whom they share a similar socio-demographic profile, a phenomenon that has been referred to by Palloni and Arias as the ‘Hispanic health paradox’ (2004). In explaining why this paradox exists, several hypotheses have been put forward, including: the buffering effects of social support and family networks; the ‘healthy migrant’ effect that argues migrants are on average healthier than those who stay behind; and the ‘salmon bias’ effect that posits migrants who are unhealthy return to their place of origin (Palloni and Arias, 2004).

This paradox is observed in mental health, as recently arrived Mexican migrants tend to have better mental health outcomes compared to U.S. native-born. In a nationally representative sample of Latinos, U.S.-born reported higher lifetime rates for most depressive disorders compared to Latino immigrants (Alegria et al., 2008). However, this finding was only reliably observed for Mexicans and only evident for depressive and anxiety disorders (Alegria, et al. 2008). Time in the U.S. plays a fundamental role as mental health deteriorates with time spent in the United States (Grant et al., 2004; Alderete et al., 2000; Escobar 2000; Vega et al., 1998; Escobar, 1998), with acculturation stress and economic and social marginality believed to be contributing factors (Cuéllar, 2000; Cuéllar, Siles, & Bracamontes 2002; Finch et al., 2001; Vega 2009).

In a study examining the prevalence of and risk factors for 12 psychiatric disorders among Mexican migrant farmworkers in northern California, Vega et al., (1998) found that the lifetime prevalence of any psychiatric disorder was lower among migrants than among Mexican

Americans. When analyzed by gender and ethnicity, they found that men had higher lifetime rates of any psychiatric disorder (27%) compared to women (17%) and indigenous migrants had higher lifetime rates (26%) compared to non-indigenous migrants (20%) (Vega et al., 1998).

In a cross-national study analyzing the risk for depressive and anxiety disorders after arrival in the U.S. among Mexican migrants, Breslau et al., (2011) found migrants had a significantly higher risk for first onset of any depressive or anxiety disorder compared to their non-migrant family members. Within migrants, the recently arrived had elevated risks for anxiety and mood disorders compared to those who had been living in the U.S. longer (Breslau et al., 2011).

In a study examining the effect of time in the U.S. and indigenous ethnicity on prevalence of 12 psychiatric disorders among Mexican Americans in northern California, Alderete et al., (2000) found that indigenous Mexican migrants had higher lifetime prevalence of any psychiatric disorders when compared to non-indigenous Mexican immigrants. These include: major depressive episodes, manic episodes, and dysthymia, and any mood disorder (Alderete et al., 2000). The authors argued, “among indigenous peoples, a variety of factors have been associated with mental health problems [including] social stress and discrimination, and factors associated with Westernization and other modernization” (Alderete et al., 2000). Another study looking at the associations between perceived discrimination and depressive symptoms among a Yucatec immigrant community found a significant association between migration experience, current U.S. residence, and depressive symptoms (Salgado et al., 2014). Applying a path analysis, Salgado et al., (2014) found migration experience and living in the U.S. were associated with perceived discrimination, which, in turn, were associated with higher risk for depressive symptoms. Overall, women were at greater risk for depressive symptoms compared to men (Salgado et al., 2014). Additionally, for women, migration history was positively associated with

perceived discrimination, which was positively associated with depressive symptoms (Salgado et al., 2014). Compared to women, men had higher levels of perceived discrimination, which in turn was positively associated with depressive symptoms (Salgado et al., 2013). This same study also found a buffering effect in attending religious service as frequency of attending religious service was associated with lower perceived discrimination, but it was only significant among women who did not migrate (Salgado et al., 2013).

A study looking at mental health within our same Mixteco migrant community, found that about 12 percent of Tlacotepenses surveyed—both in Tlacotepec and in the United States—had received treatment for depression or anxiety in the past year (Duncan et al., 2009). Although there exist gaps between prevalence of mental disorders and treatment seeking, it can be expected that the true prevalence of depression, nerves, and anxiety are greater than 12 percent. This is higher than the prevalence of major depressive disorders in the U.S. (6.7%), but lower than the prevalence of anxiety disorders (18.1%) (Duncan et al., 2009). When analyzed by gender, women reported more depressive symptoms (13.2%) compared to men (6%) (Duncan et al., 2009). Older women reported the highest prevalence and reported that separation from family and children were primary contributing factors (Duncan et al., 2009). Duncan et al., (2009) also found that non-migrants had higher prevalence (11.8%) of depression and psychological disorders compared to migrants (7.4%) and those who entered the U.S. undocumented through the desert or mountains sought more treatment for depression, anxiety, and nerves compared to those who entered legally. This same study found that women living in Tlacotepec, with husbands living in the U.S., had higher prevalence (27%) of depression when compared to married women living with their husbands (13%) (Duncan et al., 2009).

Another study in this same Mixteco migrant community found a 25 percent prevalence of

depressive symptomology, with women having higher prevalence compared to men (Calvario et al., 2013). Migrants living in the U.S. had lower levels of depressive symptoms compared to return migrants and non-migrants (Calvario et al., 2013). However, for migrants living in the U.S., the highest prevalence of depressive symptomology was found among those in their late teens while for those living in Tlacotepec, the highest prevalence of depressive symptomology was among women in their 30s (Calvario et al., 2013).

Studies trying to understand the relationship between migration and mental health have mainly focused on life before or after migrating to the U.S. We found no studies looking at the processes of migration and integration and their associations with mental health. Furthermore, studies looking at the relationship between migration and health have focused on cross-national samples of Latino migrants or on non-indigenous Mexican migrants. Few have looked at migration and health among indigenous migrants. The objective of this study is to explore the association between migration and integration stressors and depressive symptomology within an indigenous Mixteco migrant community. We hypothesize that stressors experienced while crossing the border and while integrating into the receiving community are positively associated with higher depressive symptoms (i.e., higher CES-D score). Furthermore, we hypothesize that the association between stressors and depressive symptoms varies by gender.

METHODS

Data Collection

Between January and March 2011, 901 indigenous Mixteco participants from the high-emigrating town of San Miguel Tlacotepec (Tlacotepec) in the southern Mexican state of Oaxaca completed structured questionnaires. The research team traveled to Tlacotepec in January for a two-week period during which domestic and international migrants return to partake in the

holidays, local festivities, and to visit family members. From February to March, cross-sectional data was collected in Tlacotepec's satellite communities in the cities of San Marcos, Vista, and northern San Diego County, California. Researchers were affiliated with the Center of Comparative Immigration Studies at the University of California, San Diego and were comprised of undergraduate and graduate students, as well as faculty members. This study was reviewed and approved by the University of California, San Diego Human Research Protection Program.

Eligible participants were adults aged 18-65 years and were born in, or had at least one parent/grandparent from, Tlacotepec. Potential participants were approached at their place of residence or in a public area; eligible individuals were invited to participate. U.S.-based recruitment relied on a modified "snowball" sample of migrants from Tlacotepec, a sampling approach that has been used by project investigators to successfully recruit binational migrant samples (Cornelius et al., 2009; Cornelius et al., 2007; Cornelius et al., 2009). The refusal rate for participation in the study was 12%.

Unique identifiers were assigned to each participant to protect confidentiality. Participants completed a 179-item survey administered by an interviewer from the field research team. Surveys were administered in Spanish by trained bilingual (Spanish/English) and bicultural researchers from the Universidad Autónoma Benito Juárez de Oaxaca (UABJO) and the University of California, San Diego (UCSD). They were administered in a private location of the participant's choosing. The survey covered socio-demographic characteristics, language, migration history, and health.

Variables (outcome)

The outcome of interest was measured using the Center for Epidemiological Studies Depression Scale (CES-D), a field-tested and validated depression screening tool widely used in

community health studies (Radloff, 1977). The CES-D focuses on clinical depression, a mood disorder in which feelings of sadness, loss, anger, or frustration interfere with everyday life for a period of two weeks or longer (Fava, 2008). The CES-D has been administered in rural communities in Mexico, as well as in various community settings in the United States and has been found to have high internal consistency (Irwin et al., 1999; Maldonado and Salgado-de Snyder, 1994). This study used the shorter 10-item version, which has been shown to have acceptable reliability and validity in Mexican migrant populations (Kuptniratsaikul, 2002). A higher CES-D score reflects greater levels of depressive symptoms. Participants responded to each item with the following scale: 0 = less than 1 day, 1 = 1-2 days, 2 = 3-4 days, 3 = 5-7 days. CES-D score was computed by reverse-scoring two positively worded items and then summing the responses of all ten items. Any participant with missing values on any of the 10 questions was excluded from the analysis. The scores ranged from 1 – 28 with a median score of 4.

Variables (predictor)

The primary predictors of interest were the migration stressors index and integration stressors index, two indices that measure the number of stressors to which a person is exposed while crossing the border and while integrating into the receiving community, respectively. The migration stressors index ranges from 0 – 8, with a higher score indicative of a greater number of negative experiences. One point was given for each of the following occurrences: witnessing violence, experiencing violence, personally knowing someone who died while crossing, being caught or detained by officials, unsuccessful border crossing attempt, crossing border through the wilderness, never able to cross border, and paid a bribe to officials. The integration stressors index measures the number of stressors an individual experienced as they incorporate into the U.S. receiving community and ranges from 0 – 10 with a higher score indicative of a greater

number of negative experiences. One point was given for each of the following: someone from the participant's household was deported, the participant had been deported, the participant had been stopped by police at least once in the last 5 years, the participant reported poor treatment of migrants by the police in their current city of residence, the participant was forced to return to Mexico because they were unable to find work in the U.S., the participant reported poor treatment by Americans in their current city of residence, the participant was a victim of crime in the U.S., the participant witnessed a crime in the U.S., the participant knew of any raids in their current city in the U.S., and the participant had a family member or close friend arrested during a raid.

Several additional predictors of the CES-D score were included in the analyses. *Gender* was researcher-assigned and categorized as man/woman. *Age* at the time of the survey was calculated from reported year of birth. Participants were labeled as a return migrant if they lived in Mexico at the time of survey, and a migrant if they lived in the United States. Individuals were labeled as *documented* if they had a green card, were a U.S. citizen, or used legal papers to cross or attempt to cross the U.S./Mexico border. If none of the above were true, and they did not apply for a visa or permission to enter the U.S., they were labeled as *undocumented*. Participants were categorized as *married* if they were currently married, and *not married* if they were never married, divorced or separated. Having *children* was coded as a dichotomous variable with participants either having one or more child or none. *Education* level was made continuous and is the reported number of years spent in school. Participants were asked to report their main *occupation* from the following categories: agriculture, homemaker, construction and other related trades, unemployed, student, industry, retired, other economically inactive category, other economically active category, business or trade owner, non-professional service and professional

service. *Religious frequency* consists of the number of times someone attended religious services in the past month. A *material resources* score was used as a measurement of wealth and was calculated as the number of certain household items present in their current residence. Items counted included a television, stereo, refrigerator, computer, washer, vehicle, electricity, gas stove, bathroom, cable or satellite television, internet connection, and potable water. Four indicator variables were created as a measure of social resources. They indicated if the participant had been part of a *hometown organization* in the last 5 years, the participant had *relatives living in the U.S.*, the participant *attended hometown fiestas*, and if the participant could *speak English*.

Statistical Analysis

Statistical analyses were conducted using Stata 15 and R version 3.4.3. We generated descriptive statistics for sample characteristics, which were stratified by gender (men/women) and tested for significant differences. Ordinal logistic regression models were generated to predict the association between migration stressors and integration stressors and depression as measured by CES-D score.

Several ordinal logistic regression models were fit with the covariates of interest. Model 1 is the age adjusted model, with stressors index (migration or integration) and age the only predictors. Model 2 adds the migration variables to Model 1, which include residency (U.S./Mexico) and legal status (documented/undocumented). Model 3 adds socio-demographic variables to Model 2, including gender, marital status and having children. Model 4 adds socioeconomic variables to Model 3, including years of education, religious frequency, and material resources. Model 5 adds the four social resource indicator variables to Model 4, including the participant being able to speak English, being involved in a hometown organization

in the last 5 years, attending hometown fiestas and having relatives living in the U.S. To investigate the presence of effect modification, two additional models were fit. Model 6 looks at the interaction between gender and the primary predictor on CES-D score.

RESULTS

Of the 901 participants who completed the survey, 318 were migrants and qualified as the target population for this study. Seventeen participants were removed due to missing responses needed to calculate the migration and integration stressors index values. An additional 41 participants were excluded due to missing responses needed to calculate a depression score. Another 10 individuals were excluded due to missing sex, documented status, or current country of residence. This resulted in a final sample size of 250 individuals that included 74 females and 176 males. As shown on Table 7, a significantly greater percentage of women (84%) had children compared to men (70%). A significantly greater percentage of men (55%) spoke at least some English compared to women (38%). More women (72%) had relatives living in the U.S. when compared to men (56%). With regards to the primary predictors of interest, men scored significantly higher on the migration stressors index (1.97 vs. 1.55) and on the integration stressors index (1.58 vs. 1.27).

Table 7. Descriptive statistics for all variables used in the analyses stratified by gender.

Characteristics	Sample N = 250	Gender		p-value
		Women n = 74 (%)	Men n = 176 (%)	
Age, M (SD)	39.54 (12.76)	39.34 (12.69)	39.63 (12.82)	0.87
Depression Score, M (SD)	5.91 (5.29)	6.76 (6.33)	5.55 (4.76)	0.31
Return Migrant, n (%)				
Yes	153 (61.2)	43 (58.1)	110 (62.5)	0.61
No	97 (38.8)	31 (41.9)	66 (37.5)	
Documented, n (%)				
Yes	87 (34.8)	28 (37.8)	59 (33.5)	0.61
No	163 (65.2)	46 (62.2)	117 (66.5)	
Married, n (%)				
Yes	169 (67.6)	47 (63.5)	122 (69.3)	0.45
No	81 (32.4)	27 (36.5)	54 (30.7)	
Children, n (%)				
Yes	185 (74.0)	62 (83.8)	123 (69.9)	0.03*
No	65 (26.0)	12 (16.2)	53 (30.1)	
Education (Years), M (SD)	6.78 (4.19)	6.07 (4.07)	7.08 (4.21)	0.14
Religion Frequency, M (SD)	1.62 (3.70)	2.42 (6.00)	1.29 (2.01)	0.17
English speaker, n (%)				
Yes	125 (50.0)	28 (37.8)	97 (55.1)	0.02*
No	125 (50.0)	46 (62.2)	79 (44.9)	
Home organization participation, n (%)				
Yes	108 (43.2)	25 (33.8)	83 (47.2)	0.07
No	142 (56.8)	49 (66.2)	93 (52.8)	
Relatives living in U.S., n (%)				
Yes	152 (60.8)	53 (71.6)	99 (56.2)	0.03*
No	98 (39.2)	21 (28.4)	77 (43.8)	
Attended fiestas				
Yes	114 (45.6)	32 (43.2)	82 (46.6)	0.73
No	136 (54.4)	42 (56.8)	94 (53.4)	
Material Resources, M (SD)	8.54 (2.48)	8.31 (2.69)	8.64 (2.39)	0.39
Migration Stressors Index, M (SD)	1.84 (1.33)	1.55 (1.14)	1.97 (1.39)	0.03*
Integration Stressors Index, M (SD)	1.49 (1.48)	1.27 (1.49)	1.58 (1.46)	0.05*

Note that N represents the total sample size, n represents sample size stratified by gender, M = mean and SD = standard deviation. P-values were calculated using t-tests, chi-squared tests, and Wilcoxon rank sum tests, and * indicates a p-value that is statistically significant at the 0.05 alpha level.”

Migration Stressors and Depressive Symptoms

Table 8 presents the odds ratios for the association between migration stressors and CES-D score. Model 1, the age-adjusted model, finds a significant association between migration stressors and depression score where those who experience more migration stressors have higher odds of a higher depression score. When migration variables were added in the second model, there was a modest reduction in the relationship between migration stressors and CES-D score.

However, the relationship remains significant. Those who live in the U.S. have significantly lower odds of a higher depression score compared to those who return to Tlacotepec.

Model 3 adds socio-demographic variables to Model 2 and we find that the association between migration stressors and CES-D remains significant but is less significant ($p < 0.05$) compared to Model 2 ($p < 0.01$). The added variables - being male, being married, and having children were not significantly associated with depressive symptoms.

Model 4 adds socioeconomic variables to Model 3 and finds the coefficient for and significance of the migration stressors increases. The new variable, education level, is inversely associated with depression score. The association between residing in the U.S. and CES-D remains significant. In this model, being married becomes significantly negatively associated with depression score (those who are married have greater odds of a lower score on the CES-D than those who are not married). Age becomes inversely significant in Model 4 as older individuals are more likely to have lower scores on the CES-D.

Model 5 adds social resources to Model 4 and finds that the association between migration stressors and CES-D increases in significance. We also find that those who speak English have lower odds to have a higher CES-D score than those who do not speak English (speaking English is associated with less depression). The significance between age and CES-D increases while the coefficient for being married remains significant.

In testing if the association between migration stressors and CES-D varies by gender, Model 6 adds an interaction term for gender and migration. The coefficient for this interaction is not significant and suggests that migration stressors do not have a different effect on depression score for men compared to women.

Table 8. Odds Ratio (From Ordinal Logistic Regression) and confidence intervals for the association between migration stressors and CES-D score.

Predictor	OR (95% CI)					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Migration Stressors	1.44***	1.31**	1.31*	1.36**	1.42***	1.56*
	(1.1,1.71)	(1.09, 1.56)	(1.09, 1.57)	(1.13, 1.63)	(1.17, 1.71)	(1.05, 2.31)
Age	1.00	0.99	0.99	0.97*	0.96**	0.96**
	(0.98, 1.02)	(0.98, 1.01)	(0.97, 1.01)	(0.95, 0.99)	(0.94, 0.99)	(0.9, 0.99)
Migration						
Reside in U.S.		0.36***	0.36***	0.47*	0.55	0.54
		(0.21, 0.62)	(0.21, 0.62)	(0.24, 0.91)	(0.26, 1.14)	(0.26, 1.14)
Documented		1.11	1.14	1.66	1.52	1.54
		(0.64, 1.94)	(0.65, 1.98)	(0.92, 2.99)	(0.84, 2.76)	(0.85, 2.79)
Socio-demographic						
Men			0.72	0.82	0.94	1.14
			(0.43, 1.20)	(0.49, 1.39)	(0.54, 1.61)	(0.46, 2.81)
Married			0.55	0.52*	0.51*	0.51*
			(0.29, 1.01)	(0.28, 0.97)	(0.27, 0.98)	(0.27, 0.97)
Children			1.95	1.57	1.66	1.68
			(0.93, 4.09)	(0.74, 3.33)	(0.77, 3.60)	(0.78, 3.63)
SES						
Education				0.89**	0.91**	0.91**
				(0.83, 0.96)	(0.84, 0.97)	(0.84, 0.97)
Material Resources				0.91	0.93	0.93
				(0.80, 1.04)	(0.82, 1.07)	(0.82, 1.07)
Social Resources						
Religious Frequency					1.05	1.05
					(1.00, 1.11)	(1.00, 1.11)
Speaks English					0.54*	0.55*
					(0.31, 0.96)	(0.31, 0.98)
Belong to Hometown Org					0.86	0.87
					(0.54, 1.37)	(0.54, 1.38)
Attend Fiestas					0.87	0.89
					(0.50, 1.54)	(0.50, 1.56)
Relatives in U.S.					0.77	0.78
					(0.47, 1.27)	(0.47, 1.29)
Interactions						
Migration Stress x Men						0.89
						(0.57, 1.37)

Note: OR = odds ratio; CI = confidence interval. *p<0.05, **p<0.01, ***p<0.001.

Integration Stressors and Depressive Symptoms

Table 9 presents the odds ratios for the association between integration stressors and CES-D score. In model one, the age-adjusted model, we find no significant association between integration stressors and depressive symptoms. Model 2 adds migration variables to Model 1 and finds that the association between integration stressors and CES-D remains insignificant. We do find a significant inverse association between living in the U.S. and CES-D score, with migrants who live in the U.S. less likely to have a higher CES-D score compared to return migrants.

Model 3 adds socio-demographic variables to Model 2 and finds no change in the association between integration stressors and CES-D. Having children is significantly associated with CES-D score as those who have children have higher odds of higher CES-D scores when compared to those without children. The association between living in the U.S. and CES-D remained inversely significant.

Model 4 adds social economic variables to Model 3 and finds a significant positive association between integration stressors and CES-D, those with more integration stressors are at greater odds of a higher CES-D score compared to those with less integration stressors. Education level was inversely and significantly associated with depressive symptoms as those with more education had higher odds of lower CES-D scores. In this model, being married became inversely and significantly associated with depressive symptoms. The association between living in the U.S. and CES-D remained inversely significant.

Model 5 adds social resources to Model 4 and sees the association between integration stressors and CES-D remain significant. None of the added variables have a significant association with CES-D. The coefficients for age, living in the U.S., being married, and education retain their significant association with CES-D.

In testing if the association between integration stressors and CES-D varies by gender, Model 6 adds an interaction term for gender and migration. The coefficient is significant and suggests that integration stressors have a different effect on depression score for men compared to women. This means that when integration stressors are equally higher for men and women, men have higher odds of a higher CES-D score than women.

Table 9. Odds Ratio (From Ordinal Logistic Regression) and confidence intervals for the association between integration stressors and CES-D score.

OR (95% CI)						
Predictor	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Integration Stressors	1.04 (0.89, 1.22)	1.11 (0.95, 1.30)	1.12 (0.95, 1.31)	1.18* (1.01, 1.39)	1.24* (1.05, 1.46)	0.93 (0.68, 1.27)
Age	1.00 (0.98, 1.02)	1.00 (0.98, 1.01)	0.99 (0.97, 1.01)	0.97** (0.95, 0.99)	0.96** (0.94, 0.99)	0.96** (0.94, 0.99)
Migration						
Reside in U.S.		0.31*** (0.18, 0.54)	0.31*** (0.18, 0.54)	0.41** (0.21, 0.78)	0.47* (0.23, 0.98)	0.52 (0.25, 1.07)
Documented		0.95 (0.54, 1.65)	0.99 (0.57, 1.72)	1.39 (0.78, 2.48)	1.24 (0.69, 2.23)	1.25 (0.69, 2.25)
Socio-demographic						
Men			0.78 (0.47, 1.31)	0.90 (0.53, 1.51)	1.02 (0.59, 1.76)	0.60 (0.29, 1.25)
Married			0.55 (0.29, 1.02)	0.52* (0.28, 0.98)	0.52* (0.27, 0.99)	0.54 (0.29, 1.03)
Children			2.29* (1.09, 4.80)	1.87 (0.89, 3.97)	2.05 (0.95, 4.42)	2.14 (1.00, 4.57)
SES						
Education				0.89** (0.83, 0.96)	0.91** (0.84, 0.98)	0.92* (0.85, 0.99)
Material Resources				0.90 (0.79, 1.03)	0.92 (0.80, 1.05)	0.92 (0.80, 1.05)
Social Resources						
Religious Frequency					1.06 (1.00, 1.12)	1.05 (0.99, 1.11)
Speaks English					0.58 (0.33, 1.02)	0.56* (0.32, 0.99)
Belong to Hometown Org					0.84 (0.53, 1.34)	0.86 (0.54, 1.38)
Attend Fiestas					0.92 (0.53, 1.61)	0.92 (0.53, 1.60)
Relatives in U.S.					0.79 (0.48, 1.29)	0.74 (0.45, 1.22)
Interactions						
Integration Stressors x Men						1.47* (1.03, 2.11)

Note. OR = odds ratio; CI = confidence interval. *p<0.05, **p<0.01, ***p<0.001.

DISCUSSION

This study yields new information on the experiences of the relationship between migration, integration, and mental health among indigenous Mexicans who migrate to the U.S. Our findings add to the limited evidence base regarding the relationship between the stressors experienced in the migration and integration processes and their impact on migrant mental health. This study suggests that within a community of Mixteco migrants, the negative events experienced while crossing the border and integrating into the U.S. receiving community are significant predictors of higher levels of depressive symptoms. Furthermore, the relationship between integration experiences and depressive symptoms vary by gender, with men experiencing higher levels of depressive symptoms. This is the first study, to our knowledge, to investigate the relationships between the processes of migration and integration and mental health among indigenous Mexican migrants.

Our findings suggest an association between migration stressors and depressive symptomology where a higher number of stressors is related to greater odds of having higher depressive symptoms. This relationship remained after controlling for various social and economic factors. This may suggest that the negative events experienced while crossing the border have a lasting effect on migrants well after they settle in the U.S., but future longitudinal studies are needed to truly assess this hypothesis. The fact that the relationship between migration stressors and depression symptomology did not differ by gender suggests that these negative experiences are equally impactful on the mental health of both men and women.

With regards to integration stressors, in our final model we found that individuals who experience a greater number of stressors have higher odds of having more depressive symptoms. However, this effect is different for men and women, with men being more likely of having

higher levels of depressive symptoms than women, when integration stressors are equal— suggesting that integration stressors have a disproportionate effect on men’s mental health. One possible explanation is that the norms and expectations on emotion expression follow gendered lines (Chaplin 2015) and men are expected to show control. These expectations create a social environment in which men cannot show their frustrations and anxieties, which can result in negative mental health outcomes. A study on the relationship between machismo and mental health among Mexican American men found that machismo and gender role conflict predicted levels of stress and depression, and higher levels of machismo and restrictive emotionality predicted depression and stress (Fragoso and Kashubeck, 2000).

We found various factors that might buffer against depression within indigenous Mexican migrants. Migrants residing in the U.S. were less likely to have higher depressive symptoms than return migrants; this was significant in most of our models. This finding is consistent with the literature on the “salmon effect,” where migrants with worse health are more likely to return to their hometowns. It is possible that higher levels of depressive symptoms interfered with employment and the ability to provide thus putting pressure on individuals to recover or return home. A previous study within this same Mixteco community found that return migrants felt they were a burden on the family and community because they were not able to provide for themselves, adding to their stress and anxiety (Calvario et al., 2013). In the same previous study, Calvario et al., (2013) found that indigenous Mixteco migrants living in the U.S. were less likely to prefer formal mental health services than those living in Mexico. This suggests that migrants return to the sending communities and seek treatment when the burden of depressive symptoms interferes with their ability to live and work in the U.S.

Marital status also served as a buffer against higher CES-D. Those who were married were

less likely to experience a higher depressive symptoms score than those who were not married. This is in line with the literature on the relationship between marriage and health which has shown that married individuals experience lower morbidity and mortality, on average, compared to those who are not married (Robles et al., 2014; Kiecolt-Glaser and Newton, 2001). Kiecolt-Glaser and Newton (2001) found that marital functioning is consequential for health, with married people experiencing lower prevalence of cancer, heart attacks, and surgery. One possible pathway is that being married buffers against loneliness, which is associated with increased risk of morbidity and all-cause mortality (Hawkey and Cacioppo, 2010). It is possible that marital status itself is not what protects, but the social relations that come with being married—such as extended family or broader friend networks. However, our results did not find significant relationships between other markers of social connectedness and depressive symptoms but it can be a result of the variables used, which capture connection with official hometown organizations and not the unofficial social relations that are part of our everyday interactions.

Limitations

Due to the cross-sectional design of the study, causality cannot be inferred, thus limiting our interpretations. The generalizability of these findings is limited because it captures the migration and integration experiences of one bound community of indigenous Mixteco migrants and is not representative of all indigenous migrant populations. Lastly, sampling strategy in the U.S. might have limited the sample of U.S.-residing migrants by giving us a biased insight into those who are closer to the nodes of this migration network.

CONCLUSION

This analysis represents an early step toward understanding the relationship between the experiences of migration and integration and mental health among indigenous Mexican migrants.

Despite the fact that causality cannot be attributed, this study suggests a strong correlation between mental health and the negative experiences of migration and integration. Furthermore, this relationship varies by gender as men have higher odds of higher CES-D score than women when controlling for integration stressors. This research contributes to the larger body of knowledge regarding gender, migration, and ethnicity in the context of Mexico-U.S. migration. Understanding who is affected, and how, during the migration process can help policy makers and community members target resources to help those most vulnerable. In this case, our findings on the relationship between migration stressors and mental health can help inform public health and clinical interventions aimed at addressing the mental health of migrants. However, a longitudinal study design would allow us to better assess the directionality and temporality of migration and integration stressors vis-à-vis mental health.

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Chapter 4: The Relationship Between Migration/Integration Stressors and Tobacco and Alcohol Use in an Indigenous Mixteco Community

INTRODUCTION

Cigarette smoking is one of the leading causes of chronic disease morbidity and mortality across the world. In the U.S., Latinos have lower prevalence of smoking when compared to other ethnic/racial groups, but when disaggregated there exist significant differences within Latino subgroups (Bandeira et al., 2015). A study by Perez-Stable et al., (2001), comparing cigarette smoking among Latino men and women from various countries of origin, found differences in smoking prevalence across nationalities. Respondents from Puerto Rico and Cuban origin were more likely to smoke compared to Mexican Americans and were more likely to smoke 20 or more cigarettes per day compared to Mexican Americans (Perez-Stable et al., 2001). We found no prior research that looks at smoking prevalence among subgroups of Mexican immigrants.

Alcohol use among Latino immigrants is another serious public health concern, with binge drinking being an especially high-risk behavior (Szaflarski et al., 2011). Binge drinking is associated with many problems that affect health, including: car crashes; alcohol poisoning; violence; sexually transmitted diseases; chronic diseases such as high blood pressure, stroke, heart disease, and liver disease; cancer of the liver, colon, esophagus, throat, and mouth; memory and learning problems; and alcohol dependence (World Health Organization, 2014; Naimi et al., 2003; CDC, 2018). In a cross-sectional study among 173 male Mexican immigrants in rural North Carolina, Loury et al., (2011) found higher prevalence of binge drinking in the study sample compared to the overall U.S. Hispanic population. They also found significant relationships between pre-migration alcohol uses, lower perceived social support, socialization within one's own cultural group, and post-migration binge drinking (Loury et al., 2010). In

another study assessing the association between overall perceived ethnic discrimination and binge drinking in a sample of 5,313 Hispanic participants, Ornelas et al., (2016) found an increase in discrimination type was associated with an increase in the odds of binge drinking. However, this relationship disappeared when additional demographic covariates were introduced to the models (e.g., age, sex, heritage group, language, and duration in U.S.) (Ornelas et al., 2016).

The literature looking at smoking and alcohol use within Latino immigrant subgroups is limited and needs further attention. This is especially the case with regards to ethnic minorities within Latino migrant populations, including indigenous migrants. A Lancet report on indigenous health in Latin America and the Caribbean (Montenegro & Stephens, 2006) identified various “diseases of acculturation” that disproportionately affect indigenous peoples, which were associated with poverty and vulnerability—alcohol use was one of these diseases. The literature looking at the relationship between migration and substance use among indigenous Mexican migrants is limited because most studies focus on non-indigenous migrants.

In looking at substance use among 558 indigenous Yucateco immigrants, Haviland de Leon et al., (2015) found that alcohol and drug use, especially among adolescents, has become a significant concern in a Yucatan sending community, especially when parents migrate to the U.S. and leave their teenage children behind. In another study within the same Yucateco migrant community, using cross-sectional surveys, Pinedo et al., (2014) explored migration-related factors associated with alcohol use behaviors. They discovered that U.S. migration of shorter duration was independently associated with at-risk drinking (Pinedo et al., 2014).

In the scientific literature, little attention has been given to tobacco and alcohol use among indigenous Mexican migrants. This study aims to add to the literature by looking at the

relationships between experiences (stressors) linked to migration and tobacco and alcohol use in an indigenous Mixteco migrant community. More specifically, we look at the relationship between migration and integration stressors and substance use. Migration stressors include the negative experiences on an individual's journey to the United States while integration stressors are the negative experiences of integrating into society once arriving to the U.S. We hypothesize that there is a significant relationship both between level of migration and integration stressors and substance use. Smoking is defined as smokers and non-smokers. Drinking consists of non-drinkers and drinkers.

METHODS

Data Collection

From January to March 2011, 901 indigenous Mixteco participants from the high-emigrating town of San Miguel Tlacotepec (Tlacotepec) in the southern Mexican state of Oaxaca completed structured questionnaires focused on migration history, demographics and health outcomes. The research team traveled to Tlacotepec in January for a 2-week period during which domestic and international migrants return to partake in the holidays, local festivities, and to visit family members. From February to March, cross-sectional data were collected from Tlacotepec's satellite communities in the northern San Diego County area.

Eligible participants were adults aged 18-65 years born in, or had at least one parent/grandparent from, Tlacotepec. Potential participants were approached at their place of residence or in a public area; eligible individuals were invited to participate. U.S.-based recruitment relied on a modified "snowball" sample of migrants from Tlacotepec, a sampling approach that has been used by project investigators to successfully recruit binational migrant samples (Cornelius et al., 2009; Cornelius et al., 2007; Cornelius et al., 2009). The refusal rate

for participation in the study was 12%.

Unique identifiers were assigned to each participant to protect confidentiality. Participants completed a 179-item survey administered by an interviewer from the field research team. Trained bilingual (Spanish/English) and bicultural researchers from the Universidad Autónoma Benito Juárez de Oaxaca (UABJO) and the University of California, San Diego (UCSD) administered the survey in a private location of the participant's choosing. The survey covered socio-demographic characteristics, language, migration history, and health.

Variables (outcome)

Two outcomes of interest are used in this paper, cigarette smoking status and alcoholic beverages consumption. Participants were asked about their use of cigarettes and alcoholic beverages, separately. Participants were asked whether they smoked, average cigarettes smoked per day, whether they drink alcoholic beverages, and how many alcoholic beverages they had in the past seven days. Smoking was coded as dichotomous with a value of 1 indicating a participant who smokes. For alcohol use, the dichotomous categories include a value of 1 for drinkers.

Variables (predictor)

The primary predictors of interest were two indices that measure migration and integration stressors, respectively. The *migration stressors index* measures the number of stressors experienced while crossing the border and ranges from 0 – 8, with a higher score indicative of a greater number of negative experiences. One point was given for each of the following occurrences: witnessing violence, experiencing violence, personally knowing someone who died while crossing, being caught or detained by officials, unsuccessful border crossing attempt, crossing border through the wilderness, never able to cross border, and paid a bribe to officials.

The *integration stressors index* measures the number of stressors an individual experienced as they incorporate into the U.S. receiving community and ranges from 0 – 10 with a higher score indicative of a greater number of negative experiences. One point was given for each of the following: someone from the participant’s household was deported, the participant had been deported, the participant had been stopped by police at least once in the last 5 years, the participant reported poor treatment of migrants by the police in their current city of residence, the participant was forced to return to Mexico because they were unable to find work in the US, the participant reported poor treatment by Americans in their current city of residence, the participant was a victim of crime in the US, the participant witnessed a crime in the U.S., the participant knew of any raids in their current city in the U.S., and the participant had a family member or close friend arrested during a raid.

Several additional predictors were included in the analyses. *Gender* was researcher-assigned and categorized as man/woman. *Age* at the time of the survey was calculated from reported year of birth. Participants were labeled as a *return migrant* if they currently live in Mexico, and a *migrant* if they currently live in the United States. Individuals were said to be *documented* if they had a green card, were a U.S. citizen, or used legal papers to cross or attempt to cross the U.S./Mexico border. If none of the above were true, and they did not apply for a visa or permission to enter the U.S., they were labeled as *undocumented*. Participants were categorized as *married* if they were currently married, and not married if they were never married, divorced or separated. Having *children* was coded as a dichotomous variable with participants either having one or more child or none. *Education* level was made continuous and is the reported number of years spent in school. Participants were asked to report their main occupation from the following categories: agriculture, homemaker, construction and other related trades,

unemployed, student, industry, retired, other economically inactive category, other economically active category, business or trade owner, non-professional service and professional service.

Religious frequency consists of the number of times someone attended religious services in the past month. A *material resources* score was used as a measurement of wealth and was calculated as the number of household items present in their current residence. The items included a television, stereo, refrigerator, computer, washer, vehicle, electricity, gas stove, bathroom, cable or satellite television, internet connection, and drinking water. Four indicator variables were created as a measure of social resources. They indicated if the participant had been part of a *hometown organization* in the last 5 years, the participant had *relatives living in the U.S.*, the participant attended *hometown fiestas*, and if the participant could speak *English*.

Statistical Analysis

Statistical analyses were conducted using Stata 15 and R version 3.4.3. We generated descriptive statistics for sample characteristics, which are stratified by gender (men/women) and tested for association. A series of logistic regression models were used to predict the association between migration stressors and integration stressors and cigarette smoking and alcoholic beverage consumption. Model 1 is the age-adjusted model, with stressors index (migration or integration) and age as the only predictors. Model 2 adds the migration variables to Model 1, which include residency (U.S./Mexico) and legal status (documented/undocumented). Model 3 adds socio-demographic variables to Model 2, including gender, marital status and having children. Model 4 adds socioeconomic variables to Model 3, including years of education and material resources. Model 5 adds frequency of religious attendance and the four resource indicator variables to Model 4, including the participant being able to speak English, being involved in a hometown organization in the last 5 years, attending hometown fiestas and having

relatives living in the U.S. This study was reviewed and approved by the University of California, San Diego Human Research Protection Program.

RESULTS

Of the 901 participants who completed the survey, 318 were identified as migrants and thus qualified as the target population for this study. Seventeen participants were removed due to missing responses needed to calculate the migration and integration stressors index values. An additional 41 participants were excluded due to missing responses needed to calculate a depression score. Another 13 individuals were excluded due to missing smoking status, alcohol consumption status, sex, documented status, or current country of residence. This resulted in a final sample size of 247 individuals that included 73 women and 174 men. Men smoked significantly more than women, with 38 percent of men saying they smoked compared to only 9.6 percent of women. More men also reported drinking alcoholic beverages (58.1%) than women (21.9%). A significantly greater percentage of women (83.5%) had children compared to men (69.5%). A significantly greater percentage of men (55.2%) spoke at least some English compared to women (38.4%). More women (71.2%) had relatives living in the U.S. when compared to men (56.9%). With regards to the primary predictors of interest, men scored significantly higher on the migration stressors index (1.97 vs. 1.56).

Table 10. Descriptive statistics for all variables used in the analyses stratified by gender.

Characteristics	Sample N = 247	Gender		p-value
		Women n = 73 (29.6%)	Men n = 174 (70.4%)	
Smoking Status, n (%)				
Yes	45 (18)	7 (9.6)	38 (21.8)	0.02*
No	202 (82)	66 (90.4)	136 (78.2)	
Alcohol Use, n (%)				
Yes	117 (47)	16 (21.9)	101 (58.1)	<0.001*
No	130 (53)	57 (78.1)	73 (41.9)	
Age, M (SD)	39.48 (12.78)	39.25 (12.75)	39.57 (12.83)	0.85
Depression Score, M (SD)	5.90 (5.31)	6.77 (6.37)	5.54 (4.76)	
Return Migrant, n (%)				
Yes	150 (61)	42 (57.5)	118 (67.8)	0.60
No	97 (39)	31 (42.5)	66 (32.2)	
Documented, n (%)				
Yes	87 (35)	28 (38.3)	59 (33.9)	0.60
No	160 (65)	45 (61.7)	115 (66.1)	
Married, n (%)				
Yes	166 (67)	46 (63.1)	120 (69.0)	0.45
No	81 (33)	27 (36.9)	54 (31.0)	
Children, n (%)				
Yes	182 (74)	61 (83.5)	121 (69.5)	0.03*
No	65 (26)	12 (16.5)	53 (30.5)	
Education (Years), M (SD)	6.83 (4.17)	6.15 (4.03)	7.11 (4.20)	0.16
Religion Frequency, M (SD)	1.62 (3.72)	2.45 (6.03)	1.27 (2.01)	0.12
English speaker, n (%)				
Yes	124 (50)	28 (38.4)	96 (55.2)	0.02*
No	123 (50)	45 (61.6)	78 (44.8)	
Home organization participation, n (%)				
Yes	106 (43)	25 (34.2)	81 (46.6)	0.07
No	141 (57)	48 (65.8)	93 (53.4)	
Relatives living in U.S., n (%)				
Yes	151 (61)	52 (71.2)	99 (56.9)	0.03*
No	96 (39)	21 (28.8)	75 (43.1)	
Attended fiestas				
Yes	111 (45)	31 (42.5)	80 (46.0)	0.73
No	136 (55)	42 (57.5)	94 (54.0)	
Material Resources, M (SD)	8.57 (2.48)	8.34 (2.70)	8.67 (2.38)	0.41
Migration Stressors Index, M (SD)	1.84 (1.32)	1.56 (1.14)	1.96 (1.37)	0.03*
Integration Stressors Index, M (SD)	1.50 (1.48)	1.29 (1.50)	1.59 (1.47)	0.06

Note: M = mean and SD = standard deviation. Note * p < 0.05.

Association Between Cigarette Smoking and Migration/Integration Stressors

Table 11 presents the odds ratios for cigarette smoking and the primary predictor Migration Stressors. Model 1, the age-adjusted model, finds no significant association between migration stressors and cigarette smoking. Model 2 adds migration variables and sees no change in the significance in the association between migration stressors and cigarette smoking. We see that

return migrants have 4.53 times the odds of smoking compared to those who remained in the U.S. With the addition of socio-demographic variables in the third model, we find that men have 2.89 times the odds of cigarette smoking compared to women, and return migrants continue to have higher odds (4.76) of cigarette smoking compared those who stayed in the U.S. Model 4 adds socioeconomic variables. In this model, men have 3.06 times the odds of cigarette smoking compared to women and return migrants have 4.28 times the odds of cigarette smoking compared to migrants. Model 5 adds social resources to Model 4 and finds that those who speak some English have 3.13 times the odds of cigarette smoking compared to those who speak no English. Men have 2.80 times the odds of cigarette smoking compared to women and return migrants have 6.38 times the odds of cigarette smoking compared to migrants.

Table 11. Odds Ratios and confidence intervals for the association between migration stressors and smoking status.

Predictor	OR (95% CI)				
	Model 1	Model 2	Model 3	Model 4	Model 5
Migration Stressors	1.10 (.864, 1.40)	0.95 (.73, 1.25)	0.91 (0.69, 1.21)	0.92 (0.70, 1.21)	0.89 (0.67, 1.19)
Age	0.98 (0.96, 1.01)	.97 (.95, 1.00)	0.98 (0.94, 1.01)	0.97 (0.94, 1.01)	0.98 (0.94, 1.02)
Migration					
Return Migrant		4.53** (1.73, 11.87)	4.76** (1.76, 12.84)	4.28** (1.42, 12.89)	6.38** (1.91, 21.35)
Documented		1.15 (0.47, 2.79)	1.17 (0.47, 2.91)	1.30 (0.50, 3.42)	1.58 (0.57, 4.34)
Socio-demographic					
Men			2.89* (1.14, 7.30)	3.06* (1.19, 7.84)	2.80* (1.05, 7.49)
Married			0.70 (0.38, 3.63)	0.68 (0.26, 1.80)	0.72 (0.26, 1.99)
Children			1.17 (0.38, 3.63)	1.13 (0.36, 3.55)	1.01 (0.32, 3.22)
SES					
Education				0.98 (0.87, 1.09)	0.91 (0.80, 1.03)
Material Resources				0.96 (0.79, 1.17)	0.92 (0.75, 1.13)
Social Resources					
Religious Frequency					0.78 (0.61, 1.01)
Speaks English					3.13* (1.28, 7.65)
Belong to Hometown Org					0.66 (0.31, 1.40)
Attend Fiestas					1.09 (0.48, 2.46)
Relatives in U.S.					1.81 (0.01, 2.89)

Note. OR = odds ratio; CI = confidence interval. *p<0.05, **p<0.01, ***p<0.001.

Table 12 presents the odds ratios for cigarette smoking and the primary predictor Integration Stressors. Model 1, the age-adjusted model, finds no significant association between migration stressors and smoking. Model 2 adds migration variables and finds that return migrants have 4.30 times the odds of cigarette smoking compared to those who remained in the U.S. Age becomes significant as being older is associated with having lower odds (0.97) of cigarette smoking. With the addition of socio-demographic variables in Model 3 we find that men have 3.19 times the odds of cigarette smoking compared to women. The odds for cigarette smoking remain significant for return migrants but become non-significant for age. Model 4 adds socioeconomic variables but finds no significant relationship between the added variables and outcome. In this model, men have 3.34 times the odds of cigarette smoking compared to women and return migrants have 4.23 times the odds of cigarette smoking compared to migrants. Model 5 adds social resources to Model 4 and finds that the primary predictor becomes significantly associated with cigarette smoking. Those who experience more integration stressors have lower odds (0.75) of cigarette smoking compared to those who experience less integration stressors. Speaking English is significantly associated with the outcome as those who speak some English have 3.83 times the odds of cigarette smoking compared to those who speak no English. Being a man and being a return migrant remained significantly associated with cigarette smoking in Model 5.

Table 12. Odds Ratios and confidence intervals for the association between integration stressors and smoking status.

Predictor	OR (95% CI)				
	Model 1	Model 2	Model 3	Model 4	Model 5
Integration Stressors	0.84 (0.66, 1.08)	0.88 (0.67, 1.12)	0.81 (0.63, 1.05)	0.82 (0.63, 1.06)	0.75* (0.57, 0.99)
Age	0.98 (0.95, 1.00)	0.97* (0.94, 0.99)	0.97 (0.94, 1.01)	0.97 (0.93, 1.00)	0.98 (0.94, 1.02)
Migration					
Return Migrant		4.30** (1.66, 11.15)	4.54** (1.69, 12.19)	4.23* (1.41, 12.67)	7.15** (2.07, 24.74)
Documented		1.20 (0.40, 2.89)	1.27 (0.51, 3.14)	1.38 (0.53, 3.57)	1.75 (0.64, 4.78)
Socio-demographic					
Men			3.19* (1.24, 8.20)	3.34* (1.28, 8.68)	3.15* (1.15, 8.63)
Married			0.67 (0.25, 1.79)	0.65 (0.25, 1.75)	0.67 (0.24, 1.86)
Children			1.10 (0.26, 2.27)	1.08 (0.35, 3.32)	0.95 (0.31, 2.98)
SES					
Education				0.98 (0.87, 1.09)	0.90 (0.80, 1.02)
Material Resources				0.97 (0.80, 1.19)	0.93 (0.75, 1.15)
Social Resources					
Religious Frequency					0.77 (0.59, 1.01)
Speaks English					3.83** (1.50, 9.77)
Belong to Hometown Org					0.68 (0.31, 1.49)
Attend Fiestas					1.04 (0.45, 2.40)
Relatives in U.S.					1.86 (0.81, 4.24)

Note. OR = odds ratio; CI = confidence interval. *p<0.05, **p<0.01, ***p<0.001.

Association Between Alcohol Use and Migration/Integration Stressors

Table 13 presents the odds ratios for alcoholic beverage consumption and the primary predictor Migration Stressors. Model 1 is an age-adjusted model and we find no significant associations between predictor and outcome. Model 2 introduces migration variables to Model 1 and finds no significant associations. Model 3 introduces socio-demographic variables to Model 2 and finds that men have 4.51 times the odds of alcohol consumption compared to women. In this model, being documented became significantly inversely associated with alcohol consumption compared to being undocumented. Those who are documented have 0.47 times the odds of alcohol consumption compared to undocumented. Model 4 adds SES variables and sees no change in significance for the odds of alcohol consumption among men (4.24) or those who are documented (0.38). Model 5 introduces social resources to Model 4 and none of the new variables are significantly associated with alcohol consumption. In this model men continue to have greater odds (4.04) of alcohol consumption compared to women, and those who are documented have lower odds (0.43) of alcohol consumption compared to those who are undocumented.

Table 13. Odds Ratios and confidence intervals for the association between migration stressors and alcohol use.

OR (95% CI)					
Predictor	Model 1	Model 2	Model 3	Model 4	Model 5
Migration Stressors	1.06 (0.88, 1.29)	1.00 (0.81, 1.22)	0.95 (0.77, 1.19)	0.94 (0.75, 1.18)	0.92 (0.74, 1.16)
Age	1.00 (0.98, 1.02)	1.00 (0.98, 1.02)	1.01 (-.99, 1.04)	1.02 (0.99, 1.05)	1.02 (0.99, 1.06)
Migration					
Return Migrant		0.95 (0.50, 1.78)	0.93 (0.47, 1.83)	1.08 (0.49, 2.40)	1.08 (0.44, 2.69)
Documented		0.53 (0.28, 1.01)	0.47* (0.23, 0.94)	0.38* (0.18, 0.80)	0.43* (0.20, 0.91)
Socio-demographic					
Men			4.51*** (2.33, 8.71)	4.24*** (2.19, 8.23)	4.04*** (2.02, 8.04)
Married			1.31 (0.18, 1.17)	1.35 (0.61, 2.99)	1.40 (0.61, 3.18)
Children			0.47 (0.18, 1.17)	0.52 (0.20, 1.32)	0.57 (0.22, 1.48)
SES					
Education				1.07 (0.98, 1.17)	1.04 (0.94, 1.14)
Material Resources				1.05 (0.89, 1.23)	1.04 (0.88, 1.23)
Social Resources					
Religious Frequency					0.89 (0.77, 1.03)
Speaks English					1.86 (0.92, 3.75)
Belong to Hometown Org					0.64 (0.36, 1.17)
Attend Fiestas					1.50 (0.75, 3.00)
Relatives in U.S.					0.93 (0.50, 1.74)

Note. OR = odds ratio; CI = confidence interval. *p<0.05, **p<0.01, ***p<0.001.

Table 14 presents the odds ratios for alcoholic beverage consumption and the primary predictor Integration Stressors. Model 1, the age-adjusted model, finds no significant association between migration stressors and alcohol consumption. Model 2 adds migration variables and finds no significant association between the new variables and the outcome. With the addition of socio-demographic variables in Model 3 we find that men have 4.44 times the odds of alcohol consumption compared to women. In this model, we find a significant association between documented status and alcohol use as documented migrants are at lower odds of drinking than undocumented migrants. Model 4 adds socioeconomic variables but finds no significant relationship between the new variables and outcome. In this model, men have 4.19 times the odds of alcohol consumption compared to women. The association between documented status and alcohol use remains significant. Model 5 adds social resources to Model 4 and reveals no significant associations between the new variables and the outcome. The association between documentation status and alcohol use remains significant. Gender is a significant predictor of alcohol consumption with men having 3.96 times the odds of alcohol consumption compared to women.

Table 14. Odds Ratios and confidence intervals for the association between integration stressors and alcohol use.

OR (95% CI)					
Predictor	Model 1	Model 2	Model 3	Model 4	Model 5
Integration Stressors	1.01 (0.85, 1.21)	1.03 (0.86, 1.23)	0.98 (0.81, 1.19)	0.96 (0.79, 1.17)	0.96 (0.79, 1.18)
Age	1.00 (0.98, 1.02)	1.00 (0.98, 1.02)	1.01 (0.99, 1.04)	1.02 (0.99, 1.05)	1.02 (0.99, 1.06)
Migration					
Return Migrant		0.95 (0.51, 1.77)	0.90 (0.46, 1.76)	1.04 (0.47, 2.28)	1.04 (0.42, 2.54)
Documented		0.53 (0.28, 1.00)	0.48* (0.24, 0.96)	0.39* (0.19, 0.82)	0.45* (0.21, 0.94)
Socio-demographic					
Men			4.44*** (2.31, 8.56)	4.19*** (2.16, 8.11)	3.96*** (1.99, 7.87)
Married			1.31 (0.59, 2.88)	1.34 (0.61, 2.97)	1.39 (0.61, 3.18)
Children			0.45 (0.18, 1.13)	0.50 (0.20, 1.26)	0.55 (0.21, 1.40)
SES					
Education				1.07 (0.98, 1.17)	1.04 (0.94, 1.14)
Material Resources				1.05 (0.89, 1.24)	1.04 (0.88, 1.23)
Social Resources					
Religious Frequency					0.89 (0.91, 3.70)
Speaks English					1.84 (0.91, 3.70)
Belong to Hometown Org					0.64 (0.35, 1.17)
Attend Fiestas					1.46 (0.73, 2.92)
Relatives in U.S.					0.93 (0.50, 1.73)

Note. OR = odds ratio; CI = confidence interval. *p<0.05, **p<0.01, ***p<0.001

DISCUSSION

We found no significant association between our primary predictors (migration and integration stressors) and substance use, except in one model. The only significant finding shows an association between integration stressors and odds of smoking as individuals who experience more integration stressors were less likely to smoke compared to those who experienced less integration stressors. However, this is a weak association and there is not a large change in the coefficient for smoking from the previous model. This significance emerges in the final model, when English proficiency is added and it is likely that we are capturing a suppression effect. This effect shows that once English proficiency is taken into account, there is a slight protective effect for the stressors; this relationship needs to be explored in future research. One possible explanation for the generally null findings might be error in measurement of the stressor indices. Our indices primarily measured acute stressors or events that were rare, rather than chronic stressors or ongoing difficulties. A review article by Peggy Thoits (2010) found that early stress research in psychology and sociology focused primarily on acute stressors and their association with health. Such stressors included events such as divorce, job loss, bereavement, and motor vehicle collisions (Thoits, 2010). However, researchers ignored stressors that were ongoing and recurrent such as insufficient income, work-family conflict, or living in dangerous neighborhoods (Thoits, 2010). Thoits argues that “when assessed more comprehensively, stress exposure has a much more substantial impact on the risks of psychological distress, depression, and other psychiatric disorders than research originally believed” (2010). It is possible that the reason for our null findings is that our indices of migration and integration stress do not capture the cumulative effects of stress burden. Thus, it is possible that a more comprehensive index could produce somewhat different findings.

This study yields new information on the relationship between migration, integration, and substance use among indigenous Mexican migrants. Although the primary predictor of interest showed no significant association with our outcomes, certain findings add to the existing literature on migration and health. These findings include: gendered differences in smoking and drinking; undocumented migrants with higher odds of drinking; higher odds of smoking among return migrants, and English language speakers with higher odds of smoking. Each finding will be addressed in turn.

Men had higher odds of smoking and drinking compared to women. This finding is in line with the literature on gender and migration, as migrant men have higher rates of high-risk behavior and substance use globally. Two possible explanations to why men are at higher odds for substance use in this population include: (a) cultural differences in gender expectations and roles, and (b) gendered differences in the experiences of migration and integration. It is possible that the cultural norms and expectations about gender, and its performance, differ for men and women where men are allowed to engage in unhealthy behaviors more than women. Additionally, global cultural norms and expectations about child rearing make it the women's responsibility to look after children, which, in combination with public health campaigns in Mexico and the United States make smoking and drinking taboo for those looking after children. A second possible explanation to why men have higher odds of smoking and drinking is that the effects of the stressors experienced in migration and integration are different for men and women. Studies have shown that although men and women have equivalent rates of mental health problems, these differ in kind as women report higher levels of psychological distress, mood, and anxiety disorders while men have higher prevalence of alcohol and drug use (Thoits 2010). It is possible that the combination of gender expectations and the stress experienced with

being an indigenous migrant make alcohol and tobacco an appropriate escape for men but not women.

Undocumented migrants have higher odds of drinking compared to their documented counterparts. This may suggest that the social conditions in which undocumented migrants live and work are more stressful than they are for those with documentation—alcohol serves as an escape from these stressors. Being undocumented limits opportunities in the receiving country and restricts the amount of social and civic engagement an individual can engage in—pushing them into social isolation. This isolation can be the driving factor leading to differential alcohol consumption among undocumented migrants. In a study focused on loneliness by Hawkley and Cacioppo (2010), the authors review physical and mental health consequences of loneliness. They argue that loneliness is not simply being alone, “perceived social isolation is tantamount to feeling unsafe, and this sets off implicit hyper vigilance for (additional) social threats in the environment” (Hawkley and Cacioppo, 2010). A consequence of loneliness is a diminished capacity for self-regulation of thoughts, feelings, or behaviors (Hawkley and Cacioppo, 2010) and thus places individuals at greater risk of substance abuse. This mechanism might be operating among our sample of undocumented migrants because their legal status puts them in a position of perceived social isolation. Future research on stress among immigrant populations needs to capture the potential burden of daily social and psychological stress. It is possible that the significant covariates are crude markers for aspects of the living and working conditions (stressors) that affect substance use. The challenge of future research will be to further understand these crude markers and assess their role in shaping the health profiles of this population.

Return migrants have higher odds of smoking compared to those who stayed in the U.S. We propose two explanations to this finding. First, it is possible that smoking laws and culture in the U.S., compared to Mexico, restrict where and when individuals can smoke. According to the American Lung Association's State of Tobacco Control 2018 state rankings, California received the highest grade possible in (a) tobacco prevention and cessation funding and (b) smoke free air laws (American Lung Association, 2018). The State of Tobacco Control is a report card that evaluates state and federal tobacco control policies by comparing them against targets based on the most current, recognized criteria for effective tobacco control measures (American Lung Association, 2018). It is possible that these policies have the intended effect of preventing smoking, whereas more lax policies, including lower prices in Mexico make smoking among return migrants more accessible. Another possible explanation draws upon the healthy migrant effect and the "salmon effect" in migration. These theories posit that (a) migration selects for healthier individuals and (b) among those who migrate, those who are less healthy are more likely to return to their place of origin (Palloni and Arias, 2004). It is possible that smoking is one of various behaviors and comorbidities that are prevalent among return migrants. In the preceding chapter, we found that in some models return migrants had higher odds of depression symptoms compared to those who stayed. However, future research should incorporate a longitudinal study design to develop more rigorous evidence on drivers of smoking behavior in different contexts, and what those drivers might be.

Migrants who speak some English have higher odds of smoking compared to those who speak no English. A possible explanation comes from the literature on acculturation, which suggests that Latino smoking rates will increase to eventually become equal to rates of non-Latino whites as levels of acculturation increase (Thomson and Hofmann-Goetz, 2009; Bethel

and Schenker, 2005). Latinos in the U.S. have lower smoking rates than non-Hispanic whites (Bethel and Schenker, 2005). The acculturation literature hypothesizes that as newcomers integrate into U.S. society, they adopt the behaviors and practices of the receiving society. It is possible that our variable for speaking English serves as a proxy for acculturation and thus those who speak English are more likely to have rates of smoking that are higher (and closer to the average U.S. society).

Limitations

Due to the cross-sectional design of the study, causality cannot be inferred, thus limiting our interpretations. Furthermore, the generalizability of these findings is limited because they describe the migration and integration experiences of one bound community of indigenous Mixteco migrants. Sampling strategy in the U.S. might have limited the sample of U.S.-residing migrants by giving us a biased insight into those who are closer to the nodes of this migration network. Challenges to recruiting more U.S.-residing migrants include fear of detection by government officials and social isolation from the Tlacotepec community. Lastly, our outcome variable for drinking was dichotomized as drinkers/non-drinkers due to the limited power needed to capture problem drinkers, as defined by the National Institute on Alcohol Abuse and Alcoholism (NIAAA, 2018). Additionally, a continuous outcome that captures number of drinks in the past seven days due to the disproportionate drinking between men and women, which made a gender analysis not possible.

CONCLUSION

This analysis represents an early step toward understanding the relationship between migration and integration stressors and substance use among indigenous Mexican migrants. Despite the fact that causality cannot be attributed, this study suggests that smoking and drinking

are strongly associated with gender. As such, this research contributes to the larger body of knowledge regarding gender, migration, and ethnicity in the context of Mexico-U.S. migration. Understanding substance use patterns during the migration process can help policymakers and community members target resources to help those most vulnerable. In this case, the gender differences in substance use can help inform public health, and clinical interventions aimed at reducing consumption within migrant populations. Further research that looks at variation within gender is needed to get a more nuanced understanding of the factors associated with substance use, within each gender. Additionally, a longitudinal study design will allow us to better assess the directionality and temporality of substance use vis-à-vis the migration and integration process.

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Conclusion

This collection of papers is an initial effort to understanding how the experience of migration to, and integration into, the U.S. affect populations differently. This dissertation explored the relationships between gender, migration and integration stressors, depressive symptomology, and alcohol and tobacco within a binational indigenous Mixteco migrant community. Within these analyses, three main findings stick out. When compared to indigenous migrant women, men were at higher odds of: (a) experiencing negative events while crossing the border and integrating into the U.S.; (b) having higher depressive symptoms, when integration stressors were equal; and (c) smoking and problem drinking.

Following this, two potential pathways for future work emerge. The first is to find new approaches to conducting research among migrant communities. The cross-sectional design of this dissertation provided an important first step in understanding patterns of migration and health. However, a longitudinal design will strengthen our ability to understand the causal mechanisms that drive patterns of health and illness. This is a challenge given that the populations that are most vulnerable are the same ones who are actively trying to stay out of sight as distrust, fear of deportation, and family separation become barriers for researchers to overcome. Our challenge is to find ways of conducting rigorous research while at the same time respecting and empathizing with the experiences of migrants.

A second pathway for future work is to be more nuanced, and purposeful, in incorporating gender analyses in research. Gender is the social construction of differences between women and men, which vary from one cultural context to another and across time and space (Brettell, 2016). As anthropologist Caroline Brettell writes, “to view migration through a gendered lens means to focus on how men and women relate to one another in theory and in practice, how their

experiences differ, and how gender roles, which vary from one culture to another, might both affect and be affected by geographic mobility” (2016). This understanding of gender relations can provide a more holistic understanding of the causes and consequences of migration, therefore, “gender must be considered in both sending and receiving contexts, not only in relation to families but also in relation to global labor markets and the wide range of institutions with which migrants interact in place of origin and places of destination” (Brettell, 2016).

A gendered understanding of migration will also enable a more thorough understanding of health. As social epidemiologist Nancy Krieger states, “the relevance of gender relations and sex-linked biology to a given health outcome is an empirical question, not a philosophical principle; depending on the health outcome under study, both, neither, one, or the other may be relevant—as sole, independent, or synergistic determinants” (2003). Therefore, a more nuanced and inclusive way of thinking about gender in research is needed as “clarity of concepts, and attention to both gender relations and sex-linked biology, is critical for valid scientific research on population health” (Krieger, 2003).

These findings help tell the story of how, and why, gender and ethnicity matter for understanding migration and health. Mexican migrants bring with them the same social hierarchies and structures that exist in their home country and researchers must be aware of this. Understanding the context in which indigenous migrants migrate to, and integrate into, the U.S. is of utmost importance in an era of heightened xenophobia. In paraphrasing Krieger, the purpose of studying the effects of discrimination is not to show that oppression is bad; depriving people of human rights, dignity, and love is, by definition, wrong. The purpose is to enable full accountability and to produce knowledge that will be used to guide policies and actions to reduce injustices (Krieger, 2000).

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