

2018

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García, Catherine; Garcia, Marc A.; Chiu, Chi-Tsun; Rivera, Fernando I.; and Raji, Mukaila, "Life Expectancies With Depression by Age of Migration and Gender Among Older Mexican Americans" (2018). *Sociology Department, Faculty Publications*. 627.
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Published in *The Gerontologist* (2018), 9 pp.

doi 10.1093/geront/gny107

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Submitted 17 April 2018; accepted 6 August 2018; published 8 September 2018.

Life Expectancies With Depression by Age of Migration and Gender Among Older Mexican Americans

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Abstract

Background and Objectives: Prior studies examining depression among older Mexican Americans suggest both women and immigrants are at higher risk of depressive symptomatology than males and U.S.-born Mexican Americans. We use data from the Hispanic Established Populations for the Epidemiologic Study of the Elderly to examine whether life expectancy with depression and without depression varies by nativity, age of migration, and gender.

Research Design and Methods: Sullivan-based life tables were used to estimate depression life expectancies among Mexican Americans aged 65 years and older residing in the Southwestern United States. Depression is based on the 20-item Center for Epidemiological Studies Depression scale (CES-D). The CES-D is a continuous scale (0–60) with higher values indicating worse mental health. We dichotomize depression as a score of 16 or greater.

Results: Immigrant women, particularly those who migrated in late-life (after age 50) are at a significant disadvantage in the number of years after age 65 lived with depression and the ratio of years spent without depression relative to U.S.-born women. Among men, only late-life immigrants were disadvantaged in the number of years spent with depression. Early- and mid-life immigrant males did not differ from U.S.-born males.

Discussion and Implications: Our results highlight the heterogeneity among older Mexican Americans in life expectancies with depression. These findings illustrate the importance of considering age of migration as a high-risk factor for depression among Mexican-origin immigrants. Including this risk factor as a part of depression screening is a key step for timely interventions in preventing disability and comorbidities associated with untreated depression.

Keywords: Mexican-origin population, Age of migration, Depression, Life expectancy

Research shows depression is associated with morbidity, disability, and premature death among older adults in the United States (Blazer, 2009). Older Mexican Americans (25%) residing in the Southwestern United States are more likely to report depressive symptoms than other Hispanics (10.8%), non-Hispanic Blacks (8.9%), and non-Hispanic Whites (7.8%) at the national level (Black, Goodwin, & Markides, 1998; Dunlop, Song, Lyons, Manheim, & Chang, 2003). Lower mortality among older Mexican Americans (particularly the foreign-born) vis-à-vis non-Hispanic Whites, accompanied by a disproportionate burden of chronic disease, disability, and cognitive impairment suggests this population is at a greater risk of spending more years of late-life with depression (Fenelon, Chinn, & Anderson, 2017; Garcia, Downer, et al., 2017; Garcia, Garcia, & Ailshire, 2018; Garcia, Garcia, Chiu, Raji, & Markides, 2018; Hayward, Hummer, Chiu, González-González, & Wong, 2014), which has serious policy implications for quality of life, caregiver burden, and health care utilization among this rapidly growing population.

A growing body of research suggests nativity and gender shape depression outcomes among older Mexican Americans (Black et al., 1998; González, Haan, & Hinton, 2001). Particularly, individuals born in Mexico and women are at an increased risk for depression in late-life (Black et al., 1998; González et al., 2001; Rote, Chen, & Markides, 2015). The life stress paradigm posits that events and conditions can act as potential stressors that have deleterious mental health consequences (Ensel & Lin, 1991; Turner, Wheaton, & Lloyd, 1995). For the foreign-born, migrating to a new country can be a stressful life event that impacts mental health and well-being across the life course (Torres & Wallace, 2013). Prior research shows that stressful life events and chronic strains act as significant predictors of depression (Avison & Turner, 1988). Indeed, the

higher risk for depression among immigrants has been attributed in part to additional stressors linked to migration and acculturation processes (Hovey & Magaña, 2000; Rogers-Sirin, Ryce, & Sirin, 2014).

Though nativity differentials in depression are well documented, less research has focused on how timing of migration affects late-life depression. For instance, most studies on depression examine Mexican immigrants as a monolithic group. However, older immigrants are heterogeneous in terms of sociodemographic characteristics, motivations to migrate, and immigrant experiences. Life course perspectives emphasize the importance of biological and historical timing in the migration process for understanding how sociocultural factors combine in unique ways to shape health outcomes in later life (Brown, 2018; Elder Jr, Johnson, & Crosnoe, 2003; Treas & Gubernskaya, 2016). Mounting evidence points to timing of migration and gender as two key life course dimensions that differentiate the immigrant experience in the United States (Donato, 2010; Gubernskaya, Bean, & Van Hook, 2013; Markides, Eschbach, Ray, & Peek, 2007). Differential migratory experiences among older immigrant men and women may contribute to heterogeneous patterns of health selectivity at time of migration and the amount of acculturation since arrival. Thus, accounting for life course stage at migration and gender can elucidate the role of immigration processes as selection and acculturation mechanisms may not apply uniformly to all immigrants.

The current analysis builds on prior studies by examining how nativity, age of migration, and gender combine to affect the mental health outcomes of older Mexican Americans. Specifically, we use a life course framework to assess whether any immigrant advantages/disadvantages emerge in life expectancies with depression, without depression, and the proportion of life lived without depression.

Migration History and Gender

Stressful experiences can be traced back to an individual's position within the social hierarchy (Pearlin, 1989). To the extent that social structures of inequality embody the unequal distribution of resources and opportunities, a low status within them may itself be a source of stressful life conditions (Pearlin, Schieman, Fazio, & Meersman, 2005). For instance, immigrant status has been found to be associated with acculturative stressors which include: adapting to a new environment, language barriers, severe economic hardship, occupational related exploitation, residential instability, legal status stressors, discrimination, and loss of social support

(Arbona et al., 2010; Cano et al., 2016; Cuellar, Bastida, & Braccio, 2004; Sullivan & Rehm, 2005; Torres & Wallace, 2013).

Life course theory suggests how these stressors affect psychological distress are dependent on what age migration occurs as individual's experiences in early life impact health outcomes in later life (Dannefer, 2003; Elder Jr et al., 2003). Timing in which migration occurs may serve as a proxy for health selection upon arrival and the ability to cope with acculturative stress as biological age shapes social experiences, health behaviors, economic incorporation, and access to public assistance programs (Burr, Gerst, Kwan, & Mutchler, 2008; Donato, 2010; Jasso, 2003). Furthermore, differential migratory experiences may contribute to complex gender patterns in mental health outcomes as acculturative stress, economic adversity, loss of social support, and the social position these immigrants occupy once in the United States vary between immigrant men and women.

Prior research shows immigrants who arrive as adolescents are at a lower risk for psychological distress compared to adult immigrants (Alegría et al., 2007; Breslau et al., 2007; Breslau, Borges, Hagar, Tancredi, & Gilman, 2009). Due to their primary U.S.-based socialization, younger immigrants do not face the same challenges from acculturative stressors of adapting and incorporating to a new environment as immigrants who migrate in mid-life or old age (Angel, Rote, & Markides, 2017; Treas, 2015; Treas & Gubernskaya, 2016). Moreover, increased duration in the United States among immigrants is associated with greater opportunities to create larger social networks, attain citizenship, accumulate wealth, and access health-protective resources which mitigate risks for psychological distress (Angel et al., 2017; Gerst & Burr, 2012; Gubernskaya et al., 2013).

Conversely, older immigrants have more difficulties adapting to U.S. society as they are less likely to speak English, have fewer socioeconomic resources, and have a higher likelihood of physical and cognitive decline, which increases social isolation and dependency on family members (Angel et al., 2017; Garcia, Reyes, et al., 2018; Treas & Mazumdar, 2002). Upon arrival, older immigrants face numerous barriers to health care which are important for obtaining screening and treatment for depression (Burr et al., 2008; Gerst & Burr, 2012). Moreover, since older immigrants have developed extensive social networks and cultural orientations in Mexico, the loss of these ties results in a reduction of coping resources that may buffer against the stressful experiences of acculturation (Donato, 2010; Jasso, 2003).

In addition, it is important to understand how gender combines with timing of migration to influence processes of acculturation and stress that impact mental health. Research shows clear gender gradients in motivations for why men and women migrate that may lead to differential depression outcomes. Men are often the active decision makers in the migration process and tend to migrate for occupational purposes (Angel, Angel, Díaz Venegas, & Bonazzo, 2010; Markides et al., 2007). Participation in the labor force allows men to accumulate socioeconomic resources and extend their social networks which may be protective of mental health. In contrast, women are more likely to be follower immigrants, or migrate for family reunification at older ages (Donato, 2010; Treas, 2015). As secondary migrants, women may perceive migration as more stressful than men due to lack of autonomy in the decision-making process. Furthermore, research shows Mexican American women experience unique stressors linked to gender roles associated with cultural expectations of traditional family obligations, which may increase the risk for psychological distress (Aranda, Castaneda, Lee, & Sobel, 2001). Finally, acculturative stressors may be more pronounced for immigrant women since the loss of social ties from family, friends, and cultural detachment from their country of origin may lead to stress vulnerability and increased isolation in the United States (Donato, 2010).

Hypotheses

We argue that heterogeneity among older Mexican Americans may contribute to nativity, age of migration, and gender differentials in mental health outcomes across the life course. Differences in health selectivity at time of migration may be found among older immigrant men and women as the likelihood of emigrating from Mexico and returning to Mexico varies with age (Angel et al., 2010; Garcia & Reyes, 2017; Gubernskaya, 2015). Thus, timing of migration has serious policy implications for understanding causal links between variations in exposure to social and economic stress and psychological well-being in late-life among the foreign-born. Drawing on this background, we developed the following hypotheses to guide subsequent analyses:

- H1: Foreign-born Mexicans will spend more years after age 65 living with depression compared to their U.S.-born counterparts due to increased longevity and a higher prevalence of depressive symptomology.

H2: Individuals that migrated as older adults from Mexico, particularly women, will spend more years after age 65 living with depression than those who migrate at younger ages due to loss of social ties and limited opportunities to accumulate social and economic resources beneficial to late life health.

Methods

Data

This research analyzes data from the Hispanic Established Population for the Epidemiologic Study of the Elderly (H-EPESE). The H-EPESE is a longitudinal panel of 3,050 Hispanics aged 65 years and older, residing in the five southwestern states of Arizona, California, Colorado, New Mexico, and Texas (Markides, Rudkin, Angel, & Espino, 1997). This panel was first interviewed in 1993/94, with subsequent data collected in 1995/1996, 1998/1999, 2000/2001, 2004/2005, 2007, 2010/2011, and 2012/2013. In 2004/2005, a new cohort of 902 individuals was added to increase sample size. We use individual data from 1993 to 2013 to obtain prevalence estimates across survey years, with mortality linkages through the National Death Index (NDI) up to December 31, 2015. Respondents ranged in age from 65 to 107 years. The final analytic sample includes 3,588 unique individuals and 37,203 person-years of data.

Measures

Our assessment of depression is based on the 20-item Center for Epidemiological Studies Depression scale (CESD). This instrument has been widely used in studies assessing depressive symptoms in Mexican American populations (Black et al., 1998; Black, Markides, & Ray, 2003). The CES-D is a continuous scale (0–60) with higher values indicating worse mental health. We dichotomize depression as a score of 16 or greater.

Sociodemographic Characteristics

Our main variable of interest is age of migration. We use birthplace information and categorize respondents as U.S.-born versus Mexico-born. Following previous research (Angel et al., 2010; Angel, Angel, & Hill, 2015), we measure life course stage at migration as: those who arrived in early-life (0–19 years); mid-life (20–49 years); and late-life (after age 50).

Additional baseline indicators for descriptive analysis included: gender, age, years of education, marital status, living arrangements, language of interview, social support, disability, cognitive impairment, and morbidity. Social support is assessed by asking if respondents can count on someone in times of trouble: most of the time, some of the time, or hardly ever. Activity of daily living (ADL) disability is defined as difficulty performing any of seven self-care activities: walking across a room, bathing, grooming, dressing, eating, transferring from a bed to a chair, and using a toilet. Cognitive impairment is assessed using the Mini-Mental State Examination (score <21 = cognitive impairment). Chronic conditions (cardiovascular disease, diabetes, cancer, stroke, hypertension, and arthritis) were based on self-reported diagnoses.

Statistical Analysis

In the descriptive analysis, we provide an overview of sociodemographic and health characteristics by nativity, age of migration, and gender that have been shown to be risk factors of depression among older Mexican Americans (Black et al., 1998; Black et al., 2003; Rote et al., 2015). Although these measures may shape the risk of depression in late life, they are not included in our life expectancy analyses as these variables are time-varying (i.e., cognitive functioning, disability, morbidity, social support, and financial strain). Healthy life expectancies calculated by the Sullivan method take advantage of cross-sectional health (depression) prevalence and do not focus on time varying variables other than age. However, we include these variables in our descriptives to highlight nativity and age of migration differences.

For our life table analysis, we combine age-specific mortality rates with age-specific prevalence of depression to calculate Sullivan-based life tables of life expectancy with depression and without depression by nativity, age of migration, and gender (Jagger, Van Oyen, & Robine, 2014). Prevalence is estimated with multinomial logistic regression models and mortality rates with Gompertz hazard models. Estimates are done separately for men and women to account for well-known gender differences in longevity and the prevalence of depression among older Mexican Americans (Black et al., 1998; Garcia et al. 2018; Rote et al., 2015). Life expectancy calculated by this method is the number of remaining years (at age 65) which a population can expect to live with depression and without depression. A bootstrapping technique is used to obtain standard errors for the different life expectancies. Bootstrapping generates repeated estimates of life expectancies in different states by randomly

drawing a series of bootstrap samples from the analytic samples. Based on the 300 life tables for a given group, 95% empirical intervals (EI) are obtained from the 2.5th to the 97.5th percentile of the simulated distributions of each state for that group.

Results

Table 1 presents baseline descriptive characteristics by nativity, age of migration, and gender. Approximately 58% of respondents are female. Foreign-born groups who migrated in early-life (0–19 years) and late-life (after age 50) account for the smallest shares of older Mexican Ameri-

Table 1. Baseline Socio-demographic Characteristics Among Mexican-Americans Age 65 and Older by Sex, Nativity, and Age of Migration

<i>Age of Migration</i>	<i>Females</i>				<i>Males</i>			
	<i>U.S.-Born</i>	<i>Foreign-Born</i>			<i>U.S.-Born</i>	<i>Foreign-Born</i>		
		<i>0-19</i>	<i>20-49</i>	<i>50+</i>		<i>0-19</i>	<i>20-49</i>	<i>50+</i>
N (%)	1,201 (54.4)	212 (9.9)	468 (24.2)	212 (10.5)	842 (55.6)	173 (11.7)	342 (23.4)	129 (9.3)
Age (SD)	74.4 (6.6)	77.2 (7.5)	74.9 (7.5)	76.5 (7.9)	74.2 (6.5)	78.9 (8.5)	74.4 (6.2)	76.6 (7.8)
Depression	26.2	38.1	31.9	37.5	16.4	17.2	13.7	25.5
Education (SD)	6.0 (4.1)	4.9 (3.7)	4.4 (3.6)	3.1 (3.7)	6.5 (4.5)	4.2 (3.5)	3.8 (3.7)	2.3 (2.5)
Married	41.1	32.1	41.5	26.1	69.6	69.9	77.6	77.3
Live Alone	29.4	31.4	31.0	21.1	17.8	13.8	11.4	9.2
Spanish Interview	60.8	72.3	92.0	96.5	57.2	82.1	92.0	96.8
<i>Social Support</i>								
<i>Can Count on Someone</i>								
Most of the time	80.9	72.6	71.9	72.8	74.5	68.4	76.3	77.2
Some of the time	13.2	17.7	14.5	21.1	14.5	12.5	8.7	13.6
Hardly ever	5.8	9.7	13.7	6.1	11.0	19.1	15.0	9.2
ADL Disability	17.4	16.9	18.2	21.5	14.1	15.3	11.3	15.9
Cognitively Impaired	17.3	15.9	26.6	36.1	17.4	22.6	23.6	35.7
<i>Chronic Conditions</i>								
Cardiovascular	10.4	12.3	9.2	4.9	14.7	10.0	6.9	16.3
Diabetes	31.7	27.8	30.2	19.1	30.6	29.5	25.6	30.5
Cancer	9.5	3.6	5.3	3.8	7.4	10.3	4.1	5.2
Stroke	6.5	7.0	5.6	5.5	8.5	4.5	5.8	4.1
Hypertension	54.7	53.8	57.4	51.3	42.9	32.8	42.9	29.6
Arthritis	54.1	50.5	58.8	49.3	33.6	30.9	37.1	29.8

Source: H-EPESE, 1993-2013; N = 3,588

Note: Unweighted N's'; weighted means and percentages.

cans. Overall, U.S.-born respondents were younger, more educated, less likely to interview in Spanish, and reported higher rates of diabetes. Moreover, U.S.-born women reported the highest levels of social support. Consistent with life course expectations, early-life migrants had more years of education and were less likely to interview in Spanish compared to other immigrants. Mid-life migrant women were more likely to report diabetes, cancer, hypertension, and arthritis than early-life and late-life migrants. Conversely, mid-life migrant males were more likely to report stroke, hypertension, and arthritis relative to early-life and late-life migrants. Late-life migrants were more likely to report having an ADL disability and cognitive impairment than early-life and mid-life migrants, regardless of gender. In addition, early-life migrant females and late-life migrant males were more likely to report depression.

Table 2 presents estimates of total life expectancy for men and women at age 65, as well as the average number of years spent with depression

Table 2. Depression-Free Life Expectancy at Age 65 by Sex, Nativity, and Age of Migration

			<i>Age of Migration Subgroups</i>		
	<i>US-Born</i>	<i>(All) FB--Born</i>	<i>0-19</i>	<i>20-49</i>	<i>50+</i>
	<i>Years</i> <i>(95% EI)</i>	<i>Years</i> <i>(95% EI)</i>	<i>Years</i> <i>(95% EI)</i>	<i>Years</i> <i>(95% EI)</i>	<i>Years</i> <i>(95% EI)</i>
Females					
Total Life Expectancy	17.8 (17.19-18.48)	19.3* (18.58-19.99)	20.8* (19.12-22.43)	18.9 (18.03-19.84)	19.5 (17.81-20.99)
Depression-Free Life Expectancy	13.9 (13.30-14.53)	13.4 (12.84-14.05)	14.5 (12.90-16.13)	13.6 (12.76-14.37)	12.5 (11.23-13.77)
Depression Life Expectancy	3.9 (3.61-4.19)	5.9* (5.38-6.41)	6.3* (5.27-7.44)	5.4* (4.78-5.99)	7.0* (5.94-8.16)
Ratio w/o Depression	0.78 (0.76-0.80)	0.69* (0.67-0.71)	0.70* (0.65-0.74)	0.72* (0.69-0.74)	0.64* (0.60-0.69)
Males					
Total Life Expectancy	15.5 (14.79-16.11)	16.7 (15.66-17.58)	16.0 (13.88-17.99)	17.2 (15.74-18.51)	16.2 (14.49-17.82)
Depression-Free Life Expectancy	13.3 (12.68-14.03)	14.3 (13.34-15.12)	13.8 (11.89-15.66)	14.9 (13.57-16.15)	13.2 (11.52-14.76)
Depression Life Expectancy	2.1 (1.89-2.35)	2.3 (2.06-2.64)	2.2 (1.60-2.87)	2.2 (1.86-2.64)	3.0* (2.42-3.76)
Ratio w/o Depression	0.86 (0.85-0.88)	0.86 (0.84-0.87)	0.86 (0.83-0.90)	0.87 (0.85-0.89)	0.81 (0.77-0.85)

Source: H-EPESE, 1993-2013.

Note: EI = Empirical Intervals; * $p < .05$.

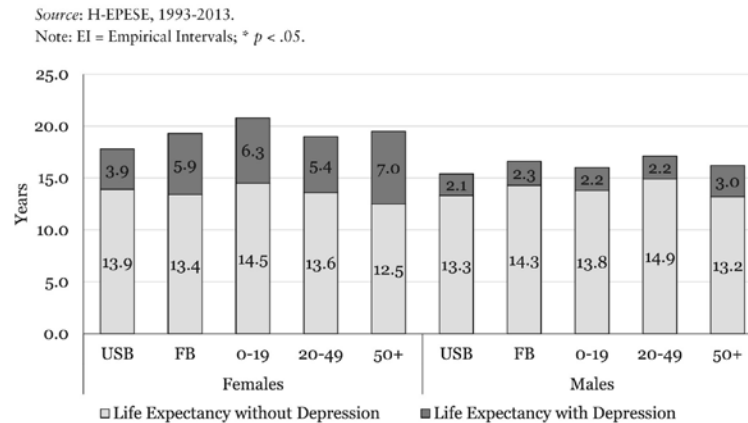


Figure 1. Life expectancies with and without depression at age 65 by sex, nativity, and age of migration. *Source:* H-EPESE, 1993–2013. FB = Foreign-born; USB = U.S.-born.

and without depression. The analysis is stratified by nativity and for the foreign-born by age of migration to determine whether an immigrant advantage in life expectancy without depression emerges. In addition, **Figure 1** provides a graphical representation of life expectancies lived with depression and without depression by gender, nativity, and age of migration.

Overall, life expectancy at age 65 for foreign-born women is 19.3 years (EI 18.58–19.99) compared to 17.8 years (EI 17.19–18.48) for the U.S.-born. By age of migration, total life expectancy is slightly higher for early-life (20.8 years; EI 19.12–22.43), and late-life (19.5 years; EI 17.81–20.99) migrants compared to mid-life migrant women (18.9 years; EI 18.03–19.84). No statistically significant differences emerge in life expectancy without depression when U.S.-born women are compared to foreign-born women as a monolithic group. However, foreign-born women (5.9 years; EI 5.38–6.41) as a group spend more years after age 65 with depression than U.S.-born women (3.9 years; EI 3.61–4.19). When viewed by life course stage at migration, mid-life migrant women (5.4 years; EI 4.78–5.99) are the least disadvantaged, whereas late-life migrant women (7.0 years; EI 5.94–8.16) are the most disadvantaged in terms of years lived with depression. Similar differences are evident in the ratio of number of years lived without depression to the total number of years lived between the foreign-born/age of migration subgroups and U.S.-born women. The results indicate that late-life migrant women spend 64% (EI 0.60–0.69) of their remaining years after age 65 without depression compared with

78% (EI 0.76–0.80) for U.S.-born women. Foreign-born women exhibit no health selectivity in life expectancy without depression as a group or by age of migration.

A different pattern emerges for men. Foreign-born men have an overall higher total life expectancy than U.S.-born men. This advantage in longevity is largely driven by men who migrated in mid-life. In addition, our findings indicate that late-life migrant men spend a significantly greater amount of time with depression (3.0 years; EI 2.42–3.76) compared to U.S.-born men (2.1 years; EI 1.89–2.35). No other nativity or age of migration differences are evident in depression life expectancies.

Discussion

In this study, we used a life course framework to better contextualize the relationship between nativity, age of migration, gender, and depression among a sample of older Mexican Americans. Prior studies suggest age of migration and gender are key factors for understanding Hispanic health disparities in later life (Angel et al., 2015; Garcia, Saenz, et al., 2017; Gubernskaya et al., 2013). However, less scholarship has examined how the association between migration history and mental health outcomes may vary by gender. Differential migratory experiences among older immigrant men and women may contribute to heterogeneous patterns of health selectivity at time of migration and level of incorporation since arrival. Research shows that advantages from health selection and disadvantages associated with negative acculturation may not apply to all immigrants as these processes appear to be contingent on age *and* gender.

For instance, differences in motivation to migrate (i.e., employment vs family reunion) and the degree of health selectivity may vary between younger and older immigrants (Angel et al., 2010; Markides et al., 2007). For individuals who migrate to the United States after age 50, health selectivity might not be applicable since their primary motivation tends to be for family reunification purposes rather than occupational opportunities (Garcia & Reyes, 2017; Gubernskaya et al., 2013). In addition, immigrant selectivity has been found to be stronger among men who migrate at working ages than women who are follower migrants (Angel et al., 2015; Markides et al., 2007). Indeed, recent findings show late-life migrant women to be particularly disadvantaged in the number of years and proportion of later-life spent with functional limitations, disability, and cognitive impairment (Garcia & Chiu, 2016; Garcia, Saenz, et al., 2017; Garcia, Valderrama-Hinds, et al., 2017), suggesting that an in-

tegrated life course intersectionality approach is useful to contextualize the mental health profiles of older immigrants.

The current analysis builds on prior research by documenting how gender interacts with migration history in unique ways to affect depression outcomes. Our first hypothesis stating foreign-born Mexicans will spend more years after age 65 living with depression compared to their U.S.-born counterparts due to increased longevity and a higher prevalence of depression was partially supported. Consistent with previous research, we found foreign-born women (as a group and by age of migration) spend a greater number of years with late-life depression compared to U.S.-born Mexican Americans (Black et al., 1998; Rote et al., 2015). A similar pattern is documented among late-life migrant men, indicating that immigrant men in general are more health selected for depressive outcomes than immigrant women. Additionally, our findings indicate that extended longevity among these groups relative to their U.S.-born co-ethnics are characterized by an increased burden of depression. Conversely, increased longevity among mid-life migrant men is accompanied by additional years of life *without* depression, suggesting an immigrant advantage in both mortality and mental health relative to U.S.-born men. Immigrant men who arrived in early-life did not differ from the U.S.-born in depression life expectancies, indicating similar social and cultural experiences as the native-born may lead to greater opportunities to incorporate into U.S. mainstream institutions which convey access to benefits and resources which are protective of mental health.

In addition, we find support for our second hypothesis that late-life immigrant women and men will spend more years after age 65 living with depression compared to those who migrate at younger ages. Biological timing of migration is an important life course factor which affects depression in late life. Previous research suggests individuals who migrate in early-life can more easily adapt to U.S. society, and thus are less sensitive to stressors related to migratory processes (Alegría et al., 2007; Angel et al., 2017; Breslau et al., 2007; Breslau et al., 2009). In contrast, individuals who migrate in late-life may experience loss of social ties from their country of origin and have more difficulty integrating socially and culturally to an unfamiliar environment (Angel et al., 2017; Kahn & Fazio, 2005; Rudkin & Markides, 2001; Shattell, Smith, Quinlan-Colwell, & Villalba, 2008). Furthermore, late-life immigrants have less opportunities than early-life immigrants to accumulate social and economic resources that may be protective of health in late-life (Burr et al., 2008; Gerst & Burr, 2012). These factors have been linked to higher levels of depressive symptoms, loneliness, and social isolation (Alegría

et al., 2007; Breslau et al., 2007; Breslau et al., 2009). Importantly, our findings support the notion that migration history is more important for women than for men.

Timing of migration coupled with lack of social and economic resources (which are key components of the stress process) hinders the social position of late-life immigrant men and women differently and increases their vulnerability to experience depression. Particularly, limited access to federally funded health and welfare benefits such as Medicare Medicaid, and Affordable Care Act (ACA) subsidies due to legal status in the United States presents major barriers in accessing care in order to obtain a diagnosis and receive treatment for depression (Angel & Berlinger, 2018; Burr et al., 2008; Gerst & Burr, 2012; Ku & Matani, 2001). Our study findings support a need to simultaneously consider nativity, age of migration, and gender as important predictors of depression in epidemiological and clinical studies of older Mexican Americans. Researchers should develop and test culturally appropriate programs to increase mental health literacy, English Language proficiency sufficient to effectively interact with the health care system, and social media networking skills sufficient to develop density and diversity of social networks, particularly among late-life migrant women. These skills are necessary for knowledge of available mental health resources and public benefits with potential to promote mental health functioning.

Drawing from previous studies, we can speculate on the role that these factors play on the late-life mental health of Mexican Americans. For instance, migration from Mexico to the United States has been found to be a significant predictor for increased risk of depressive and anxiety disorders (Breslau et al., 2009). In addition, recent findings indicate that the process of acculturation, loss of social support, and traditional gender roles associated with familial obligations increase the risk for psychological distress among Mexican-origin women (Aranda et al., 2001; Kahn & Fazio, 2005). Conversely, social marginalization, economic hardship, and occupational exploitation have been found to be associated with anxiety and depression among men (Aranda et al., 2001; Steffens et al., 2006).

Furthermore, social determinants of health such as poverty, low levels of education, and financial strain among immigrants decreases social position, creates stressful situations, and increases vulnerability for depression (Kahn & Fazio, 2005; Rudkin & Markides, 2001). These risks, especially in the context of the substantial proportion of late-life lived with depression are associated with lower quality of life, higher level of health care utilization, and premature death.

These results are particularly important for mental health practitioners with older Mexican American patient populations as they have low rates of health insurance coverage (particularly the foreign-born), reduced health care access, and language and cultural barriers that affect whether an individual receives a depression diagnosis and treatment (Sue, Fujino, Hu, Takeuchi, & Zane, 1991). Recent evidence shows late-life migrants are at greater risk for dependency on children and are more likely to “age in place” than early-life and mid-life migrants, raising serious questions for policy makers regarding the extent to which home and community-based services are a viable alternative for caregiving (Angel & Berlinger, 2018; Angel et al., 2017). Higher dependency on family and children may be associated with increased levels of social support among late-life migrants, however, it may also lead to caregiver burden for individuals who have no choice but to keep their aging parents at home (Angel et al., 2017). Some of these issues can be ameliorated with Hispanic, Spanish-speaking, and culturally-sensitive providers. For instance, research based in Los Angeles found that Mexican Americans were more likely to attend appointments with a mental health care provider that matched their ethnicity and language use (Sue et al., 1991). Thus, reducing mental health disparities in Mexican American populations will require investments in programs and policy initiatives to address access and quality of mental health services that are culturally and linguistically appropriate on providing effective care. Public health interventions and clinical trials of new treatments for depression need to specifically consider the emotional and psychological phenotype of Mexican American immigrants, specifically older women who migrate to the United States at later ages. In addition, clinicians need to be more aware and proactive in screening for and treating depression and psychological distress commonly associated with the immigrant experience. Screening instruments that may help are the PRIME-MD-9 for primary care patients of any age and the GDS-15-Spanish for older patients. These tools have been well validated in Spanish-speaking populations.

A limitation of the current study is that it did not address mechanisms associated with depression such as poverty, low levels of education, financial strain, social support, social marginalization, and psychosocial stress. Although the H-EPESE contains variables related to financial strain, social support and health status, these variables are time-varying. The nature of Sullivan healthy life expectancies takes advantage of cross-sectional health prevalence and it does not focus on time varying variables. In addition, we are unable to account for legal status, or citi-

zanship, which confers access to benefits and resources that may lead to better health. Finally, specific information on motivations for migration are not included in the survey and thus cannot be ascertained. Even with these limitations, our results provide insights on how differences in nativity, age of migration and gender are related to depression in later life.

As the largest subgroup of Hispanics aged 65 years and older in the United States, the higher prevalence of depression in the older Mexican American population has significant policy implications for quality of life, care giver burden, and health care utilization. Late-life depression can be particularly costly due to the association with disability, chronic conditions, and premature mortality. More resources are needed to develop and implement interventions to improve the health and quality of life of this socially and economically disadvantaged population.

Funding — This study was supported by the NIH National Institute of Minority Health and Health Disparities (R01 MD005894-01), National Institute on Aging (5R01AG010939, 5T32AG270, R36AG057949), and the Nebraska Tobacco Settlement Biomedical Research Development Funds through the University of Nebraska-Lincoln.

References

- Alegría, M., Mulvaney-Day, N., Torres, M., Polo, A., Cao, Z., & Canino, G. (2007). Prevalence of psychiatric disorders across Latino subgroups in the United States. *American Journal of Public Health, 97*, 68–75. doi:10.2105/ajph.2006.087205
- Angel, R. J., Angel, J. L., Díaz Venegas, C., & Bonazzo, C. (2010). Shorter stay, longer life: Age at migration and mortality among the older Mexican-origin population. *Journal of Aging and Health, 22*, 914–931. doi:10.1177/0898264310376540
- Angel, R. J., Angel, J. L., & Hill, T. D. (2015). Longer lives, sicker lives? Increased longevity and extended disability among Mexican-origin elders. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences, 70*, 639–649. doi:10.1093/geronb/gbu158
- Angel, J. L., & Berlinger, N. (2018). The Trump administration's assault on health and social programs: Potential consequences for older Hispanics. *Journal of Aging & Social Policy, 30*, 1–16. doi:10.1080/08959420.2018.1462678
- Angel, J. L., Rote, S., & Markides, K. (2017). The Role of the Latino family in late-life caregiving. In J. M. Wilmoth & M. Silverstein (Eds.), *Later-life social support and service provision in diverse and vulnerable populations* (pp. 58–73). New York: Routledge.

- Aranda, M. P., Castaneda, I., Lee, P.-J., & Sobel, E. (2001). Stress, social support, and coping as predictors of depressive symptoms: Gender differences among Mexican Americans. *Social Work Research*, **25**, 37–48. doi:10.1093/swr/25.1.37
- Arbona, C., Olvera, N., Rodriguez, N., Hagan, J., Linares, A., & Wiesner, M. (2010). Acculturative stress among documented and undocumented Latino immigrants in the United States. *Hispanic Journal of Behavioral Sciences*, **32**, 362–384. doi:10.1177/0739986310373210
- Avison, W. R., & Turner, R. J. (1988). Stressful life events and depressive symptoms: Disaggregating the effects of acute stressors and chronic strains. *Journal of Health and Social Behavior*, **29**, 253–264. doi:10.2307/2137036
- Black, S. A., Goodwin, J. S., & Markides, K. S. (1998). The association between chronic diseases and depressive symptomatology in older Mexican Americans. *The Journals of Gerontology, Series A: Biological Sciences and Medical Sciences*, **53**, M188–M194. doi:10.1093/gerona/53a.3.m188
- Black, S. A., Markides, K. S., & Ray, L. A. (2003). Depression predicts increased incidence of adverse health outcomes in older Mexican Americans with type 2 diabetes. *Diabetes Care*, **26**, 2822–2828. doi:10.2337/diacare.26.10.2822
- Blazer, D. G. (2009). Depression in late life: Review and commentary. *Focus*, **7**, 118–136. doi:10.1176/foc.7.1.foc118
- Breslau, J., Aguilar-Gaxiola, S., Borges, G., Kendler, K. S., Su, M., & Kessler, R. C. (2007). Risk for psychiatric disorder among immigrants and their US-born descendants: Evidence from the National Comorbidity Survey Replication. *The Journal of Nervous and Mental Disease*, **195**, 189–195. doi:10.1097/01.nmd.0000243779.35541.c6
- Breslau, J., Borges, G., Hagar, Y., Tancredi, D., & Gilman, S. (2009). Immigration to the USA and risk for mood and anxiety disorders: Variation by origin and age at immigration. *Psychological Medicine*, **39**, 1117–1127. doi:10.1017/S0033291708004698
- Brown, T. H. (2018). Racial stratification, immigration, and health inequality: A life course-intersectional approach. *Social Forces*, **96**, 1507–1540. doi:10.1093/sf/soy039
- Burr, J., Gerst, K., Kwan, N., & Mutchler, J. (2008). Economic well-being and welfare program participation among older immigrants in the United States. *Generations*, **32**, 53–60.
- Cano, M. Á., Castro, Y., de Dios, M. A., Schwartz, S. J., Lorenzo-Blanco, E. I., Roncancio, A. M.,...Zamboanga, B. L. (2016). Associations of ethnic discrimination with symptoms of anxiety and depression among Hispanic emerging adults: A moderated mediation model. *Anxiety, Stress, and Coping*, **29**, 699–707. doi:10.1080/10615806.2016.1157170
- Cuellar, I., Bastida, E., & Braccio, S. M. (2004). Residency in the United States, subjective well-being, and depression in an older Mexican-origin sample. *Journal of Aging and Health*, **16**, 447–466. doi:10.1177/0898264304265764
- Dannefer, D. (2003). Cumulative advantage/disadvantage and the life course: Cross-fertilizing age and social science theory. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, **58**, S327–S337. doi:10.1093/geronb/58.6.S327

- Donato, K. M. (2010). US migration from Latin America: Gendered patterns and shifts. *Annals of the American Academy of Political and Social Science*, **630**, 78–92. doi:10.1177/0002716210368104
- Dunlop, D. D., Song, J., Lyons, J. S., Manheim, L. M., & Chang, R. W. (2003). Racial/ethnic differences in rates of depression among preretirement adults. *American Journal of Public Health*, **93**, 1945–1952. doi:10.2105/ajph.93.11.1945
- Elder, G. H., Jr., Johnson, M. K., & Crosnoe, R. (2003). The emergence and development of life course theory. In J. T. Mortimer & M. J. Shanahan (Eds.), *Handbook of the life course* (pp. 3–19). Boston, MA: Springer. doi:10.1007/978-0-306-48247-2_1
- Ensel, W. M., & Lin, N. (1991). The life stress paradigm and psychological distress. *Journal of Health and Social Behavior*, **32**, 321–341. doi:10.2307/2137101
- Fenelon, A., Chinn, J. J., & Anderson, R. N. (2017). A comprehensive analysis of the mortality experience of Hispanic subgroups in the United States: Variation by age, country of origin, and nativity. *SSM - Population Health*, **3**, 245–254. doi:10.1016/j.ssmph.2017.01.011
- Garcia, M. A., & Chiu, C. T. (2016). Age at migration and disability-free life expectancy among the elder Mexican-origin population. *Demographic Research*, **35**, 1523–1536. doi:10.4054/DemRes.2016.35.51
- Garcia, M. A., Downer, B., Chiu, C-T., Saenz, J. L., Rote, S., & Wong, R. (2017). Racial/Ethnic and Nativity Differences in Cognitive Life Expectancies Among Older Adults in the United States. *The Gerontologist*, 1–9. doi:10.1093/geront/gnx142
- Garcia, C., Garcia, M. A., & Ailshire, J. A. (2018). Sociocultural variability in the Latino population: Age patterns and differences in morbidity among older US adults. *Demographic Research*, **38**, 1605–1618. doi:10.4054/demres.2018.38.52
- Garcia, M. A., Garcia, C., Chiu, C. T., Raji, M., & Markides, K. S. (2018). A Comprehensive analysis of morbidity life expectancies among older Hispanic subgroups in the United States: Variation by nativity and country of origin. *Innovation in Aging*, **2**, igy014. doi:10.1093/geroni/igy014
- Garcia, M. A., & Reyes, A. M. (2017). Physical functioning and disability trajectories by age of migration among Mexican elders in the United States. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, 1–11. doi:10.1093/geronb/gbw167
- Garcia, M. A., Reyes, A. M., Downer, B., Saenz, J. L., Samper-Ternent, R. A., & Raji, M. (2018). Age of migration and the incidence of cognitive impairment: A cohort study of elder Mexican-Americans. *Innovation in Aging*, **1**, igx037. doi:10.1093/geroni/igx037
- Garcia, M. A., Saenz, J. L., Downer, B., Chiu, C.-T., Rote, S., & Wong, R. (2017). Age of migration differentials in life expectancy with cognitive impairment: 20-year findings from the Hispanic-EPESE. *The Gerontologist*, 1–10. doi:10.1093/geront/gnx062
- Garcia, M. A., Valderrama-Hinds, L. M., Chiu, C. T., Mutambudzi, M. S., Chen, N. W., & Raji, M. (2017). Age of migration life expectancy with functional limitations and morbidity in Mexican Americans. *Journal of the American Geriatrics Society*, **65**, 1591–1596. doi:10.1111/jgs.14875

- Gerst, K., & Burr, J. A. (2012). Welfare program participation among older immigrants. *Public Policy and Aging Report*, **22**, 12–16. doi:10.1093/ppar/22.2.12
- González, H. M., Haan, M. N., & Hinton, L. (2001). Acculturation and the prevalence of depression in older Mexican Americans: Baseline results of the Sacramento area Latino study on aging. *Journal of the American Geriatrics Society*, **49**, 948–953. doi:10.1046/j.1532-5415.2001.49186.x
- Gubernskaya, Z. (2015). Age at migration and self-rated health trajectories after age 50: Understanding the older immigrant health paradox. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, **70**, 279–290. doi:10.1093/geronb/gbu049
- Gubernskaya, Z., Bean, F. D., & Van Hook, J. (2013). (Un)Healthy immigrant citizens: Naturalization and activity limitations in older age. *Journal of Health and Social Behavior*, **54**, 427–443. doi:10.1177/0022146513504760
- Hayward, M. D., Hummer, R. A., Chiu, C. T., González-González, C., & Wong, R. (2014). Does the Hispanic paradox in U.S. adult mortality extend to disability? *Population Research and Policy Review*, **33**, 81–96. doi:10.1007/s11113-013-9312-7
- Hovey, J. D., & Magaña, C. (2000). Acculturative stress, anxiety, and depression among Mexican immigrant farmworkers in the midwest United States. *Journal of Immigrant Health*, **2**, 119–131. doi:10.1023/A:1009556802759
- Jagger, C., Van Oyen, H., & Robine, J-M. (2014). *Health expectancy calculation by the Sullivan method: A practical guide*. United Kingdom: Institute for Ageing, Newcastle University, Newcastle upon Tyne.
- Jasso, G. (2003). Migration, human development, and the life course. In J. T. Mortimer & M. J. Shanahan (Eds.), *Handbook of the life course* (pp. 331–364). Boston: Springer.
- Kahn, J. R., & Fazio, E. M. (2005). Economic status over the life course and racial disparities in health. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, **60** Spec No 2, 76–84. doi:10.1007/978-0-306-48247-2_16
- Ku, L., & Matani, S. (2001). Left out: Immigrants' access to health care and insurance. *Health Affairs (Project Hope)*, **20**, 247–256. doi:10.1377/hlthaff.20.1.247
- Markides, K. S., Eschbach, K., Ray, L. A., & Peek, M. K. (2007). Census disability rates among older people by race/ethnicity and type of Hispanic origin. In J. L. Angel & K. E. Whitfield (Eds.), *The health of aging Hispanics* (pp. 26–39). New York: Springer.
- Markides, K. S., Rudkin, L., Angel, R. J., & Espino, D. V. (1997). Health status of Hispanic elderly. In L. G. Martin & B. J. Soldo (Eds.), *Racial and ethnic differences in the health of older Americans* (pp. 285–300) Washington, DC: National Academies Press.
- Pearlin, L. I. (1989). The sociological study of stress. *Journal of Health and Social Behavior*, **30**, 241–256. doi:10.2307/2136956

- Pearlin, L. I., Schieman, S., Fazio, E. M., & Meersman, S. C. (2005). Stress, health, and the life course: Some conceptual perspectives. *Journal of Health and Social Behavior*, **46**, 205-219. doi:10.1177/002214650504600206
- Rogers-Sirin, L., Ryce, P., & Sirin, S. R. (2014). Acculturation, acculturative stress, and cultural mismatch and their influences on immigrant children and adolescents' well-being. In R. Dimitrova, M. Bender, & F. van de Vijver (Eds.), *Global perspectives on well-being in immigrant families* (pp. 11-30): New York: Springer. doi:10.1007/978-1-4614-9129-3_2
- Rote, S., Chen, N. W., & Markides, K. (2015). Trajectories of depressive symptoms in elderly Mexican Americans. *Journal of the American Geriatrics Society*, **63**, 1324-1330. doi:10.1111/jgs.13480
- Rudkin, L., & Markides, K. S. (2001). Measuring the socioeconomic status of elderly people in health studies with special focus on minority elderly. *Journal of Mental Health and Aging*, **7**, 53-66.
- Shattell, M. M., Smith, K. M., Quinlan-Colwell, A., & Villalba, J. A. (2008). Factors contributing to depression in Latinas of Mexican origin residing in the United States: Implications for nurses. *Journal of the American Psychiatric Nurses Association*, **14**, 193-204. doi:10.1177/1078390308319034
- Steffens, D. C., Otey, E., Alexopoulos, G. S., Butters, M. A., Cuthbert, B., Ganguli, M.,...Yesavage, J. (2006). Perspectives on depression, mild cognitive impairment, and cognitive decline. *Archives of General Psychiatry*, **63**, 130-138. doi:10.1001/archpsyc.63.2.130
- Sue, S., Fujino, D. C., Hu, L. T., Takeuchi, D. T., & Zane, N. W. (1991). Community mental health services for ethnic minority groups: A test of the cultural responsiveness hypothesis. *Journal of Consulting and Clinical Psychology*, **59**, 533-540. doi:10.1037//0022-006x.59.4.533
- Sullivan, M. M., & Rehm, R. (2005). Mental health of undocumented Mexican immigrants: A review of the literature. *Advances in Nursing Science*, **28**, 240-251. doi:10.1097/00012272-200507000-00006
- Torres, J. M., & Wallace, S. P. (2013). Migration circumstances, psychological distress, and self-rated physical health for Latino immigrants in the United States. *American Journal of Public Health*, **103**, 1619-1627. doi:10.2105/AJPH.2012.301195
- Treas, J. (2015). Incorporating immigrants: Integrating theoretical frameworks of adaptation. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, **70**, 269-278. doi:10.1093/geronb/gbu067
- Treas, J., & Gubernskaya, Z. (2016). Immigration, aging, and the life course. In L. K. George & K. F. Ferraro (Eds.), *Handbook of aging and the social sciences* (8th ed., pp. 143-161). New York: Elsevier. doi:10.1016/b978-0-12-417235-7.00007-x
- Treas, J., & Mazumdar, S. (2002). Older people in America's immigrant families: Dilemmas of dependence, integration, and isolation. *Journal of Aging Studies*, **16**, 243-258. doi:10.1016/s0890-4065(02)00048-8
- Turner, R. J., Wheaton, B., & Lloyd, D. A. (1995). The epidemiology of social stress. *American Sociological Review*, **60**, 104-125. doi:10.2307/2096348 gbw167