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Marc A. Garcia
University of Nebraska - Lincoln, marcagarcia@unl.edu

Adriana M. Reyes
Cornell University, a.reyes@cornell.edu

Sunshine Rote
University of Louisville, sunshine.rote@louisville.edu

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Disability and the Immigrant Health Paradox: Gender and Timing of Migration

Marc A. Garcia,[1] Adriana M. Reyes,[2] and Sunshine Rote [3]

1 Department of Sociology and Institute for Ethnic Studies, University of Nebraska–Lincoln, Lincoln, NE, USA

2 Policy Analysis and Management, Cornell University, Ithaca, NY, USA

3 Kent School of Social Work, University of Louisville, Louisville, KY, USA

Corresponding author — M. A. Garcia

Emails: marcagarcia@unl.edu ; a.reyes@cornell.edu ; sunshine.rote@louisville.edu

Abstract

Although research has documented better health and longer life expectancy among the foreign-born relative to their U.S.-born counterparts, the U.S. Mexican-origin immigrant population is diverse and the healthy immigrant effect likely varies by key structural and demographic factors such as gender, migration history, and duration in the United States. Using a life course framework, we use data from the Hispanic Established Populations for the Epidemiologic Study of the Elderly (H-EPESE 1993–2013) which includes Mexican-American individuals aged 65 and older to assess the heterogeneity in the immigrant health advantage by age of migration and gender. We find that age of migration is an important delineating factor for disability among both men and women. The healthy immigrant hypothesis is only observable among mid- and late-life migrant men for ADL disability. While among immigrant women, late-life migrants are more likely to have an IADL disability putting them at a health disadvantage. These findings illustrate that Mexican immigrants are not a homogeneous group and migrant health selectivity depends on both gender and when migrants arrived in the United States.

Introduction

The Latino population in the United States has experienced unprecedented growth in the past several decades, surpassing African Americans as the nation's largest minority group. While the Latino population is generally young, Latinos aged 65 and older represent the fastest-growing segment of the population in the United States currently at or near retirement age (Ortman et al. 2014). In 2016, approximately 63% of Latinos in the United States were of Mexican-origin (U.S. Census Bureau 2017), the majority of which are U.S.-born (Flores 2017). However, more than a third of U.S. Mexican-Americans were born in Mexico (Gonzalez-Barrera and Lopez 2013). The rapid growth and aging of this population suggests both U.S.-born and Mexican-born Latinos will play an increasingly central role in shaping future health and longevity patterns among older adults in the U.S.

There has been a growing interest in the disability profiles of older Latinos by researchers and policy makers (Garcia et al. 2017). Studies consistently show older Latinos experience lower mortality and greater longevity than non-Latino Whites (Arias et al. 2017; Fenelon et al. 2017; Garcia et al. 2017). However, Latinos 65 and older also have a higher prevalence and are at an increased risk for disability and disabling conditions relative to non-Latino Whites (Markides et al. 2007; Melvin et al. 2014; Sheftel 2017). Therefore, older Latinos spend more years and a larger proportion of their life after age 50 with a disability than non-Latino Whites (Hayward et al. 2014). Longer durations of disability have been attributed to structural factors across the life course including inequality in social and economic resources, engagement in physically demanding labor, substandard medical care, and exposure to social and economic stressors (Markides and Rote 2015). This is of particular concern as the social benefits of increased longevity are undermined by additional years of life characterized by high levels of disability and dependency (Markides et al. 2007).

Furthermore, mounting evidence suggests that age alone does not account for health differentials as nativity, immigrant selectivity, age of migration, and gender have been shown to be important factors that influence the disability profiles of older Latinos (Hayward et al. 2014;Melvin et al. 2014;Garcia et al. 2015, 2017;Garcia and Chiu 2016;Garcia and Reyes 2017, 2018; Sheftel 2017). Consequently, we assess the variability of disability among older Mexican-Americans by nativity and biological timing of migration to elucidate potential health differentials that may emerge in later life. We pay particular attention to the role of gender given the higher risk for disability among Latina women due to greater longevity and gendered patterns in motivations for immigration (Angel et al. 2001; Massey et al. 2006; Donato 2010; Hayward et al. 2014).

Thus, the current study contributes to prior research in two key ways. First, drawing from a life course framework, we build on the immigrant health literature by providing a more comprehensive documentation of nativity differentials by assessing the heterogeneity of this rapidly aging and growing population. Specifically, we examine the extent to which the immigrant health advantage varies by gender and biological timing of migration among older Mexican-Americans residing in the southwestern United States. Second, rather than focusing solely on one form of disability we include two separate measures that capture self-care and household tasks considered important for living independently: Activities of Daily Living (ADLs) and Instrumental Activities of Daily Living (IADLs).

Background

The Healthy Immigrant Effect and Disability

A large body of research has supported the phenomenon coined the "healthy immigrant effect" in which foreign-born individuals residing in the United States tend to show favorable health, mortality, and life expectancy profiles relative to their U.S.- born counterparts (Palloni and Arias 2004; Singh and Hiatt 2006; Akresh and Frank 2008; Bostean 2013). The healthy immigrant effect has been attributed to two factors: (1) health selection, that is, individuals who migrate tend to be healthier, on average, than non-migrants (Jasso et al. 2004) and therefore arrive in the United States in better health and; (2) social and cultural factors that influence health and lifestyle behaviors such as a diet that originates in their country of origin and social support that enables immigrants to cope with stress (Palloni and Arias 2004; Jasso et al. 2004; Markides and Gerst 2011).

Most research indicates that the immigrant health advantage observed among recent arrivals dissipates as immigrants spend more time in their country of destination. While Mexican immigrants appear healthy when they arrive in the United States, after 10–20 years in the United States their health deteriorates to the level of or below their U.S.-born counterparts (Markides and Eschbach 2005; Markides and Rote 2015). Recent findings confirm a crossover effect for disability rates among older Mexican immigrants relative to the U.S.-born Mexican-Americans. For example, studies show foreign-born Mexicans have a disability advantage compared to U.S.-born Mexican-Americans until older ages when this advantage disappears (Melvin et al. 2014; Sheftel 2017; Sheftel and Heiland 2018).

Research suggests several reasons why immigrant health likely deteriorates with time spent in the United States. First, a lack of health insurance

and inadequate access to health care, particularly for undocumented migrants, may lead to health deterioration and contribute to worse health and higher rates of morbidity and disability among this segment of the population (Markides and Eschbach 2005; Teruya and Bazargan-Hejazi 2013). Second, evidence suggests that foreign-born Latinos are more likely to engage in negative health behaviors (smoking, alcohol consumption, and unfavorable dietary changes) with longer length of residence and greater acculturation in the United States (Antecol and Bedard 2006; Turra and Goldman 2007; Kimbro 2009). Finally, Mexican immigrants may live and work under unhealthy conditions that expose them to infectious diseases, environmental toxins, physical injuries, and other health related conditions that place them at disproportionate risk of physical difficulties and disabilities at older ages (Kandel and Donato 2009; Holmes 2013; Hummer and Hayward 2015).

Gender and the Healthy Immigrant Effect

Prior research indicates nativity and gender interact in unique ways to affect the disability profiles of older Mexican-Americans based on type of disability measured (Melvin et al. 2014; Nam et al. 2015; Garcia et al. 2015; Sheftel 2017; Garcia and Reyes 2018). In particular, immigrant advantages in disability have been found to vary across different measures of disability for men and women (Markides et al. 2007; Cantu et al. 2013; Hayward et al. 2014; Angel, Angel, and Hill 2014; Garcia et al. 2015). Two common measures of disability are: Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL). These measures capture different dimensions of self-care and household management limitations. ADLs are generally considered more severe and capture basic self-care tasks such as eating, bathing, and grooming that are less influenced by culture and environmental factors (Katz et al. 1963). In contrast, IADLs are conceptualized as capturing the ability to live independently by asking about day to day household tasks and are thought to occur relatively late in the disablement process, but also capture elements of the environment (Lawton and Brody 1969).

Research shows that older foreign-born Mexican women have a higher prevalence, and spend a larger fraction of their late life years with disability than both U.S.- born women and U.S.- and foreign-born Mexican-American men; which has been attributed to negative health selection, inequalities in access to resources, low levels of acculturation, and increased longevity (Warner and Brown 2011; Garcia et al. 2015; Garcia and Reyes 2018). Overall, these studies document a nativity advantage in ADL disability among foreign-born men and disadvantage in IADL disability among foreign-born women relative to their U.S.-born co-ethnics. IADL tasks may capture traditional gender division in the household by asking about food prepping and

shopping (Sheehan and Tucker-Drob 2017). Among older Mexican-Americans some IADL tasks (i.e. driving/obtaining transportation) have also been found to be associated with acculturation (Garcia et al. 2015).

Overall, there is evidence that the healthy immigrant effect is more reflective of health patterns for men than women (Read and Reynolds 2012) and among the Mexican-origin population in particular (Angel et al. 2014;Melvin et al. 2014;Garcia et al. 2015; Nam et al. 2016; Sheftel 2017; Garcia and Reyes 2018). Observed gender differences in the healthy immigrant effect may be attributed to patterns of selective migration. The decision to migrate is based on both larger structural factors that allow for migration flows as well as individual agency and certain capacities/skills that allow individuals to effectively navigate moving their lives (Jasso et al. 2004). The life course concept of linked lives states that individuals' lives are interdependent and interconnected (Treas and Gubernskaya 2016). Social relationships influence the motivations and ability to move to another country. Among foreign-born Mexicans, men tend to migrate for employment opportunities while women tend to migrate with their husbands based on their employment needs or for family purposes (Markides et al. 2007). Since immigrant women are migrating for family rather than occupational reasons, they may be less selected on health than their male counterparts.

Timing of Migration and Disability

While many older Mexican-Americans were born in the United States and others arrived during the early parts of the 20th century when they were young, many others immigrated as adults, including those who entered the country during their elder years (O'Neil and Tienda 2015). According to Garcia et al. (2017), biological timing of migration is an important early-life risk factor that influences late-life disability. For instance, age of migration can be useful for understanding the physical functioning and disability profiles of older immigrants by incorporating life course information on type of migration (i.e., labor vs. family reunification) and degree of health selectivity among older immigrants. Differences in motivation for immigration and selection mechanisms might be found between younger and older immigrants and within the older immigrant population (Angel et al. 2010; Treas 2015).

For instance, late-life immigrants' major motivation for migration tends to be family reunification rather than occupational opportunities (Angel et al. 2001; Treas and Mazumbdar 2002). In addition, age of migration captures the importance of biological timing in the life course as it shapes age-graded opportunities for social and economic incorporation, which has implications for immigrants' ability to accumulate resources that may be protective of health in later life (Angel et al. 2001, 2010; Treas and Gubernskaya 2016).

Furthermore, age of migration indicates the length of exposure to hazardous environmental conditions in countries of origin, which may affect health throughout the life course (Gubernskaya et al. 2013; Garcia and Reyes 2017). Finally, among older adults, age of migration approximates the historical era of migration, which may influence migration outcomes through the social and political landscape during migration.

From a life course perspective, we argue that the life experiences of older foreign-born Mexicans are shaped by the age at which they immigrated to the United States. Research shows health selection varies by age group and sex (Garcia and Chiu 2016). For example, migration selectivity may be strongest in young and early middle age (20–49), when foreign-born Mexicans migrate to the United States to pursue employment opportunities in physically demanding jobs in agriculture, construction, and the service sector (Angel et al. 2010; Gubernskaya et al. 2013). Labor migrants are by definition healthy enough to migrate, work when they arrive, and are thus self-selected on the basis of good health and the desire to improve their situations (Angel et al. 2010). Older foreign-born Mexicans who migrated in midlife, largely came during the Bracero Era (1942–1964) to fill labor shortages in agriculture and the expansion of the U.S. railroad (Gonzalez 2017). The opportunities of the Bracero programs were almost exclusively open to men, with women either staying behind in Mexico or migrating to the United States with their husbands without legal authorization (Gonzalez 2017). These historical patterns suggest gender differences in both motivations for migration from structural forces as well as a political difference in status for men and women migrating during this era.

In contrast, foreign-born Mexicans who migrated in early-life (ages 0–19) as children or adolescents are more likely to have migrated with parents or relatives. Therefore, early-life migrants have little or no health selection since their migration reflects their parents' characteristics, and they do not necessarily have to meet the demands required for migration by themselves (Angel et al. 2010; Gubernskaya 2015). In addition, these migrants are more likely to have an experience that resembles that of their U.S.-born counterparts, given that most of their development and experiences occur in the United States (Rumbaut 2004; Burr et al. 2008; Treas 2015). With longer duration of residence, foreign-born individuals increase their opportunities to adapt and incorporate into U.S. society (Angel et al. 2001; Treas 2015). For instance, those migrating in early-life may have greater opportunities for incorporation in U.S. mainstream social institutions through educational attainment and labor force participation (Burr et al. 2008; Gubernskaya et al. 2013). Thus, early-life migration may be associated with a greater opportunity to accumulate higher levels of income, pension and other retirement benefits as a consequence of longer duration in the United States

(Angel et al. 1999; Burr et al. 2008; Treas and Gubernskaya 2016). Older Mexican-born adults, who came to the United States at early ages, primarily migrated in the "Post-Mexican Revolution" era (1918–1928). Political turmoil and economic problems in Mexico, coupled with relaxed enforcement of immigration policies increased migration to United States. In addition, many of these migrants were able to legalize either during their initial migration or later through the Immigration Reform and Control Act (IRCA) of 1986 (Durand et al. 2001).

Similarly, health selectivity may be weaker among those who migrate in late-life (after age 50) as older Mexican migrants are more likely to migrate for family reunification rather than employment opportunities (Angel et al. 2010; Treas 2015). In addition, those migrating in late-life have fewer opportunities for social and economic incorporation and tend to experience greater difficulty with accumulating socioeconomic resources that would benefit health later in life (Angel et al. 1999; Treas and Mazumbdar 2002; Burr et al. 2008). Furthermore, late-life immigrants are less likely to qualify for Social Security or Medicare and more likely to be dependent upon family than their U.S.-born counterparts or those immigrating earlier in life (Angel et al. 1999; Burr et al. 2008; O'Neil and Tienda 2015). However, migrants who come to the United States in late-life are likely to retain social and cultural factors that influence health and lifestyle behaviors, and are unlikely to acculturate rapidly into U.S. society (Kimbro 2009; Garcia et al. 2015). Moreover, exposure to environmental factors, health risks, and poorer access to health care in their country of origin may also play a significant role in the health of older migrants (Akresh 2007; Gubernskaya 2015). Older migrants who have migrated in recent years have come during the era of undocumented migration, a period of often hostile reception with the fear of deportation and limited access to government programs for immigrants with the passage of the Illegal Immigration Reform and Immigrant Responsibility Act (IIRIRA) in 1996. Though many older immigrants migrate to the United States legally through family reunification, their ability to incorporate into U.S. society may be hampered by negative attitudes towards immigrants in their communities (Treas and Mazumbdar 2002).

Gender Differences in the Timing of Migration

More recent findings by Garcia and Chiu (2016) suggest nativity advantages and disadvantages in the disability profiles of older foreign-born Mexican-Americans vary by time of migration *and* gender. Specifically, this study found midlife and late-life migrant men exhibited an immigrant advantage in the number of years after age 65 spent ADL disability-free compared to U.S-born Mexican-Americans, whereas early-life migrants exhibited no

health advantage. In addition, their findings showed all foreign-born immigrant women to be at a significant disadvantage in the number of years after age 65 spent with IADL disability relative to their U.S.-born coethnics. Among foreign-born women, late-life migrants were the most disadvantaged spending approximately 78% of their elderly years with an IADL limitation.

Potential explanations for these gender differences are that health selectivity among migrants is not as strong for women (Markides et al. 2007) or that the convergence process happens at amore rapid pace for Mexican immigrant women than men (Antecol and Bedard 2006). This more rapid decline may be attributable to gender inequalities in factors that lead to disability. For both men and women, it appears that acculturation is a key factor that influences nativity differences in disability (Garcia et al. 2015). In the current study, we document gender, nativity, and age of migration differences in both ADL and IADL disability.

Conceptual Framework

We utilize a life course perspective to link gender, timing of migration, and disability among older Mexican-Americans. The life course framework focuses on how early life experiences can have lasting effects on individuals as they age and move through the lifespan (Dannefer 2003; Elder et al. 2003). Migration is an important life course transition that alters an individual's long-term path in terms of career, family life, and health (Angel and Angel 1992; Treas and Gubernskaya 2016). For voluntary immigrants, motivations for migration are based on both structural factors including social and financial resources and agency in terms of perceived opportunity and ability to migrate all of which vary by gender and age at migration (Angel et al. 1999).

The connection between immigration and health is complex, and a host of factors related to the migratory process, in terms of the initial migration from Mexico (health selection) and subsequent adaptation and incorporation into the United States, produce a variety of health outcomes (Palloni and Morenoff 2001). Although migration from Mexico to the United States is recognized as an important social, political and economic phenomenon, past research has overlooked how age, period, and cohort distinctly influence disability risk. Additionally, relatively little research has examined how gender and migration-related factors combine to effect various aspects of disability among older Mexican-Americans. By focusing on health disparities by nativity, the "healthy immigrant effect" literature downplays disability differentials *within* the older foreign-born population. This is a crucial factor considering one of the most unique features of the foreign-born Mexican population is their range of immigration experiences by gender, timing of migration, and incorporation into mainstream U.S. society; disregarding these

key factors results in an incomplete understanding of the disability profiles of older Mexican immigrants. Thus, the current analysis aims to add to the literature on the healthy immigrant effect by examining the association between timing of migration and gender on self-care and household disabilities among older Mexican-Americans.

Data and Methods

Data

We employ data from the Hispanic Established Populations for the Epidemiologic Study of the Elderly (H-EPESE). The H-EPESE is a large, multi-stage probability sample of Mexican-Americans age 65 and older living in Arizona, California, Colorado, New Mexico, and Texas (Markides et al. 1997). Aggregated individual level data is used for a total of up to eight observations. The present study used baseline data (1993/1994, n=3050) and 2-year (1995/1996), 5-year (1998/1999), 7-year (2000/2001), 11-year (2004/2005), 13-year (2006/2007), 17-year (2010/2011), and 20-year (2012/2013) follow-up assessments. Due to attrition in the original cohort, a new cohort of 902 individuals aged 75 and older was added in 2004 to increase sample size and statistical power. Note that we omitted respondents (n=411) from the analytic sample due to missing information on nativity and age of migration variables. The final analytic sample includes 3541 unique individuals and 11,445 cases.

Measures

Disability is defined as difficulty or the inability to individually perform activities due to health and lasting for some time (Verbrugge 2016).We use two different measures of disability that capture personal care tasks of everyday life and household management/independent living tasks: Activities of Daily Living (ADLs) and Instrumental Activities of Daily Living (IADLs). To assess ADL disability, respondents were asked if they needed help from another person or special equipment/device to perform the following tasks: walk across a small room; bathing (either a sponge bath, tub bath, or shower); personal grooming (brush hair/teeth or washing face); dressing (putting on a shirt or shoes, buttoning and zipping); eating (holding a fork, cutting food, or drinking from a glass); transferring from a bed to a chair; and using the toilet (Katz et al. 1963; Branch et al. 1984). ADL disability was dichotomized as “no help needed” vs. “unable to do/needed help” in one or more of the tasks. Instrumental activities of daily living (Rosow and Breslau 1966;

Lawton and Brody 1969; Fillenbaum et al. 1988) are self-reported measures that are crucial for living independently in the community. Ten IADL activities were measured: using telephone without assistance; driving a car or traveling alone on buses or taxis; shopping for groceries or clothes, preparing own meals; light housework (dishwashing and making the bed); taking medicine; managing finances (write checks/pay bills); heavy housework (washing windows, walls, and floors); walk up and down the stairs; and walk a half mile. Respondents were asked to indicate if he/she were unable to perform the activity without help. IADL disability was dichotomized as "no help needed" versus "unable to do/needed help" in one or more of the tasks.

Our main variable of interest is life-course age at migration. Following previous research (Angel et al. 2010; Garcia and Reyes 2017) we create four categories: (1) U.S.-born respondents; (2) early-life migrants (born in Mexico and migrated to the United States before the age of 20); (3) mid-life migrants (born in Mexico and migrated to the United States between the ages of 20 and 49 years); and (4) late-life migrants (born in Mexico and migrated to the United States at age 50 or older). Additional sociodemographic variables used in the analysis include gender, age, and years of education. Gender corresponds to female or male. Education is measured by the number of years of schooling the respondent has completed. In addition, we include several morbidity items that have been shown to influence disability (Patel et al. 2006). Morbidity is measured with six self-reported questions regarding whether an individual has ever been diagnosed with one of the following medical conditions: (a) heart attack; (b) stroke; (c) cancer of any type; (d) high blood pressure; (e) arthritis or rheumatism; or (f) diabetes. Response categories for each item were coded dichotomously: 1 for "yes" and 0 for "no."

Analytic Approach

In the descriptive analysis, we draw comparisons using chi-square and *z*-tests for independent proportions to assess nativity, and for immigrants, age of migration differentials by gender and age. For the multivariate models, random effects Poisson regression with normally distributed individual level random effects is used to account for repeated measurements on the same individual for up to 8 waves of data and estimate risk ratios to quantify the association between nativity, age of migration, and disability by gender. Models are specified with robust standard errors, resulting in a modified Poisson regression, which has been shown to be a valid method to estimate relative risk in binary response data (Zou 2004). Moreover, the standard errors are adjusted since individuals can contribute more than one observation to the data set during the period under study. That is, the individual

measures are clustered by subject and this specification takes that aspect of the data structure into account in a general way to produce the appropriate standard errors for a design such as this. The models are further stratified by gender because of the widely varying patterns of disability by sex.

Results

Descriptive Statistics

Table 1 reports descriptive characteristics of the sample by age of migration and gender. Approximately 59% of women and 55% of men are U.S.-born. Among the foreign-born, 9.4% of female respondents report that they migrated during early-life (0–19), 22.3% in mid-life (20–49), and 9.3% in late-life (50 and older), respectively. Conversely, 10.6% of male respondents report migrating in early-life, 25.9% in midlife, and 8.1% in late-life. Note that among the foreign-born, mid-life migrants make up a majority of the sample for men and women. There are no major gender differences in the distribution of older adults across age of migration categories. Nonetheless, women are slightly more likely than men to have migrated to the United States in late-life (50 years or older). The mean age for U.S.-born women (77.6 years) is slightly lower than early-life and late-life migrant women(80.3 years, and 78.9 years). Similarly, the mean age of U.S.-born men (76.6 years) is slightly lower than that of foreign-born men (80.1 years, 77.9 years, and 77.9 years).

Table 1. Socio-demographic characteristics among Mexican-origin elders age 65 and older by gender and nativity

	Females								*Males*							
	U.S.-born		*Foreign-Born*						*U.S.-born*		*Foreign-born*					
Age of migration			*0–19*		*20–49*		*50+*				*0–19*		*20–49*		*50+*	
N (%)	4051	(59.1)	645	(9.4)	1529	(22.3)	635	(9.3)	2538	(55.4)	485	(10.6)	1189	(25.9)	373	(8.1)
Age (SD)	77.6	(7.0)	80.3	(7.7)	77.4	(7.2)	78.9	(7.4)	76.6	(6.6)	80.1	(7.7)	77.9	(6.9)	77.9	(7.3)
Education (SD)	6.0	(4.1)	4.9	(3.4)	4.4	(3.5)	2.9	(3.2)	6.5	(6.5)	4.2	(3.7)	3.8	(3.3)	2.2	(2.6)
Heart attack	8.0		7.9		7.6		6.4		12.8		7.6		5.9		12.0	
Stroke	5.9		6.6		4.5		3.9		7.1		5.2		4.7		4.7	
Cancer	8.9		3.9		6.4		4.2		8.2		7.7		6.3		6.2	
Hypertension	59.1		61.5		60.9		59.5		48.4		41.2		49.4		43.9	
Arthritis	58.4		64.4		61.2		59.3		39.7		40.8		45.6		35.9	
Diabetes	32.7		31.1		28.1		25.2		29.6		25.8		24.2		29.8	
English	36.1		16.9		5.3		2.7		37.3		16.0		5.6		2.7	
Smoke	30.3		33.6		29.2		25.6		67.0		56.4		68.8		63.0	
Drink	36.3		39.6		32.0		29.1		79.4		81.5		83.2		81.5	
Obese	34.2		28.8		33.3		29.6		24.4		25.5		26.4		27.1	

Source: H-EPESE Waves 1–8 (1993–2013).
Total N = 11,445; unweighted N's' weighted percentages and means

In addition, U.S.-born respondents report more years of education than foreign-born respondents, regardless of gender. Education levels decrease with older age of migration consistent with expectations that early-life and mid-life migrants have more opportunities to incorporate into U.S. mainstream institutions than late-life migrants.

Disability

Regression Models

The multivariate analysis is designed to examine the relationship between nativity, timing of migration, and disability by gender among older Mexican-Americans residing in the southwest United States. The analysis is stratified by gender because of the widely varying patterns of disability by sex. Table 2 shows the results from Poisson regression models predicting any ADL and any IADL disability. Model 1 documents the overall association between nativity, age of migration and disability, independent of age. In Model 2, we add controls for education to assess whether this key social factor is associated with disability. Model 3 includes six self-reported chronic health conditions that are associated with disability. Finally, Model 4 includes language of interview and health behaviors (smoking, drinking, and obesity) that have been shown to influence health and mortality.

ADL Disability

The results in Table 2 (Models 1 and 2) for women illustrate that nativity and age of migration are not associated with any ADL disability, whereas advancing age is associated with an increased risk, and greater educational attainment is associated with a decreased risk of any ADL disability. In Model 3,women who reported having a heart attack, stroke, hypertension, arthritis, or diabetes were between 24 and 56% more likely to report any ADL disability. Conversely, cancer was not associated with any ADL disability among women. In Model 4, smoking and drinking were not associated with any ADL disability. However, taking the survey in English and being obese increased the odds of any ADL disability by 21 and 22% respectively.

For men Table 3 a different pattern emerges. Nativity, age of migration, and age are positively related to any ADL disability. Mid-life and late-life migrant men have a significantly lower risk of any ADL disability compared to their U.S.-born counterparts. For example, late-life migrant men are 27% less likely and mid-life migrant men 23% less likely than U.S.-born men to report any ADL disability. Consistent with a life course perspective, there are no significant differences in any ADL disability between early-life migrant

Table 2. Poisson regression (rate ratios) predicting ADL/IADL disability among Mexican-origin Women ages 65 and older

	Any ADL				Any IADL			
Predictor variables[a]	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Age of migration								
0–19	0.88	0.85	0.86	0.86	1.12 *	1.09	1.09	1.1
20–49	1.03	0.98	1.02	0.97	1.11 **	1.07	1.07	1.08
50+	1.08	0.99	1.05	0.97	1.23 ***	1.15 **	1.18 ***	1.18 ***
Age	1.10 ***	1.10 ***	1.10 ***	1.10 ***	1.03 ***	1.03 ***	1.03 ***	1.03 ***
Education		0.97 ***	0.97 **	0.99		0.98 ***	0.98 ***	0.98 ***
Morbidities								
Heart attack			1.44 ***	1.36 ***			1.16 **	1.16 **
Stroke			1.33 **	1.53 ***			1.15 *	1.14 *
Cancer			1.06	1.01			1.06	1.06
Hypertension			1.24 ***	1.18 **			1.09 **	1.09 **
Arthritis			1.51 ***	1.57 ***			1.23 ***	1.22 ***
Diabetes			1.56 ***	1.44 ***			1.14 ***	1.13 ***
Language				1.21 **				0.99
Smoke				1.00				1.05
Drink				0.95				0.95
Obese				1.22 ***				1.03
N	6860							

a.The reference category in the Poisson regression is U.S.-born Mexican Americans

* Significant at the 0.05 level. ** Significant at the 0.01 level. *** Significance at the 0.001 level

Table 3. Poisson regression (rate ratios) predicting ADL/IADL disability among Mexican-origin Men ages 65 and older

	Any ADL				*Any IADL*			
Predictor variables[a]	*Model 1*	*Model 2*	*Model 3*	*Model 4*	*Model 1*	*Model 2*	*Model 3*	*Model 4*
Age of migration								
0–19	0.83	0.81	0.88	0.88	0.94	0.88	0.90	0.91
20–49	0.77 *	0.75 **	0.78 *	0.78 *	1.00	0.93	0.95	0.97
50+	0.73 ***	0.70 ***	0.73 ***	0.73 ***	1.14	1.00	0.99	1.00
Age	1.11 ***	1.11 ***	1.10 ***	1.10 ***	1.06 ***	1.05 ***	1.05 ***	1.05 ***
Education		0.98	0.98	0.98		0.97 ***	0.96 ***	0.96 ***
Morbidities								
Cardio			1.47 ***	1.47 ***			1.27 ***	1.27 ***
Stroke			1.61 ***	1.62 ***			1.36 ***	1.36 ***
Cancer			1.24	1.24			1.17 *	1.17 *
Hypertension			1.30 **	1.30 **			1.02	1.01
Arthritis			1.46 ***	1.46 ***			1.15 **	1.15 **
Diabetes			1.24 *	1.24 *			1.25 ***	1.25 ***
Language				1.02				0.96
Smoke				1.03				1.02
Drink				0.92				0.97
Obese				1.03				1.06
N	4585							

a. The reference category in the Poisson regression is U.S.-born Mexican Americans

* Significant at the 0.05 level. ** Significant at the 0.01 level. *** Significance at the 0.001 level

men and U.S-born men. While early-life migrant men report lower odds of any ADL disability, their disability profile reflects a similar health experience as their U.S.-born co-ethnics. When education is added to Model 2, age of migration remains significant with mid-life and late-life migrant men 25 and 30% less likely to report any ADL disability compared to their U.S.-born counterparts. In Model 3, heart attack, stroke, cancer, hypertension, arthritis and diabetes are all positive predictors (between 24 and 61%) of any ADL disability among older Mexican-American men. After these controls are added, nativity and age of migration remain significant for mid-life and late-life migrants. Mid-life migrants are 22% less likely and late-life migrants are 27% less likely to report any ADL disability relative to U.S.-born men. In sum, the healthy immigrant effect on any ADL disability is evident only among mid-life and late-life migrant men. No health selectivity is observed among early-life migrant men relative to U.S.-born men.

IADL Disability

The results in Model 1 show the association between nativity, age of migration and IADL disability. Among Table 2 women, early-life, mid-life, and late-life migrants are more likely to report any IADL disability compared to U.S.-born women (12, 11, and 23%, respectively). Older age is also associated with an increased risk. Including years of education in Models 2 attenuates the relationship between age of migration and any IADL disability, however late-life migrant women continue to be at a significant disadvantage relative to U.S.-born women. Higher educational attainment is associated with decreased risk of any IADL disability. Morbidities are added in Model 3 and late-life migrant women continue to be significantly more likely to report an IADL compared to their U.S.-born co-ethnics. Having reported a heart attack, stroke, hypertension, arthritis, or diabetes increased the risk of any IADL disability between 9 and 23%. As with ADLs, there was no association between reporting cancer and any IADL disability among women. In the fully adjusted model, late-life migrant women continue to exhibit and increased risk of any IADL disability relative to U.S.-born women, independent of socioeconomic and health characteristics. However, results indicate smoking, drinking, and obesity were not associated with any IADL disability among older Mexican-American women.

Among males Table 3, nativity and age of migration are not associated with any IADL disability. However, increasing age and fewer years of education are associated with an increased risk of IADL disability (Models 1 and 2). Furthermore, Models 3 and 4, show men who reported a heart attack, stroke, cancer, arthritis, or diabetes had 15–36% higher risk of having any IADL disability. Conversely, drinking, smoking, and being obese were not

significantly related to having any IADL disability. Our results indicate there is no healthy immigrant effect among foreign-born males by age of migration for any IADL disability.

Discussion

We propose that mechanisms throughout the life course shape the disability status of older Mexican-Americans, namely, nativity, gender, and timing of migration. This analysis contributes to ongoing discussions related to the heterogeneity in types of disability risk within the older Mexican-origin population in the United States. We contribute to the literature on the healthy immigrant effect by documenting how gender and age of migration interact to impact late-life ADL and IADL disability. First, we find that the healthy immigrant hypothesis is only observable among mid- and late-life migrant men for ADL disability. This supports prior research that the healthy immigrant hypothesis is more reflective of the life course processes for men rather than for women (Melvin et al. 2014; Angel et al. 2014; Garcia et al. 2015; Nam et al. 2016; Sheftel 2017; Garcia and Reyes 2018).

This ADL advantage of mid- and late-life migrant men likely reflects life course patterns in motivations for migration and the historical context of immigration. Individuals in the three foreign-born categories migrated to the United States at different historical eras (see Table 4). Most of the mid-life migrants moved to the United States during the Bracero period, a time when there were ample economic opportunities for immigrants and a politically receptive climate. Mid-life men migrate for occupation purposes, which require a certain level of health and positive outlook, making this segment

Table 4. Summary characteristics age of migration groups and historical eras

	ERA				
	Enganche 1900–1929	*Deportations 1929–1941*	*Bracero 1942–1964*	*Undocumented migration 1965–1985*	*The great divide 1986–2000*
Panel A: females					
Immigrated at 0–19	57.7	32.2	10.1	–	–
Immigrated at 20–49	0.9	5.3	69.9	23.9	–
Immigrated at 50+	–	–	3.8	67.6	28.6
Panel B: males					
Immigrated at 0–19	56.9	27.2	15.9	–	–
Immigrated at 20–49	0.5	2.5	82.0	15.0	–
Immigrated at 50+	–	–	3.0	73.7	23.3

Source H-EPESE Waves 1–8 (1993–2013)

of the older Mexican-American population the most health selected (Jasso et al. 2004; Angel et al. 2010; Gubernskaya et al. 2013).

For late-life migrant men, the majority migrated during the Era of Undocumented Migration and The Great Divide, a period that saw the enactment of the Immigration Reform and Control Act (IRCA) in 1986 which granted amnesty to many foreign-born Mexicans who could prove that they had been in the United States on a continuous basis for at least five years. However, a sizeable proportion of late-life migrant men and women immigrated to the United States between 1996 and 2000. These older migrants may have also been pursuing better occupational opportunities as this was a time of economic expansion as well as welfare and immigration reform that made it more difficult for immigrants already in the United States to utilize social services (Espenshade et al. 1998). Given the difficulty in the migration period, those healthy enough at age 50 for migration may also be selected on several aspects of physical and mental health.

Whereas early-life migrant men and women generally arrived in the United States between the Mexican Revolution and the Great Depression during the eras of Enganche and Deportations. However, these early-life migrants were mostly children traveling with parents and were able to assimilate and adapt potentially negative health behaviors. Given this long period of assimilation and minimal health selection for the children of immigrants it is not surprising that early-life migrants have similar levels of ADLs and IADLs as their U.S.-born co-ethnics.

Similar to previous studies, we also find that the healthy immigrant effect is not observed for disability among older Mexican-American women (Hayward et al. 2014; Melvin et al. 2014; Angel et al. 2014; Garcia et al. 2015; Garcia and Reyes 2018). In fact, the results point to an IADL *disadvantage* for foreign-born women in later-life, particularly for those who arrived in the United States after the age of 50. The reasons for this finding may also be based on motivations for migration. Since women are more likely to migrate to the United States for family reunification purposes (Markides et al. 2007; Angel et al. 2010; Treas 2015), late-life immigrant women migrating to join their children may not need the same level of physical health required among those migrating without family reunification.

In addition, older foreign-born women may be migrating due to poor health. Outmigration selectivity, also known as the "salmon bias effect," posits that foreign-born Mexicans who have become ill or are in poor health to return to their country of origin, particularly at older ages (Palloni and Arias 2004; Markides and Eschbach 2005; Turra and Elo 2008; Riosmena et al. 2013). However, our findings may reflect that late-life migrant women may move to be with adult children or family caregivers in the United States especially those with initial limited functional ability such as being able to

shop for groceries or using the telephone which tends to exhibit itself earlier in the disablement process.

Timing of migration is associated with how space (living in Mexico vs. the United States) and time (both historical and biological) shape the lives of migrants across several dimensions including employment, health care access and quality, health behaviors, and immigrant receptivity. Late life migrants spend more years in Mexico exposed to worse health care but with potentially better access than immigrants in the U.S. depending on their migration status. More years spent living in Mexico is also associated with better dietary practices, less smoking, and less exposure to discrimination. While being a migrant in the United States may improve many aspects of living conditions, it also brings stress from ethnic discrimination and sometimes precarious legal status. Additionally, many migrants work in very physically demanding jobs and hazardous work conditions. These examples demonstrate a few of the many ways in which space and place are important for understanding health disparities, especially among older immigrants.

In the present analysis, we use age at migration, to get at one aspect of these dimensions of how space and time relate to disabilities among older Mexican-Americans. Unfortunately, we are unable to examine directly how period of migration is associated with disability due to data limitations. However, as demonstrated in Table 4, there is significant overlap between historical era of migration and age at migration for our sample. Therefore, we argue that age of migration can proxy for some aspects of historical era for this group of migrants.

Our results clearly indicate that a better understanding of the work histories of the elderly is necessary, so that disability status can be contextualized. For example, if a Mexican male arrived in the United States under the Bracero Program it is fairly safe to assume that he was exposed to pesticides and other agents that can have both short and long-term health effects. In addition, this type of work requires taxing physical assertion that may be related to their disabilities in later life. However, at what point in the life course does an "epidemiological crossover" take place since birthplace, age of immigration, and time in the United States (as individual factors or in combination) no longer serve as protective factors for those of Mexican-origin? This is an important question that is particularly paramount now more than ever with the recently established Affordable Care Act, current anti-immigrant sentiments, and the economic insecurities that are all part of the national discourse.

The current study represents an important contribution to knowledge of the complex relationship between nativity, immigration and gender for aging Mexican-origin individuals. With a rapidly changing demographic profile that includes a large number of aging Mexican-origin immigrants, the

policy implications of these results cannot be overstated, especially in light of the heavy burden of large and persistent health inequalities across U.S.-born and foreign-born Mexican-American sub-groups. The findings here detail the needs for culturally-competent tailored intervention efforts for disability and caregiver support to focus specifically on supporting families and communities who are providing disability-related assistance for late life migrant women and U.S.-born Mexican males.

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