Research Article

Gender-Based Pathways to Cognitive Aging in the Mexican-Origin Population in the United States: The Significance of Work and Family

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Abstract

Objectives: This study uses the life course perspective to explore the role of key midlife factors (occupation and number of children) for gender- and nativity-based pathways to cognitive aging for older Mexican Americans.

Method: Using the Hispanic Established Populations for the Epidemiologic Study of the Elderly (H-EPESE, 1993/1994–2016, $n = 2,779$), this study presents (a) cognitive impairment trajectories over 20 years of data and (b) multinomial logistic regression analyses of trajectory group membership by lifetime occupation and number of children, controlling for educational attainment.

Results: For older Mexican American men, lifetime employment in agricultural occupations is associated with elevated risk for late-life cognitive impairment. Delayed risk for impairment is observed for U.S.-born men who were employed in factory work (e.g., production and repair) and in Mexican-born men who were employed in occupations with skilled or supervisory requirements. For all women, labor force participation, especially in skilled occupations, is related to a delayed risk of cognitive impairment. Number of children is unrelated to impairment for men; however, women with five or more children (compared to women with two to four children) are at risk for consistent and rapid cognitive impairment in late life.

Discussion: Late-life cognitive health disparities that disproportionately impact the Mexican American population can be addressed by improving access to educational and occupational opportunities in early and midlife. This study points to key areas of intervention within work and the home for the Mexican-origin population.

Keywords: Dementia, Latinos, Life course

The older adult population is becoming more diverse, with growth of Latinos aged 65 and older expected to double between 2020 and 2050 from 8.8% to 18.6% (U.S. Census Bureau, 2017). While Latino older adults tend to outlive non-Latino Whites by several years, many of these additional years are characterized by poor health, functional limitations, and cognitive impairment (Angel et al., 2015). For example, older Latinos are at

1.5 times greater risk for Alzheimer's disease and other forms of dementia in late life than non-Latino Whites and on average display symptoms of cognitive impairment 7 years earlier (Wu et al., 2016). These disparities in cognitive impairment and dementia have been attributed to genetic, behavioral, and socioeconomic factors, with most evidence pointing to the importance of socioeconomic factors.

The Mexican-origin population represents about 65% of the Latino population in the United States (Malavé & Giordani, 2015) and is at high risk for cognitive impairment, dementia, and dementia-related neuropsychiatric symptoms (Downer et al., 2018; Rote et al., 2015). Mexican American women and immigrant older adults may be at especially high risk for cognitive impairment in late life (Garcia et al., 2018a, 2018b) due to social and economic inequalities that disproportionately affect these groups. Socioeconomic status (SES) and educational attainment are key factors that influence cognitive health across and within racial/ethnic groups and have been shown to explain part of the gender and nativity disparities in cognitive impairment among older Latinos (Díaz-Venegas et al., 2018; Garcia et al., 2018b; Langa et al., 2017; Weden et al., 2017). There is also evidence that socioeconomic disadvantage cumulates over the life course to increase risk of dementia and cognitive impairment in older Mexican Americans (Zeki Al Hazzouri et al., 2011).

The current study draws from a life course perspective to identify the role of midlife factors, specifically occupation and number of children, which may bridge earlier educational attainment to late-life cognitive impairment. We utilize data on a long-term cohort study of Mexican Americans aged 65 and older (Hispanic Established Populations for the Epidemiologic Study of the Elderly [H-EPESE], 1993/94–2016; $N = 2,779$). The study contributes to the literature by (a) using trajectory analyses to describe long-term patterns of stability and change in cognitive impairment and (b) describing the role of occupation and number of children for cognitive health over and above educational attainment. The study pays attention to gender and nativity differences given the role of gender inequality and migration in shaping occupational attainment and family formation.

Cognitive Health in Older Mexican Americans: Gender and Nativity Differences

The Hispanic health paradox of extended longevity—wherein Latino older adults outlive non-Latino Whites by about 2 years—is not a propitious indicator of general health (Markides & Rote, 2019). Older Latinos, and specifically older Mexican Americans, spend more years in late life with cognitive impairment (Garcia et al., 2018a, 2018b). Protracted physical and cognitive disability can be attributed to cumulative disadvantage processes. That is, differential exposure to risk factors, such as socioeconomic strain throughout the life course, can contribute to downstream factors (such as health behaviors and chronic conditions) as well as the onset and chronicity of cognitive impairment. There is evidence that indicators of SES—especially individual educational attainment—partially explain the elevated risk for cognitive impairment for older Latinos (Garcia et al., 2018b; Weden et al., 2017).

There is also evidence of disparities in cognitive impairment *within* the Mexican-origin population. One of the most well-established patterns—which is observed in the older population in general—is that women are at greater risk for cognitive impairment and, due to extend longevity, spend more years in late life with cognitive impairment than men (Garcia et al., 2018a; Garcia, Downer, et al., 2019; Hill et al., 2012b; Howrey et al., 2015, 2020). These gender disparities have been attributed to stress exposure throughout the life course, differences in biological function (hormones and epigenetics), and less opportunity for educational attainment, with recent evidence highlighting the importance of gender differences in social roles and occupational opportunities (Andrew & Tierney, 2018). While individual educational attainment partially explains gender differences in impairment within older Latino and Mexican-origin populations (Garcia et al., 2018b), less opportunity for educational pursuits in early life likely influences occupational attainment and family formation in midlife, contributing to gender differences in cognitive impairment in late life.

Migration-related factors also shape cognitive aging in the Mexican origin population. The Hispanic health paradox is attributed to the especially extended longevity of immigrant older Mexican Americans. Immigrant older Mexican Americans are believed to live longer than their U.S.-born counterparts due to migration selection of healthy people, strong families and social networks, and health-promoting behaviors (Markides & Rote, 2019; Reyes & Garcia, 2019). However, for other indicators of health, such as functional limitations and chronic conditions, there is strong evidence of an immigrant health convergence, in that the health advantage of immigrants upon arrival in the United States declines to at or below native levels over 10–20 years (Markides & Rote, 2019). This is attributed to cumulative exposure to stress and discrimination, adoption of health compromising behaviors, as well as substandard medical care and concentration in physically demanding jobs (Rote & Markides, 2015). In late life, both immigrant and U.S.-born Latinos are at greater risk for dementia and cognitive impairment than non-Latino Whites, and educational attainment explains a portion of the elevated risk for older immigrant Latinos (Garcia et al., 2018b; Garcia, Downer, et al., 2019; Weden et al., 2017).

Gender and immigrant status also combine in unique ways to influence cognitive health. Mexican-born immigrants spend more years in late life with cognitive impairment than their U.S.-born counterparts (Garcia et al., 2018a). Others document a slight cognitive health advantage for immigrant men over time, especially those who migrated in midlife (Hill et al., 2012a, 2012b; Garcia et al., 2018a). This persistent advantage may be attributed to immigrant men being the most health selected, in that they tend to migrate for occupational purposes. Additionally, migrating during a time in the life course that is characterized by independence may require additional cognitive

demands for linguistic and social adaptation (Hill et al., 2012b). Immigrant women in this cohort, who tended to migrate with their husbands or for family reunification purposes, may be less health selected and the immigrant health advantage is less pronounced (Garcia, Downer, et al., 2019). Research on the immigrant health advantage in the Mexican-origin population has yet to examine the role of occupational type for long-term patterns in cognitive health.

Lifetime Occupation and Cognitive Health in Older Mexican Americans

Most research on SES and cognitive health draws from the cognitive reserve hypothesis, which focuses on resiliency in cognitive function (Stern, 2012). Education and occupational attainment, it is proposed, result in a cognitive reserve that protects against the development of dementia. Specifically, cognitively and mentally stimulating environments help individuals build cognitive reserve through developing cognitive capacity and compensation (Fisher et al., 2017; Stern, 2012). While occupation and education can delay cognitive impairment and the effects of pathology on cognitive performance, when memory does become impaired, the rate of decline is more rapid for those with more cognitive reserve (Stern, 2012). Therefore, research on SES and cognitive impairment should take into consideration growth and decline processes in cognitive function over time.

Studies of older adults in general tend to find that workforce participation is related to better cognitive health, with persons in occupations with greater cognitive complexity performing better on cognitive tests (Liu et al., 2019). There is also evidence that lower levels of cognitive abilities in early life can be altered and improved with cognitively challenging work in adulthood (Grzywacz et al., 2016). In terms of specific occupation and industry type, a recent meta-analysis by Liu and colleagues (2019) found that older adults who were previously agricultural workers or full-time homemakers had an increased risk for dementia in comparison to those with higher occupational prestige scores.

For the older Mexican American population, gender and migration history combine to influence opportunities for occupational attainment. Many older Mexican-born men migrated to the United States for employment opportunities in physically demanding jobs in agriculture, construction, and the service sector (Angel et al., 2010; Garcia, Downer, et al., 2019). Part of the immigrant health convergence may be attributed to occupational factors, especially for immigrant men employed within the agricultural sector, which has fewer benefits, less autonomy, and lower compensation than in professional occupations that require advanced training (Angel et al., 2009; Rote & Markides, 2015). Agricultural work may be linked to cognitive impairment through exposure to workplace hazards, the repetitive nature of the work, lack of control and autonomy,

and wear and tear on the body which affects mobility (Fisher et al., 2017; Grzywacz et al., 2016). Since older Mexican American men spend more years in the formal labor force, while women tend to have varied patterns based on family formation, number of children is a factor that is likely closely linked to women's health.

Family Size and Cognitive Health in Older Mexican Americans

Data on older adults throughout Europe, in England specifically, and in Mexico show a curvilinear relationship between number of children and cognitive function (Bordone & Weber, 2012; Read & Grundy, 2016; Saenz et al., 2019). With European older adults, risk for impairment is greatest at low parity (no children to one child) and high parity (three or more children). Since the cognitive benefits of having two children (rather than one or no children) are observed for both men and women, Bordone and Weber (2012) attribute the benefits of having two children to social and psychological factors such as increased social support, feelings of usefulness, and time spent with family. In the United States, the older Mexican-origin population has high rates of fertility. Given the cultural importance of family relationships, having more children may provide the basis for social support and engagement for older Mexican Americans and delay risk for cognitive impairment.

There is also evidence of elevated risk for dementia at high parity (six or more children for older adults living in Mexico) (Saenz et al., 2019). Having many children may leave parents with less time for educational and occupational pursuits, limit retirement savings, and increase stress exposure. Traditional gender roles may encourage women to focus on family more than occupational goals, especially older women born in Mexico (Gorman et al., 2010). Previous research has found that family factors, including family dynamics and marital status, have a greater influence on cognitive impairment for Mexican American immigrant women than other groups (Monserud, 2019). Therefore, there are likely gender and nativity/immigrant status differences in the impact of number of children. The current study draws from the above reviewed literature to test the hypotheses below.

Hypotheses

1. Lifetime occupation will be related to cognitive function, with employment in agricultural occupations related to elevated risk of cognitive impairment, especially for immigrant Mexican American men.
2. Number of children will have a curvilinear relationship with cognitive impairment, with older adults with no children to one child and five or more children exhibiting the greatest risk for impairment over time, especially for immigrant Mexican American women.

Method

Data

The H-EPESE is a study of Mexican Americans aged 65 years and older residing in the southwestern United States (Texas, New Mexico, Colorado, Arizona, and California). In 1993/1994, 3,050 respondents were interviewed in their homes in English or Spanish. Follow-up interviews were conducted every 2 years (Black et al., 1998). We use data from this original cohort and nine waves spanning over 20 years of data (1993/1994 to 2016). The analytic sample includes respondents with complete data on baseline variables ($N = 2,779$), with most responses missing on cognition ($n_{\text{missing}} = 172$) and educational attainment ($n_{\text{missing}} = 48$).

Measures

Cognitive impairment is measured each wave using the Mini-Mental State Examination (MMSE), which is a brief, standardized method used to grade cognitive status (Folstein et al., 1975; Nguyen et al., 2003). Respondents completed the MMSE in English or Spanish and both languages draw from the Diagnostic Interview Scale. The Spanish version included formal translation, back-translation, and agreement on final content (Black et al., 1999; Hill et al., 2012b). Prior research finds that overall scores on the English and Spanish language versions of the MMSE are similar (Morales et al., 2006). In Wave 3, if a respondent did not complete the MMSE and relied on a proxy due to being mentally or cognitively incapacitated by Alzheimer's disease or dementia, they were assigned a "0" on the MMSE. For consistency across waves, if the respondent was missing a score on the MMSE and used a proxy for this reason, they were assigned a "0" (Sheffield & Peek, 2009). The final coding compares older adults with cognitive impairment (score of 0–23) to those without (24 or higher) (Tombaugh & McIntyre, 1992).

Regarding *Occupation*, In Wave 1, respondents were asked: "In what kind of business or industry did you work for most of your working life?" "Did you have a particular job title?" "What were your most important activities or duties?" and "Have you never worked?" Responses to these questions were used to determine 1990 Census industry and occupational codes (U.S. Census Bureau, 2019). Given the significant gender differences in occupation, coding was different for men and women. Most women reported they were never employed (30%). This was followed by women who were employed in the service industry (21%), those who identified as homemakers (17%), and women employed in agricultural occupations (10%). The remaining were collapsed into an "other occupation" category, which included the following occupational and industry codes: operators (9%); tech and sales (6%); management and professional (2%); precision production, craft, and repair (2%); and transportation (2%). Only 26 men were not employed in the formal labor force, with the

largest portion reporting they were disabled, and these respondents were removed from the current analysis due to lack of power in multivariate analyses. The most common lifetime occupational industries for men include agriculture (32%), transportation (21%), precision production, craft, and repair (21%), and service (8%). The "other occupation" category included: managerial/professional (3%), operators (7%), technical and sales (7%), and military (<1%). Most respondents were retired at Wave 1 with a small fraction (3%) employed full- or part-time.

Number of children is based on the number of daughters and sons at Wave 1 and is recoded into categories of no children to one child, two to four children (reference category), and five or more children. Five or more children is considered high parity since it represents the top quarter of the unweighted distribution.

Gender, years of *Education*, and *Nativity status* are self-reported.

Analytic Strategy

First, we use latent class growth analysis in STATA15 to identify multiple subpopulations of longitudinal change in cognitive impairment (Nagin, 2005; Nagin & Odgers, 2010). Since this is a longitudinal cohort of older adults spanning 20 years, our final analytic sample lost 83% of respondents due to mortality (family-reported and verified through the National Death Index). Our approach uses maximum likelihood estimation and produces unbiased parameter estimates for data missing at random (Haviland et al., 2011). However, trajectory group membership may be biased due to attrition. To overcome this limitation, we utilize an extension of trajectory modeling that accounts for nonrandom attrition that varies across trajectory groups (Haviland et al., 2011); therefore, trajectory-specific attrition rates are calculated and adjusted to trajectory group membership probabilities. Second, multinomial logistic regression analyses are presented to determine the association between both occupation and number of children for cognitive impairment trajectory group membership. These results are presented for separately for men and women and by nativity status, controlling for educational attainment.

Results

Trajectory Modeling

To determine the appropriate number of cognitive functioning trajectories, we fit five consecutive logit models using the TRAJ command in STATA15 (Jones & Nagin, 2013). Comparisons of sample size for trajectory group and BIC estimates comparing the two-class ($BIC = -6832.78$), three-class ($BIC = -6775.98$), and four-class models ($BIC = -6783.55$) indicate that the three-class model is the optimal fit for the data, with posterior probabilities across the three groups at 0.77, 0.69, and 0.74. The model

presented in Figure 1 shows the estimated trajectories (two linear and one quadratic) of cognitive impairment throughout the waves. The first trajectory group with cognitive impairment throughout the waves includes 32% of the sample. The second trajectory group with rapid onset of cognitive impairment includes 43% of the sample. The third trajectory group with delayed risk for impairment includes 24% of the sample.

The actual attrition rates for the groups over the course of the study are 86% for the impairment group, 83% for the rapid onset group, and 78% for the delayed impairment group; therefore, attrition due to mortality is more common for the impaired and rapid onset groups. We also include diabetes and cardiovascular disease as a time-varying covariate in our estimation of trajectory groups, and diabetes was the only significant risk factor; therefore, it was retained in the final modeling of cognitive impairment trajectories.

Bivariate Results

Table 1 describes the sample of older Mexican American women and men by nativity status. First, throughout the study waves, a larger portion of immigrant women are in the cognitively impaired group than U.S.-born women ($\chi^2 (2, n = 1,642) = 10.47, p < .05$). Ancillary analyses show that at Wave 1, the mean MMSE scores for U.S.-born women was 25.10 and for immigrant women was 24.07. Additionally, while over half of older Mexican American women were not employed in the paid, formal labor force, a larger portion of U.S.-born women identified as homemakers and were employed in the “other occupations” category ($\chi^2 (4, n = 1,642) = 30.50, p = .001$). There are no significant differences in number of children by nativity/immigrant status, and over a third of all older Mexican American women in the sample have two to four children. Educational attainment and age vary significantly by nativity status, with immigrant women reporting about a year and a half less formal education ($t(1,640) = -7.74, p < .001$) and being a year and a half younger on average than U.S.-born women ($t(1,640) = 4.84, p < .001$). Also,

significantly more immigrant women report financial strain in late life than their U.S.-born counterparts ($\chi^2 (1, n = 1,575) = 10.01, p < .01$).

Next, we describe the sample of older Mexican American men by nativity status. Contrary to the results for women, there are no significant nativity differences in risk of cognitive impairment trajectory group membership for men. Ancillary analyses show that at Wave 1, the mean MMSE score for U.S.-born men is 25.31 and for immigrant men, it is 24.36. As expected, a large portion of older immigrant men were employed in the agricultural occupations for most of their lives, and more U.S.-born men were employed in transportation occupations and precision production, craft, and repair occupations ($\chi^2 (4, n = 1,137) = 43.30, p < .001$). There are also significant nativity differences in number of children, with almost half of all immigrant Mexican American men reporting five or more children and more U.S.-born men reporting two to four children ($\chi^2 (2, n = 1,137) = 20.19, p < .001$). Immigrant Mexican American men report having 2 years less formal education ($t(1,137) = 9.49, p < .001$) and being more than a year and a half younger on average than their U.S.-born counterparts ($t(1,137) = 4.25, p < .001$). Similar to the results for women, more immigrant men report financial strain in late life than their U.S.-born counterparts ($\chi^2 (1, n = 1,130) = 37.95, p < .001$).

Multivariate Results

Next, we present results of multinomial regression results for women and men, separately controlling for education. For women, when education is included in the model, there are no longer significant nativity differences in cognitive impairment. However, even when controlling for education, occupation and number of children are significantly related to risk of cognitive impairment. Specifically, women who were employed in the service industry for most of their lives have a 40% lower relative risk of cognitive impairment throughout late life (vs delayed impairment) than women who were unemployed most of their lives. Also, women who were employed in “other occupations” (operators, tech and sales, management and professional, precision production, craft, and repair, and transportation) have a 67% lower relative risk of cognitive impairment throughout late life (vs delayed impairment) than women who were unemployed. The predicted probabilities of trajectory group membership based on these results are presented in Supplementary Figure 1.

Results also show that there is an increased risk for cognitive impairment at higher parity. In comparison to older Mexican American women with two to four children, women with five or more children have 1.46 times greater relative risk of rapidly increasing impairment and 1.81 times greater relative risk of impairment throughout late life (vs delayed impairment). It is also important to note that women with no children or one child do not

Figure 1. Cognitive impairment trajectories (H-EPESE).

Table 1. Sample Description by Gender and Nativity Status

	Women		Men	
	United States-born	Mexican-born	United States-born	Mexican-born
Cognitive impairment (%)				
Delayed onset	27	20*	26	23
Rapid onset	43	45	44	40
Impaired	30	34	30	37
Occupation (%)				
Unemployed	28	31**	—	—***
Homemaker	23	18	—	—
Agriculture	14	22	24	41
Service	11	10	7	8
Transportation	—	—	26	17
Precision production, craft, and repair	—	—	24	17
Other occupations	24	19	19	17
Number of children (%)				
0–1 child	17	18	14	12***
2–4 children	35	35	40	29
≥5 children	48	46	46	59
Education ^a	5.37	3.94***	5.99	3.79***
	(3.87)	(3.37)	(4.29)	(3.30)
Age ^a	72.64	74.23***	72.58	74.64***
	(5.95)	(7.34)	(5.90)	(7.02)
Financial strain ^b (%)	57	65	50	68***
N	931	711	632	505

Notes: H-EPESE estimates based on sample weights.

^aMean (SD). ^bDifficulty paying monthly bills a great deal or some of the time ($n = 2,707$).

* $p < .05$. ** $p < .01$. *** $p < .001$.

significantly vary from women with two to four children in cognitive impairment. In separate analyses (not shown), we include interactions of occupation by family size as well as nativity status by both occupation and number of children. However, the relative risk ratios for these interactions are also not statistically significant.

In the next step of the analyses, we partition the sample by immigrant status. For U.S.-born women, we find similar results as the full sample. For Mexican-born women, however, the relative risk ratio for service jobs is not statistically significant. Therefore, we find that only women who were employed in “other occupations” have a significantly lower relative risk for cognitive impairment in late life in comparison to women who were unemployed. Similar to the results for the full sample and for U.S.-born women, immigrant Mexican American women with five or more children are at greater risk for impairment in late life (vs delayed impairment) than immigrant women with two to four children (Table 2).

The predicted probabilities of trajectory group membership based on these results are presented in [Supplementary Figure 2](#). As shown in the figure and in [Table 3](#), men who were employed in agricultural occupations for most of their lives have the greatest probability for impairment throughout late life, followed by men who were employed in the service, transportation, precision production, craft,

and repair, and “other” occupations. Unlike the results for women and previous studies on the topic, number of children is unrelated to cognitive impairment for older Mexican American men. In separate analyses, we include interactions of lifetime occupation with family size and lifetime occupation with number of children by nativity status, and none of the interaction terms are statistically significant (not shown).

When the sample is partitioned by immigrant status, we find that different occupations are related to risk of impairment for U.S.-born and immigrant men. Only U.S.-born men who were employed in occupations in precision and production, craft, and repair for most of their lives have both a lower relative risk of rapid impairment and consistent impairment in late life (vs delayed impairment) than men in agricultural occupations. Similarly, only immigrant men employed in “other occupations,” such as managerial and professional, operations, technical and sales, and military, have a significantly lower relative risk of impairment throughout the study (vs delayed impairment).

Ancillary Analyses

To check the robustness of the findings, ancillary analyses using a lower MMSE scores (<21), which has been utilized by previous researchers given the low formal educational

Table 2. Multinomial Logistic Regressions of Cognitive Impairment Trajectory Group for Women

	All women		United States-born		Mexican-born	
	vs Delayed onset		vs Delayed onset		vs Delayed onset	
	Rapid onset	Impaired	Rapid onset	Impaired	Rapid onset	Impaired
Occupation ^a						
Service industry	0.85 (0.59–1.24)	0.60* (0.40–0.91)	0.82 (0.50–1.33)	0.57* (0.33–0.98)	0.93 (0.51–1.68)	0.64 (0.33–1.24)
Homemaker	1.30 (0.85–1.97)	0.89 (0.56–1.41)	1.37 (0.76–2.48)	0.82 (0.42–1.61)	1.29 (0.71–2.34)	0.96 (0.50–1.81)
Agriculture	0.79 (0.47–1.32)	0.95 (0.56–1.61)	0.70 (0.36–1.35)	0.88 (0.44–1.74)	0.99 (0.43–2.27)	1.08 (0.46–2.51)
Other occupations	0.73 (0.51–1.04)	0.33*** (0.21–0.51)	0.75 (0.47–1.22)	0.34*** (0.19–0.62)	0.71 (0.41–1.23)	0.31*** (0.15–0.60)
Number of children ^b						
0–1 child	1.01 (0.73–1.38)	1.14 (0.77–1.42)	1.21 (0.79–1.85)	1.28 (0.77–2.13)	0.80 (0.49–1.28)	0.98 (0.57–1.69)
≥5 children	1.46* (1.08–1.98)	1.81*** (1.28–2.58)	1.52* (1.03–2.24)	1.74* (1.09–2.76)	1.40 (0.85–2.29)	1.93* (1.11–3.34)
United States-born	0.98 (0.75–1.28)	1.05 (0.77–1.42)				
Education	0.88*** (0.85–0.91)	0.70*** (0.66–0.73)	0.86*** (0.82–0.90)	0.70*** (0.66–0.74)	0.91*** (0.86–0.96)	0.70*** (0.64–0.76)
Constant	3.89*** (2.67–5.66)	7.15*** (4.71–10.84)	4.10*** (2.51–6.70)	7.92*** (4.60–13.63)	3.51*** (2.04–6.04)	6.76*** (3.72–12.27)
LR χ^2	404.89***		253.55***		148.37***	
Pseudo- R^2	0.12		0.13		0.10	
N	1,642	1,642	931	931	711	711

Notes: H-EPESE; relative risk ratios presented.

^aReference group = unemployed. ^bReference group 2–4 children.

* $p < .05$. *** $p < .001$.

attainment of the sample (Garcia et al., 2018a), are presented. A similar number and pattern of trajectories are identified: delayed impairment (37%), rapid onset (44%), and impaired (19%). The results from multinomial regression analyses separated by gender and nativity indicate a similar pattern of findings for men (Supplementary Tables 1 and 2). For women, there are notable differences. First, U.S.-born women who were employed in the service industry no longer significantly differ from unemployed women on risk for impairment. Additionally, U.S.-born women who were employed in agricultural occupations and Mexican-born women who identified as homemakers are at greater risk for arriving in late life with impairment compared to their unemployed counterparts. While higher parity was still associated with greater risk for impairment, there was also evidence that Mexican-born women with no children to one child had lower risk for late-life impairment than women with two to four children.

Discussion

Our study supports previous literature which indicates improving educational and occupational opportunities

earlier in the life course can decrease cognitive impairment inequities that disproportionately affect the Mexican-origin population (Vega et al., 2017, 2018; Wu et al., 2019). By identifying cognitive impairment trajectories, the current study highlights the unique impact of work and family for both arriving in late life with impairment and experiencing rapid impairment during late life. Finally, stratifying models by gender and nativity/immigrant status and comparing results across two specifications of cognitive impairment (MMSE <24 and <21) (Garcia et al., 2018a), strengthens the conclusions drawn from the study.

First, Mexican American women who were employed in operations, managerial and professional, tech and sales, precision production, craft, and repair, and transportation occupations have the lowest risk for late-life cognitive impairment. These types of occupations are characterized by high levels of autonomy and complexity (Hughes & Ganguli, 2009). Among this cohort, where educational and occupational opportunities were limited for women, older Mexican American women who were able to obtain and remain within these occupations may be especially resilient. Also, women employed in these occupations tend to report low financial strain in late life. Therefore, cumulative

Table 3. Multinomial Logistic Regressions of Cognitive Impairment Trajectory Group for Men

	All men		United States-born		Mexican-born	
	vs Delayed onset		vs Delayed onset		vs Delayed onset	
	Rapid onset	Impaired	Rapid onset	Impaired	Rapid onset	Impaired
Occupation ^a						
Transportation	0.80 (0.50–1.28)	0.57* (0.34–0.94)	0.78 (0.40–1.52)	0.54 (0.26–1.10)	0.69 (0.34–1.42)	0.55 (0.26–1.14)
P.P., craft, and repair	0.64 (0.40–1.02)	0.42*** (0.25–0.69)	0.51* (0.27–0.99)	0.37** (0.18–0.76)	0.82 (0.41–1.65)	0.50 (0.24–1.06)
Service industry	0.55 (0.29–1.04)	0.50* (0.23–0.69)	0.46 (0.18–1.17)	0.50 (0.18–1.36)	0.62 (0.25–1.51)	0.47 (0.19–1.19)
Other occupations	0.64 (0.39–1.04)	0.39** (0.22–0.69)	0.57 (0.28–1.15)	0.56 (0.25–1.27)	0.69 (0.35–1.37)	0.26** (0.12–0.58)
Number of children ^b						
0–1 child	1.13 (0.74–1.72)	1.22 (0.76–1.94)	1.29 (0.73–2.30)	1.83 (0.96–3.50)	0.97 (0.51–1.84)	0.77 (0.39–1.54)
≥5 children	1.06 (0.75–1.50)	0.97 (0.65–1.44)	1.01 (0.65–1.58)	1.10 (0.65–1.88)	1.11 (0.64–1.93)	0.81 (0.45–1.48)
United States-born	1.28 (0.93–1.78)	1.39 (0.97–2.00)				
Education	0.90*** (0.86–0.94)	0.76*** (0.72–0.80)	0.90*** (0.85–0.94)	0.74*** (0.69–0.79)	0.91** (0.85–0.98)	0.78*** (0.71–0.85)
Constant	3.70*** (2.33–5.88)	7.14*** (4.36–11.71)	5.51*** (0.282–10.75)	10.03*** (4.89–20.59)	3.36*** (1.74–6.47)	7.90*** (3.98–15.67)
LR χ^2	212.07***		147.39***		70.87***	
Pseudo- R^2	0.09		0.11		0.07	
N	1,137		632		505	

Notes: H-EPESE; relative risk ratios presented.

^aReference group = agriculture. ^bReference group 2–4 children.

* $p < .05$. ** $p < .01$. *** $p < .001$.

advantage processes of high levels of education attainment, occupational prestige in midlife, and financial well-being in late life likely result in more cognitive reserve or capacity at advanced ages (Zeki Al Hazzouri et al., 2011).

Second, our findings support the hypothesis that older Mexican Americans who were employed in agricultural occupations experience the greatest risk for cognitive impairment in late life, regardless of educational attainment. Exposure to pesticides and hazards in the workplace, lack of control or autonomy, wear and tear on the body, low benefits and compensation, and cumulative disadvantage processes may account for this observed difference (Angel et al., 2009; Fisher et al., 2017; Grzywacz et al., 2016). Additionally, nativity/immigrant status also plays an important role in the relationship between occupation and cognitive impairment for men. U.S.-born men who were employed in occupations categorized as precision production, craft, and repair are more likely to be in the delayed cognitive impairment group in comparison to men who were employed in the agricultural sector. The most reported occupations within precision production, craft, and repair include construction, mechanics and repairs, construction supervisors, and food production. Compare to immigrant

men who were employed in precision production, craft, and repair, more U.S.-born men were employed in occupations with supervisory roles which allow for more autonomy and decision making and, therefore, can facilitate cognitive reserve.

Third, for older immigrant Mexican American men, lifetime employment in managerial/professional, operator, and technical and sales occupations is related to a lower risk of impairment throughout late life. A key life course factors that can shape cognitive aging is socio-historical period since policy can shape the composition of the migrant population and access to services that aid in successful aging (Mueller & Bartlett, 2017). Close to a third of immigrant men who were employed in these occupations entered as children during the Era of the Enganche (1900–1929), when legal immigrants from Mexico entered the United States to work on railroads, mining, and agriculture with the promise of high wages (Garcia, Reyes, & Rote, 2019). Their families entered the United States at a time with less hostility toward immigrants and less threat of deportation, stressors which can undermine educational advancement, cognition, and overall health. Future studies should examine how

historical period and immigrant social inclusion can aid in successful aging to offset dementia risk.

Supporting previous studies (e.g., Bordone & Weber, 2012; Read & Grundy, 2016; Saenz et al., 2019), we find that high parity is related to greater risk for cognitive impairment. In contrast to previous research, we found that this relationship is limited to older women. Elevated risk of impairment for Mexican American women with five or more children can be attributed to gender inequality, attachment to gender-based cultural norms that emphasize the importance of family more prominently for women, chronic stress due to the financial and emotional costs of caring for more children, and the physical results of short birth intervals between children. These factors have been shown to limit health-promoting behaviors such as exercise and increase risk of metabolic and vascular dysfunction and functional limitations (Aiken et al., 2012; Bordone & Weber, 2012), which can increase risk for cognitive impairment.

The most prominent risk factor for rapidly increasing late-life impairment for US-born women is high parity (five or more children). In general, U.S.-born Mexican American women tend to outlive their spouses and, therefore, rely heavily on their adult children for care and support and reside with more family members in late life (Rote et al., 2015). While living in extended households may facilitate more sources of support and opportunities for engagement with others, this is not always the case. Living in extended households may reduce engagement in memory tasks and limit cognitive function, particularly in terms of attention and recall (Bordone & Weber, 2012). Financial and interpersonal barriers can create tension, even when there are many potential caregivers within the family, especially for U.S.-born women whose children may be less subscribed to culturally based family norms (Rote et al., 2019). There is also certain evidence of a protective role of low parity for rapid late-life impairment for Mexican-born women when specifying the MMSE at a lower cut point (MMSE < 21). About one-third of immigrant women with low parity were employed in professional and technical occupations and future research should examine the role of life course SES and late-life family support structures for immigrant women with smaller families.

Certain limitations are worth mentioning. Our measure of occupation is limited to self-reported lifetime occupation. Variations in workforce participation and occupational type may impact impairment. Similarly, these occupation categories are self-reported and social constructions of personal identities. For example, there are significant differences in impairment between Mexican-born women who identify as unemployed for most of their lives and homemakers when with using the MMSE cut point of <21. Identifying as a homemaker may reflect attachment to cultural ideologies that emphasize traditional gender roles. More attention should be paid to the meaning associated with occupation and a more nuanced approach to measuring lifetime occupation and occupational complexity for older Mexican Americans.

Work within and outside of the family has implications for cognitive health, and our results highlight ways to intervene to reduce cognitive health disparities throughout the life course. Early in the life course, interventions that increase access to educational and occupational opportunities are especially important for reducing cognitive health disparities that disproportionately impact older Latinos. In midlife, increasing income benefits and health coverage for working families and decision making and autonomy in the workplace and home is especially necessary. In late life, Latino communities and families are being confronted with dementia while having the least access to resources used to help manage the illness. Better community-based long-term care services, such as adult day care centers, that complement cultural preferences, stimulate brain activity, and help preserve day-to-day functioning, are especially suited for Mexican American families (Bilbrey et al., 2018).

Supplementary Material

Supplementary data are available at *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences* online.

Supplementary Figure 1. Predicted probability of cognitive impairment trajectory for men (H-EPESE).

Supplementary Figure 2. Predicted probability of cognitive impairment trajectory for women (H-EPESE).

Supplementary Table 1. Ancillary analyses of multinomial logistic regression of cognitive impairment trajectory group for women (MMSE < 21).

Supplementary Table 2. Ancillary analyses of multinomial logistic regression of cognitive impairment trajectory group for men (MMSE < 21).

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Conflict of Interest

None declared.

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S. M. Rote planned the study, conducted the data analysis, and wrote the paper. J. L. Angel helped plan the study, contribute to interpretation of results, writing the paper, and revising the paper.

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