HHS Public Access

Author manuscript

J Aging Health. Author manuscript; available in PMC 2023 February 24.

Published in final edited form as:

J Aging Health. 2022 October ; 34(6-8): 951–960. doi:10.1177/08982643221083107.

Linguistic Adaptation and Cognitive Function in Older Chinese and Korean Immigrants in the United States: A Cross-Sectional Study

Yuri Jang, PhD[1], **Eun Young Choi, MA**[2], **Bei Wu, PhD**[3], **XinQi Dong, MD**[4], **Miyong T. Kim, PhD**[5]

[1]Edward R. Roybal Institute on Aging, Suzanne Dworak-Peck School of Social Work, University of Southern California, Los Angeles, CA, USA

[2]Leonard Davis School of Gerontology, University of Southern California, Los Angeles, CA, USA

[3]Rory Meyers College of Nursing, New York University, New York, NY, USA

[4]Institute for Health, Health Care Policy and Aging Research, Rutgers University, New Jersey, NJ, USA

[5]School of Nursing, University of Texas at Austin, Austin, TX, USA

Abstract

Objectives: To examine the cross-sectional association of linguistic adaptation with cognitive function, as well as its interactions with sociodemographic and health profiles in older Chinese and Korean immigrants in the U.S.

Methods: Using harmonized data ($N = 5063$) from the Population Study of Chinese Elderly (PINE) and the Study of Older Korean Americans (SOKA), we examined between- and within-group differences in the role of linguistic adaptation (English use in older Chinese Americans and English proficiency in older Korean Americans) in cognitive function.

Results: The positive association between linguistic adaptation and cognitive function was common in both groups. We also found that the relationship was pronounced among subgroups with the underlying linguistic and cognitive vulnerabilities (i.e., the very old, women, those with low education, and newly immigrated individuals).

Discussion: Findings show the importance of linguistic adaptation in older immigrants' cognitive health and suggest a need for targeted interventions for high-risk groups.

Keywords

english proficiency; linguistic adaptation; acculturation; cognitive function; older immigrants; asian americans

Corresponding Author: Yuri Jang, Edward R. Roybal Institute on Aging, Suzanne Dworak-Peck School of Social Work, University of Southern California, 669 West 34th Street, Los Angeles, CA 90089-0411, USA. yurij@usc.edu.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Introduction

From 1990 to 2018, the older foreign-born population in the U.S. almost tripled from 2.7 to 7.3 million (Mizoguchi et al., 2019). Currently, 14% of U.S. individuals aged 65 and older are foreign-born immigrants, and this proportion is projected to reach 23.3% by 2060 (Mizoguchi et al., 2019). Although 29% of these older immigrants are of Asian origin, attention to older Asian immigrants has been limited (Hanna & Batalova, 2021; Đoàn et al., 2019). The facts that a majority of older Asian Americans (60%–80%) have English language barriers and that these individuals speak over 100 distinctive languages (Hanna & Batalova, 2021; Mizoguchi et al., 2019; U.S. Census Bureau, 2019) suggest not only difficulties for reaching out to them with conventional English-only survey methods but also the many challenges imposed on them in various aspects of life. In the present study, given the central role of language, we examine the association between linguistic adaptation and cognitive function in older Chinese and Korean Americans by harmonizing data from two existing studies. It is important to note that Chinese and Koreans are major U.S. ethnic immigrant groups with a notably high rate of limited English proficiency (Hanna & Batalova, 2021). Chinese is the second and Korean is the seventh most common language spoken by the U.S. population with English-language barriers (Batalova & Zong, 2016).

The growth of the older immigrant population calls for attention to their brain aging and cognitive health within the unique context of immigration (Lamar et al., 2021). In the process of cultural, societal, and linguistic adaptation to a host country, acculturation is a key contextual factor for immigrants' health (Lopez-Class et al., 2011; Tan & Burgess, 2020; Thomson & Hoffman-Goetz, 2009). However, findings on the link between acculturation and cognitive health are mixed (Xu et al., 2017). One line of research has demonstrated that higher levels of acculturation within a host society are associated with better cognitive health outcomes (e.g., Choi et al., 2020; Lamar et al., 2021; Tang et al., 2019), whereas other researchers have reported no association between them (e.g., Casanova & Aguila, 2020; Statucka & Cohn, 2019). These inconclusive findings are attributable in part to the use of varied measures of acculturation, including proxies (e.g., nativity, age at migration, length of residence in the U.S.) and scales with multiple domains of cultural adaptation (e.g., language, media use, food consumption, social relationships, familiarity with customs and practices); hence, in the present study, we focus on linguistic adaptation, which is the most integral component of acculturation (Lommel & Chen, 2016; Tan & Burgess, 2020). Such a targeted approach is also imperative for harmonizing data from independently designed studies with different measures in order to optimize those data for comparability (Jang et al., 2021).

With a strong connection to education, the pathway between linguistic adaptation and cognitive health could be bidirectional. For example, individuals with high education may be well-equipped to learn a new language, and such linguistic adaptation may promote cognitive function (Casey & Dustmann, 2008; Diwan, 2008; Shi et al., 2009). On the other hand, education may serve as a cognitive reserve enhancing cognitive function, and the high state of cognition may facilitate the acquisition of new language skills (Akresh, 2007; Chiswick & Miller, 2007). Given the cross-sectional scope of the present assessment and the chronological nature of the variables of interest, we conceptualized educational attainment

during an early stage of life as a contextual covariate, the status of linguistic adaptation acquired during the process of immigration as an independent variable, and the current cognitive status as a health outcome. Our conceptualization is in line with the literature suggesting the better opportunities for upward social mobility and health advantages of immigrants who have acquired language skills of the host society (Jasinskaja-Lahti, 2008; Shi et al., 2009). Familiarity with two languages may be particularly beneficial for cognitive function because it helps older immigrants to engage with both the host and their own ethnic community, offering cognitively stimulating opportunities for networking and social participation in two realms (Nawyn et al., 2012; West et al., 2017).

Another line of inquiry in the present investigation is how the association between linguistic adaptation and cognitive function may vary by sociodemographic and health characteristics. Studies on immigrant health suggest that the way in which cultural and linguistic adaptation exerts its impact is shaped by contexts (Fox et al., 2017; Lommel & Chen, 2016). Sociodemographic characteristics, such as age, gender, marital status, education, and length of stay in the U.S., and physical and mental health status may not only serve as contextual variables to be considered in the assessment of the link between linguistic adaptation and cognitive function, but also may function as a moderator that determines the strength of their relationships. For example, gender has been identified as a significant moderator in the association between acculturation and health; compared to men, women were more susceptible to the positive impact of acculturation on the measures of physical and mental health (Leu et al., 2011) and cognitive function (Choi et al., 2020). By examining the direct and moderating effect models, we aim to explore within- and between-group variations in older Chinese and Korean Americans in the dynamics among linguistic adaptation, cognitive function, and potential modifiers— sociodemographic backgrounds and health profiles.

For this study, we utilize two large sets of data on older Chinese and Korean Americans: the Population Study of Chinese Elderly (PINE; Dong, 2014) and the Study of Older Korean Americans (SOKA; Jang et al., 2020). Unlike conventional survey methods that target only English-speaking participants, the PINE and the SOKA employed culturally and linguistically sensitive strategies (e.g., questionnaires in native languages, survey assistance by bilingual and bicultural staff, and partnerships with ethnic communities) to include older immigrants with language and cultural barriers (Jang et al., 2021). Although these two studies differ in design and sampling methods, they provide data from large samples of older Chinese and Korean immigrants on linguistic adaptation and cognitive function and allow cross-group assessments.

The merging of independent sets of data can be guided by data harmonization, which has been employed in cross-racial/ethnic studies and health disparities research (Fortier et al., 2017; National Institute on Aging [NIA], 2012). Given the high rate of limited English proficiency in older Chinese and Korean Americans (Batalova & Zong, 2016; Hanna & Batalova, 2021), the harmonization of the PINE and SOKA datasets offers ways to enhance access to these hard-to-reach populations and increase our understanding of their linguistic adaptation and cognitive health. Our harmonization of these datasets is intended to broaden their reach and impact and to guide public health strategies. By allowing identification of similarities and differences between the groups, the methods of harmonization facilitate

strategic planning for services and programs. Based on the review, the goal of the present investigation is to examine the direct effect of linguistic adaptation on cognitive function, as well as its interactions with sociodemographic and health profiles in the harmonized data of older Chinese and Korean Americans.

Methods

Datasets

The PINE is a population-based longitudinal study of Chinese Americans aged 60 and older, conducted in the greater Chicago area (Dong, 2014). Attending to cultural and linguistic characteristics of the sample, face-to-face home interviews for the PINE were conducted by trained bicultural and bilingual interviewers. Since 2011, four waves of data have been collected. Detailed information on the PINE is available elsewhere (Dong, 2014).

The SOKA is a multi-state survey of Korean Americans aged 60 and older. The sites for the SOKAwere selected from states with differing proportions of the entire Korean American population: California, New York, Texas, Hawaii, and Florida. In each state, a primary metropolitan statistical area with a representative proportion of Korean Americans was selected: Los Angeles, New York, Austin, Honolulu, and Tampa. Combined, these sites present a continuum of Korean population densities. During 20172018, community-based samples were recruited by a team of investigators who shared the target population's language and culture. The survey questionnaire was in Korean, developed using back-translation and reconciliation. The questionnaire was designed to be self-administered; however, bilingual and bicultural assistants were present at survey sites to help participants complete the surveys. Upon completion of the survey, each participant was assessed for cognitive function, using the Mini Mental State Examination (MMSE), by trained research personnel. A total of 2176 individuals participated in the survey. Detailed information on the SOKA is available elsewhere (Jang et al., 2020).

Both studies were approved by the institutional review boards at the educational institutions where the two studies' principal investigators were affiliated. Although the PINE has multiple waves, we used the fourth wave (N = 3124) collected in 2017–2019 to be comparable to the SOKA. Cognitive function has been longitudinally examined in the PINE data (e.g., Chen et al., 2019; Li et al., 2017). For our cross-sectional comparative analysis, the two datasets were reduced to include only those who were without cognitive impairment (MMSE score >10) to ensure the credibility of self-reported data. After deleting 122 participants from the PINE and 115 participants from the SOKA, the final sample size was 5063: 3002 older Chinese Americans and 2061 older Korean Americans. None of the participants had more than 10% of data missing, and pair-wise deletion was used in all analyses.

Measures

Because the two studies were independently designed, data were managed by following guidelines for retrospective data harmonization (Fortier et al., 2017; NIA, 2012). First, we identified common variables and evaluated potentials for harmonization. Depending on

comparability levels, we implemented multiple strategies, including rational harmonization based on shared conceptual meanings, common/similar item selection, score standardization, and rescaling. The variables selected and managed for the present analyses are given below.

Cognitive function.—The MMSE (Folstein et al., 1975) was employed in both studies as an indicator of global cognitive function. The MMSE consists of items for time and place orientation, memory recall, attentional and computational capabilities, language ability, three-stage commands, pentagon drawing, judgment, and comprehension. Responses for each item are scored as 0 (*incorrect*) or 1 (*correct*). The composite score ranges from 0 to 30, with higher scores indicating better cognitive function. The psychometric properties of the Chinese and Korean versions of the MMSE have been previously validated (Han et al., 2010; Li et al., 2016). Cronbach's alpha was high in both samples (0.84 for Chinese Americans, 0.73 for Korean Americans).

Linguistic adaptation.—No item for linguistic adaptation was shared by the two studies; the conceptually relevant items were English use in the PINE and English proficiency in the SOKA. In the PINE, a five-response option asked participants to indicate which language they used (1 = *only Chinese*, 2 = *more Chinese than English*, 3 = *both equally*, 4 = *more English than Chinese*, 5 = *only English*). The SOKA assessed English proficiency by asking participants to rate how well they spoke English on a 4-pointscale (1 = *not at all*, 2 = *not well*, 3 = *well*, 4 = *very well*). Given the related but distinctive natures of language use and proficiency (Chiswick & Miller, 2007), we used the two variables as independent indicators of linguistic adaptation in each sample. In both measures, higher scores indicated a greater level of linguistic adaptation. We used the measures as continuous variables to ensure their variances.

Health profiles.—Chronic medical conditions, functional disability, and depressive symptoms were used as indicators of physical and mental health. For chronic medical conditions, participants in both studies were asked to indicate whether a medical professional had ever told them that they had specific chronic diseases or conditions, which were presented on a checklist. Because the two studies did not use identical checklists, we selected six diseases that the studies' checklists had in common (heart disease, stroke, cancer, diabetes, hypertension, and arthritis). Affirmative responses to individual items were summed for a total count.

Functional disability was assessed with items on basic and instrumental activities of daily living (Katz et al., 1963; Lawton & Brody, 1969): eating, dressing, bathing, walking, transferring, grooming, toileting, managing money, using the telephone, and managing medications. The two studies' different response formats (a 4-point scale in the PINE and a 3-point scale in the SOKA) were dichotomized (0 = *no help needed*, 1 = *in need of help*). Total scores could range from 0 (*no disability*) to 10 (*severe disability*). Cronbach's alpha was high in both samples (0.85 for Chinese Americans, 0.87 for Korean Americans).

With regard to depressive symptoms, the two studies employed different versions of the Patient Health Questionnaire (PHQ; Kroenke et al., 2001; 2003): PHQ-9 for the PINE; and PHQ-2 for the SOKA. We selected the two items that were common to both datasets; these

items pertained to the frequency of having “little interest or pleasure in doing things” and feeling “down, depressed or hopeless” over the past 2 weeks. Each item was scored on a 4-point scale ranging from 0 (*not at all*) to 3 (*nearly every day*). Total scores could range from 0 to 6, with higher scores indicating greater levels of depressive symptoms. Cronbach’s alpha was high in both samples (0.70 for Chinese Americans, 0.80 for Korean Americans).

Demographic characteristics.—Background information in both samples was managed to indicate age (in years), gender (0 = *male*, 1 = *female*), marital status (0 = *married*, 1 = *not married*), education (0 = ≤*high school graduation*, 1 = >*high school graduation*), and length of stay in the U.S. (in years).

Analytical Strategy

The harmonized data from the two studies were examined as follows. First, we reviewed the samples’ descriptive characteristics and conducted group comparisons using *t* or chi-square tests. Next, after examining bivariate correlations, we tested linear regression models of cognitive function in each group. The direct effect of linguistic adaptation (English use for older Chinese Americans and English proficiency for older Korean Americans) was examined after controlling for sociodemographic and health-related covariates. Interaction terms of linguistic adaptation were then entered with covariates. When an interaction term reached statistical significance, we conducted a simple slope analysis for further investigation. The sample was divided into two groups based on moderating factors, and the regression slopes of linguistic adaptation predicting cognitive function in subgroups were compared. All analyses were performed using STATA version 17.0 (Stata Corp, College Station, TX).

Results

Descriptive Characteristics of the Samples

Table 1 summarizes the descriptive characteristics of the older Chinese and Korean Americans. Compared with the Chinese American sample, the Korean American sample was slightly younger and included more women and more who were not married, with higher education and more years in the U.S. Both samples were comparable in number of chronic medical conditions. Older Korean Americans had higher levels of functional disability and depressive symptoms than did older Chinese Americans. Reflecting the characteristics of older Asian immigrants who immigrated after their transformative years, the status of linguistic adaptation was generally low in both samples. Eighty-two percent of the Chinese American sample reported that they spoke only Chinese, and three quarters of the Korean American sample reported that they spoke English either “not at all” or “not well.” Due to the lack of standardized cut-offs to indicate linguistic adaptation across the measures, we used them as continuous variables. Noting the non-normal distribution of the English use score in the Chinese American (skewness = 2.81), we conducted a log transformation, and the transformed scores were used in the analyses. With regard to cognitive function, the Korean American sample demonstrated higher MMSE scores than did the Chinese American sample.

Bivariate Correlations Among Study Variables

Correlations among study variables were examined in each sample to understand the associations among study variables and ensure the absence of collinearity (not shown in a tabular format). In both groups, higher cognitive function was associated with younger age, male gender, married status, fewer chronic medical conditions, lower functional disability, and less frequent symptoms of depression. In the Chinese American sample, English use and cognitive function were positively associated ($r = .25$, $p < .001$). English proficiency in the Korean American sample was also associated with higher cognitive function ($r = .33$, $p < .001$). In both samples, the highest correlation coefficient was found in the relationship between education and English use/proficiency ($r = .38$, $p < .001$, for the Chinese American sample; $r = .42$, $p < .001$, for the Korean American sample). There was no indication of collinearity.

Linear Regression Models for Cognitive Function

Table 2 includes linear regression models for cognitive function in older Chinese and Korean Americans. In both samples, the direct effect of linguistic adaptation was significant when demographic and health-related variables were controlled. Older Chinese Americans with more use of English and older Korean Americans with better proficiency in English were better in cognitive function. Younger age, male gender, married status, higher educational attainment, lower functional disability, and fewer symptoms of depression were common predictors for better cognitive function. Chronic medical conditions lost significance in both groups, and years in the U.S. were only significant in the Chinese American sample. The direct effect model accounted for 31% and 26% of the variance of cognitive function in the Chinese American and Korean American samples, respectively.

Subsequently, the interaction terms of linguistic adaptation with demographic and health-related variables were added to the model. There were eight terms, and they explained a small but significant amount (1%–2%) of the variance, resulting in a total explained variance of 33% in the Chinese American sample and 27% in the Korean American sample. In the Chinese American sample, the effect of English use on cognitive function was significantly moderated by age, gender, education, and years in the U.S. In the Korean American sample, age and years in the U.S. were identified as significant moderators.

Examination of the Pattern of the Moderating Effect

The sample was divided based on the moderating variable for each interaction with significance, and the regression slope of linguistic adaptation predicting cognitive function in each subgroup was examined. In the analysis for each moderating variable, other covariates from the set (age, gender, marital status, education, years in the U.S., chronic medical conditions, functional disability, and depressive symptoms) were considered. In creating figures, all covariates were fixed at their means. Among older Chinese Americans (Figure 1), the subgroups with advanced age, female gender, lower education, and fewer years in the U.S. demonstrated a steeper slope than did their respective counterparts, indicating a stronger connection between English use and cognitive function. A similar pattern was observed among older Korean Americans (Figure 2) in the subgroup analyses based on age and years in the U.S., where those in the older age group and with a shorter

stay in the U.S. presented a stronger connection between English proficiency and cognitive function than their respective counterparts. There was a crossover pattern in all subgroup analyses except the one with age in older Korean Americans. These findings suggest that the positive impact of linguistic adaptation was pronounced and optimized in the groups with the underlying linguistic and cognitive vulnerabilities (i.e., the very old, women, those with low education, and newly immigrated individuals).

Discussion

This investigation was prompted by multiple causes, including the increase in the older Asian immigrant population in the U.S. (Hanna & Batalova, 2021; U.S. Census Bureau, 2019), public health concerns about immigrant health and language barriers (Lommel & Chen, 2016; Tan & Burgess, 2020), increased attention to brain aging andcognitive health inolder immigrants (Lamar et al., 2021; Xu et al., 2017), lack of appropriate data on older Asian Americans (Đoàn et al., 2019), and the potential of merging the datasets for older Chinese and Korean Americans (Jang et al., 2021). Harmonized data from two independently designed studies (the PINE and SOKA), which employed culturally and linguistically sensitive approaches to reach out to older Chinese and Korean Americans, generated a combined sample size of 5063 and allowed us to examine between- and within-group differences in the association between linguistic adaptation and cognitive function at a cross-sectional level. Our findings not only confirm the positive link between linguistic adaptation and cognitive function common to both groups but also further demonstrate how this link may be modified by sociodemographic and health profiles in each group.

Our data management was largely guided by the literature on retrospective data harmonization (Fortier et al., 2017; NIA, 2012). The multiple strategies employed in the present study demonstrate challenges of harmonizing retrospective data as well as ways to optimize data use. The major challenge was the absence of comparable indicators of linguistic adaptation. Although English use and English proficiency were selected as the most relevant measures, they represent related but distinct characteristics. While English proficiency indicates one’s acquired language skills and competencies, English use in particular may reflect social and geographic contexts in which older immigrants are embedded (Akresh, 2007; Chiswick & Miller, 2007). Noting the difference, analysis was conducted for each group; however, caution in interpretation is warranted. It should also be noted that, in order to be comparable to the SOKA, the two items were selected from the full items of the PHQ-9 available in the PINE. The approach is based on the high correspondence between PHQ-9 and PHQ-2 reported in the literature (e.g., Liu et al., 2016; Suzuki et al., 2015). In our sensitivity analyses, we also found a strong correlation between the two-item total score and the original PHQ-9 score ($r = .70$, $p < .001$). When the analyses were replicated with the original score, the results remained the same. Nonetheless, the inherent discrepancy in the measures need to be taken into consideration.

In line with previous studies with diverse groups of immigrant populations (e.g., Choi et al., 2020; Lamar et al., 2021; Tang et al., 2019), our findings show a positive association between linguistic adaptation and cognitive function in both samples. Speaking English more than Chinese in the Chinese American sample and having greater English proficiency

in the Korean American sample indicate better linguistic adaptation in the U.S., and both indicators were associated with higher cognitive function. As described earlier, the underlying characteristics of linguistic adaptation, such as sociodemographic advantages, opportunities for upward social mobility, better access to resources and services, and successful coping and resilience (Diwan, 2008; Jasinskaja-Lahti, 2008; Shi et al., 2009), seem to yield positive cognitive health outcomes. Linguistic abilities in both their native language and English may allow older immigrants to become engaged within a larger social network and a broader range of social activities, which can foster the flow of novel information and stimulate cognitive function (Nawyn et al., 2012; West et al., 2017). The associated characteristics of new language acquisition, such as self-initiative, desire for independence, openness to new information and experiences, and positive attitudes toward learning, may also serve as promoting factors for older immigrants' cognitive health.

In both samples, we found that age and length of stay in the U.S. significantly modified the association between linguistic adaptation and cognitive function. The positive role of linguistic adaptation in cognitive function was more pronounced among those who were older and with a shorter stay in the U.S. in comparison with their counterparts. The moderating effects of gender and education were observed only in the Chinese sample. These findings suggest that the magnitude of the positive role of linguistic adaptation may differ by personal characteristics. The subgroups identified as having a greater positive impact of linguistic adaptation were the ones with predisposed linguistic challenges and cognitive disadvantages (i.e., the very old, women, those with low education, and newly immigrated individuals). In line with the notion of resource substitution (Ross & Mirowsky, 2006), our findings demonstrate that the presence of one resource can compensate for the lack of alternative resources and that the substituted resource can exert a notable health benefit. Although such characteristics as advanced age, female gender, low education, and a short length of stay in the U.S. disadvantageously position older immigrants in terms of linguistic adaptation and cognitive function, those who had overcome these ascribed vulnerabilities and managed to acquire new language skills earned the most optimized cognitive health returns. These findings shed new light on older immigrants' vulnerabilities and resilience, such that those who lack resources have a great potential for benefiting from resource substitution. In a previous study with older Korean Americans (Choi et al., 2020), gender-related resource substitution was reported where the positive association of education and acculturation with cognitive function was pronounced among women. Findings from the present investigation suggest the existence of resource substitution in other vulnerability factors and another ethnic group.

Certain limitations of this study are worth mentioning. First, our cross-sectional data do not permit causal inferences regarding associations among the study's variables. Future studies with a longitudinal design would provide a clearer understanding of the causal link between linguistic adaptation and cognitive function. Longitudinal data will allow the control of baseline cognition and the assessment of the reversal pathway. Second, although our samples included a sizable number of older immigrants from the U.S. Chinese and Korean communities, they were geographically restricted and recruited with nonprobability sampling. Replications should be conducted with more representative samples that cover a more diverse regions and with other racial/ethnic groups. In addition, although data

harmonization allowed us to capitalize on the existing datasets and to conduct cross-group comparisons, discrepancies in measures across the studies limited the scope of the assessment. A significant amount of variance of cognitive function was explained by the selected measures, but consideration of other variables such as family and community-related resources would be useful.

Despite these limitations, this study has demonstrated how the role of linguistic adaptation in older immigrants' cognitive health is contextualized by personal resources, and it suggests practical implications. Given the cognitive health risk associated with linguistic adaptation, special attention needs to be paid to older immigrants with limited English use and proficiency. In efforts to protect and promote their cognitive function, prioritization of and tailoring for high-risk groups with limited resources are highly recommended.

Acknowledgments

The authors thank Stephanie Bergren, Qun Le and Yingxiao Hua for their assistance with data management.

Funding

Data collection for the Study of Older Korean Americans (SOKA, R01AG047106, PI: Yuri Jang, PhD) and the Population Study of Chinese Elderly (PINE, R01AG042318, PI: XinQi Dong, MD) was supported by the National Institute on Aging

References

Akresh IR (2007). Contexts of English language use among immigrants to the United States. International Migration Review, 41(4), 930–955. 10.1111/j.1747-7379.2007.00106.x

Batalova J, & Zong J. (2016). Language diversity and English proficiency in the United States. Migration policy Institute. https://www.migrationpolicy.org/article/language-diversity-and-english-proficiency-united-states-2015

Casanova M, & Aguila E. (2020). Gender differences in cognitive function among older Mexican immigrants. The Journal of the Economics of Ageing, 16. Article 100226. 10.1016/j.jeoa.2019.100226

Casey T, & Dustmann C. (2008). Intergenerational transmission of language capital and economic outcomes. The Journal of Human Resources, 43(3), 660–687. 10.3368/jhr.43.3.660

Chen Y, Liang Y, Zhang W, Crawford JC, Sakel KL, & Dong X. (2019). Perceived stress and cognitive decline in Chinese-American older adults. Journal of the American Geriatrics Society, 67(S3), S519–S524. 10.1111/jgs.15606 [PubMed: 31403192]

Chiswick BR, & Miller PW (2007). Modeling immigrants' language skills. Emerald Group Publishing Limited.

Choi EY, Jang Y, & Chiriboga DA (2020). Gender as a moderator of the effect of education and acculturation on cognitive function: A study of older Korean immigrants. Journal of Aging and Health, 32(10), 1659–1666. 10.1177/0898264320950554 [PubMed: 32783692]

Diwan S. (2008). Limited English proficiency, social network characteristics, and depressive symptoms among older immigrants. The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 63(3), S184–S191. 10.1093/geronb/63.3.S184 [PubMed: 18559693]

Đoàn LN, Takata Y, Sakuma K-LK, & Irvin VL (2019). Trends in clinical research including Asian American, Native Hawaiian, and Pacific Islander participants funded by the US National Institutes of Health, 1992 to 2018. JAMA Network Open, 2(7), e197432. 10.1001/jamanetworkopen.2019.7432

Dong X. (2014). The population study of Chinese elderly in Chicago. Journal of Aging and Health, 26(7), 1079–1084. 10.1177/0898264314550581 [PubMed: 25239967]

Folstein MF, Folstein SE, & McHugh PR (1975). Mini-Mental State": A practical method for grading the cognitive state of patients for the clinician. Journal of Psychiatric Research, 12(3), 189–198. 10.1016/0022-3956(75)90026-6 [PubMed: 1202204]

Fortier I, Raina P, Van den Heuvel ER, Griffith LE, Craig C, Saliba M, Doiron D, Stolk RP, Knoppers BM, Ferretti V, Grand P, & Burton P (2017). Maelstrom Research guidelines for rigorous retrospective data harmonization. International Journal of Epidemiology, 46(1), 103–105. 10.1093/ije/dyw075 [PubMed: 27272186]

Fox M, Thayer ZM, & Wadhwa PD (2017). Acculturation and health: the moderating role of sociocultural context. American Anthropologist, 119(3), 405–421. 10.1111/aman.12867 [PubMed: 28966344]

Han JW, Kim T, Jhoo J, Park J, Kim JL, Ryu S, Moon S, Choo I, Lee DW, Yoon JC, Do YJ, Lee S, Kim M-D, & Kim KW (2010). A normative study of the Mini-Mental State Examination for Dementia Screening (MMSE-DS) and its short form (SMMSE-DS) in the Korean elderly. Journal of Korean Geriatric Psychiatry, 14(1), 27–37.

Hanna M, & Batalova J. (2021). Immigrants from Asia in the United States. Migration policy Institute. https://www.migrationpolicy.org/article/immigrants-asia-united-states-2020

Jang Y, Choi EY, Rhee M-K, Park NS, Chiriboga DA, & Kim MT (2020). Determinants of self-rated cognitive health among older Korean Americans. The Gerontologist, 60(2), 250–258. 10.1093/geront/gnz134 [PubMed: 31618436]

Jang Y, Yoon H, Li M, Park NS, Chiriboga DA, Wu B, Dong X, & Kim MT (2021). Self-rated health as a mediator between physical health conditions and depressive symptoms in older Chinese and Korean Americans. Plos One, 16(1). Article e0245136. 10.1371/journal.pone.0245136

Jasinskaja-Lahti I. (2008). Long-term immigrant adaptation: Eight-year follow-up study among immigrants from Russia and Estonia living in Finland. International Journal of Psychology, 43(1), 6–18. 10.1080/00207590701804271 [PubMed: 22023496]

Katz S, Ford AB, Moskowitz RW, Jackson BA, & Jaffe MW (1963). Studies of illness in the aged: The index of ADL: A standardized measure of biological and psychosocial function. JAMA, 185(12), 914–919. 10.1001/jama.1963.03060120024016 [PubMed: 14044222]

Kroenke K, Spitzer RL, & Williams JBW (2001). The PHQ-9: Validity of a brief depression severity measure. Journal of General Internal Medicine, 16(9), 606–613. 10.1046/j.1525-1497.2001.016009606.x [PubMed: 11556941]

Kroenke K, Spitzer RL, & Williams JBW (2003). The Patient Health Questionnaire-2: Validity of a two-item depression screener. Medical Care, 41(11), 1284–1292. https://www.jstor.org/stable/3768417 [PubMed: 14583691]

Lamar M, Barnes LL, Leurgans SE, Fleischman DA, Farfel JM, Bennett DA, & Marquez DX (2021). Acculturation in context: The relationship between acculturation and socioenvironmental factors with level of and change in cognition in older Latinos. The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 76(4), e129–e139. 10.1093/geronb/gbaa156 [PubMed: 32918471]

Lawton MP, & Brody EM (1969). Assessment of older people: Self-maintaining and instrumental activities of daily living. The Gerontologist, 9(31), 179–186. 10.1093/geront/9.3_Part_1.179 ., Part [PubMed: 5349366]

Leu J, Walton E, & Takeuchi D. (2011). Contextualizing acculturation: Gender, family, and community reception influences on Asian immigrant mental health. American Journal of Community Psychology, 48(3–4), 168–180. 10.1007/s10464-010-9360-7 [PubMed: 20882334]

Li H, Jia J, & Yang Z. (2016). Mini-Mental State Examination in elderly Chinese: A population-based normative study. Journal of Alzheimer's Disease, 53(2), 487–496. 10.3233/JAD-160119

Li LW, Ding D, Wu B, & Dong X. (2017). Change of cognitive function in US Chinese older adults: A population-based study. Journals of Gerontology Series A: Biomedical Sciences and Medical Sciences, 72(1), S5–S10. 10.1093/gerona/glx004

Liu ZW, Yu Y, Hu M, Liu HM, Zhou L, & Xiao SY (2016). PHQ-9 and PHQ-2 for screening depression in Chinese rural elderly. Plos One, 11(3), e0151042. 10.1371/journal.pone.0151042

Lommel LL, & Chen J-L (2016). The relationship between self-rated health and acculturation in Hispanic and Asian adult immigrants: A systematic review. Journal of Immigrant and Minority Health, 18(2), 468–478. 10.1007/s10903-015-0208-y [PubMed: 25894534]

Lopez-Class M, Castro FG, & Ramirez AG (2011). Conceptions of acculturation: A review and statement of critical issues. Social Science & Medicine, 72(9), 1555–1562. 10.1016/j.socscimed.2011.03.011 [PubMed: 21489670]

Mizoguchi N, Walker L, Trevelyan E, & Ahmed B. (2019). The older foreign-born population in the United States: 2012–2016. U.S. Government Printing Office. (American Community Survey Reports No. 42). https://www.census.gov/content/dam/Census/library/publications/2019/acs/acs-42.pdf

National Institute on Aging (2012). Harmonization strategies for behavioral, social science, and genetic research: Workshop summary. https://www.nia.nih.gov/sites/default/files/d7/nia_bssg_harmonization_summary_version_2-5-20122.pdf

Nawyn SJ, Gjokaj L, Agbenyiga DL, & Grace B. (2012).´ Linguistic isolation, social capital, and immigrant belonging. Journal of Contemporary Ethnography, 41(3), 255–282. 10.1177/0891241611433623

Ross CE, & Mirowsky J. (2006). Sex differences in the effect of education on depression: Resource multiplication or resource substitution?. Social Science & Medicine, 63(5), 1400–1413. 10.1016/j.socscimed.2006.03.013 [PubMed: 16644077]

Shi L, Lebrun LA, & Tsai J. (2009). The influence of English proficiency on access to care. Ethnicity & Health, 14(6), 625–642. 10.1080/13557850903248639 [PubMed: 19953393]

Statucka M, & Cohn M. (2019). Origins matter: Culture impacts cognitive testing in Parkinson's disease. Frontiers in Human Neuroscience, 13, Article 269. 10.3389/fnhum.2019.00269

Suzuki K, Kumei S, Ohhira M, Nozu T, & Okumura T. (2015). Screening for major depressive disorder with the Patient Health Questionnaire (PHQ-9 and PHQ-2) in an outpatient clinic staffed by primary care physicians in Japan: A case control study. Plos One, 10(3), e0119147. 10.1371/journal.pone.0119147

Tan YW, & Burgess GH (2020). Multidimensional effects of acculturation at the construct or index level of seven broad neuropsychological skills. Culture and Brain, 8(1), 27–45. 10.1007/s40167-018-0075-1

Tang F, Chi I, & Dong X. (2019). Sex differences in the prevalence and incidence of cognitive impairment: Does immigration matter? Journal of the American Geriatrics Society, 67(S3), S513–S518. 10.1111/jgs.15728 [PubMed: 31403204]

Thomson MD, & Hoffman-Goetz L. (2009). Defining and measuring acculturation: A systematic review of public health studies with Hispanic populations in the United States. Social Science & Medicine, 69(7), 983–991. 10.1016/j.socscimed.2009.05.011 [PubMed: 19525050]

U.S. Census Bureau (2019). ACS 5-year estimates 5-year estimates – public use microdata sample. https://data.census.gov/mdat/#/search?ds=ACSPUMS5Y2019&vv=AGEP(55:99)&cv=CIT&rv=ENG(1,2,3,4)&nv=RACASN(1)&wt=PWGTP

West AL, Zhang R, Yampolsky M, & Sasaki JY (2017). More than the sum of its parts: A transformative theory of biculturalism. Journal of Cross-Cultural Psychology, 48(7), 963–990. 10.1177/0022022117709533

Xu H, Zhang Y, & Wu B. (2017). Association between migration and cognitive status among middle-aged and older adults: A systematic review. BMC Geriatrics, 17(1), Article 184. 10.1186/s12877-017-0585-2

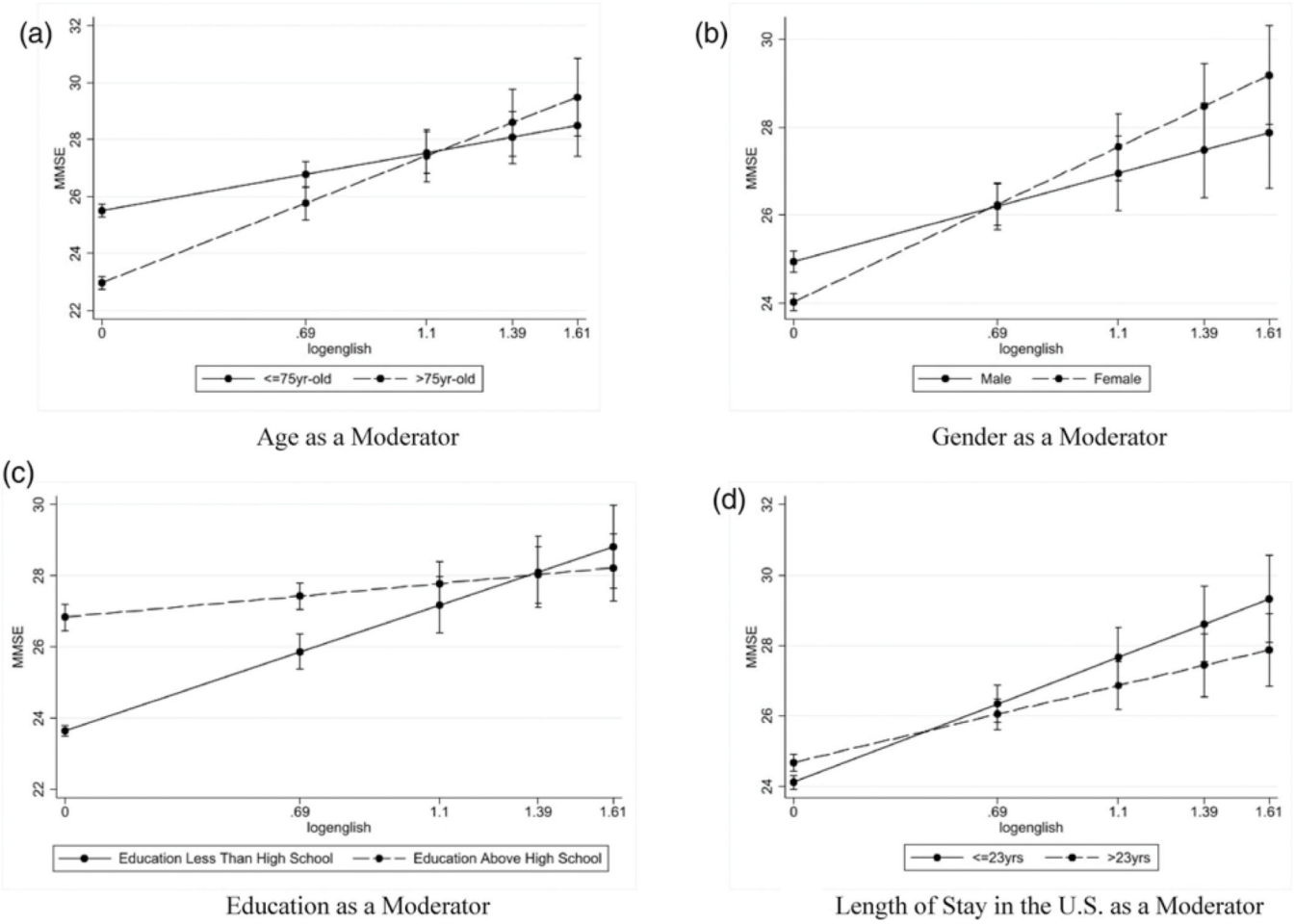

Figure 1.

Moderators of the Impact of Linguistic Adaptation (English Use) on Cognitive Function in Older Chinese Americans.

Note. The sample was divided based on mean age (75 years) or mean number of years of stay in the U.S. (23 years). In the analysis with each moderating variable, other covariates from the set (age, gender, marital status, education, years in the U.S., chronic medical conditions, functional disability, and depressive symptoms) were controlled. (a) Age as a Moderator, (b) Gender as a Moderator, (c) Education as a Moderator, and (d) Length of Stay in the U.S. as a Moderator.

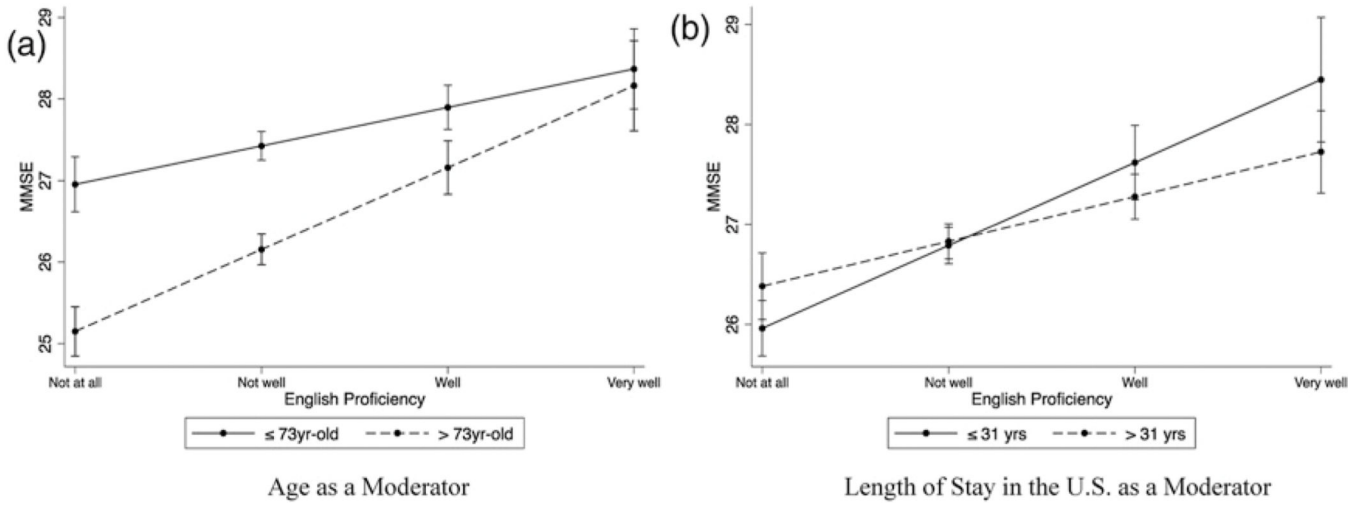

Figure 2.

Moderators of the Impact of Linguistic Adaptation (English Proficiency) on Cognitive Function in Older Korean Americans.

Note. The sample was divided based on mean age (73 years) or mean number of years of stay in the U.S. (31 years). In the analysis with each moderating variable, other covariates from the set (age, gender, marital status, education, years in the U.S., chronic medical conditions, functional disability, and depressive symptoms) were controlled. (a) Age as a Moderator, (b) Length of Stay in the U.S. as a Moderator.

Table 1.

Comparisons of Sample Characteristics.

	Older Chinese Americans (*n* = 3002)		Older Korean Americans (*n* = 2061)		
	%	*M*±*SD*	%	*M*±*SD*	t or (χ^2)
Demographic characteristics					
Age		74.9±7.99		73.2±7.93	7.39***
Gender (female)	61.0		66.8		(19.0***)
Marital status (married)	67.8		60.8		(26.4***)
Education (>high school graduation)	23.1		39.7		(158.3***)
Years in the U.S.		22.8±12.4		31.4±12.1	−24.4***
Health profiles					
Chronic medical conditions		1.43±1.10		1.39±1.16	1.36
Functional disability		0.30±1.05		0.37±1.28	−2.23*
Depressive symptoms		0.25±0.80		1.03±1.54	−23.3***
Linguistic adaptation					
English use		1.21±0.51	—	—	
Only Chinese	82.0		—		
More Chinese than English	15.2		—		
Both equally	2.1		—		
More English than Chinese	0.5		—		
Only English	0.1		—		
English proficiency		—		2.08±0.76	—
Not at all	—		21.4		
Not well	—		53.2		
Well	—		21.6		
Very well	—		3.9		
Cognitive function					
Mini-mental state examination score		24.5±4.48		26.7±2.92	−18.9***

*p < .05.

***p < .001.

Table 2.

Linear Regression Models for Cognitive Function.

	B (SE)			
	Older Chinese Americans		**Older Korean Americans**	
Linguistic adaptation				
English use	1.56 *** (.25)	2.47 *** (.62)	—	—
English proficiency	—	—	.57 *** (.09)	.70 ** (.23)
Demographic characteristics				
Age	.19 (.01)	−.20 *** (.01)	−.11 *** (.01)	−.11 *** (.01)
Gender (female)	.73 (.15)	−.72 *** (.14)	−.47 *** (.13)	−.38 ** (.13)
Marital status (married)	.48 (.16)	.46 ** (.16)	.43 ** (.13)	.39 ** (.13)
Education (>high school graduation)	2.76 (.18)	2.87 *** (.18)	.86 *** (.13)	.84 *** (.13)
Years in the U.S.	.02 (.01)	.03 *** (.01)	.01 (.01)	.00 (.01)
Health profiles				
Chronic medical conditions	.08 (.06)	.05 (.06)	.02 (.05)	.00 (.05)
Functional disability	.88 (.07)	−.93 *** (.06)	−.22 (.05) ***	−.19 ** (.05)
Depressive symptoms	.37 (.09)	−.34 *** (.08)	−.11 (.04) **	−.11 ** (.04)
Interactions				
Linguistic adaptation × Age		.17 *** (.03)		.04 *** (.01)
Linguistic adaptation × Gender		1.38 ** (.48)		.14 (.18)
Linguistic adaptation × Marital status		−.15 (.50)		−.27 (.17)
Linguistic adaptation × Education		−2.35 *** (.49)		−.04 (.19)
Linguistic adaptation × Years in the U.S.		−.06 *** (.01)		−.01 * (.01)
Linguistic adaptation × Chronic medical conditions		−.07 (.20)		−.02 (.07)
Linguistic adaptation × Functional disability		−.70 (.44)		.01 (.06)
Linguistic adaptation × Depressive symptoms		.31 (.33)		.03 (.05)
ΔR^2	.31 ***	.02 ***	.26 ***	.01 ***
Overall R^2	.31 ***	.33 ***	.26 ***	.27 ***

* $p < .05$.

J Aging Health. Author manuscript; available in PMC 2023 February 24.

** $p < .01$.

*** $p < .001$.