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Note

Age of dementia diagnosis in community dwelling bilingual and monolingual Hispanic Americans



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ABSTRACT

Bilingualism has been reported to delay the age of retrospective report of first symptom in dementia. This study determined if the age of clinically diagnosed Alzheimer's disease and vascular dementia occurred later for bilingual than monolingual, immigrant and U.S. born, Hispanic Americans. It involved a secondary analysis of the subset of 81 bi/monolingual dementia cases identified at yearly follow-up (1998 through 2008) using neuropsychological test results and objective diagnostic criteria from the Sacramento Area Latino Study on Aging that involved a random sampling of community dwelling Hispanic Americans ($N = 1789$). Age of dementia diagnosis was analyzed in a 2×2 (bi/monolingualism \times immigrant/U.S. born) ANOVA that space revealed both main effects and the interaction were non-significant. Mean age of dementia diagnosis was descriptively (but not significantly) higher in the monolingual ($M = 81.10$ years) than the bilingual ($M = 79.31$) group. Overall, bilingual dementia cases were significantly better educated than monolinguals, but U.S. born bilinguals and monolinguals did not differ significantly in education. Delays in dementia symptomatology pertaining to bilingualism are less likely to be found in studies: (a) that use age of clinical diagnosis vs. retrospective report of first dementia symptom as the dependent variable; and (b) involve clinical cases derived from community samples rather than referrals to specialist memory clinics.

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1. Introduction

Bilingualism has been reported to delay the onset of Alzheimer's disease and related dementias compared to monolingualism by contributing to cognitive reserve. In the initial study, Bialystok, Craik, and Freedman (2007) studied the age of first clinical symptom as determined by patient, family member, or caregiver report in bi/monolingual dementia

referrals to a specialist memory clinic in Toronto, Canada ($N = 184$). Bilingualism was determined by a panel of 11 judges using the criterion: "had spent the majority of their lives, at least from early adulthood, regularly using at least two languages" (p. 460). Bilinguals were predominantly (87%) immigrants to Canada from Europe who spoke any one of 25 different languages in addition to English, whereas monolinguals were predominantly (86%) Canadian born, English

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speakers. Years of education was significantly lower in the bilingual ($M = 10.8$ years) than the monolingual ($M = 12.4$) group. The bilingual group had an average age of retrospectively reported first clinical symptom 4.1 years later than the monolingual group.

This finding has been replicated. Alladi et al. (2013) compared relative retrospective report of first clinical symptom for all types of dementias among 648 bi/monolingual referrals to a specialist memory clinic in India. Bilingualism was defined as an ability to meet the communication demands of the self and society in everyday functioning in two or more languages. The bilingual group (57% of whom were actually multilingual) had an average age of relative retrospective report of first clinical symptom 4.5 years later than the monolingual group. Bilingual and monolingual groups were born in India. Years of education was significantly higher in the bilingual ($M = 13$) than the monolingual ($M = 6$) group. Craik, Bialystok, and Freedman (2010) studied 211 patients diagnosed with Alzheimer's disease at the same memory clinic as in Bialystok et al. (2007) and found that bilingual patients had relative retrospective report of first clinical symptom an average of 5.1 years later than monolinguals.

Contradictory findings also have been reported. Chertkow et al. (2010) found no significant difference in age of diagnosis of Alzheimer's disease among 632 bi/monolingual referrals to a memory clinic in Montreal, Canada. Education level of the two groups was similar (both $M = 11$ years). A subgroup of multilingual participants had an average five year delay in age of Alzheimer's disease diagnosis in comparison to monolinguals. Gollan, Salmon, Montoya, and Galasko (2011) studied the impact of bilingualism (measured objectively by Boston Naming Test scores in each language) as a continuous variable on: (a) age of relative retrospective report of first clinical symptom; and (b) age of dementia diagnosis, among 44 Hispanic Americans. Those ($N = 22$) who preferred to be tested in English had significantly higher education ($M = 13$ years) than those ($N = 22$) who preferred to be tested in Spanish ($M = 7$). Degree of bilingualism was related to later age of dementia onset only in the lower education ($N = 22$; $M = 6$ years) group, who primarily (73%) preferred to be tested in Spanish. There was no relationship between degree of bilingualism and age of dementia diagnosis or relative retrospective report of first clinical symptom for the higher education ($N = 22$; $M = 15$ years) group who preferred to be tested in English.

In a prospective study of 1067 community dwelling, Spanish-speaking immigrants primarily from the Caribbean who were followed over 23 years, Zahodne, Schofield, Farrell, Stern, and Manly (2014) found bi/monolingualism had no effect on the age of diagnosis of the 282 participants who developed dementia. Defining bilingualism by self-report or from scores on the Wide Range Achievement Test-3 did not affect the results. The bilingual group was significantly better educated ($M = 8.3$ years) than the monolingual ($M = 5.1$) group.

As yet, no clear explanation has emerged to explain the discrepant results, with studies differing on potentially important variables like: immigrant status of participants; objective measurement vs. self-report of bilingualism; bi vs. multilingualism; education level differences between bi/monolingual groups; age of relative report of first dementia

symptom vs. age of clinically determined dementia diagnosis as the dependent variable; and clinic referral vs. community sample cases. Fuller-Thomson and Kuh (2013) suggested the protective influence of bilingualism may form part of the "healthy immigrant effect" (p. 129), whereby immigrants tend to have lower rates of morbidity than non-immigrants of the same ethnicity. The present study examined the age of diagnosis of Alzheimer's disease and vascular dementia among a community dwelling sample of bi/monolingual, immigrant and U.S. born, Hispanic Americans, primarily of Mexican origin. The question was whether age of diagnosis of incident dementia would be delayed for bilinguals compared to monolinguals.

2. Method

2.1. Participants

The clinical data set was derived from the Sacramento Area Latino Study on Aging (SALSA) and involved a secondary analysis of data. SALSA was a cohort study of 1789 community-dwelling, self-identified Hispanic Americans, aged ≥ 60 in 1998–99, who resided in the Sacramento, California metropolitan area and surrounding suburban and rural counties (Haan et al., 2003). About half (51%) were immigrants, overwhelmingly from Mexico (89%). Follow-up data collection occurred every 12–15 months from 1998 through 2008. Over the course of the study, 55 cases were diagnosed with Alzheimer's disease and 26 with vascular dementia, for a total N of 81. A diagnosis of vascular dementia was considered as a rule-out for a diagnosis of Alzheimer's disease.

2.2. Procedure

2.2.1. Dementia diagnosis

Every fifth participant and those whose scores fell < 20 th percentile on either of two screening tests: (a) Modified Mini Mental Status Exam (3MSE: Teng and Chui, 1987; maximum = 100: nondemented $M = 85.6$); or (b) delayed free recall trial from the Spanish and English Verbal Learning Test (González, Mungas, Reed, Marshall, & Haan, 2001), underwent further neuropsychological assessment. This consisted of: (a) the Spanish English Neuropsychological Assessment Scale (Mungas, Reed, Crane, Haan, & González, 2004) that has five tests of verbal semantic memory, non-verbal semantic memory, verbal attention span, verbal abstraction, and visual-perceptual skills; and (b) the Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE: Jorm & Jacomb, 1989). Higher scores on this 26 item scale reflect greater subjective decline in cognitive functioning as rated by caregiver/family members. Participants were referred for dementia adjudication if they obtained: (a) a score < 10 th percentile on > 1 of the 6 neuropsychological tests and a score on the IQCODE ≥ 3.40 (about 20% of the overall sample had scores in this range); (b) scores < 10 th percentile on ≥ 4 of 6 neuropsychological tests; or (c) IQCODE > 4.0 (about 5%). Dementia diagnosis was assigned by a team of neurologists and neuropsychologists using California Alzheimer's Disease Diagnostic and Treatment Center criteria (Chui et al., 1992) for vascular

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