

Cultural factors related to neuropsychological performance and brain atrophy among Hispanic older adults with Mild Cognitive Impairment (MCI): A pilot study.

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Introduction

The proportion of Hispanics continues to increase in the United States. Hispanics are also 1.5 times more likely to develop Alzheimer's disease than other non-ethnic groups (Haan et al., 2003; Manly & Mayeux, 2004). With regard to the diagnosis of AD, cross-cultural cognitive testing poses major challenges; such as cultural factors interfering with performance. Among cultural factors known to have the greatest influence on mediating performance on neuropsychological instruments, are the levels of acculturation, bilingualism, and education. The current study aimed to investigate cultural and demographic factors that contribute to cognitive functioning and brain atrophy among Hispanic older adults with MCI in an ethnically heterogeneous cohort.

Hypothesis: It was hypothesized that cultural factors would be highly related to cognitive functioning, but not related to brain atrophy.

Results

Table 1. Demographic and Cultural Factors among MCI

Variables	M	SD
Age (yrs; range: 65-97 yrs)	75.92	6.84
Education (yrs; range: 4-19 yrs)	14.11	3.20
MMSE (range 20-30)	26.86	1.99
Literacy (LWIS) (range: 62-77)	73.70	3.14
U.S. Acculturation (BAS-NH) (range: 0-3.58)	2.47	.82
Hispanic Acculturation (BAS-H) (range: 3-10.25)	3.73	1.36
Bilingualism (LEAP-Q) (range: 0-1)	.61	.34
Gender (%)	46% Males 54% females	
Ethnicity	54% Cuba 21% Central America 11% South America 4% Other	

Note. CDR=Clinical Dementia Rating scale; WNH=White non-Hispanic; H=Hispanic



Methods and Materials

The sample consisted of 28 older adults (54% females) diagnosed with MCI (Table 1). Partial correlations and linear regression analyses was applied to examine the following cultural factors:

- Acculturation level (Bidimensional Acculturation Scale; Marin & Gamba, 1996)
- Literacy (Woodcock Munoz, Muñoz-Sandoval, Woodcock, McGrew, & Mather, 2005, letter-word identification subtest)
- Bilingualism (Language Experience and Proficiency Questionnaire; Marian, Blumenfeld, & Kaushanskaya, 2007)

Relationships to cognitive measures of memory, attention, executive function, language, and visual spatial function were examined.

Relationships to regional brain volumes on MRI scans of 10 left sided regions of interest were examined.

Table 2. Results of partial correlations between cultural factors and neuropsychological measures controlling for age.

Neuropsych tests	Literacy	U.S. Acculturation	Hispanic Acculturation	Bilingualism
TMT-B	-.07	-.44*	-.21	-.46*
FAS	.03	.03	.04	-.03
C-flu	.05	-.07	.22	-.08
HVLT-II	-.08	.13	.53**	.05
LM-II	-.09	.30	-.172	.12

Note. FAS: FAS verbal fluency; C-Flu: Category fluency; HVLT-II: Hopkins Verbal Learning Test delayed; TMT-B: Trail Making Test-Part B; LM-II: Logical Memory test delayed from the Wechsler Memory Scale, 3rd edition (WMS-III).
* p<.05; ** p<.01

Conclusion

1. The degree of bilingualism was associated with better performance on the TMT-B (Executive Function), most likely because conceptual flexibility (a component of executive functioning) is needed to alternate between numbers and letters.
2. Among Hispanic participants, higher acculturation to the Hispanic culture contributed to better performance on delayed recall on verbal learning tests.
3. Cultural factors did not modify the relationship of regional brain volumes to cognitive performance
4. These preliminary findings should be confirmed among larger cohorts, utilizing more diverse measures, which capture other cultural constructs.

Results Cont.

Table 3. Results of Multiple Linear Regression between Cultural Factors and Neuropsychological Measures.

	Adj R ²	F	B	SE B	β	t	p	n
TMT-B	.27	1.91						
• Literacy			-1.00	5.12	-.04	-.20	.85	27
• Bilingualism			-45.49	65.67	-.19	-.69	.50	28
• U.S. Accul			-30.04	26.75	-.30	-1.12	.28	26
• Hisp Accu			-12.25	11.32	-.20	-1.08	.29	26
• Age			5.04	2.28	.41	2.21	.04	28
HVLT-II	.21	2.78						
• Literacy			-.07	.20	0.07	-.35	.73	26
• Bilingualism			-2.69	2.55	-.30	-1.06	.30	27
• U.S. Accul			1.50	1.04	.39	1.44	.17	25
• Hisp Accul**			1.42	.44	.62	3.24	.004	25
• Age			-.104	.09	-.23	-1.18	.25	27

Note. HVLT-II: Hopkins Verbal Learning Test delayed; TMT-B: Trail Making Test-Part B; * p<.05; ** p<.01

- There were no significant findings for FAS, category fluency, or logical memory delayed.
- Relationships between cultural factors, cognition and MRI volumetric analyses of 10 left sided regions of interest revealed no significant relationships.

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