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CLINICAL MANIFESTATIONS

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Neuropsychology: Cognitive and functional assessment in diverse populations

Subjective versus objective cognitive assessment in an ethnically diverse cohort of oldest-old individuals: The LifeAfter90 Study

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Abstract

Background: The ability to measure cognition accurately in ethnically diverse populations is important. However, information about cognition in the oldest-old (people aged 90+) comes almost exclusively from cohorts of highly educated Caucasian individuals. We studied the association between self-rated cognition and objectively measured cognition among the first 610 participants enrolled in an ongoing multi-ethnic oldest-old cohort.

Method: LifeAfter90 participants are long-time members of the Kaiser Permanente Northern California Health Care System without a dementia diagnosis in their medical record at recruitment. Evaluations are every six months and include the Everyday Cognition (ECog) and Spanish and English Neuropsychological Assessment Scales (SENAS). The ECog is a self-rated questionnaire about abilities to perform cognitively relevant functional tasks across multiple domains (on a 4-point scale from 'no change' to 'much worse'). For analysis, we averaged items within each domain (memory-2, language-2, visuospatial abilities-5, and executive function-7). The SENAS assesses episodic memory, semantic memory, and executive function domains. We estimated the cross-sectional associations between self-rated cognition (ECog) and objectively measured cognition (SENAS) measured at baseline. Using linear regression, we determined in the full cohort which ECog items had the strongest association with each SENAS domain and compared those associations across racial/ethnic groups.

Result: At baseline, participants were on average 92.6 years of age, 62% were women, 45% had a college education, and 68% were racial/ethnic minorities (Table 1). Table 2 shows the associations between ECog items and SENAS domains. 'Concerned about memory' was the ECog item most strongly associated with SENAS Verbal Memory,

and that association was strongest among Whites and Blacks. The visuospatial ECog items had the strongest association with SENAS Semantic Memory, and that association was present among Whites and Latinos. The executive function ECog items had the strongest association with SENAS Executive Function, and the association was present among Whites and Latinos. No associations between ECog items and SENAS domains were observed among Asians or the multiracial group.

Conclusion: In this oldest-old cohort, we found differences in how racial ethnic/groups report their everyday cognitive function in relation to their measured cognitive abilities. These differences need to be considered when assessing subjective cognitive function in diverse populations.

TABLE 1

Table 1. Baseline Characteristics of Participants by Race/Ethnic Group: The *LifeAfter90* Study

Characteristic	Total	White	Black	Latino	Asian	Other/ Multiracial
No. of Participants (%)	610	198 (32)	136 (22)	85 (14)	138 (23)	53 (9)
Demographics						
Average Age, y (range)	92.6 (90-104)	93.0 (90-102)	91.9 (90-102)	92.2 (90-104)	91.9 (90-98)	92.7 (90-98)
No. of Women (%)	380 (62.30)	122 (61.62)	92 (67.65)	57 (67.06)	72 (52.17)	37 (69.81)
Education, N (%)						
≤High School	210 (34.65)	51 (26.02)	60 (44.44)	49 (58.33)	33 (23.91)	17 (32.08)
Some College	123 (20.30)	40 (20.41)	27 (20.00)	17 (20.24)	21 (15.22)	18 (33.96)
Associate Degree/College	156 (25.74)	49 (25.00)	30 (22.22)	11 (13.10)	53 (38.41)	13 (24.53)
Graduate School	117 (19.31)	56 (28.57)	18 (13.33)	7 (8.33)	31 (22.46)	5 (9.43)
ECog-15 item						
Concerned that have memory problems, N (%)	239 (39.44)	80 (40.82)	56 (41.48)	31 (36.47)	56 (40.58)	16 (30.77)
Avg memory score (SD)	1.78 (0.72)	1.80 (0.72)	1.76 (0.79)	1.80 (0.67)	1.82 (0.69)	1.66 (0.64)
Avg language score (SD)	1.64 (0.72)	1.64 (0.74)	1.64 (0.80)	1.66 (0.64)	1.64 (0.66)	1.55 (0.65)
Avg visuospatial score (SD)	1.26 (0.47)	1.22 (0.41)	1.30 (0.57)	1.37 (0.51)	1.28 (0.47)	1.17 (0.33)
Avg exec function score (SD)	1.42 (0.50)	1.42 (0.49)	1.43 (0.50)	1.47 (0.57)	1.38 (0.49)	1.36 (0.46)
SENAS Domain						
Avg Episodic Memory (SD)	-0.80 (0.76)	-0.79 (0.74)	-0.78 (0.71)	-0.97 (0.84)	-0.76 (0.80)	-0.74 (0.78)
Avg Semantic Memory (SD)	-0.78 (0.98)	-0.14 (0.70)	-1.34 (0.83)	-0.88 (0.80)	-1.00 (1.10)	-0.89 (0.89)
Avg Executive Function (SD)	-0.47 (0.70)	-0.19 (0.75)	-0.66 (0.65)	-0.69 (0.59)	-0.54 (0.63)	-0.48 (0.64)

Abbreviations: ECog=Everyday Cognition; SENAS= Spanish and English Neuropsychological Assessment Scales

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TABLE 2

Table 2. Multiple Regression Coefficients[1] for The Association Between ECog Items and SENAS Domains Across Racial/Ethnic Groups							
SENAS Domain	**ECog Item**	**Total**	**White**	**Black**	**Latino**	**Asian**	**Multiracial /Other**
Episodic Memory	**Concerned About Memory (Yes/No)**	-.269	-.285	-.337	-.323	-.136	-.263
	Memory Avg.	-.108	-.090	-.233	-.257	.001	.339
	Language Avg.	-.114	-.113	-.151	-.291	-.078	.200
	Visuospatial Avg.	-.199	-.092	-.248	-.517	-.193	.010
	Executive Function Avg.	-.163	-.050	-.236	-.531	-.096	-.045
Semantic Memory	**Concerned About Memory (Yes/No)**	-.007	-.175	.045	.244	.188	-.099
	Memory Avg.	-.096	-.073	-.064	-.279	-.131	.106
	Language Avg.	-.096	-.138	.075	-.184	-.039	-.410
	Visuospatial Avg.	-.301	-.266	-.170	-.595	-.160	-.043
	Executive Function Avg.	-.254	-.187	-.153	-.545	-.042	-.419
Executive Function	**Concerned About Memory (Yes/No)**	-.122	-.243	-.163	.056	.048	-.143
	Memory Avg.	-.098	-.141	-.108	-.103	-.038	.135
	Language Avg.	-.119	-.144	-.088	-.130	-.095	-.028
	Visuospatial Avg.	-.168	-.309	-.078	-.352	-.008	.052
	Executive Function Avg.	-.249	-.325	-.189	-.384	-.055	-.298

p<0.001 p<0.01 p<0.05 p<0.1

[1] Coefficients are from multiple linear regression models with SENAS domain as the outcome and ECog item as the independent variable of interest adjusting for age, sex, and education. Analyses of the total cohort also adjusted for race/ethnicity. Abbreviations: ECog=Everyday Cognition; SENAS= Spanish and English Neuropsychological Assessment Scales