

Occupational complexity and brain volume in an older multiethnic sample

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Background

- Higher occupational complexity (OC) in one's main occupational role is associated with better cognitive performance and reduced dementia risk.^{1,2}
- The relationship between domains of OC and brain health is not well understood.

Objectives

To examine the association between OC domains (people, data, and things) and overall and region-specific brain volumes in older adults.

Methods

Sample

- Kaiser Health Aging and Diverse Life Experiences (KHANDLE) participants with 3T MRI (n = 357).

Occupational Complexity (OC)

- Participant-reported main lifetime occupation linked to "people", "data", and "things" OC scores from the 1970 Census Dictionary of Occupational Titles³
 - Scores were reverse-coded from original so higher values indicate higher complexity.
- Examples of job responsibilities and their complexity rating are below: (modified from Miller et al, 1980)

Data	People	Things
0 Compare	0 Take instructions	0 Handle
1 Copy	1 Serve	1 Feed
2 Compute	2 Speak	2 Tend
3 Compile	3 Persuade	3 Manipulate
4 Analyze	4 Divert	4 Drive-operate
5 Coordinate	5 Supervise	5 Operate/control
6 Synthetize	6 Instruct	6 Precision work
	7 Negotiate	7 Setting up
	8 Mentor	

Brain Imaging Measures

- Measures of total cortical gray matter volume as well as hippocampal, frontal, parietal, occipital, and temporal volume residualized on intracranial volume and z-scored.

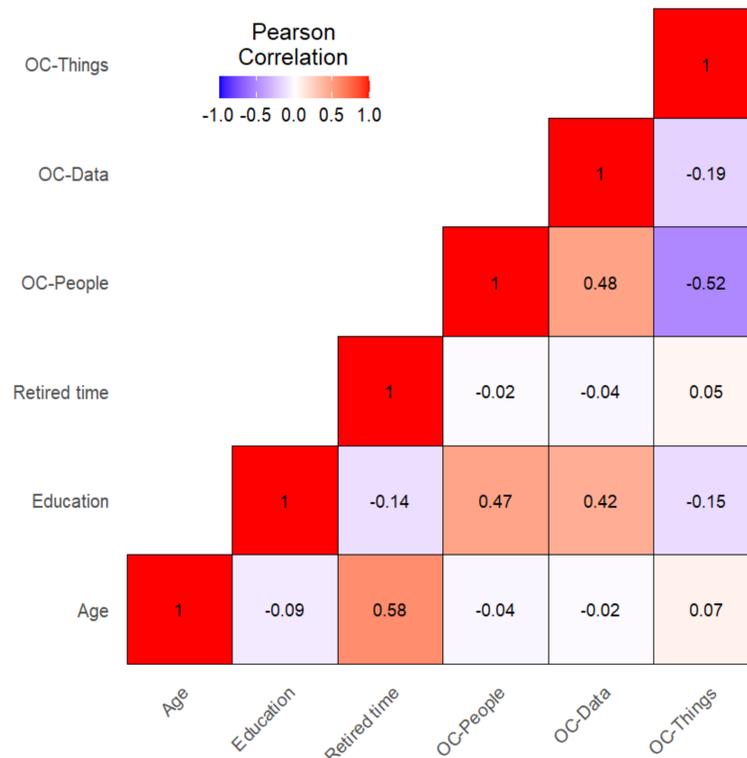
Covariates

- Adjusted for current income, years of education, race and ethnicity, retirement status (yes/no), years since retirement (0 for not retired), and age at scan.

Statistical Analyses

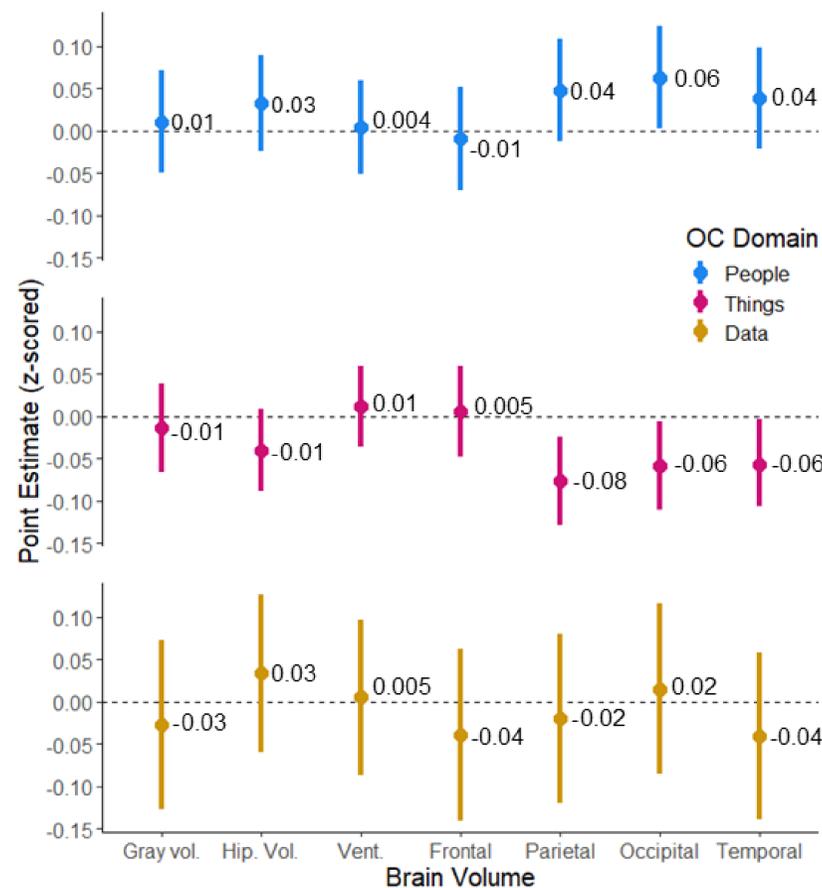
- Pearson correlations for continuous variables
- Linear regression models (robust standard error) for associations of domain-specific OC with brain volume measures, with covariate adjustment.

Results



OC-people is positively correlated with OC-data.
OC-people and OC-data are negatively correlated with OC-things.

OC-people is positively associated with occipital volume.
OC-things is negatively associated with parietal, occipital, and temporal volume.
No association between OC-data and brain volume measures.



Participant Demographics

Characteristic	N (%) or Mean (SD)
N	357
Age at scan	77.5 (6.0)
Race/ethnicity	
Asian	87 (24.3%)
Black	74 (20.7%)
LatinX	86 (24.3%)
White	109 (30.4%)
Years of education	
Range	1-20
Mean (SD)	14.99 (2.81)
Sex	
Male	162 (45.3%)
Income range	
\$0-\$54,999	91 (25.4%)
\$55,000-\$99,999	132 (36.9%)
\$100,000+	109 (30.4%)
NA/Refused	25 (7.3%)
Retirement	
Years since retirement*	16.5 (8.6)
Currently working	41 (11.5%)
Missing	5
High occ. complexity	
with data	125 (35.0%)
with people	101 (28.3%)
with things	84 (23.5%)

*Years since retirement from main occupation, excluding those still working.

Implications & Future Directions

- Higher OC-things during one's main occupation is associated with reduced volume in some brain regions.
- Future research could further elucidate how differences in OC and brain volume affect cognitive and clinical outcomes.

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