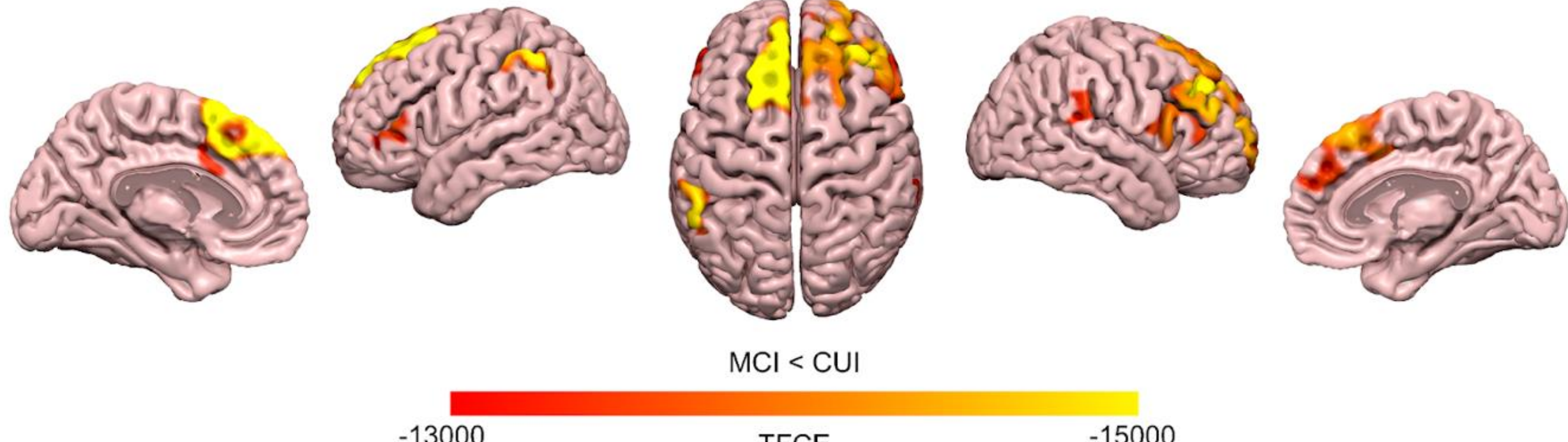


Brain atrophy patterns linked to cognition and speech markers: evidence from a mild cognitive impairment Peruvian cohort

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INTRODUCTION	METHODS	RESULTS	CONCLUSIONS	REFERENCES
Structural brain magnetic resonance imaging (MRI) can detect subtle changes in brain structures in individuals at pre-dementia stages. Previous studies have reported reduced cortical thickness in frontoparietal and frontotemporal regions among participants with mild cognitive impairment (MCI). These structural patterns have been associated with poorer performance in general cognition, executive function, and speech tasks (Clarke et al., 2021). Our objective was to compare cortical thickness and cognitive performance between Peruvian older adults with MCI and cognitively unimpaired individuals (CUIs) and to examine their association with acoustic speech markers.	We recruited 58 native Spanish speakers (29 with MCI, 29 CUIs) from Arequipa, Peru. Participants were excluded if they had a diagnosis of dementia or a severe neuropsychiatric disorder, illiteracy, or visual and/or auditory impairment that could interfere with cognitive assessment. MRI data were available for a subsample of 33 right-handed individuals (16 with MCI, 17 CUIs); matched for sex, handedness, age, and education. MRI were acquired using a Siemens Spectra 3T scanner.	Compared with CUIs, participants with MCI exhibited reduced cortical thickness in the left supplementary motor area, as well as in the right inferior temporal gyrus and the bilateral middle and superior temporal and frontal gyri. Significant group differences were also observed in MOCA scores ($t=-2.95$, $p<.005$) and INECO frontal screening scores ($t=2.38$, $p<.023$). Regarding speech markers, pause duration during the prompt-based video narration task was negatively correlated with cortical thickness in parietal regions (right inferior and superior parietal lobule, right postcentral gyrus, and left precuneus), frontal regions (precentral gyrus), and occipital regions (left middle occipital gyrus).	We observed significant frontotemporal atrophy in participants with MCI compared with healthy controls, along with poorer performance in general cognition and executive function. In addition, prompt-based acoustic speech markers showed significant associations with frontoparietal regions. These findings highlight characteristic patterns of brain atrophy during pre-dementia stages and their impact on cognitive performance and speech markers in under-resourced settings.	Clarke, N., Barrick, T. R. & Garrard, P. A comparison of connected speech tasks for detecting early Alzheimer's disease and mild cognitive impairment using natural language processing and machine learning. <i>Frontiers in Computer Science</i> 3, 634360 (2021).
Figure 1. Atrophy in the MCI group (based on cortical thickness) 				CONTACT Claudia Rivera-Fernández clauri01@ucm.es FUNDING N° PE501082737-2023-PROCIENCIA  ALZHEIMER'S ASSOCIATION AAIC>26