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INTRODUCTION

Previous research has documented structural brain differences between monolingual and bilingual adults (Mechelli et al., 2004). However, little is known about the structural brain difference between bilinguals who are biliterate in different scripts.

OBJECTIVES

To identify whether gray matter (GM) differences arise between 2 groups of healthy bilingual young adults who differ in biliteracy experience.

HYPOTHESIS: The 2 bilingual groups will differ in GM volume in word processing regions because of their different biliteracy experiences.

METHODS

Participants:

- Hindi-English bilingual adults (n = 10), education: M =21.6, SD = 2.1).
- Spanish-English bilingual adults (n = 9), education: M =17.7, SD = 2.4).

Groups matched on:

- Chronological age (~ 25 y.o.)
- L2 AoA (~ 4 y.o.)
- Self Rating L1, Self Rating English
- Naming Accuracy (L1, English)

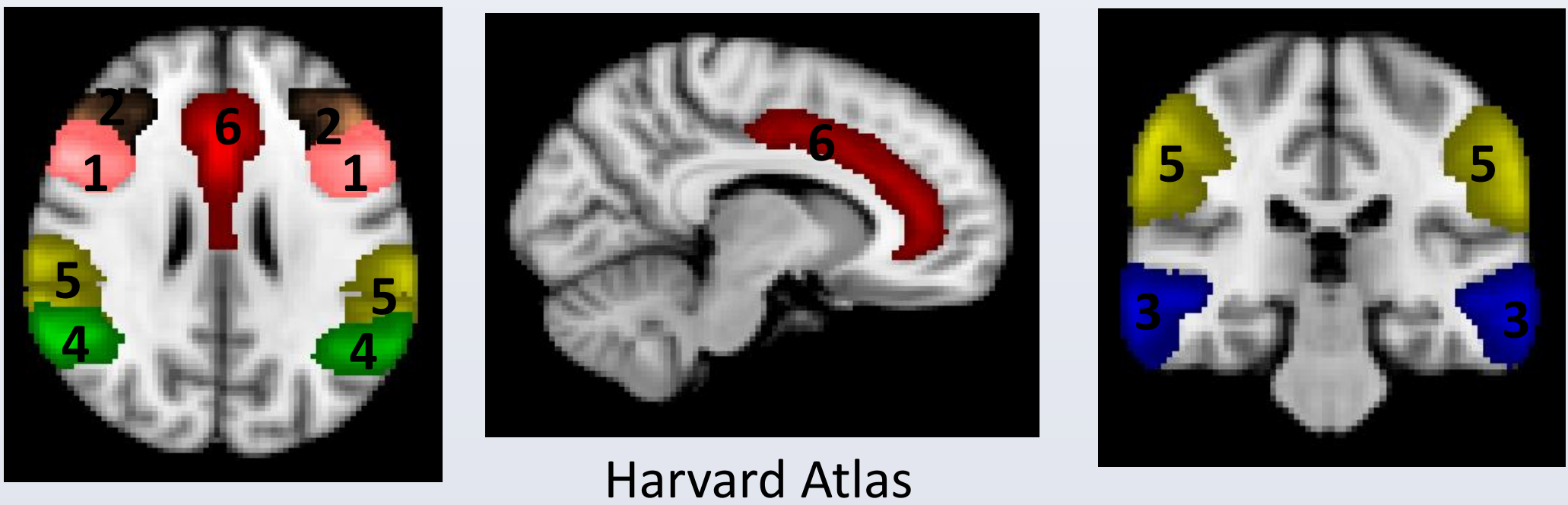
Language/Script Differences:

Language:	English	Spanish	Hindi
Representation:	cat	gato	बिल्ली

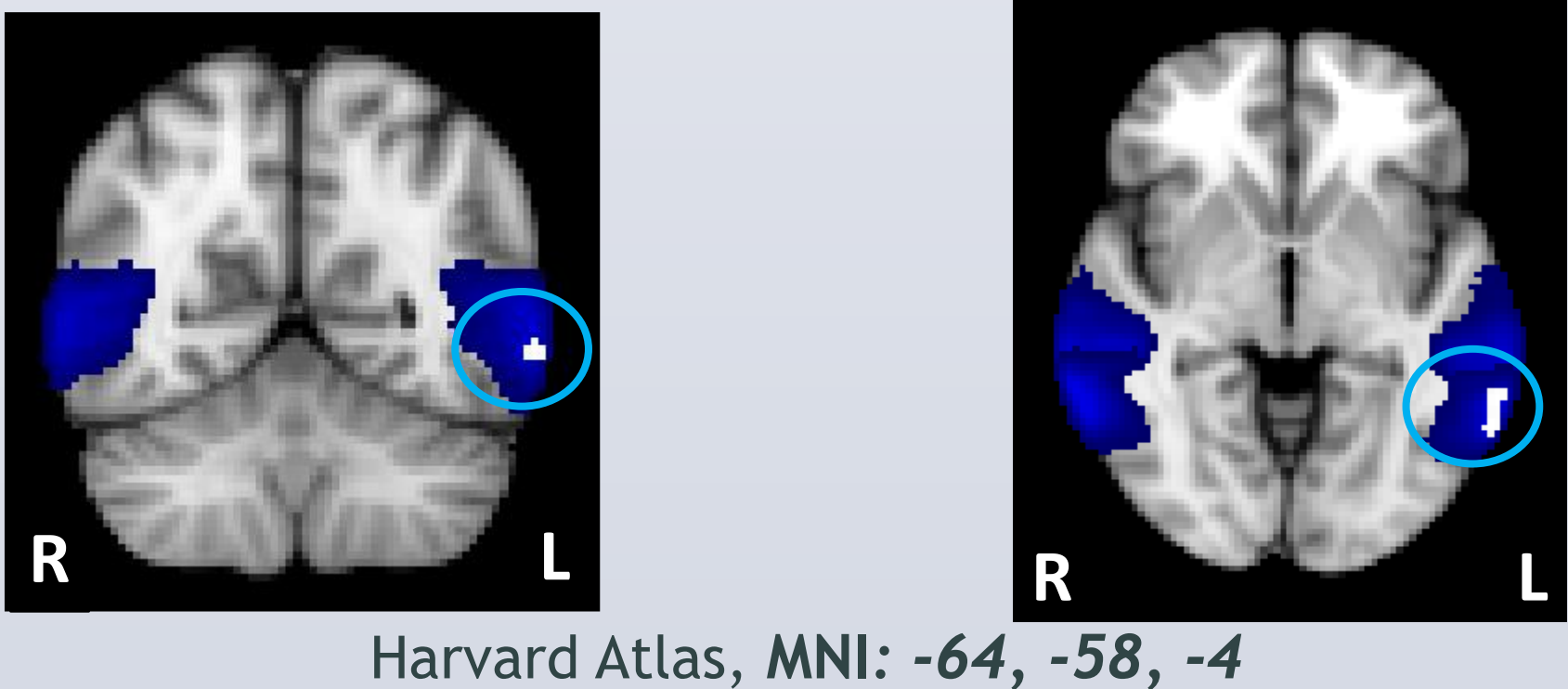
ANALYSIS

T1-weighted images were collected; the data were analyzed using voxel-based morphometry (VBM) analysis in FSL.

Based on the literature, we chose these ROIs: bilateral inferior (1) and middle (2) frontal gyri, middle temporal gyri (MTG) (3), angular gyri (4), supramarginal gyri (5), and anterior cingulate (6).



RESULTS



- Results revealed that the Hindi-English bilinguals had higher GM volume in the posterior portion of left MTG (BA 21) compared to the Spanish-English bilinguals (corrected p < .05).
- The Spanish-English bilinguals did not show higher GM volume than Hindi-English bilinguals ROIs.

IMPLICATIONS

Results suggest that brain structures responsible for word processing may be influenced by literacy experience using different written representations.

GM differences may be influenced by

- biliteracy experience: divergence of orthographic overlap
- quantity and quality of education
- contextual exposure across the lifetime

Finally, no difference of GM in frontal regions increases reliability of results because the 2 groups encounter similar demands in cognitive function when managing 2 languages.

CLINICAL RELEVANCE:

Abnormalities of the left posteroinferior MTG have been linked to impaired access to lexical orthographic representations in reading and spelling (Hillis 2001, 2002). Biliteracy experiences have an influence on effective treatment plans.

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