

Cortical activation during word processing in late bilinguals: Similarities and differences as revealed by functional magnetic resonance imaging

**Viorica Marian,¹ Yevgeniy Shildkrot,² Henrike K. Blumenfeld,¹
Margarita Kaushanskaya,¹ Yasmeen Farooqi-Shah,³ and Joy Hirsch⁴**

¹Northwestern University, Evanston, IL, USA

²New York University School of Medicine, New York, NY, USA

³University of Maryland, College Park, MD, USA

⁴Columbia University, New York, NY, USA

Functional magnetic resonance imaging was used to compare cortical organization of the first (L1, Russian) and second (L2, English) languages. Six fluent Russian–English bilinguals who acquired their second language post-puberty were tested with words and nonwords presented either auditorily or visually. Results showed that both languages activated similar cortical networks, including the inferior frontal, middle frontal, superior temporal, middle temporal, angular, and supramarginal gyri. Within the inferior frontal gyrus (IFG), L2 activated a larger cortical volume than L1 during lexical and phonological processing. For both languages, the left IFG was more active than the right IFG during lexical processing. Within the left IFG, the distance between centers of activation associated with lexical processing of translation equivalents across languages was larger than the distance between centers of activation associated with lexical processing of different words in the same language. Results of phonological processing analyses revealed different centers of activation associated with the first versus the second language in the IFG, but not in the superior temporal gyrus (STG). These findings are discussed within the context of the current literature on cortical organization in bilinguals and suggest variation in bilingual cortical activation associated with lexical, phonological, and orthographic processing.
