

BOOK REVIEWS

REFERENCES

- Charteris-Black, J. (2004). *Corpus approaches to metaphor analysis*. Basingstoke: Palgrave Macmillan.
- Charteris-Black, J. (2011). *Politicians and rhetoric. the persuasive power of metaphor*. Basingstoke: Palgrave Macmillan.
- Chilton, P. (2004). *Analysing political discourse: theory and practice*. London: Routledge.
- Feldman, J. A. (2006). *From molecule to metaphor: a neural theory of language*. Cambridge, MA: MIT Press.
- Gibbs, R. W. (1992). Categorization and metaphor understanding. *Psychological Review*, **99**(30), 572–577.
- Goatly, A. (2007). *Washing the brain: metaphor and hidden ideology*. Amsterdam and Philadelphia: Benjamins.
- Goffman, E. (1967). *Interaction ritual: essays on face-to-face behaviour*. Garden City, NY: Doubleday, Anchor Books.
- Johnson, M. (1987). *The body in the mind: the bodily basis of meaning, imagination and reason*. Chicago: Chicago University Press.
- Lakoff, G. (1991). The metaphor system used to justify war in the Gulf. *Journal of Urban and Cultural Studies*, **2**(1), 59–72.
- Lakoff, G. (1996). *Moral politics: how liberals and conservatives think*. Chicago: University of Chicago Press (2nd ed. 2002).
- Lakoff, G., & Johnson, M. (1999). *Philosophy in the flesh: the embodied mind and its challenge to Western thought*. New York: Basic Books.
- Mio, J. S. (1997). Metaphor and politics. *Metaphor and Symbol*, **12**(2), 113–133.
- Stockwell, P. (2007). Towards a Critical Cognitive Linguistics. In A. Combrink & I. Biermann (Eds.), *Discourses of war and conflict* (pp. 510–528). Potchefstroom: Potchefstroom University Press.
- Turner, M. (2001). *Cognitive dimensions of social science*. New York: Oxford University Press.

Reviewed by LIUDMILA ARCIMAVIČIENĖ

University of Vilnius, Lithuania

E-mail: liudmila.arcimaviciene@uki.vu.lt

Edna Andrews, *Neuroscience and Multilingualism*. Cambridge: Cambridge University Press, 2014. Pp. xiv + 254 pp. ISBN 978-1-107-03655-0

In a massively interconnected world, marked by constant political, educational, and recreational exchanges across cultures and nations, it is no surprise that multilingualism has become at least as prevalent as monolingualism (Grosjean, 1994, 2013). Neither is it startling for this phenomenon to have entered the radar of neuroscience, as it entails various cognitive peculiarities of theoretical and translational interest (Bialystok, Abutalebi, Bak, Burke, & Kroll, 2016; Bialystok, Craik, & Luk, 2012). The ensuing research niche has grown dramatically in the last two decades, rekindling classical debates and prompting reflection on novel issues. Against this background, *Neuroscience and Multilingualism* addresses the challenge of offering a concise but diverse introduction to the topic.

The book was written by Professor Edna Andrews, whose knowledge of neuroscience is combined with vast expertise in semiotics, linguistics, and Russian grammar. Such disciplinary eclecticism pervades the volume's six chapters. Andrews' approach to the polyglot brain includes insights not only from aphasiology and neuroimaging, but also from structuralism, pragmatics, and translation studies, among other fields. Readers who expect a focalized summary of the main experimental trends on multilingualism will likely be caught off guard by the author's pivotal reliance on scholars such as Roman Jakobson, John Searle, Charles S. Peirce, and Yuri Lotman. The book covers much wider ground than its title suggests.

Chapter 1 introduces and articulates some of the main issues in the current neurolinguistics literature, including the very notion of language and the relevance of classic models in the field. In addition, the chapter offers preliminary insights into the bilingual brain, suggesting that the mechanisms for processing one or more languages are broadly the same. Newcomers to neuroscience will benefit from a summary description of key imaging technologies, their advantages and disadvantages, and their role in studying linguistic processes. Last, major landmarks in the study of language and brain are discussed, such as the critical period hypothesis, the innateness position, and claims for the autonomy of language. In sum, this first chapter is an invitation to approach neurolinguistics from the vantage point of different linguistic theories instead of focusing on a single, standard model.

Chapter 2 presents the foundations for an extended discussion on the links between neuroscientific studies and notions of linguistic theory. To this end, language is first defined as a complex of interconnected systems rather than a single-piece structure. Insights into human speech are derived from research on the production and perception of phonemes and morphemes. Then, from a broader perspective, Andrews underscores the need to consider cultural aspects to fully understand how language and brain operate, drawing on ideas from several sources, including translation theory. In addition, she questions the concept of 'native speaker' and highlights the relevance of errors and misunderstandings in the study of language. Finally, the concepts of meaning, sign, speech act, and icon are also discussed as building blocks for an overarching model of this particular semiotic. In short, this chapter brings together notions from varied disciplines as a contribution to empirical neurolinguistic research.

Applications of neurolinguistics to the study of multilingualism are introduced in Chapter 3. First, Andrews questions the generalizability of data from brain-lesioned patients to characterize functions in healthy individuals. A discussion is then offered of aphasia and, more particularly, bilingual aphasia, alongside a critique of instruments used to assess the

two languages of affected subjects. In the final part, the author focuses on the lesion-deficit tradition, by first analyzing the famous case of HM and then exemplifying the usefulness and limitations of cortical stimulation mapping to study language (dys)functions. As in the previous two chapters, Andrews emphasizes the need to study language and brain from a pluralistic linguistic perspective.

Chapter 4 brings together notions from cognitive linguistics and cross-cultural pragmatics. The author starts by discussing emotion categories and how the semantics of emotion is differentially construed across languages. This is followed by an engaging treatment of literal and figurative meaning. In particular, Andrews proposes that the analysis of metaphoric forms should be revised to develop a more complex classification of meaning. She then recapitulates Vygotsky's work on thought and speech and highlights the idea that lexical meanings have differentiated neuropsychological representations according to the personal experiences of each subject with linguistic signs. Vygotskian theory is proposed to illuminate various key concepts which may bridge extant gaps between neuroscience and linguistics. Finally, through a review of language embodiment research, Andrews maintains that while sensorimotor systems are internally determined inside each individual's body, language is a product of social interaction in a culturally determined space.

A more direct treatment of neuroscientific research on language and multilingualism is finally offered in Chapter 5. Relevant studies are reviewed with a focus on the advantages and disadvantages of imaging methods. Emphasis is placed on the use of functional magnetic resonance imaging (fMRI) to foster progress in the fields of language acquisition, theoretical linguistics, and neurolinguistics. As clarified by the author, the intention of this chapter is not to discourage the use of fMRI in language studies, but to identify the method's weaknesses in addressing factors as complex as language proficiency, among others. The chapter concludes with a proposal on how the use of fMRI in longitudinal experiments could contribute to the study of multilingualism.

Chapter 6 concludes the book with a joint discussion of key aspects from previous chapters. First, it emphasizes the need to carry out ecologically valid experiments. It then briefly recapitulates the contributions of various linguistic and psycholinguistic theories. In addition, a plea is made to improve theories about language and brain, drawing on developmental psychology, naturalizing experimental set-ups, and enhancing both instrument and participant selection protocols. The concluding section offers an apt synthesis of the book's main contents, corroborating the impression that, more than a book about neuroscience and multilingualism, this volume is a call to consider linguistic theories in experimental neurolinguistics.

Despite its broad scope, the book overlooks key sources of insight into the multilingual brain. In particular, it does not incorporate findings from electroencephalographic methods (for reviews, see Caffarra, Molinaro, Davidson, & Carreiras, 2015; Moreno, Rodríguez-Fornells, & Laine, 2008), it only marginally considers bilingual aphasia research (for reviews, see García, 2015a; Paradis, 2004), and it omits the contributions of behavioral psycholinguistic paradigms (for reviews, see García, 2015b; Kroll, van Hell, Tokowicz, & Green, 2010). Also, only a few lines are devoted to some of the field's central topics, such as the neurocognitive impact of second-language proficiency and age of acquisition (e.g., Ferré, Sánchez-Casas, & Guasch, 2006; Silverberg & Samuel, 2004), the debates surrounding the bilingual advantage hypothesis (Bialystok et al., 2012; Paap, Johnson, & Sawi, 2016), and the proposal of multilingualism as a potential neuroprotective factor (Bialystok et al., 2016; Calvo, García, Manoiloff, & Ibáñez, 2015).

Notwithstanding, Andrews's work features several strong points. First, it addresses critical issues, such as the relationship between memory and language (sub)systems, the contributions and limitations of lesion models, and the role of neuroimaging evidence. Second, it is characterized by an unusual interdisciplinary breadth, as it pursues theoretical connections that are rarely addressed in volumes devoted to neurolinguistics, and even multilingualism in general. Third, it features a didactic though rigorous style, accompanied by informative, high-quality figures. Finally, and more generally, it offers a friendly access gate into neuroscience for readers coming from the humanities, thus covering a major gap in the literature.

In sum, *Neuroscience and Multilingualism* is a timely scholarly effort which targets a flourishing research arena. Although some of the hot topics in the literature are only briefly discussed, the book stands out by its rare cross-disciplinary framework. The emphasis on linguistics, pragmatics, and semiotics sets it apart from other works exploring the neurobiology of polyglots. Because of such features, the volume makes a distinct contribution to the conceptualization of this complex, highly prevalent phenomenon.

REFERENCES

- Bialystok, E., Abutalebi, J., Bak, T. H., Burke, D. M., & Kroll, J. F. (2016). Aging in two languages: implications for public health. *Ageing Research Reviews*, *27*, 56–60.
- Bialystok, E., Craik, F. I., & Luk, G. (2012). Bilingualism: consequences for mind and brain. *Trends in Cognitive Sciences*, *16*(4), 240–250.
- Caffarra, S., Molinaro, N., Davidson, D., & Carreiras, M. (2015). Second language syntactic processing revealed through event-related potentials: an empirical review. *Neuroscience & Biobehavioral Reviews*, *51*, 31–47.

- Calvo, N., García, A. M., Manoiloff, L., & Ibáñez, A. (2015). Bilingualism and cognitive reserve: a critical overview and a plea for methodological innovations. *Frontiers in Aging Neuroscience*, *7*, 249.
- Ferré, P., Sánchez-Casas, R., & Guasch, M. (2006). Can a horse be a donkey? Semantic and form interference effects in translation recognition in early and late proficient and nonproficient Spanish–Catalan bilinguals. *Language Learning*, *56*(4), 571–608.
- García, A. M. (2015a). Translating with an injured brain: neurolinguistic aspects of translation as revealed by bilinguals with cerebral lesions. *Meta: Translators' Journal*, *60*(1), 112–134.
- García, A. M. (2015b). Psycholinguistic explorations of lexical translation equivalents: thirty years of research and their implications for cognitive translatology. *Translation Spaces*, *4*(1), 9–28.
- Grosjean, F. (1994). Individual bilingualism. In R. E. Asher (Ed.), *The encyclopaedia of language and linguistics* (pp. 1656–1660). Oxford: Pergamon Press.
- Grosjean, F. (2013). Bilingualism: a short introduction. In F. Grosjean and P. Li (Eds.), *The psycholinguistics of bilingualism* (pp. 5–26). West Sussex: John Wiley & Sons Ltd.
- Kroll, J. F., van Hell, J. G., Tokowicz, N., & Green, D. W. (2010). The Revised Hierarchical Model: a critical review and assessment. *Bilingualism: Language and Cognition*, *13*, 373–381.
- Moreno, E. M., Rodríguez-Fornells, A., & Laine, M. (2008). Event-related potentials (ERPs) in the study of bilingual language processing. *Journal of Neurolinguistics*, *21*(6), 477–508.
- Paap, K. R., Johnson, H. A., & Sawi, O. (2016). Should the search for bilingual advantages in executive functioning continue? *Cortex*, *74*, 305–314.
- Paradis, M. (2004). *A neurolinguistic theory of bilingualism*. Amsterdam: John Benjamins.
- Silverberg, S., & Samuel, A. G. (2004). The effect of age of second language acquisition on the representation and processing of second language words. *Journal of Memory and Language*, *51*(3), 381–398.

Reviewed by ADOLFO M. GARCÍA

*Laboratory of Experimental Psychology and Neuroscience (LPEN),
Institute of Cognitive and Translational Neuroscience (INCyT),
INECO Foundation, Favaloro University, Buenos Aires, Argentina;
National Scientific and Technical Research Council (CONICET),
Buenos Aires, Argentina; Faculty of Education, National University of
Cuyo (UNCuyo), Mendoza, Argentina*
E-mail: adolfomartingarcia@gmail.com

AND

EDINSON MUÑOZ*

*Departamento de Lingüística y Literatura, Facultad de Humanidades,
Universidad de Santiago de Chile, Santiago, Chile*

[*] This work was partially supported by grants from Proyectos Basales (USA 1498), Vicerrectoría de Investigación, Desarrollo e Innovación (Universidad de Santiago de Chile, USACH), CONICET, and the INECO Foundation.