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Jubin Abutalebi | Harald Clahsen

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EDITORIAL

Bilingualism, cognition, and aging

JUBIN ABUTAEBI

University San Raffaele Milan, Italy

HARALD CLAHSSEN

University of Potsdam, Germany

Topics in psycholinguistics and the neurocognition of language rarely attract the attention of journalists or the general public. One topic that has done so, however, is the potential benefits of bilingualism for general cognitive functioning and development, and as a precaution against cognitive decline in old age. Sensational claims have been made in the public domain, mostly by journalists and politicians. Recently (September 4, 2014) *The Guardian* reported that “learning a foreign language can increase the size of your brain”, and Michael Gove, the UK’s previous Education Secretary, noted in an interview with *The Guardian* (September 30, 2011) that “learning languages makes you smarter”. The present issue of BLC addresses these topics by providing a state-of-the-art overview of theoretical and experimental research on the role of bilingualism for cognition in children and adults.

Our *keynote article* (Valian, 2014a) examines the role of bilingualism in cognitive development and aging, focusing on whether bilingualism provides any SPECIFIC benefits to general cognitive abilities that are covered under the label of ‘executive function’, i.e., processes that manage and control other cognitive activities, such as attention, visual perception, and switching between languages. Valian points out that there is a wide variety of factors that may lead to improved executive function, and she concludes that there is no consistent cross-study evidence that bilingualism is more beneficial than other non-linguistic experiences that bi- or monolingual people may have to improve executive function.

Ten experts representing different fields of research and different views on the topic commented on Valian’s keynote article. Some of them echo Valian’s skepticism (e.g., Klein, 2014; Paap, 2014; Zahodne & Manly, 2014). Others are more critical of her claims (‘invisible’ may not mean ‘absent’), suggesting ways of detecting cognitive benefits of bilingualism that might not be apparent on the surface (e.g. Costa, Hernández & Calabria, 2014; Kroll, 2014). A number of commentators note that more sophisticated theoretical notions are required of what is meant by ‘bilingualism’, including attempts to understand individual differences (Kaushanskaya & Prior, 2014; Luk, 2014; Mishra, 2014; Zahodne & Manly, 2014), and by ‘executive function’, including the neural underpinnings of connections between executive function and bilingualism (Marton, 2014; Kroll, 2014; Titone, Pivneva, Sheikh, Webb & Whitford, 2014). In

her response, Valian (2014b) acknowledges many of the qualifications pointed out by her commentators and the limitations of current research in this domain. All parties seem to agree that more empirical data, more theory, and more advanced methods of data analysis are necessary before any further claims should be made. As for the current wisdom on the cognitive benefits of bilingualism, a nuanced picture seems to emerge from Valian’s response. She concludes that while bilingualism is only one of the factors that may boost cognitive functioning and that data from children and young adults are currently inconclusive, a bilingual advantage seems to be present among older people. Indeed, as Valian (2014a) suggests, studying younger individuals is difficult *per se* because they are exposed to so many other activities that may enhance executive function, such as video-gaming, physical activity, and intellectual challenges. In older individuals these potentially confounding factors are generally reduced, hence in older people bilingualism may be more prominent as a key factor that influences executive function. However, Valian also notes that there are currently very few studies on bilingualism in the aging population relative to those on bilingualism in children and young adults, thus further studies are needed in order to have a clearer picture.

The second set of studies in this issue of BLC directly addresses bilingualism and aging. The literature on bilingualism and aging falls largely into two lines of research. One line focuses on how linguistic processing of two or more languages is achieved by the aging brain (as compared to younger bilinguals). This kind of research also investigates whether cognitive decline (and/or aphasia) affects language processing to an equal degree in both languages. The second line of research is a more recent one and is concerned with how (and whether) lifelong bilingualism protects the brain from cognitive decline. As mentioned above, the latter line of research has recently captured both neuroscientific and public interest because of its societal implications. Indeed, with more than 5 million cases of Alzheimer disease in the USA and no treatment upon the horizon, the notion that bilingualism could delay cognitive decline is of crucial importance.

We present in this issue four papers on language processing in older bilinguals and the potential cognitive benefits of bilingualism during aging that aim to enlighten this interesting and very recent research field. Hernandez

& Kohnert (2013) compare language switching in older and younger bilinguals using a blocked-language and a mixed-language condition. They report slower reaction times in the older than the younger bilinguals, particularly in the mixed condition. The second contribution (Calabria, Branzi, Marne, Hernández & Costa, 2013) addresses, first, age-related changes in bilingual language control mechanisms across the lifespan, and second, age-induced effects on the relation between language control and domain-general executive control. The third contribution examines the behavioral performance of elderly bilinguals in three cognitive domains (inhibition, attention and working memory), and suggests that bilingualism may confer a cognitive advantage in old age only for a subset of bilinguals (Goral, Campanelli & Spiro, 2013). The final paper (Manchon, Buetler, Colombo, Spierer, Assal & Annoni, 2014) deals with language processing in aging-related brain pathology. Manchon et al. present a study focusing on Alzheimer dementia in bilinguals and conclude that this type of dementia affects both languages similarly.

This collection of papers is in line with our view of future research directions for our field. We would like to encourage researchers to conduct more studies on aging and bilingualism. Knowledge about language processing in older bilinguals (and monolinguals), and about the potential factors that prevent cognitive decline, should contribute to preparing for the demographic changes which our society faces. We very much hope readers will enjoy the comprehensive coverage of bilingualism, cognition, and aging presented in this issue of BLC.

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