

# **Language and Productivity for all Americans**

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## **What are the Benefits of Multilingualism to the Personal and Professional Development of Residents of this Country?**

Although most of the world is multilingual, the use of two or more languages in the US has historically been marked as a complicating factor, confounded with attitudes towards immigration and cultural diversity. Those attitudes have created a wealth of mythology surrounding language learning and language use. The assumption of English as the only language or the majority language in the US has led to the belief that acquiring a second language as an adult is an impossible task, accomplished successfully only by the few who possess a special talent for language learning. Likewise, although young children appear to be able to acquire multiple languages easily, there has been an assumption that introducing a second language too early during infancy will produce confusion and irrevocable damage to language and cognitive development. For those who are proficient speakers of two or more languages, and who freely mix the two languages when they speak to others who are similarly proficient, there has been an assumption that language mixing or language switching is a sign of pathology or incomplete language ability.

The attitudes that have shaped the views of multilingualism in the US have not only affected public perceptions, but also those of educators and scientists. It is more difficult to have a classroom of children who speak home languages other than English and it is a challenge to conduct research on language and cognitive development in speakers of more than a single language. In 2016, the assumptions and attitudes that have been prevalent historically have been turned around. We have come to see that the assumptions about the dangers of multilingualism are simply mythology.<sup>2</sup> Far from being a complication, multilingualism provides benefits to individuals at all points along the lifespan, from the youngest infants and children, to young adults, and to older adults who may be facing cognitive decline.<sup>3</sup> Young babies are not confused by hearing two or more languages but develop the ability to discriminate the languages they hear and to be more open to new language learning than their monolingually exposed counterparts.<sup>4</sup> Adult learners who are well past early childhood have been shown to be able to acquire sensitivity to the grammar of a second language despite their age.<sup>5</sup> And all of that language mixing? Code switching is a common feature of bilingual discourse, with language switches occurring right in the middle of spoken sentences. We now know that code switching is not only rule governed, but that it reflects a sophisticated cognitive strategy that enables listeners to exploit the features of bilingual speech as speech is produced.<sup>6</sup> For language scientists, the multilingual speaker is now seen as a model for understanding the way that language experience shapes the mind and the brain.<sup>7 8</sup>

A set of research discoveries in the last two decades provides compelling evidence to reverse the older false beliefs about multilingualism. We have learned that there is far

greater plasticity throughout the lifespan than previously understood. Life experience at all ages has consequences for cognition and for both the structure and function of the brain. As an important aspect of life e



and protections afforded by multilingualism might be greatest. These include young children, for whom the failure to acquire literacy skills may endanger academic outcomes, and older adults, facing normal cognitive decline as they age, or pathology if they are likely to develop dementia. The findings on multilingualism at these two ends of the lifespan have been informed by the basic research on young adults, but we focus here on the very young and very old because the benefits for society at large may be greatest. We then consider more generally the directions that this work suggest for best practices for second language learning and for recommendations about the type of investments that we might make to overcome the biases about multilingualism that prevent the full range of benefits to be observed for all Americans across the diverse contexts in which they find themselves.

### ***Literacy and academic achievement in young school age children***

One in five children in the United States lives in a household in which a language other than English is spoken.<sup>17</sup> The 2004 National Center for Education Statistics has reported that about 30% of children who speak English but who are exposed to another a language at home do not complete high school. Many studies have shown a well-established relation between low socio-economic status and low English skill level in children from homes where a language other than English is spoken.<sup>18 19</sup> Recent work also suggests that speaking a language other than English at home acts as an independent risk factor.<sup>20</sup> Poor literacy outcomes among a significant portion of the population constitute a substantial public health concern because low levels of literacy are associated with higher rates of incarceration, unemployment, and mental illness.<sup>21</sup> These facts are alarming and suggest that unless there is a marked improvement in the literacy skills of today's

minority children, the future labor force will have lower literacy skills than the labor force of today.<sup>22</sup> Because mastery of English by immigrant children is a critical aim, one response has been to push aside the development of the home language to encourage the development of English. Often parents, educators, policy makers and pediatricians operate on the basis of a mix of folklore and intuition. Findings that bilingualism affects the rate at which each language is acquired<sup>23</sup> have been misinterpreted by some as evidence that bilingualism provides an inadequate environment for the development of English language skills. Quite to the contrary, the research that has systematically examined early and concurrent acquisition of a home language and a majority lan

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first bit of evidence that bilingual babies ‘figure out’ how to learn two different languages as easily as monolingual infants learn one.<sup>34</sup> We also know that six-month old babies growing up in a bilingual environment are better than monolingual babies at rapidly forming internal memory representations of novel visual stimuli.<sup>35</sup> One account for this finding is that learning two languages requires enhanced information processing efficiency compared to learning one language only, making it necessary for infants to develop enhanced skills to cope with the task of dual language acquisition. One exciting result from the work exploring the effects of bilingualism in children growing up in poverty is that bilingual children from low-income families are better than monolingual matched controls on a number of verbal and nonverbal tasks.<sup>See 31</sup> Given that children in the US who are born to the lowest income families have a 43 percent chance of remaining in that income bracket,<sup>36 37</sup> one way to mitigate the academic risks associated with low socioeconomic status and to maximize school readiness is by promoting the development of bilingual language acquisition in children from language minority homes. Monolingual children will also benefit from bilingual immersion programs similar to the ones offered in Illinois and California because they too will experience the cognitive and linguistic advantages associated with growing up bilingual. Learning a new language and culture will also have transformative effects on their readiness as global citizens.

***Speaking two or more languages protects older adults against cognitive decline***

Former Speaker of the House of Representatives, Newt Gingrich, published an Op-Ed column in the New York Times on April 22, 2015 in which he urged congress to double the NIH budget. He argued that a breakthrough discovery about Alzheimer’s that might



delay the onset of the disease by five years would create a dramatic reduction in the number of afflicted Americans, with a corresponding reduction in costs and stress to family members. What he failed to mention, is that research on bilingualism has already documented a delay of 4-5 years in the onset of Alzheimer's symptoms for bilinguals relative to age and education matched monolinguals.<sup>38</sup> No known pharmaceutical agent has any effect that comes close to bilingualism. The consequence effect of bilingualism is not to affect Alzheimer's directly, but rather the symptoms of the disease. A life as a bilingual seem to provide protection to the cognitive mechanisms that enable the person to negotiate the deleterious consequences of the disease. The protective effects of

But does bilingualism benefit older adults who are healthy and free of signs of cognitive pathology? It is important to note that cognitive aging is a normal process, with reports of increasing word finding difficulties in spoken language, and increasing disruption to executive control.<sup>41 42</sup> These declines do not begin abruptly at age 75 or 80 but begin to develop gradually as individuals age. Notably, those aspects of cognition that decline in aging coincide with many of the features of executive function that have been reported to be influenced by bilingualism, including ignoring irrelevant information, resolving competition or conflict across alternative responses, and switching between tasks. Studies that have examined the performance of healthy older adults have shown that bilinguals often outperform monolinguals on these measures of executive function.<sup>43</sup>

the more likely they are to be proficient, and proficiency seems to be more critical to these consequences of bilingualism than age of exposure per se.

Another question and criticism that has been leveled at much of the research on this topic is that it inevitably involves comparisons across different groups of people. As with any comparison across groups of people, we can attempt to control or match as many factors as possible to be sure that the inferences we draw in how these groups differ is really about their language experience and not about some other aspect of their life experience that is correlated with their bilingualism or multilingualism. But it is difficult to do this perfectly. Some individuals acquire a second or third language by choice and others as a consequence of the demands of immigration. Some live in an environment where everyone else s



languages in play are likely to influence one another and the neural plasticity that has been shown to characterize learners at all ages suggests that these changes can sometimes occur quickly during the earliest stages of new language learning.

The bottom line is that the two or more languages that are spoken by a bilingual or multilingual individual are not like the native language spoken by a monolingual speaker. Most of the past research on second language learning is based on a model of the native speaker, with the goal to attain native speaker like abilities in processing the second language. That model assumes, for the most part, that the two languages are independent of one another, an assumption that we now know to be incorrect. If proficient multilinguals are not like monolingual native speakers, then the classic native language model is the wrong model for language learning.

A problem in adopting a multilingual model for new language learning is that for adult learners who are already proficient speakers of their native language, there are some features of the native language and indeed, of their native language skill, that may need to suffer interference, at least briefly, to enable the second language to become established. There is an approach to new learning that has been examined extensively in research on memory and learning that may be useful to the new perspective that we suggest may be necessary. Robert Bjork and Elizabeth Bjork at UCLA have pursued a program of research on what they call “desirable difficulties” in learning.<sup>50</sup> The idea is that conditions of learning that give rise to difficulties that increase the contextual salience of new material, that produce errors that provide meaningful feedback, and that encourage elaboration, may ultimately produce better learning and better memory for what has been

learned. Desirable difficulties can be imposed externally during learning, e.g., by having learners acquire information under conditions that are costly or slow, or by mentally imposing those condition on themselves, by self-regulation.<sup>51</sup> In the realm of language learning, there have been a few studies that can be understood within this framework, but the implications for language learning more generally have yet to be developed.<sup>52</sup> Learning new material quickly may produce a level of satisfaction for the learner but may not necessarily produce enduring memory for what has been learned.

The lessons about multilingualism and desirable difficulties come together when we consider what is known about mixing languages. As we noted earlier, code switching, even within a single utterance, is a common occurrence in bilingual speech. Not all bilinguals code switch but those who do appear to move seamlessly from one language to the other with little disruption on the part of either the bilingual speaker or the bilingual listener. Likewise, studies of memory and learning suggest that learning under mixed conditions may produce more stable outcomes than learning under blocked conditions.<sup>53</sup> In the field of education, the idea of “translanguaging” proposes a related concept about having learners exploit all known languages within the context of a given lesson.<sup>54</sup> Mixing information may not simplify learning, but creating learning environments that simultaneously create desirable difficulties and move new language learners in a direction that more closely resembles the experience of proficient bilinguals may be likely to enhance productive outcomes.

The studies we have reported on infant learners suggest tremendous gains that result when babies are exposed to language variation early in life. A recent proposal is that the very conditions that are available naturally during infancy may also give rise to learning strategies that may be applied to adu







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