1 WHO IS BILINGUAL?

Chapter Objectives

- Learn about the simultaneous or consecutive exposure to two languages and the stages of bilingualism;
- Examine the nature of codemixing and linguistic transfer;
- Explore how the bilingual brain works differently than the monolingual brain;
- Discuss the linguistic, cognitive, and socio-cognitive benefits of bilingualism across the life span and why it is important to learn more than one language in adulthood.

1.1 The Stages of Bilingualism

The regular use of more than one language is a widespread skill in society. Increased migration, the prevalence of research being published in English, foreign language learning, and more generally, the mobility of people and ideas, have contributed to an upsurge in bi-/multilingualism. Today, more than half of the world's population is estimated to be bilingual or multilingual. The European Commission (2016) found that around two-thirds of working-aged adults in the European Union (EU) knew at least one foreign language, about 21 percent defined themselves as trilingual (i.e., speaking two languages in

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addition to their first language, L1), and 8 percent said that they know three or more languages in addition to their first.

So, what exactly does it mean to be bilingual? Is this a phenomenon applicable to anyone as described above, or are speakers who only have a native or very advanced proficiency in two or more languages considered bilingual? The term **bilingualism** is often adopted loosely in everyday communication to refer to anyone who knows two languages or two linguistic **varieties**. In truth, many factors contribute to being bilingual, and we will see in the upcoming chapters that the way a language is learned and used varies considerably, both between communities and individual speakers.

Throughout this book, we will view bilingualism based on the *use* of languages and on the *situations* in which the brain is "juggling" languages. Thus, a person who knows more than one language and uses them to communicate is considered a bilingual, even if she does not have native-like proficiency in both languages. This definition is deliberately uncategorical. As we will discuss in Chapter 3, bilingualism is determined by the regular use of two languages, rather than by the level of competence achieved. For example, if an individual habitually speaks Hindi and a regional dialect spoken in India, or if she lives in India and speaks Hindi at school, at work, and during social activities, but her family speaks another language at home, she is considered a bilingual – her brain is constantly managing two languages and switching from one to the other. Bilingualism therefore does not only describe those who have a similar proficiency in the two languages and who speak both at the same level, but also to those who have a dominant language yet use the other in specific circumstances. Furthermore, the term bilingual can refer to adults who learn a second (L2) or third (L3) language, without having been exposed to it as a child, and who use it effectively in communicative situations. All of these variations of bilingualism are based on speakers' experiences, and they offer a unique opportunity to explore the effects of language learning on the brain. The various types of bilingualisms also allow us to ask questions about the neurobiology of language that involve cultural, social, and environmental factors. In practice, speaking more than one language can provide communicative and cognitive skills, even if an individual does not have native-like proficiency.

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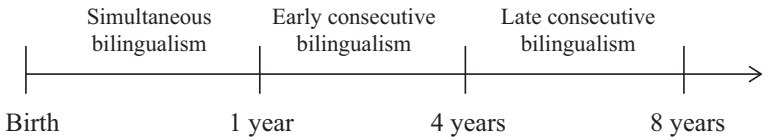

Figure 1.1 Stages of childhood bilingualism based on age of exposure to both languages.

From a scientific point of view, however, we need to fully describe the different stages of bilingualism. And to do this, we must identify and test the many variables that are essential to understand this phenomenon. These variables, which we will begin to discuss next, will accompany us along our journey into the bilingual brain.

To better define bilingualism, the first concept we should examine is **age of acquisition**, that is, the moment one first is exposed to a language. It is possible to become bilingual even in adulthood. However, as we will see, learning a language as an adult can lead to different stages of development and degrees of competence. With respect to age of acquisition, an important distinction that is reported in scientific research is between early and late bilingualism (see Figure 1.1). Early bilingualism has been studied extensively and involves learning more than one language from birth or within the first years of life. We can further classify early bilinguals as either simultaneous or consecutive bilinguals. A **simultaneous bilingual** is an individual who has learned more than one language in parallel since birth. An **early consecutive bilingual**, on the other hand, is one who has learned more than one language during childhood, but not from birth. Consecutive bilingualism can therefore affect different stages of childhood: if an L2 is introduced after the age of 4 but before the onset of puberty (say around 8 years of age), we refer to this as **late consecutive bilingualism**.

However, it is important to keep in mind that these age ranges and bilingual classifications are simply estimates; the unique experiences and different patterns of exposure to each of the two (or more) languages can give rise to several individual differences. Furthermore, it is not rare to find individuals who learn an L2 well into adulthood yet attain proficiency levels on par with their native-speaking counterparts (Paradis, 2011). We often refer to these individuals as **late adult**

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bilinguals. These individuals are particularly important for studying the bilingual brain because it has often been claimed that the reduction of brain plasticity in adulthood is one of the causes of having poorer language learning outcomes as we age. In the strictest sense, calling individuals who have learned an L2 as adults *bilinguals* may seem incorrect. Thus, in the case of late bilinguals, it is appropriate to distinguish between those who are still learning an L2 and those who use both languages, if not in a balanced way, at least on a regular basis. This is because for many years it was believed that the biological period presumed to be available for language learning (the so-called **critical period**) is limited, and that after puberty, the linguistic functioning of the brain is somewhat different in L2 or L3 learning (Johnson & Newport, 1989). However, recent research shows that languages can be learned in adulthood to very high levels.

We also know that over the course of life, an L2 can become more dominant and cause changes in the first language. This has been demonstrated in studies on **language attrition**, that is, the phenomenon by which the L2 modifies the first (Sorace, 2011; Schmid & Köpke, 2019). Although many researchers adopt the term **second language acquisition** to refer to the process leading to bilingualism for adolescents and adults, in more recent research, the term bilingualism is preferred even for speakers who are not equally proficient in both languages but who make use of both languages on a regular basis. This is because – as we will also see in Chapter 4 – the brain may undergo morphological and functional changes due to language learning even well into adulthood.

Although adults can achieve near-native proficiency in an L2, learning two languages from an early age can have significant advantages, and therefore it makes no sense, as we will see in Chapter 6, to wait for the child to attain a certain level of competency in one language before exposing them to another. On the contrary, restricting exposure to an L2 in the most receptive period fails to exploit the many advantages of bilingual learning during these early years. In Chapter 2, we will see that **phonology** can benefit from early exposure to an L2. Vocabulary and pragmatic competence, on the other hand, are acquired almost continuously over the course of life and can change considerably with age. This is because the various domains of linguistic competence

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have different sensitive periods with unique characteristics. For instance, throughout our lives, we do not continuously learn and relearn the grammar or sounds of our languages, but it is not uncommon to acquire new words along the way or to find ourselves in new communicative environments.

Bilingualism Matters

A Bilingual Family: A Different Language Profile for Each Family Member

To illustrate the terminology presented thus far, let's take an example of a family of two parents and two daughters who move to a country where a language other than their mother tongue is spoken. One of the girls is 6 years old, the other is 8 months old, and they both have only been exposed to one language up until the move. The older girl, who is now learning an L2 in the prepubertal phase, represents a case of consecutive bilingualism. The younger girl, on the other hand, falls into the category of simultaneous bilingualism since the two languages will share a large part of the acquisition process during the critical period. On the contrary, both parents have an opportunity to acquire an L2 in their adulthood and therefore, if they have sufficient opportunity to practice both languages, they will become late bilinguals.

After a few years, it is possible that changes in language competence will happen for each member of the family. When parents practice the L2 regularly, they demonstrate that doing so is an active option that can be chosen when needed. The two girls will need to keep practicing both languages, and it is possible that their exposure to the family language will come mainly from family members. It is important at this stage to support their learning by offering exposure to the L1 with as much **input** from a variety of speakers as possible. Exposure to more varieties of the language will help to acquire cultural and linguistic features more fully.

1.2 Bilingualism and Codemixing

Bilingual speakers have the seemingly astonishing skill of switching from one language to another almost effortlessly. This

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observation is especially surprising in very young children who are still acquiring, or have yet to acquire, sophisticated cognitive reasoning skills. Although bilinguals distinguish between the two linguistic systems, they often tend to mix them and therefore show interference between one language and another. In the past, **codemixing**, such as inserting a word of a different language into a sentence or starting a sentence in one language and continuing it in another, was viewed as evidence for causing confusion in bilinguals' brains and for the inability to separate two languages in one mind. However, several studies have shown that for bilinguals, codemixing adheres to very precise linguistic and situational rules. In an experiment by Genesee et al. (1995), the amount of codemixing spoken by a bilingual adult was manipulated in a conversation with a child. The adult speech either included very little language mixing or a significant amount. The findings showed that the child adapted to the communicative situation, codemixing less when the adult did so less and more if the adult frequently codemixed. From the point of view of linguistic (syntactic) rules, it is not surprising that a bilingual can start a sentence in one language and end it in another. Nonetheless, very precise rules of mixing have been observed that suggest that bilinguals tend to follow the constraints of their languages. For example, an English-Portuguese bilingual might produce the sentence in (1) but it would be difficult for them to say something as in (2). This is because the words *some* and *rice*, as a constituent, form the object of *cooked* and thus, have a strong grammatical connection that is difficult to break apart with a language switch.

(1) Esta manhã eu cozinhei some rice.

(2) Esta manhã eu cozinhei some arroz.
'This morning I have cooked some rice.'

In general, codemixing is circumscribed to situations of interaction or to linguistic properties, as well as in the case of **transfer**, in which characteristics of one language affect the other. For example, it is possible that an English-Spanish bilingual makes some errors with grammatical gender in Spanish because English words are not always marked as such. So, you may hear him say (3) or (4), both of which are incorrect (*).

(3) * La chico ha caído
* The.fem boy.masc has fallen

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(4) * La chica está cansado
* The.fem girl.fem is tired.masc

In Italian, on the other hand, grammatical gender is present in all relevant words, as shown in each word in (5) except for the verb è (third person singular of *essere*, 'to be').

(5) La ragazza alta è cresciuta.
The.fem girl.fem tall.fem has grown.fem
"The tall girl has grown."

The examples of transfer in (3)–(5) demonstrate the operations the brain unconsciously executes with language. Another linguistic phenomenon that occurs differently in languages is the possibility of not pronouncing the subject of a verb, as shown in Greek in (6). These languages, also including, Hindi, Italian, Portuguese, Spanish, among others, are known as pro-drop languages.

(6) Βλέπεις εκείνο το κούτσουρο
See.2s that the dog
'You see that dog.'

Studies on English-Italian bilingual children show that, although bilingual children know that the subject can be omitted in Italian, they nonetheless make extensive use of subject pronouns as they would in English. For instance, based on the English gloss in (7), which requires the overt use of *he* as the subject of *will come*, English-Italian bilinguals may produce a sentence like in (7). An Italian monolingual[1] speaker would rarely specify *lui* as in (7) and would prefer not to verbalize it as was shown in (7) (Serratrice et al., 2004; Sorace et al., 2009). *Lui* in this sentence would normally be interpreted as referring to someone other than Gianni and therefore, bilinguals in this case introduce more ambiguity in the sentence.

(7) Gianni ha detto che lui verrà domani
Gianni has said that he.subj come.fut.3s tomorrow.
'Gianni has said that he will come tomorrow.'

[1] Throughout the book, the term "monolingual" is used to refer to individuals who are closer to the monolingual end of the bilingual continuum.

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1.3 The Monolingual vs. Bilingual Debate

So far, we have defined the stages of bilingualism and have emphasized that an individual can be bilingual even when learning an L2 as an adult or making predictable language mixes. Before proceeding further, it is important to understand that bilinguals are not the sum of two monolingual speakers in one, nor should they be compared to monolinguals of each of the two languages (Grosjean, 1998). This belief often leads to an erroneous perception of the language abilities of bilinguals, who often feel that they are less proficient than monolinguals. And, in many circumstances, especially in educational settings, bilinguals feel that their bilingualism is ignored and undervalued. However, to researchers in bilingualism, the presence of a large population of bilingual speakers is a unique opportunity to discuss new topics that would not have otherwise emerged, such as the ability to learn languages, the possibility of using different language systems in various circumstances, and the facility to develop metalinguistic competence due to the comparisons that the brain makes between languages. But above all, bilingualism allows us to examine the influence that a varied and rich linguistic input has on the brain in its various cognitive abilities.

It is interesting to note that many aspects of bilingualism derive from the fact that the input of a monolingual speaker is often much more homogeneous than that of a bilingual speaker, although monolinguals use different registers of their language. Bilinguals are often exposed to diverse input in both languages, produced, for example, by a variety of speakers who may find themselves in one of many stages of language acquisition or attrition.

Several indices have been developed to measure the effects of input on linguistic development in bilinguals. The most common way is calculated by simply subtracting the number of years a bilingual has been exposed to a language from his age. In the example of the family presented earlier, the 6-year-old girl, who had never been exposed to the L2 before arriving in the new country, would be quite unbalanced when using this index: 6 for the native language minus 0 for the new language = 6. It is very likely that after a few years of living and going to school in the new country, the girl's L2 will become more dominant than her L1,

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but according to an index of 6, her first language should still be more dominant.

This suggests, first, that the traditional index may not be specific enough. In Chapter 6, we will present refined indices that dynamically and cumulatively consider the quantity and quality of input over time. These measures are therefore more appropriate for examining the effects of linguistic input. Secondly, it highlights the fact that language dominance is not a stable concept, but rather a dynamic process that differs from one individual to the next based on their unique language experiences. For example, in a study by Flege et al. (2002), the researchers examined the effects of age of arrival to Canada on language use and dominance among Italian-English bilinguals. The results showed that even speakers who arrived later as adults tended to perceive the L2 as dominant, given their constant use of it in their everyday lives. Therefore, linguistic experience – and as we shall see, cognitive factors – of a bilingual speaker clearly differentiate them from monolinguals. In sum, due to the changes that bilingualism causes in various stages of life and because of the greater variability of the input to which bilingual speakers are exposed, they cannot be viewed as two monolingual speakers in one.

1.4 Why Is It Important to Talk About a Bilingual Brain?

Research on the neural bases of language initiated because of new tools in neuroscience. Initially, this body of work was limited to examining monolingual speakers and did not consider the effects that bilingualism has on the brain. From a cerebral point of view, it was assumed that the knowledge of one language, and therefore, its neural representation, was not modified by the presence of an L2 or L3 and that it was sufficient to study the brain of a monolingual speaker to understand how the language(s) in general was/were processed in the brain.

However, the last twenty years of research has adapted a neuroscientific perspective that favors a more ecological study of languages, the brain, and its functions – a view which reflects the way we really use languages. By enhancing the study of bilingualism during neuroimaging experiments with actual *bilingual* participants, we have gained a greater

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understanding of how language is organized in the brain. And for the study of the bilingual brain, new cross-disciplinary intersections such as linguistics and neuroscience have produced refined models that can characterize the neural properties of languages. In Chapters 3 and 4, we will discuss in detail neuroimaging studies examining areas of brain activity. We will see that languages are all processed in the same way by monolinguals and that there is no difference with respect to how Spanish or Chinese, for example, are organized in the brain. In other words, at the phonological, morphological, syntactic, and pragmatic levels, the respective brain and temporal areas that are activated are very similar regardless of the language in question. However, differences *do* emerge if we measure the sensitive variables for bilingualism, which we discussed above, namely language proficiency, the age at which an individual is first exposed to the language, and the quantity and quality of linguistic input.

In a seminal study by Perani et al. (1996), the researchers used **positron emission tomography (PET)** to identify a qualitative difference between the activation of specific areas of the left hemisphere while listening to stories in the mother tongue (Italian), in the L2 learned as adults (English), and in an unknown language (Japanese). PET is a brain imaging technique that uses a harmless radioactive drug to trace and measure changes in functional processes in the brain. In this study, brain activity while listening in the mother tongue was more intense and uniform than the language learned later. The study, however, was limited to speakers who had learned English as adults and thus did not explore whether the differential activity level in the L2 was due to proficiency level or age of exposure. These variables were instead considered by Perani et al. (1998) in which the researchers tested Italian adults who learned English after the age of 10 and Spanish-Catalan bilinguals who used both languages on a regular basis and acquired them before the age of 4. The findings suggested that the regular use of the languages, rather than the age of acquisition, was more crucial for language learning in adulthood.

In sum, new horizons in language neuroscience are challenging the idea that languages can only be acquired by children. It seems more plausible that the differences between speakers, found, for example, in word naming tasks in the L2, are potentially related to linguistic

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competence rather than age of exposure. Neuroimaging techniques, among other things, can show us how the brain recruits areas predisposed to language processing and other areas, such as the prefrontal regions associated with cognitive control that generally would not fit into the brain network of a speaker with high competence (Perani & Abutalebi, 2005). There are also some conflicting neuroimaging data that must be interpreted in the context of a coherent language network in the brain. Some studies have shown that depending on the linguistic task selected, there is less activity in temporoparietal areas for less proficient bilinguals than for highly proficient bilinguals. Moreover, it seems that language experience and especially practice (i.e., factors that can change even in a short period) can produce important brain changes (Perani et al., 2003). In Chapter 4, we will review this expanding body of research and see that in general, the findings support brain plasticity – even in adulthood – that adapts with practice, at least for certain aspects of language acquisition.

Now, in addition to the differences linked to linguistic factors (e.g., sensitivity to phonological or grammatical factors) or to environmental factors (e.g., exposure or age of acquisition), one of the most fascinating discoveries that research in bilingualism has offered is that being bilingual seems to modify the brain even outside of the domain of language itself and has consequences both for cognition and personal health.

1.5 The Benefits of Bilingualism

A unique attribute of bilingual speakers is that they have a heightened understanding of how language works. Bilingual children are intuitively interested in the structure and functioning of languages and they unconsciously notice the differences and similarities between them. Parents often observe how bilingual children "play" with languages, for example, by creating new words that do not exist in one language but that sound familiar in the other, imitating different accents, or creating predictable mistakes in one language. Part of these important metalinguistic skills is that bilingual speakers develop a greater ability to distinguish between the shape and meaning of words, naturally sensing that a meaning, such as the concept of *dog*, can have

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different linguistic forms in various languages: *chien* in French, *kalb* in Arabic, *perro* in Spanish, and 狗 ("gǒu") in Mandarin.

In reality, there are two words (one in each language) for every concept in the bilingual brain – for an Arabic-Spanish bilingual, *kalb* and *perro* both refer to a dog. This increases the ability to reflect on language and stimulates the acquisition of vocabulary within each language. For instance, as we will see in Chapter 2, bilinguals may acquire synonyms easier, even though they are more easily avoided in the early stages of language learning. Furthermore, because of these sharpened metalinguistic skills, research has shown that in some cases, bilingual children learn to read before monolinguals. This early reading ability, which has been found in particular in learning alphabetic writing systems, derives from the fact that bilinguals are better at recognizing the systematic correspondence between written letters and spoken sounds (Bialystok & Herman, 1999). Their decoding mechanisms while reading are more transparent, although this may be connected to having literacy in the other language as well. It has also been reported that metalinguistic awareness of language structure has a positive effect on learning a third or fourth language, as is often observed by both families and teachers (Abu Rabia & Sanitsky, 2010).

Putting aside the linguistic domain for now, there are other potential benefits of bilingualism that are connected to general cognition, and in particular, to some aspects of **executive control** that regulate attention mechanisms. Research has shown that compared to age-matched monolinguals, bilinguals often have an advantage in laboratory experiments in which rapid switching from one task to another is required, when interfering factors must be ignored, and when selective attention is involved. As we will discuss in Chapter 3, some of these tasks measure the speed and accuracy of reacting to a stimulus. These advantages are not temporary, but rather persist into adulthood, as has been found in adults who have grown up speaking two languages from childhood (Bialystok et al., 2008). But why is there a link between bilingualism and executive control? From the brain activity of bilinguals, the main hypothesis is that both languages are constantly active in the brain. In a practical sense, the brain always keeps the possibility open to call on and use any language it knows. The obvious problem is that we cannot speak two languages at the same time. Therefore,

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bilingual speakers seem to develop an inhibition mechanism that allows them to keep the two languages separate in order to limit the language not being used from interfering with the target language – all while keeping it actively available to some degree. The exception to this is **bimodal bilingualism**, which refers to the regular use of a signed language and an oral language (Emmorey et al., 2008).

So, for bilinguals, the prolonged experience of inhibiting one language when speaking the other strengthens control mechanisms that are utilized in other activities requiring attention and executive control. Consequently, this improves the ability to perform multiple cognitive tasks simultaneously or in rapid succession. Some studies suggest that these cognitive advantages are maintained into old age and can protect bilinguals from some of the typical phenomena associated with aging, such as decline in cognitive functioning (Bialystok et al., 2008). It is important to note that if the benefits of bilingualism derive from the constant practice of inhibiting one language while the other is being used, then this should happen in all bilinguals, regardless of which languages they speak. Therefore, there are no languages that are "better" for the brain than others. In fact, cognitive advantages have also been reported for bilinguals who speak minority and regional languages such as Sardinian (Garraffa et al., 2015; Garraffa et al., 2017).

Another little-known benefit of bilingualism is the greater and earlier awareness that other people have a different perspective than their own. The phenomenon of **decentralized cognition** is often defined in cognitive and developmental psychology in the context of **theory of mind**. It has been reported in some studies that the ability to see the point of view of others is achieved by bilingual children about a year earlier than monolingual ones. This advantage seems to be linked to the bilinguals' constant practice with monitoring the linguistic competence of their listeners in order to better adapt their language choices to the particular person with whom they are speaking (e.g., whether the listener is a monolingual of Language A, monolingual of Language B, or a bilingual of A and B (Kovács, 2009).

Finally, more recent research on the effects of bilingualism on cognition has found that **decision-making** behavior, or the way we make decisions, is conditioned by the language in which the decision

is made. Some experiments have shown that humans are less sensitive to emotions if processing information in a foreign language (Costa et al., 2014). In other words, our choices are influenced less by things like happiness or nervousness when we are using the L2. Interestingly, the effects of a foreign language on decision-making are limited to situations that involve emotional factors. If, on the other hand, the situation has no emotional relevance, decision-making seems to be no different in the L1 or L2. The conclusion of these studies is that the effect of making decisions in an L2 reduces the influence of emotions and sharpens the focus on the choices at hand.

Bilingualism Matters

Cognitive and Linguistics Advantages of Minority Languages

Most research on the benefits of bilingualism has reported on speakers of "global languages" such as Spanish, Chinese, or English. Some researchers are now addressing the issue of whether bilingualism involving global vs. minority languages is a modulating factor of the benefit of bilingualism. In principle there is no reason for us to believe that the brain discriminates between languages based on the number of speakers or the social prestige of a language.

It is important that research in bilingualism include studies on languages that are often considered dialects and minoritized, as this is crucial in better defining the advantages for the bilingual brain. Some research has been conducted on language varieties spoken in Italy in the Sardinian Island where the local languages are practiced and passed on to the new generations. The language is more diffused in the central part of Sardinia, where people are conversing in Sardinian and using the dominant language, Italian, mostly for formal communication.

In a study by Garraffa et al. (2017), adult fluent Sardinian-Italian speakers were reported to have enhanced verbal memory (i.e., a stronger ability to recall a list of numbers/facts/words) compared to monolingual Italian adults living in the same area. Moreover, while this same group of bilinguals had no formal postsecondary education, they showed better memory skills compared to educated individuals living in the same area but not using Sardinian regularly. The findings suggest that bilingualism with an oral language can benefit verbal memory, due to the unique oral

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medium and the consequent need of memorizing. Many regional/local languages in the world have no writing system or have little use of reading and writing. Unfortunately, this often classifies the language as less prestigious, as it is not represented in literature or news. Although having a writing system is extremely important, bilinguals whose language does not have a writing system can develop enhanced cognitive abilities such as memory skills.

Other studies on regional languages have been conducted on Gaelic, a language spoken in Scotland (e.g., Garraffa et al., 2020). The studies often involve children studying at Gaelic medium education (GME) schools who are learning how to read and write in both Gaelic and English. While there are not many examples of schools across the world promoting biliteracy of a regional language, the GME schools in Scotland offer Gaelic as the primary language and source for literacy and English as a modern language subject. In the study by Dickson et al. (2021) the authors compared English reading abilities among students from the GME system and monolingual English students in non-GME schools. The findings showed that English literacy among the children in GME schools was on par with that of English monolingual children in non-GME schools. Furthermore, by the last years of education in the GME schools, the individuals outperform their monolingual counterparts in English reading. These positive findings about biliteracy are crucial for many families and schools which are considering education in more than one language.

1.6 Why Learn a New Language?

The outcomes of learning a language, especially as adults, generally reveal significant individual differences such that some individuals manage to attain a very high proficiency in the languages while others may struggle. At times, one may wonder if it is worth trying to learn a new language, or whether it would be enough to exercise the brain with less complex activities. The answer is not so much whether it is better to start learning a language, say after the age of 40, to do at least one Sudoku per day, or to work on cognitive training programs. Research is showing that what is important for the development of a healthy brain is to keep the brain trained with complex and stimulating activities,

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which can progress in complexity. However, it is even better if these activities entail social interaction (Valenzuela & Sachdev, 2009). Accordingly, learning a language seems to be the ideal activity that meets the criteria for the development of a healthy brain, as suggested by studies on aging. Learning an L2 is certainly not the only activity beneficial for maintaining a health brain; however, because languages are often widely available within one's region or country (e.g., minority languages and regional varieties are a significant asset), and because traveling is more available than it was before, doing so can improve daily activities that can be integrated into lifestyles.

There are still many questions about whether the manner of language learning or the environment in which a language is learned can have additional influences on the human brain. A recent study on a group of adults attending an intensive language course showed improved attention control after only one week of language learning compared to individuals who had either attended other intensive activities or simply maintained their normal routines (Bak et al., 2016). These findings suggest that engaging in language learning pays off quickly, with visible effects at any age that are maintained over time if practiced regularly. We will return to these issues in Chapter 4.

Research addressing how to lead a healthy lifestyle now includes learning a language. The impact of language learning on the health and well-being of individuals is a fascinating subject that presents new perspectives on why it is important to learn languages. In countries with a large number of monolinguals, such as in the United Kingdom where English reigns for its global usefulness, foreign language education is undervalued, resulting in a significant reduction in the number of people who learn languages compared to other countries. This is because social benefits are associated with knowing the global language and because research has not yet been able to massively inform society about the benefits of bilingualism for cognition and that these benefits are the same for *every language* including minority and regional languages.

Summary

In this chapter, we have discussed how to define bilingualism based on the actual use of the language and not so much on the level of

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proficiency or the age of acquisition of the languages. Bilingualism has been defined as a continuum on which speakers are able to move as a result of their exposure to and practice with the languages. Throughout the chapter, we have introduced the key terms in bilingualism that help us to more accurately characterize the nature of speakers of two or more languages. We also discussed the phenomenon of codeswitching as a rule-governed process, along with examples from different languages. The chapter also presented some of the differences between bilingual and monolingual competence, followed by a brief look at the cognitive benefits of bilingualism. In reporting evidence from empirical research about the bilingual brain, we offered considerations about the benefits of language learning for healthy aging across the life span – regardless of the social prestige attached to the languages.

Discussion Topics

1. Bilingualism has been presented as a dynamic process across the life span. Define two or three factors that can affect bilingualism.
2. Bilingual speakers often mix languages, generating sentences in one language with inserted words from another language. Define what codemixing is and provide two or three examples that show how it is rule governed.
3. It has been argued that bilingualism can have benefits outside of the language domain. Provide two or three examples of nonlinguistic domains that can benefit from bilingualism.
4. Bilingualism can be a positive resource at any age. Briefly describe why bilingualism matters, particularly in adulthood and later years of life.
5. Discuss whether the benefits associated with bilingualism depend on their global or social status.
6. Discuss some evidence for the proposal of a bilingual brain.
7. Describe decentralized cognition and its relationship with bilingualism.

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