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# Towards an interdisciplinary lifetime approach to multilingualism

## From implicit assumptions to current evidence<sup>1</sup>

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### Abstract

Many types of human behaviour, from scientific research to political decision-making, are based on implicit assumptions, considered to be so self-evident that they do not need any further justification. Such assumptions are particularly powerful in topics related to language: one of the most universal and fundamental human abilities and a prerequisite for social life, civilisation and culture. They become a driving force in the current debates about multilingualism.

We identify three central assumptions underlying key controversies related to language: (a) the “limited resources model” assuming that learning languages has a detrimental effect on learning other subjects, (b) the notion that the “normal” state of human brain, mind and society is either monolingualism, or a strong dominance of a “mother tongue”, accompanied by less relevant “additional” languages, (c) the belief that the aim of language learning is a “native-like” proficiency and anything that fails to reach it has only limited value.

Combining radically different academic backgrounds (education and cognitive neuroscience) and methodologies (qualitative and quantitative) we examine how these assumptions influence attitudes towards multilingualism. We evaluate the available empirical evidence and explore conceptual common ground, from the design of school curricula to the promotion of healthy ageing. We conclude that our perspectives complement each other, providing a valuable tool to inform language policy.

**Keywords:** bilingualism, multilingualism, language learning, education, neuroscience, ageing, dementia

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## Introduction

In the world characterised by globalisation, migration and multiculturalism on one side and by strong, occasionally violent reactions to these phenomena on the other, the topic of multilingualism is becoming increasingly a scientifically controversial and politically divisive issue. It affects the questions of individual wellbeing and social cohesion, education, health and politics. It is of interest and relevance to different scientific disciplines, from education through sociology and linguistics to cognitive neuroscience. However, this fundamental challenge of our times is usually studied separately by different disciplines, with only a few attempts to integrate their approaches. In this paper, we try to bring together the perspectives of education and cognitive neuroscience of ageing, identifying questions of shared interest, exploring common conceptual ground and examining how our findings can complement each other.

We believe that a potentially fruitful way of starting such collaboration is to examine central assumptions, which, although usually not stated explicitly, shape the way of thinking and reasoning, asking questions, interpreting research findings and formulating policy guidelines. We identify and discuss three central assumptions:

- (a) the “limited resources models” assuming that learning languages has a detrimental effect on learning other subjects,
- (b) the notion that the “normal”, “default” state of human brain, mind and society is either monolingualism, or a strong dominance of a “mother tongue”, accompanied by less relevant “additional” languages,
- (c) the belief that the aim of language learning is to reach a “native-like” proficiency and anything that fails to reach this goal has only limited value.

We examine how these assumptions influence attitudes towards bi/multilingualism, explore their conceptual background and evaluate the available empirical evidence.

Throughout this article we are constantly moving between two distinct, but in our opinion closely related topics: *multilingualism* and *language learning*. One of the reasons why these two topics are perceived as so different is an unduly strict and narrow definition of bi/multilingualism (we use the term “multilingualism” as the generic term for exposure to, and use and/or knowledge of more than one language and bilingualism as its special case, involving two languages). Equating multilingualism with a perfect, native-like command of all languages in question limits the use of the term to cases

of simultaneous acquisition of both languages from the moment of birth. However, if we define multilingualism as a spectrum, encompassing different degrees of language knowledge and use, simultaneous bilingualism, early sequential bilingualism and language learning in later life will appear as a part of the same continuum. We argue that the latter approach is not only closer to the multilingual reality of contemporary societies, but also to the latest findings of cognitive neuroscience.

In this article we propose that multilingualism and language learning need a fresh approach in education and a new rationale in life-long learning. In the recent months we have participated in the work of the EU Commission focusing on rethinking languages in education. Four key reasons for a new approach have been agreed by the stakeholders who participated in this work (European Commission forthcoming: 3):

- From a human rights perspective, the discrimination of learners based on their language violates article 2 of United Nations Convention on the Rights of the Child, which specifies non-discrimination grounds including a child's language.
- From an educational equity and inclusion perspective, ensuring that bilingual and multilingual learners, in particular those who had less access to learning the language of schooling, have equal opportunities to thrive alongside their peers is a priority for any education system. Effective multilingual teaching and learning has the potential to close the achievement gap of migrant students compared to "native" learners, while enhancing the cultural and civic education of all learners.
- From a public health perspective, various clinical studies in the area of neuroscience show the positive effects of bilingualism, independent of the languages involved. Positive effects are sustained over the life course and relate to increased cognitive abilities beyond linguistic skills.
- Finally, there is an intrinsic value in supporting all learners to develop plurilingual competencies.

In the following, we will discuss the main assumptions and consequences of "limited resources models" and normative monoglot ideologies and conclude with the concept of the Healthy Linguistic Diet and its implications for education and health.

### Limited resources models: languages versus maths?

Although attitudes to learning foreign languages and the value attached to them varies substantially from country to country, in many places across Europe foreign languages are in crisis. This is particularly pronounced in Britain, where the number of schools offering foreign language classes and the number of students choosing it for their GCSE and A levels is in constant decline. The latest British Council survey (2017) has established that the funding cuts and cost increases are making a big impact on post-16 courses, with languages among the subjects worst hit, resulting in 39% of colleges dropping courses in languages. At the GCSE level (General Certificate of Secondary Education, taken at the age of 16) there are no big changes in terms of overall percentage of students taking language exams: in the last four years 48–9% of students took a language exam. It is more revealing to look at the data analysis by local authority, as the participation in language learning varies widely. In the Isles of Scilly, there is just a single school, with an exceptionally low entry level (13%). In England, three local authorities have participation rates of 30% or less (Middlesbrough, Blackpool and Sandwell), while at the other end of the scale, three London local authorities have more than 70% of pupils sitting a language GCSE (Hammersmith and Fulham, Newham, and Kensington and Chelsea).

In parallel, more and more universities are either radically reducing foreign language departments or closing them down altogether. UCAS data show that the number of applicants placed onto European language and literature courses at UK higher education institutions based on A-level results was down 7.8% year-on-year, with an intake of 3,080 in 2016 being a record low for recent years. Non-European languages and literature courses experienced a similar decline, with just 940 students placed on these programmes. As the direct consequence of this decline more universities have closed down their languages departments, such as Northumbria and Ulster University. This trend is expected to continue.<sup>2</sup>

However, the problem exists also in continental Europe (and the rest of the world), where the popularity of English means that the previously broader foreign language palette becomes reduced to English only, at the detriment of all others. According to Eurostats (2017) 99–100% of primary and 97.3% of lower secondary education students in EU countries study English. It is a mandatory foreign language in nearly all education systems that identify a particular

2. See 'University Language Departments 'at Risk' as Recruitment Slumps', *Times Higher Education*, <https://www.timeshighereducation.com/news/university-language-departments-risk-recruitment-slumps>.

foreign language that all students must study, as is the case in almost half of the European countries. After English, French and German are the most widely offered languages; in the UK 70% of primary school children study French. Although the proportion of multilingual school children and adults across Europe and the number of languages they use is constantly increasing, languages offered in education do not seem to reflect this trend. The growing diversity and complexity of the European linguistic landscape contrasts with a progressive reduction of language teaching to only a few and often only one foreign language, namely English.

One of the main arguments used against introducing or maintaining foreign languages in school curricula is the notion that they take away valuable space/time, which can better be devoted to more “useful” subjects, such as maths or science. The argument goes that languages are not per se unimportant, but that other subjects are much more relevant and, therefore, have to take priority. Typically, languages are pitched in this context against mathematics as a classical example of a “useful” subject. Indeed, a recent survey of 8,000 school children age 7–14 reveals that a significant percentage of children have adopted the message that numeracy is of a higher value than literacy. More than 60% of the 8,000 children who participated said maths was more important than English. Just 21% put English as the most important lesson. They also expressed a large preference for having skills to create a computer game rather than a book or a film. However, there is also an important positive aspect: foreign languages were included by the participants in the top five key subjects, demonstrating that children recognise multilingualism as an important skill for the age of globalisation.<sup>3</sup>

In recent times, the argument of “more useful subjects” is often further strengthened by the claim that it reflects the limited capacity of the human brain to cope with acquiring new knowledge. In the public discussion following the paper by Bak et al. (2014a) on the impact of bilingualism on cognitive ageing, one of the readers remarked: “The human brain can only contain a finite amount of information and as English speakers we are fortunate not to need a secondary language. That space is much better utilised for science, history and our rich culture” (Broer et al. 2016).

The argument appears intuitively extremely convincing, in fact, so convincing that no empirical evidence is usually cited to support it. Indeed, it would be very difficult to find any empirical evidence for it. What the “limited

3. See ‘Maths is More Important than English, Say Schoolchildren’, *Teaching Times*, <http://www.teachingtimes.com/news/maths-important.htm>.

resources models”, whether applied to school curricula, society, economy or brain function, fail to take into account is the interaction between different components. They are based on a static assumption that different units of knowledge pile up independently, like boxes in a storehouse. But is this really the case? Many people arguing for the removal of languages from the curriculum would agree that knowing maths makes it easier to learn physics or chemistry or that knowledge of history can help in understanding literature. In this case, removing maths and history will not make pupils better but rather worse in physics or literature. In case of languages, the benefits could be direct, related to concrete subjects (e.g. knowledge of French facilitating understanding of English language and literature), but also could lead to more profound changes in the way of thinking. Since the seminal work of Peal and Lambert in the early 1960s in Montreal (Peal and Lambert 1962), there has been a constant stream of evidence demonstrating that children exposed to more than one language tend to perform better than their monolingual counterparts. Studies conducted with early years and school age children have found that bilingual pre-school children focus better on tasks, while ignoring distractions, than their monolingual peers. A similar enhanced ability to concentrate has been found in bilingual adults (Bialystok 2009).

Metalinguistic studies focusing on the relationship between thought, word and meaning, a key factor in Vygotsky’s developmental theory (Vygotsky 1962), shed light on differences between monolingual and bilingual children. A number of linguists have used Piaget’s sun-moon problem (Piaget 1929) to test the ability of children to separate word from meaning. This test consists in changing the names for sun and moon, getting children to decide which is up in the sky at night and finally what the sky is like at night: dark or light? In studies conducted by Cummins (1978), Bialystok (1988) and Eviatar and Ibrahim (2000) bilingual and monolingual children alike accepted with ease the name change and inferred that sun would be what we see at night. However, bilingual children were quicker in reaching the final conclusion that the sky remained dark at night. Rosenblum and Pinker (1983) and Ricciardelli (1992) conducted further studies getting children to use new names or nonsense names. All of these studies provided evidence that bilingual children either demonstrate higher flexibility in use of newly agreed names or more abstract explanations for changing conventions.

The evidence of children approaching language and other academic content in a more abstract mode was recorded by two Canadian researchers, Lambert and Tucker, observing and testing a group of 6-year-olds educated mainly in their second language. In this longitudinal study, observed children demonstrated

a high level of interest in comparing their two languages; approaching their second language as a code and using their first language as the basis for relating and translating both academic content and linguistic input. Therefore, the researchers were proposing that the acquisition of the second language had benefited not only the competence in their first language, but also their mastery of the academic content (Lambert and Tucker 1972: 82).

The benefits of bilingual education extend also to literacy in more than one language. Li, Nuttal and Zhao (1999) conducted this study with two groups of Chinese-American students, one group was literate in both languages, the other group was not literate in Chinese. The students literate in Chinese achieved significantly better results on the mathematical tests for university entry. Moreover, knowledge of one language can lead to better reading skills in the other one: a recent comprehensive review of the available literature (Tsimpli 2017) demonstrates that literacy in English not only does not decrease if children become literate in another language, it improves. Indeed, local authorities in England with low participation rates for languages at GCSE also tend to perform poorly on other measures of educational attainment, such as the proportion of pupils achieving a good GCSE in English and maths (British Council 2017: 18). Summarising, the existing evidence of interest to policy and practice in education suggests that continued development of bilingual children's two languages during schooling is associated with positive educational and linguistic consequences (Cummins 2000, Collier and Thomas 2007).

This "added value model", in which knowledge of languages has beneficial effects across different cognitive domains, also reflects the state-of-the-art in cognitive neuroscience. The current views of brain development and functions moved away from the static and narrow "localisationist" approach that characterised much of the previous century towards dynamic, interactive models, emphasising the importance of neuroplasticity (the life-long ability of the brain to reconfigure and adapt). Contemporary neuroscience stresses the importance not just of single nerve cells (neurons), but their connections (synapses), linking them into complex interactive functional networks, which can be observed both in healthy brain and in neurological disorders (Seeley et al. 2009; Bak and Chandran 2012). Rich and complex neural networks, integrating perceptually and conceptually varied information, lead to a better "cognitive reserve" (the ability of the brain to compensate, at least partly, emerging pathological changes) (Bak and Alladi 2014). Accordingly, bilinguals have been shown to be more resilient than monolinguals to different types of brain damage: they have slower cognitive ageing (Bak et al. 2014a), develop dementia four to six

years later (Alladi et al. 2013) and recover their cognitive functions significantly better after stroke (Alladi et al. 2016).

### **Normative monoglot ideologies and the myth of the mother tongue**

“Limited resources models” of language learning, assuming that additional languages take away valuable “brain space” or instruction time, usually make another important assumption, namely that the “normal”, “default” state of human brain, mind and society is monolingualism. Blommaert and colleagues refer to this as “normative monoglot ideologies” (Blommaert et al. 2006). Their research team recorded consistent teaching strategies in Belgian schools, which dismissed the linguistic and literacy skills of newly arrived immigrant children as not being relevant to the acquisition of standard Dutch used in these schools. Children observed by the researchers, even though they were able to demonstrate their understanding of the spoken and written language relationship, and varied degrees of literacy in different alphabets, were not given recognition of this prior knowledge. These children were treated as illiterate in the process of “language-ideological disqualification” (Blommaert et al. 2006: 46).

The experience of being exposed to monoglot ideologies in London schools is very clearly expressed in the following statement of a 14-year-old refugee child from Iraq. As a recent arrival from Iraq, speaking Kurdish and Arabic and new to English, with an ambition to work in tourism, this student reflected on the usefulness of her two languages by saying: “Miss, who needs the languages of immigrants? You need to be good at English, very good at English.” After eleven months of living in England this student has not only received, but also adopted a low value message in relation to minority languages or, as she terms them, “immigrant languages”. Her question is captivating in its grasp of issues of inequality, power and marginalisation and recognition that the only affirmed and desirable profile is the one of a highly competent English speaker, “native” or “near native”. The fact that a young person at the time of choosing the direction of her future occupation in a global city such as London is not encouraged to explore how the skills she has in different languages can be used as resources, needs to be addressed as an issue of equal opportunity and social justice. In the case of younger bilingual learners, excluding language skills they have in languages other than English in their everyday learning creates predictable pedagogical difficulties which may result in patterns of educational underachievement (Mehmedbegovic 2011).

This negative value attached to “immigrant languages” can also lead to children trying to hide their knowledge. UK figures reveal that year on year there has been around 4% difference between the percentage of bilingual children in primary and secondary schools, e.g. in 2012, 15.2% in primary schools, 11.1% in the secondary schools. In 2016 these have increased to just over 19% in primary and just over 15% in secondary. So what happens to 4% of bilingual children in the transition from primary to secondary? Do they move away, lose their home languages or start self-identifying as monolinguals? Based on research done by the Institute of Education, London (IOE 2009) it has been identified that children in secondary schools will “hide” their bilingualism and “play monolingual”.

The dilemma of children knowing multiple languages but trying to appear as English-speaking monolinguals illustrates another implicit assumption closely related to normative monoglot ideology: the notion of a single, “native”, “dominant”, “main” language. One place in which this assumption becomes visible is the national UK census. Although the exact wording of the questions on national and ethnic identity and language from the 2011 census varied slightly between England, Wales, Scotland and Northern Ireland, all versions allowed for multiple national identities (Question 15: “Tick all that apply”) and to a smaller degree, multiple ethnic identities (here, one was only allowed one answer (Question 16: “Tick one box”), but this also included the option “*Mixed/multiple ethnic groups*”). Not so for language. Question 18 in England and Wales asked “What is your *main* language?” and in Scotland “Do you use a language other than English at home?” In a recent consultation event to discuss potential questions for the next Census 2021 (20 April 2017, New Register House, Edinburgh), the proposed new formulation of this question was “What is your *first/preferred* language?” Census questions are relevant: they inform not only research, but also policy decisions. And the question, which language(s) families speak at home can be used (and has been used) in political arguments. In 2002, David Blunkett, at that time UK home secretary, in an essay rife with references to terrorism, 9/11 and Osama bin Laden, complains that 30% of British Asian households reported that they speak languages other than English at home, and calls on them to speak English as a way to “overcome the schizophrenia which bedevils generational relationships”.<sup>4</sup> Given this political climate, families daring to speak at home any other language than English might well feel obliged to change their census answers to “English only”,

4. See David Blunkett, ‘What does Citizenship Mean Today?’, *Guardian*, 15 September 2002, <http://www.theguardian.com/world/2002/sep/15/race.thinktanks>.

producing as an effect an underestimation of the number of languages spoken across the country.

A similar problem occurs in the context of school education, when parents are asked what is their “*home language*”: a question, which does not leave any room for an option that a family can have multiple “home languages”. In the diverse and complex linguistic landscapes of the modern world, the notion of the “home language” is not always straightforward as there are many households in which a variety of languages is being spoken. This diversity can be illustrated by a recent survey of teachers in Scottish primary schools as part of the “Transnationalising Modern Languages” project (Ann Robertson, personal communication). Many teachers reported that their pupils speak, in addition to English, at least two other languages, in dozens of different language combinations. Typical language combinations included that of an official and a minoritised language in the countries of origin (e.g. Catalan/Spanish, Kurdish/Turkish, Russian/Lithuanian, Punjabi/Urdu), a constellation likely to occur frequently among refugees belonging to national, ethnic and/or linguistic minority groups in their own countries. The pressure to identify a single main language in this group can be particularly problematic, since in many cases the main spoken language (e.g. Kurdish) might be different from the language in which the children received their education and became literate (e.g. Turkish, Arabic, Persian). Another combination leading potentially to a dissociation between spoken language and writing skills was that of an indigenous and former colonial language (e.g. Wolof/French, Lingala/French, Arabic/French). In other cases, the language combination reflected the personal history of children’s parents and families (e.g. Spanish/Polish, Tamil/German, Tamil/Italian, Hindi/Lithuanian, Greek/Polish, Twi/Italian). Some children spoke, apart from English, up to four different languages (Gaelic/Spanish/French/Urdu). This remarkable multilingual background often goes unnoticed, since most surveys allow the respondents only to mention one “home language”. Hence, the broad and inclusive definition of *exposure to more than one language* (Hall et al. 2012) is much more suitable to the context where there are many different types of multilingualism with various degrees of competencies in languages used.

This definition had been used in London schools to collect data on home languages during the Ethnic Minority Achievement Grant (1999–2010), which funded specialist teachers providing language support to children new to English. Language Capital Study (Eversley et al. 2010), which used school data, showed that over one million children in London mainstream schools at that time used 233 languages. These figures reflect the highly multinational

character of the British capital: according to the 2011 census, out of the 8.2 million inhabitants of London, 3 million were born outside the UK, and that nearly half of these migrants arrived during the last decade. Compared to 1987, when just under a fifth of all London residents had been born abroad, the relative size of London's immigrants has more than doubled from 18% to 37% of the total population of the city (Mehmedbegovic et al. 2015). Although the complexities of the language use of the relevant groups and individuals have not been fully explored, there are small-scale studies that provide rich insights (Cooke 2008; Cooke et al. 2014).

The assumption of a single main/preferred language alias mother tongue becomes even more inappropriate if we take a whole lifespan approach, since it does not take into account changes of language dominance during lifetime (e.g. through study abroad, emigration, marriage, work requirements, etc.) or differential use of languages in specific contexts. Indeed, significant shifts in language use can still occur in later life, e.g. after retirement. A recent study examining the use of English and Gaelic across the lifespan in the Inner and Outer Hebrides, Scotland (de Bruin et al., 2016) demonstrated that (a) the preference shifted across the lifetime, with English being more dominant during working life but Gaelic becoming increasingly used after retirement, (b) throughout lifetime, Gaelic and English dominated different contexts, e.g. Gaelic family and friends, English school and work.

The notion of a single main/dominant language is also not supported at the brain level by the findings of modern neuroscience. Contrary to the popular belief, the first language is not always better preserved in patients with brain diseases such as stroke (Aglioti et al. 1996) or Parkinson's Disease (Zanini et al. 2004); it can be in fact be more affected. Moreover, cases have been described in which, within the same individual, aphasia (language disorder caused by a brain lesion) can take different forms in different languages (Albert and Obler 1975). In a more recent case, a Hindi-English bilingual patient had relatively well-preserved verb naming but severely impaired noun naming in Hindi and exactly the opposite pattern (verb deficit with preserved noun knowledge) in English (Balasubramanian and Bose 2016).

The last example, unusual as it may seem, could be explained by a characteristic language mixing pattern, in which the patient before his stroke had had a tendency to insert English nouns into a largely Hindi-dominated sentence frame. This illustrates another characteristic feature of real-life multilingualism: language switching and mixing. For long time, both were considered taboo, as it was assumed they would lead to an imperfect mastery of each of the involved languages. However, language mixing and switching

are not a chaotic failure to control language output: they take into account the linguistic competence of the interlocutor, so that only those languages are used which can be understood. Indeed, recent theories of bilingualism and cognition (Green and Abutalebi 2016) postulate that language switching is one of the driving forces behind increased executive abilities associated with bilingualism; they might also play an important role in the delay of onset of dementia in bilinguals (Freedman et al. 2014). Another strand of research suggests that learning new material mixed in different languages does not have any negative effect on learning outcomes (Antón et al. 2016).

Summarising, the notion of a single, first/native/main/dominant mother tongue is based on a normative monoglot ideology (Blommaert et al. 2006) and is contradicted by converging qualitative and quantitative empirical evidence evaluating different aspects of language use in multilinguals, from children to retirees and neurological patients. Its persistence is likely to have historical and political rather than scientific reasons: the myth of an idealised monolingual past, in which every member of a nation spoke the same mother tongue, was well suited to the ideology of emerging European nation states in the nineteenth century and resonates well with modern nationalist and populist movements driven by the fear of alienation in a non-monolingual environment. Similar arguments presenting multilingualism as a danger to social cohesion have been made by politicians of powerful nation states, trying to enforce one-language policy (as in the example of the David Blunkett statement discussed above), and by speakers of minoritised languages pursuing political independence (as illustrated by the manifesto of the Catalan group *Koiné* from 17 October 2015, denouncing the “political ideology of the so-called bilingualism”<sup>5</sup>).

### **The perfect native speaker versus a “healthy linguistic diet”**

The notion of a perfect native speaker is not only problematic because of its mother tongue ideology discussed above. It has produced the ideal of being “native-like” as the ultimate goal of any foreign language learning. Accordingly, non-native mastery of a language is perceived as less valuable. This attitude can be problematic for several reasons. In a recent paper, Myles (2017) explains how the introduction of foreign language teaching in primary schools in England

5. See ‘For a True Process of Language Planning in the Independent Catalonia’, <http://epoo.epimg.net/descargables/2016/03/29/b6b7ffd526f5e1f661fd9dcad7cea36b.pdf?rel=mas>).

in 2014 was based on the assumption that early exposure to a second language will be able to create in children similar conditions as exist in those who grew up with different languages. Thus, it was hoped that those children would be fast in developing high proficiency in the languages introduced early. In this point, the programme has failed: young children develop proficiency slower than older ones. However, this does not mean that early introduction of new languages does not have positive effects: younger children “are enthusiastic and love learning foreign languages, discovering new worlds and new ways of saying things” (Myles 2017). And this potentially life-long positive attitude to language learning could provide enough justification for the whole scheme. In contrast, an overambitious and inappropriately narrow focus on proficiency can lead to the neglect of other important aspects of language acquisition.

This applies equally to the cognitive effects of bilingualism and language learning delineated earlier. According to Cummins (1991: 84) the crucial elements that provide conditions for benefiting from the cognitive advantages of bilingualism in terms of academic achievement are, first of all, that *exposure* to two languages provides broader linguistic experiences with the access to a wider range of thinking modes; secondly, that switching between two languages exercises flexibility in thinking, and thirdly, that the conscious or subconscious comparison of two languages, resolving interference between languages and using the knowledge of one language to advance the other, results in a higher level of metalinguistic skills. This last point reflects the Vygotskian view which says that bilingualism enables a child to see his/her language as a particular system and to approach the language in a more abstract way and in more general categories (Vygotsky 1962: 110). All this can be achieved without accent-free, native-like command.

Equally, in the majority of recent studies showing beneficial effects of multilingualism on cognitive functions in young adults (Bak et al. 2014b; Vega-Mendoza et al. 2015), in cognitive ageing (Bak et al. 2014a), in the recovery from stroke (Alladi et al. 2016) and in dementia (Alladi et al. 2013) the definition of multilingualism was not based on early acquisition and perfect, “native-like” command of the languages in question, but on the ability to communicate in them. Indeed, in a recent study an intensive one-week language course was able to improve attentional switching; an effect which remained stable nine months later in those who practiced five hours/week or more (Bak et al. 2016).

In a recent paper (Bak and Mehmedbegovic 2017), we proposed an alternative to the normative monolingual mother-tongue ideology: the concept of a “Healthy Linguistic Diet”. The notion of “Healthy Linguistic Diet” has dual roots in education and health science. It was first introduced by Mehmedbegovic

(2011) in the context of the “Healthy School Initiative” and it is based on two main principles:

- Sharing relevant knowledge on values and advantages of bilingualism: Bilingual children and their parents need to be given clear, affirmative and consistent messages by schools and their teachers in terms of benefits of bilingualism and home language support. Children and parents should be given advice and examples on what they can do themselves in order to support their own bilingual development. These messages should include raising awareness on cognitive advantages of bilingualism, which are applicable to all languages. Teachers need to be provided with examples of good practice, guidance and training to develop skills essential for integrating home languages across the curriculum. This shift in practice should be led by the awareness that: where home languages are a part of teaching and learning throughout schooling, starting with early years, with the aim of supporting bilingual children in developing their full potential and positive attitudes towards this specific intellectual potential that they have, the impact of it will be evident in improved results across the curriculum as a whole.
- Providing a framework which supports life-long development of bilingual competencies: All children (monolingual and bilingual/multilingual) and adults (monolingual and bilingual/multilingual) in schools should be encouraged to develop behaviours and habits which would support life-long development of bilingual competencies. These practices need to become an integral part of our efforts to bring up children in the spirit of the Healthy School Initiative leading to a healthy lifestyle.

However, the metaphor of a healthy linguistic diet can be applied equally well at the other end of the life spectrum, in the context of healthy ageing. Here, research into potential risk and protective factors for age-related cognitive decline, dementia and other cognitive disorders identified healthy diet, alongside physical and mental exercise, as an important part of a healthy lifestyle. The best known diet studied in this context is “*Mediterranean diet*” (Féart et al. 2009), although non-Western dietary patterns are also increasingly researched (Ozawa et al. 2013). Importantly, whatever the specifics, a diet is more than the sum of its ingredients: it is their combination. Likewise, we argue that “language cannot be reduced to a sum of sounds, words and grammatical rules, cognitive effects of bilingualism to a single test of executive function or the richness of a multilingual environment to a listing of different languages that occur in it” (Bak and Mehmedbegovic 2017).

Accordingly, we advocate a multilingual environment, in which everybody (and in particular all children), mono- and multilingual alike, can have a chance to be exposed to a wide range of languages, used by different speakers in different contexts. This means not only a natural environment for multilinguals but also a more stimulating one for monolinguals. Evidence collected in Britain on peer and sibling learning supports the view that early-age bilingual children will, with a little encouragement in the school context and even no encouragement in the home context, be inclined to share their insights into different languages and teach what they know to other children around them (Kenner 2004; Mehmedbegovic 2011). These benefits were clearly seen by lead professionals in England and Wales during the introduction phase of Languages Strategy in primary schools:

Where languages are being introduced (in primary schools) teachers are realising bilingual children are very able to take up another language and they help other children who aren't. They (bilingual children) help pupils who are monolingual to access the language, they teach them the skills to access it. The case is that where you have classes with big groups of bilingual children, monolingual children develop very quickly. (English lead professional, interview data: Mehmedbegovic 2011: 137)

And we certainly have evidence that children in schools where English is their second or third language and they are introduced to a European language, Spanish or French – they learn it very quickly, because they have the skills. (English-Welsh lead professional, interview data: Mehmedbegovic 2011: 130)

Also in this case, parallels can be found at the other end of the life spectrum. Based on the research findings of bilingualism delaying the onset of dementia (Alladi et al. 2013), a new Scottish enterprise (Lingo Flamingo) has recently developed a programme of language classes as cognitive training for patients with Mild Cognitive Impairment (MCI) and dementia, attempting, as far as possible, to employ refugees as their language tutors. Here, the knowledge of languages, which many refugees bring with them, can be applied to the benefit of the whole society, producing a more positive attitude to multilingualism as well.

The inclusion of potential health benefits opens an entirely new and highly relevant dimension in the discussions of multilingualism and language learning. Dementia is recognised as a “public health priority” by the World Health Organization,<sup>6</sup> and presents one of the main challenges to modern society, across the whole world, including developing countries. The widespread “therapeutic nihilism” associated with dementia, the feeling that “nothing can be done”, together with the stigma of mental illness, can have negative impact

6. See World Health Organization (2012).

on patients as well as their carers and lead to patients giving up mental activities. This in turn compounds the effects of the disease, leading to an even faster cognitive decline. Any interventions that can break this vicious circle, making patients more proactive and more confident could produce far-reaching effects. Equally important is promotion of lifestyle changes that can delay the onset of dementia symptoms and/or slow down the progression of the disease. Our approach of “Healthy Linguistic Diet” is based on an analogy between physical and mental health; it is widely accepted that regular physical activity and a healthy diet are important factors in maintaining physical health. We argue that language learning and their active use provides regular mental exercise, leading to a better brain health and an increase in “cognitive reserve”. We hope that our concept will appeal across different generations and cultures and will be useful in promoting language learning and multilingualism. Our efforts are directed towards rethinking engagement with languages as a lifestyle change, which is systematically and integrally built into developing habits, behaviours and understandings from early childhood throughout school education and adulthood with the aim of utilising language diversity for the benefits of individuals and societies.

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## Résumé

Bien des comportements humains, des recherches scientifiques aux prises de décisions politiques, sont basés sur des hypothèses implicites, considérées comme si évidentes en elles-mêmes qu'elles ne nécessitent donc pas de justifications supplémentaires. Ces hypothèses sont particulièrement pertinentes sur les sujets concernant le langage, capacité humaine la plus universelle et la plus fondamentale, et pré-requis pour la vie en société, la civilisation et la culture. Ces hypothèses jouent un rôle moteur dans les débats actuels sur le multilinguisme.

On distingue trois hypothèses majeures subordonnées aux controverses clés liées au langage: a) "le modèle à ressources limitées" qui défend l'idée que l'apprentissage des langues se fait au détriment de l'apprentissage d'autres matières, b) la notion selon laquelle l'état "normal" du cerveau humain, de la pensée et de la société est, soit le monolinguisme, soit une forte domination de la langue maternelle, accompagnée de langues additionnelles moins pertinentes, c) la croyance selon laquelle le but de l'apprentissage des langues est d'atteindre le niveau de compétence d'un locuteur natif et que tout échec à y parvenir en limite la valeur.

L'association de nos formations académiques (éducation et neurosciences cognitive) et de nos méthodologies (qualitative et quantitative) qui sont radicalement différentes, nous permettent d'examiner comment ces hypothèses influencent les nombreuses théories au sujet du multilinguisme. Nous analysons les résultats empiriques disponibles et explorons les points communs conceptuels depuis l'élaboration des programmes scolaires jusqu'à la sensibilisation au vieillissement sain. Nous en concluons que nos perspectives se complètent les unes les autres et offrent un précieux outil qui contribue au développement de la politique linguistique.

**Mots clés:** bilinguisme, multilinguisme, apprentissage des langues, éducation, neurosciences, vieillissement, démence.