

ECDA-7004: Cognitive Aspects of Bilingualism

Foreword

This 30-credit module forms part of the MA Bilingualism and Multilingualism programme and introduces the student to cognitive aspects of bilingualism. As will be seen, the cognitive and intellectual aspects of being bilingual or multilingual have generated a range of conflicting viewpoints over the years engaging the attention of much academic debate as well as generating much uninformed prejudice. It is for this reason that attention will be given to both the historical and more recent research related to cognitive and metalinguistic aspects of bilingualism. However, although focusing mainly on this area, issues appertaining to the political, educational, economic and social implications of such research will also be examined.

Students are referred to various chapters of “Foundations of Bilingual Education and Bilingualism” (Baker, 2017) which accompanies this course, especially **Chapters 7 and 8**. You should always refer to these, either in order to find the information mentioned in this Guidance Handbook or to enhance, deepen and enrich your understanding of information already provided. However, as this module will also refer to what are alleged to be the political, educational, social and economic implications of more recent research, reference will also be made to **Chapters 17, 18 and 19** which can illustrate and elaborate upon some of these additional issues.

Also included in this Guidance Handbook for Module ECDA-7004: *Cognitive Aspects of Bilingualism* are readings legally photocopied for your convenience. These are:

Reading 1

Chin, N. B. & Wigglesworth, G., 2007. *Bilingualism: an advanced resource book*. London: Routledge

Reading 2

Nicoladis, E., (2008). Bilingualism and Language Cognitive Development. In J. Altarriba & R.R. Heredia (eds) *An Introduction to Bilingualism: Principles and Processes*. London: Lawrence Erlbaum Associates

Reference is made to Baker (2017) and the Readings from time to time either in order to facilitate students’ *comprehension* of information already discussed or to provide *additional* information which is too detailed to be covered by the Guidance Handbook. However, for the convenience of students, the Guidance Handbook also *summarises* such

information on occasions to aid the learning process. Reference is also made very occasionally to Baker (2011) when information considered relevant has been omitted from the latest 2017 edition of the publication accompanying this programme.

Dr Hywel Glyn Lewis

MA Bilingualism and Multilingualism Programme Director

Telephone: 0044-(0)1267-676680 / 0044-(0)1269842413

Mobile: 0044-(0)7944426320

E-mail: h.lewis@uwtsd.ac.uk

h.lewis@pcydds.ac.uk

Assessment

Coursework: 100%

The module has two assignments (4,500 words each) which have an *equal weighting* of 50%.

The following are provided as exemplars:

Assignment 1 (50%)

Give a balanced account of the historical evidence for and against raising children bilingually, and to what extent do you consider the current evidence to be irrefutable?

Assignment 2 (50%)

What, if any, do you consider to be the educational, economic, social and political implications of the latest research into the cognitive and intellectual aspects of bilingualism and multilingualism?

Students will be provided with details at the start of the module. Although assignments can vary from one semester to another, the weighting and specified length of each will apply until any further notice.

Introduction

Bilingualism has been the subject of much controversy over the years, generating much debate about its possible cognitive and intellectual advantages and/or disadvantages and resulting in much uninformed criticism and blind prejudice. In view of such controversy, this module will aim to provide an account of prevalent public perceptions of bilingualism and bilinguals historically, reflecting early research and leading to what are more enlightened current attitudes based on more recent research. Such current research can, arguably, be said to have major political, educational, social and economic implications which often are not recognised, let alone addressed.

To highlight only one instance, the historical failure of the British educational system in the teaching of modern foreign languages (MFL) has been widely acknowledged both domestically and abroad. A report entitled *Language Matters* launched on 3 June, 2009 by the British Academy raised concerns that the future of the United Kingdom's world class research base might be threatened by the decline in modern language learning and called for a series of measures by universities and government bodies to address the danger. The Academy concluded that declining language skills were damaging the education system in a number of ways by:

- having a harmful impact on the ability of UK-born and UK-educated researchers to compete with their counterparts from overseas
- working against efforts to ensure that the UK is a world-class hub of research, which in turn is damaging to the UK's economy
- damaging the health of humanities and social science research
- affecting the UK's ability to address many of the most urgent global challenges.

On Wednesday, 9th February 2011, the British Academy launched a further report entitled *Language Matters More and More* making recommendations on how the higher education sector itself could increase language take-up at both school and university levels, whilst building the capacity of the UK's knowledge economy to meet national and international challenges.

It is ironic, of course, to see a report strongly supported by the UK government suddenly placing such an emphasis on foreign language teaching in schools and universities in the light of the UK's historical

imperialistic and negative attitude to multilingualism, particularly in the days of the British Empire and *linguistic colonialism*. Such a change reflects the fact that it was once “an empire on which the sun never set”, but no longer.

Whereas this module primarily addresses *cognitive* aspects of bilingualism, it will also endeavour to place research in this field of study in a wider *political* and *social* context. Such an approach reflects the inter-relatedness of the various components of this MA course and, in particular, this module with certain aspects of ECDA-7011: Societal Bilingualism.

In summary, therefore, it is suggested that while cognitive aspects of bilingualism can be studied in an academic vacuum, one must be aware that any historical attitudes and resultant prejudices relating to the adoption of other non-indigenous languages may be rooted (whether consciously or sub-consciously) in a *political* paradigm resulting in other dependent educational, social and economic variables. We shall firstly examine some historical aspects.

Historical attitudes and perspectives

In the book which accompanies this course, Baker (2017) refers to three periods which categorise varying and changing attitudes to cognitive aspects of bilingualism, namely:

- the period of detrimental effects
- the period of neutral effects
- the period of additive effects

The period of detrimental effects

Baker (2011: 133-137) describes the earliest period, ranging from the early 1800s until as late as the 1960s, as embracing extremely negative and prejudiced attitudes towards being bilingual /multilingual. It was believed that bilingualism had negative effects on the ability of an individual to think, and on intelligence generally. Baker (2017:132) refers to Laurie’s (1890) assertion, that a bilingual person’s intelligence would be halved rather than doubled, as being characteristic of the time:

If it were possible for a child to live in two languages at once equally well, so much the worse. His intellectual and spiritual growth would not thereby be doubled, but halved. Unity of mind and character would have great difficulty in asserting itself in such circumstances.
(Laurie, 1890:15)

Being a Cambridge University academic at a time when there would have been very little knowledge, let alone expertise, in this field, it was inevitable that opinions such as his would have carried great weight amongst the general public, especially in the previously mentioned political context of an ever-increasing British Empire which carried with it the force of the English language. The effect of colonialism and political domination which led to prejudiced attitudes towards linguistic diversity is reflected in the words of Thompson (1953) much later:

There can be no doubt that the child reared in a bilingual environment is handicapped in his language growth. One can debate the issue as to whether speech facility in two languages is worth the consequent retardation *in the common language of the realm*. (Thompson, 1953, italics added)

As well as abroad, British colonialism had an inevitable linguistic and political impact on territories annexed *internally* within the British Isles, referred to by Blauner (1969) as “internal colonialism” (see ECDA-7011). An ethnocentric *Anglo*-British attitude towards the Welsh language, for example, was famously expressed by Matthew Arnold as an inspector of schools in 1852:

It must always be the desire of a government to render its dominions, as far as possible, homogeneous. Sooner or later, the difference between Welsh and English will probably be effaced ... an event which is socially and politically so desirable.
(Cited in Jones & Thomas, 1973: 127)

In Wales, children in elementary schools were punished for speaking Welsh by having to wear a piece of wood on which the letters W.N. (Welsh Not) were written. The child wearing it at the end of the day would be physically beaten. In Australia, children of Greek settlers in Sydney were punished by having their mouths washed with soap and water for speaking Greek rather than English. In the past, therefore, there was so much prejudice against bilingualism that children were punished for speaking certain languages.

Although in the Welsh context the Welsh Not had been imposed for *social* as well as more purely educational reasons, bilingualism was generally widely regarded as having a range of negative cognitive effects, such as putting unnecessary strain on the brain, the cause of mental confusion, split personality and schizophrenia, and impeding the effective learning of a more useful language. As Baker (2017:132) points out,

wide-spread concerns about bilingualism tended to be based on two main issues and beliefs:

- **balance:** the greater a person's use of and competence in a second language, the lesser one's ability would be in the first language
- **efficiency:** the belief that the ability to speak two languages restricted a person's ability to think effectively.

Such attitudes and beliefs were also propagated by many early research tests on the relationship between bilingualism and cognition, such as those carried out in the USA between the 1890s and 1920s; for example, the IQ tests given to immigrants, the results of which were compared to those of *monoglot* English Americans. These were tests which attempted to examine the relationship between bilingualism and cognition on the basis of a narrow concept of intelligence, resulting in a comparison of IQ scores (especially verbal IQ) where bilinguals were shown to be inferior to monolinguals. Goddard (1917) for instance 'found' that 25 out of 30 Jews tested were "feeble-minded" and Brigham (1923) ascribed the poor performance of immigrants to the USA in IQ tests to their racial background. However, early research carried out in Wales into the effects of bilingualism also contributed to this misconception. Saer's (1923) study compared the IQ score of 1,400 children mainly aged 7-12 who were from monoglot English and Welsh-English bilingual backgrounds. The results were as follows:

Urban bilinguals	100
Urban monoglot English	99
Rural bilinguals	86
Rural monoglot English	96

The 10-point difference in IQ scores between the *rural* bilingual children and the *rural* monolingual English speakers led him to conclude:

...that monoglot English-speaking children in the rural districts of Wales showed a considerable and a consistent superiority over the bilingual children in the same districts. The most obvious factor which seems to account for this is the use of two languages by the bilingualists before the power of using one has been acquired. (Saer, 1923: 52)

Further research by Saer et al. (1924) also concluded that this was also true of university students, that is, a mental condition which continued in later life and was of a permanent nature. However, Saer's research had

fundamental methodological weaknesses; for example, comparing middle-class monolingual children with working-class bilinguals and translating tests from English to Welsh which can skew results. Reading 1 from Chin & Wigglesworth(2007) refers to the range of methodologically deficient research studies which were conducted world-wide and which encompassed a range of cultural groups. The most glaring methodological weakness of such research, however, is reflected in the fact that, although more than half the bilingual populations tested seemed to demonstrate low levels of English proficiency, the language in which tests were conducted was English.

Baker (2017: 133-136) draws our attention to the methodological defects of the early research, mentioning factors such as:

- the problem of defining and measuring ‘intelligence’
- the language used in IQ tests
- unscientific methods of analysis
- ‘bilingual’ classification
- over-generalisation
- the social context (linguistic and cultural)
- inconsistent and unequal sampling

Defining ‘intelligence’ is itself problematic, Gardner’s (2003) typology, for example, encompassing a wide-range of possible aspects including logical-mathematical, verbal-linguistic, musical-rhythmical, visual-spatial as well as more socially-oriented interpersonal and intrapersonal intelligence.

Poor sampling is a characteristic which has bedevilled research in bilingualism at various times and even relatively recently, as Chin & Wigglesworth (2007: 55) point out in Reading 1 with regard to research carried out by Crutchley et al. (1997) into bilingual children with Specific Language Impairment. Nevertheless, despite the obvious methodological limitations and defects of the early period which lasted even as late as the 1960s, its effect on both professional practitioners and an impressionable public world-wide was immense. As Jones (1993) stated later:

The quality of the research is not as important in this respect as its adverse effect on the opinion of educators of the time; because this (and its unfortunate label ‘bilingual handicap’) was the period which coloured the attitude of the public towards bilingual education for future decades. (Jones, 1993: 9) (translated from the original Welsh)

However, despite the limitations which had a substantial adverse influence on professional and public attitudes generally, prevalent negative attitudes shown towards bilingualism may also have been rooted in misconceptions of how language is *generated*.

The Separate Underlying Proficiency Model of Bilingualism (SUP): the Balance or ‘Balloon’ Theory.

Cummins (1980) describes what was (and still is, possibly, for many people) an historical concept of bilingualism and the generation of bilingual communication in terms of the Separate Underlying Proficiency Model of Bilingualism (SUP) and the Balance or ‘Balloon’ Theory (Figure 1). This model illustrates a common concept of bilingualism as two languages co-existing as *totally separate entities* in the human brain. It is a concept of having to keep a *balance* between two languages, hence the ‘weighing scales’ analogy of bilingualism adopted occasionally. An alternative analogy is that of conceiving each language as a balloon, the potential volume of inflation which can be applied to one being only *relative* to the volume of inflation applied to the other. In other words, the full potential size of one can only be achieved to the *detriment* of the other, *both* being unable to reach their *full* potential development. Such an erroneous concept leads to a natural preference for one full ‘balloon’ rather than two half-filled ‘balloons’ and, inevitably, suggests an advantage in being monolingual rather than bilingual. Underpinning this concept, therefore, were (and are) two fundamental perceptions:

- both languages as being *totally separate* and operating as such
- a limited space for each language due to the presence of the other.

As Baker (2011: 165) mentions:

The balance and balloon picture theories of bilingualism and cognition appear to be held intuitively by many people. Many parents and teachers, politicians and large sections of the public appear to latently, subconsciously take the balloon picture as the one that best represents bilingual functioning.

Reading 1 makes a reference to Grosjean’s (1982) comment that while one does not doubt the pursuit of music as being good for one’s general development, learning an additional language attracts close scrutiny. Although Grosjean does not follow this argument through, music makes a very valid comparison since mastering the technique of playing a second (or third) instrument for instance is never seen as being at the expense of the first. To the contrary, musicians usually see this as a positive

development in one's *overall* musical development, the development on one instrument contributing to and strengthening one's development on the other. As Chin & Wigglesworth (2007: 55) state in Reading 1:

While mathematical skills and musical skills are seen to enhance mental ability and, therefore, mental space, language learning has always been seen as something that occupies mental space. When it comes to languages, the brain is seen as a finite space for which language or languages must jostle for room.

Baker (2017) provides some examples as well as explanations for some of the conclusions reached by the comparative testing of bilinguals and monolinguals e.g. the sometimes slower lexical retrieval shown by some bilinguals caused by less frequency of use of some words being the inevitable effect of using both languages; pointing out, however, that “none of these studies suggests that bilinguals have a mental overload, process inefficiently or have weaknesses compared with monolinguals in everyday thinking” (p. 136).

Figure 1: The Separate Underlying Proficiency Model of Bilingualism (SUP) or the Balance or ‘Balloon’ Theory. (Source: Baker (1993: 133))



The period of neutral effects

This was a period which ran from approximately the 1920s until the 1960s and which overlapped with the periods on each side. Research carried out during this period, despite being limited in volume, emphasised the defective nature of the earlier research. For example, in Wales, W.R. Jones' (1966) research undermined the results of Saer's (1923) earlier research by proving that there was no negative connection between bilingualism and intelligence. Having previously concluded on the basis of his own research involving 2,500 children aged 10 and 11 that bilinguals were inferior on IQ (Jones, 1959), a later reanalysis drew his attention to certain methodological deficiencies, such as a lack of attention to differences in socio-economic background (Jones, 1959), leading him to maintain that there was no significant difference between the two linguistic groups. Pinter & Arsenian (1937) had also previously shown a zero correlation in verbal (and non-verbal) IQ between Yiddish-English bilingualism and monolingualism. Chin & Wigglesworth (2007: 57) in Reading 1 provide further examples.

Research which characterised this period adopted a range of IQ tests in order to assess the cognitive skills of bilinguals which were a mixture of language-based and non-language-based measures and which showed that bilinguals were not inferior when linguistic aspects were controlled.

Reading 1 also draws attention to the methodological inadequacies of the earlier research, mentioning issues such as the definition of bilingualism as well as ethnicity and the socio-economic background of bilinguals in the sampling. It mentions the analysis of previous studies made by McCarthy (1930) who maintained that, while English monolinguals in those studies were from middle-class homes, more than half of the bilingual children came from a working-class background. Problems regarding methods of assessing so-called 'bilingual' proficiency were also evident, an issue previously investigated in module ECDA-7010.

However, as the quotation from Jones (1993:9) above emphasises, the defective and misconceived research of the earlier period had already almost indelibly left its mark on attitudes towards bilingualism, resulting in the label 'bilingual handicap' "which coloured the attitude of the public towards bilingual education for future decades".

Categorising into three *discrete* periods the attitudes and perceptions of academics and the public at large towards the cognitive effects of bilingualism is, therefore, extremely misleading. Even today, it is not uncommon to hear of teachers, doctors, speech therapists and educational psychologists advising parents not to bring up their children to be

bilingual. As Lewis (1981) commented much later than the period of the early research:

Delinquency, the propensity to drop out of school, and fragmented personality development are all laid at the door of bilingualism (Lewis, 1981:343)

However, in the meantime, reasons for adopting a far more positive attitude towards bilingualism had already begun to emerge.

The period of additive effects

In 1962 in Montreal, Canada, research carried out by Peal & Lambert (1962) compared the intelligence of 110 bilingual 10 year old children in six French-immersion schools with that of their monoglot peers. It is notable for heralding the dawn of a new period of research into the cognitive effects of bilingualism and for making bilingualism politically and culturally more acceptable. From that time to the present, research generally has tended to show not only that there are no detrimental effects to bilingualism, but also that bilinguals have cognitive advantages over monolinguals.

Although, (as Chin & Wigglesworth (2007: 58-59) point out in Reading 1), Leopold (1949) had already drawn attention to the possible positive benefits of being bilingual, based on the evidence of his daughter's early ability to separate the sounds of words from their meaning, yet, his was a voice in the wilderness amidst what seemed to be a deluge of contrary evidence. Therefore, as Reading 1 states: "Peal and Lambert's (1962) study, which re-examined the issue of the relationship of bilingualism to intelligence, marked a watershed in the history of bilingual research." The research, (an extract of which is provided in Reading 1, B4.1), has been acknowledged as being significant for three reasons:

- Firstly, for overcoming many methodological deficiencies which characterised earlier research. For example, the original group which consisted of 364 10 year-old pupils was reduced to 110 so that the bilingual and monolingual groups were matched on socio-economic criteria as well as age, language and intelligence.
- Secondly, having controlled the socio-economic and language proficiency variables, the research pointed to evidence of *positive* cognitive advantages in IQ tests, contrary to the evidence of both previous periods. As Baker (2017:138) mentions, the research showed that the balanced bilinguals out-performed monolinguals on 15 out of 18 IQ variables, suggesting that bilingualism provided:

- (a) greater mental flexibility
- (b) the ability to think more abstractly and more independently of words, consequently providing superiority in concept formation
- (c) a more enriched bilingual and bicultural environment which benefits the IQ
- (d) a positive transfer between a bilingual's two languages, facilitating the development of verbal IQ.
- Thirdly, a major significant *methodological* aspect of the research, despite using IQ tests, was the broadening and extension of the attention given to cognitive aspects other than simply the IQ.

With regard to the *non-verbal* tests on which bilinguals were *not* found to be superior, Chin & Wigglesworth (2007: 59-60) mention that such tests can be divided into two sub-groups, namely:

- those which require spatial and perceptual processes
- those requiring symbolic manipulation

Whereas the performance of monolinguals was *equal* to that of bilinguals in tasks related to spatial and perceptual processes, bilinguals outperformed monolinguals in non-verbal tasks requiring symbolic manipulation, an ability which Peal & Lambert (1962) referred to as “mental or cognitive flexibility”. They ascribed this to the use of two linguistic codes and the association of two words with one object (Reading 1, page 60).

This research, which provided a fillip to bilingual education policies for example, also indirectly had more *political* consequences in that it not only undermined the concept of bilinguals as being intellectually inferior, but also suggested the contrary.

Despite the positive effect of the Peal & Lambert (1962) research which not only led to further similar research findings but also to a change in attitudes towards being bilingual, the need to be academically objective demands that we draw attention to some possible weaknesses in methodology. Again, these are discussed in some detail by Baker (2017:138) and include:

- the problem of generalisation
- the representativeness issue of being a ‘balanced’ bilingual (see Thresholds Theory (Cummins, 1976) below)
- the ‘chicken and egg’ causal relationship between bilingualism and IQ (or vice versa)

- the effect of *non-controllable socio-cultural* variables within a controlled socio-economic paradigm.

Chin & Wigglesworth (2007: 60) also deal with some of these issues in Reading 1 including that of the “thorny ‘chicken first or egg first’ issue”, referring to the longitudinal research of Hakuta and Diaz (1985) as evidence “that it is bilingual proficiency which exerts an influence on cognitive functioning and not the other way around”. However, subsequent re-analysis by Hakuta (1987) qualified this standpoint, pointing out that the opposite was also true, although not as strong (see Reading 1, page 60). Nevertheless, as Chin & Wigglesworth (2007: 60) emphasise:

Peal and Lambert’s study is extremely significant because it gave the next generation of researchers the ideological backdrop underpinning the methodological guidelines with which to investigate more rigorously the relationship between bilingualism and the mind.

Reading 1 mentions that, following Peal & Lambert’s (1962) seminal research, subsequent studies showing the positive cognitive effects of bilingualism focussed their attention on more specific aspects than general IQ superiority, particularly *cognitive flexibility* (or *divergent thinking*) and *metalinguistic awareness*.

The Common Underlying Proficiency Model of Bilingualism (CUP) or ‘Ice-berg’ Theory

In response to later research which indicated meta-linguistic cognitive advantages of bilingualism (and to highlight the archaic concept of the Separate Underlying Proficiency Model of Bilingualism (SUP) or ‘Balloon’ Theory), Cummins (1980) has illustrated the current concept of the cognitive process by means of the Common Underlying Proficiency Model (CUP) or the ‘Ice-berg’ Theory (Figure 2). Rather than existing as totally *separate* entities in the brain, this analogy presents the co-existence of two languages as being attached and emanating from *the same central processing system*. This model, therefore, dismisses the erroneous perceptions attached to the earlier SUP model (see above) which pictured both languages as separate ‘balloons’, each operating with limited space due to the presence of the other. To the contrary, the CUP model suggests that:

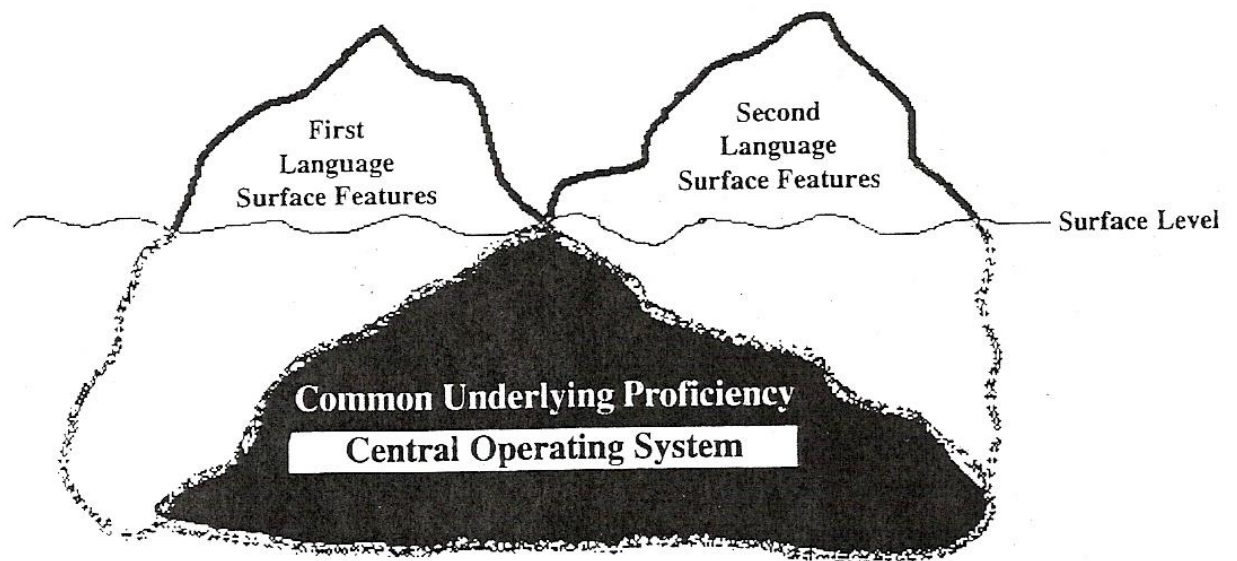
- languages share the same cognitive process
- concepts acquired in one are transferred to the other since both languages are interactive.

Baker (2017: 159) lists various points related to the CUP model of bilingualism but which can be further summarised as follows:

- the four basic linguistic skills emanate from “one integrated source of thought” or “the same central engine” regardless of which language a bilingual or multilingual person is using
- bilingualism/ multilingualism can be acquired easily because the human brain has sufficient capacity to store more than one language, enabling individuals to function competently in each
- since an individual’s linguistic proficiency in various languages emanates from the same “integrated source of thought”, information processing can be handled by either linguistic channel or both *as long as they are well-developed*, so that educational achievement, for instance, can be developed bilingually as well as monolingually
- *bilingual* cognitive processing, however, can have adverse effects when one of the two languages is not sufficiently developed.

However, to adopt a totally objective stance, differentiating between the two models of Separate Underlying Proficiency and Common Underlying Proficiency may over-simplify the cognitive process. Baker (2017: 159) points out that it “does not sum up the findings from research on cognitive functioning and bilingualism, nor does it reflect recent research on the brain and bilingualism” and refers to the Sapir-Whorf hypothesis that different languages result in individuals having different views of the world, thus *possibly* challenging the concept of one integrated source of thought (see also pages 150-51).

Figure 2: The Common Underlying Proficiency Model of Bilingualism (CUP) or 'Ice-berg' Theory. (Source: Baker (1993: 134))



The Iceberg Analogy

Neurolinguistic issues

The physiological aspect of language storage in the brain and whether or not two languages function *independently* or *interdependently* is an area of further research relating to hypotheses of

- separate storage and
- shared storage

This is further complicated by consideration of whether or not this differs between

- compound or early bilinguals and
- co-ordinate or late bilinguals

This seems to be an area of disagreement, although there is consensus that *both* languages are active even when only one is being used and that they function independently even if there is shared processing. As quoted in Baker (2011: 146), Bialystok (2001: 104) states: "Adults are not confused by the fact that two linguistic systems share processing space for knowledge and communication".

Interest in the cognitive aspects and implications of being bilingual have led to research in areas such as *neurolinguistics* and attempts to answer questions related to any differences which may exist in the way a

bilingual's brain functions from that of a monolingual, particularly in terms of:

- language storage
- language processing

However, many of the questions related to this area have not yet been answered. Could this even vary according to the number of languages an individual can speak?

It is generally acknowledged that the left hemisphere of the brain is used for language processing in right-handed adults, what is referred to as *left lateralization* (see Figure 3), but are bilinguals different in this respect?

Research has recently discovered (Hull & Vaid, 2007) that bilinguals seem to be less left-lateralized than monolinguals i.e. more *bilateral*, with early fluent bilinguals being more so than late fluent bilinguals. Baker (2017: 148-49) refers to research by Bialystok et al. (2005) involving magnetoencephalography (MEG) for neural investigation of the brain of young bilingual and monolingual adults using the Simon Task. Compared with monolinguals, the bilinguals used more areas of the brain as well as the Broca's area which is associated with language processing.

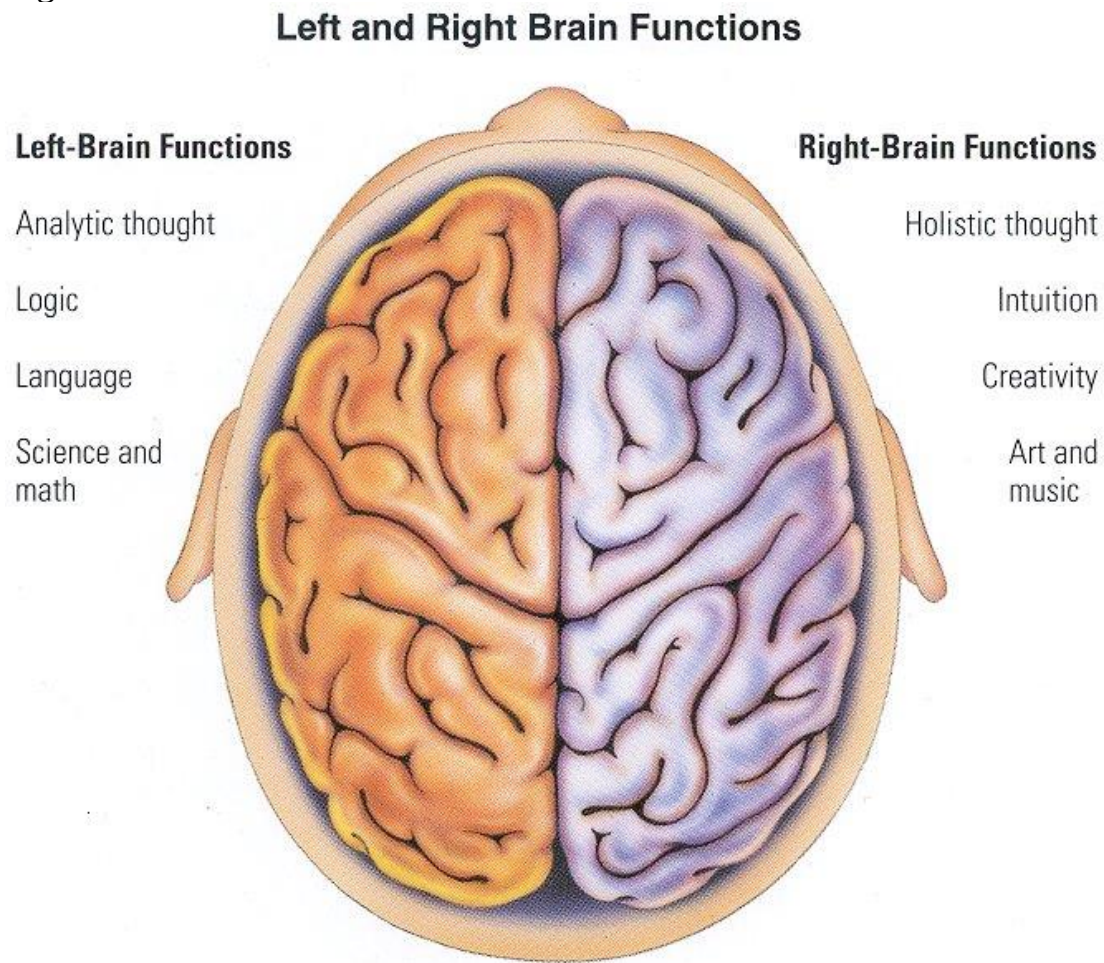
Such research has been dependent on scientific advancement and the ability to create images of the brain or *neuroimaging*. Neuroimaging enables one to understand:

- *where* things happen in the brain (by means of fMRI)
- *when* it happens (e.g. the use of event-related brain potentials or ERP) (see Baker, 2017:139-40).

Research using fMRI conducted by Kim et al. (1997) seemed to indicate that there is also a difference between late bilinguals and early bilinguals (those who learn both languages before the age of three years). The research showed that in the case of late bilinguals the two languages were stored more separately than in early bilinguals where both languages appeared in adjacent areas, thus making the regions encompassing the processing of *both* languages more identical. However, as Baker (2017:147-48) points out, such research needs further investigation and replication due to certain methodological issues:

- the size of the sample being restricted to only six bilinguals in each group despite the range of languages involved
- being based on *thinking* rather than on speech production
- most data not indicating any differences between the two groups (i.e. early and late bilinguals)
- other research using ERP and PET having produced contrary results e.g. Goral et al. (2002).
(See also Baker, 2017: 141).

Figure 3



Baker (2017) draws our attention to the *status quo* of research in this controversial area, pointing out that:

...we are only just beginning to understand the neural architecture underlying language and cognitive processing in individuals. There is a danger of believing that brain images represent thought. Such snapshot brain images are a visible consequence of thinking but do not reveal the complex operation of the mind. The correspondence between these images of the brain and thought processes is not yet known. (Baker, 2017:141)

De Bot (2008) offers the following reason for the lack of progress made by neuroimaging in understanding cognitive and language processing in bilinguals:

- the fact that the neuroscientists involved in studies are uninitiated in many significant aspects of bilingualism, thus ignoring variables of which linguists have always been aware and which impact directly on linguistic processing e.g. levels of proficiency, age of second-language acquisition, levels of motivation, linguistic context and use, etc.
- the fact that neuroscientists tend to ignore the wide variations in brain activity amongst bilinguals which, possibly resulting from varying stages in bilingual development, could provide the key to linguistic and cognitive processing.

Research has also indicated that bilingualism or the acquisition of a second language increases the density of grey matter in the brain (Mechelli et al., 2004), early bilinguals again showing superiority over late bilinguals with both showing superiority over monolinguals. The research shows that grey matter:

- increases with second language proficiency but decreases with age of acquisition
- is activated by the acquisition of vocabulary in both bilinguals and monolinguals
- enlarges in different areas according to the languages used.

Cognitive aspects of bilingualism

Divergent thinking

As mentioned earlier, more recent research has focused on specific aspects of cognition rather than general IQ so that, by today, *received wisdom* tends to associate bilingualism with a range of cognitive advantages including *divergent thinking*, which is referred to in North America as *creative thinking*. This is the opposite to what is called *convergent thinking* which is a cognitive process required when answering questions which have one correct answer, thus requiring individuals to ‘think’ in the same way. Convergent thinking characterizes IQ testing and fails to take account of more creative and imaginative aspects. Means are, therefore, required to assess other aspects which will enable individuals to provide original answers as well as the more obvious ones thought by others generally. Reader 1 (page 61) refers to Scott’s (1973) study where individuals were asked to think of as many uses of paper clips as possible. Baker (2017: 142) refers to the work of Torrance (1974a, 1974b) and the “Use of an Object Test” which assesses individuals on the following criteria:

- fluency; the *number* of answers given
- flexibility: the *range* of answers according to set categories provided in a Test Manual
- originality: scored according to the statistical *infrequency* of a response indicated in the Test Manual
- elaboration: the *additional detail* provided over and above an account of the use of the object.

The hypothesis, therefore, is that having two languages is conducive to divergent and more creative thinking in relation to these four criteria and that having two or more words for the same object increases word associations.

Based on the above criteria adopted by Torrance (1974), Kharkhurin's (2008) study also showed a positive causal relationship between being bilingual and the ability to think divergently, as quoted in Baker (2011: 150):

Kharkhurin (2008: 232) found that bilingualism appears to 'have an impact on the ability to rapidly produce a large number of ideas or solutions to a problem (fluency), the capacity to consider a variety of approaches to problems simultaneously (flexibility), and have a tendency to encourage the process of thinking through the details of an idea (elaboration)'.

However, the Kharkhurin (2008) study did not indicate any superiority with regard to the criterion of creativity i.e. *originality* and, therefore, Baker (2011: 150) seems to distinguish between the four criteria of Torrance (1974) by associating fluency, flexibility and elaboration with a *psychological* paradigm and originality with a *creative* paradigm; differentiating between "the ability to *activate* a multitude of unrelated concepts [and] the ability to generate novel ideas" and asking, "Do bilinguals show advantages on psychological rather than the purely linguistic creativity measures?"

One can, therefore, possibly question the superiority of bilinguals on the basis of *creativity*, Lauren (1991) finding that differences on this measure amongst children also varied with age.

Metalinguistic advantages

The advantages of bilingualism with regard to divergent thinking leads one, inevitably, to consider whether or not there are *other* possible cognitive advantages also. Whether consciously and/or subconsciously, bilinguals may well analyse, compare and contrast their two languages, a process referred to as *objectification*. Being aware of differing grammar as well as the need to avoid language interference may provide a bilingual with *metalinguistic* benefits. Vygotsky (1962) maintained that bilingualism enables a child “to see his language as one particular system among many, to view its phenomena under more general categories, [which] leads to awareness of his linguistic operations”.

A bilingual person has two or more words for every object and idea. Compared with a monolingual, a balanced bilingual is, therefore, likely to have a larger total vocabulary across both languages. When slightly different meanings or nuances are attached to words in the two languages, a bilingual person may develop the ability to think more flexibly.

Working with two linguistic and conceptual codes also nurtures the ability to deal with abstract ideas independently of words.

This relates to the ability to separate the *sound* of words from their meaning to which a very early longitudinal and often-mentioned study had referred. Leopold (1939-49) ascribed his daughter’s ability to repeat stories and to freely substitute vocabulary in the process of the story-telling to her bilingual German-English development. The study provides early evidence of the relationship between bilingualism and *metalinguistic flexibility*.

In Reading 1, Chin & Wigglesworth (2007: 62) define metalinguistic awareness as “the ability to focus on different levels of linguistic structures such as words, phonemes and syntax” also paraphrasing Cummins’ (1977) definition as “the development of children’s awareness of certain properties of language including their ability to analyse linguistic output”. Baker (2011: 152) quotes Tunmer & Herriman’s (1984: 12) definition:

Metalinguistic awareness may be defined as the ability to reflect upon and manipulate the structural features of spoken language, treating language itself as an object of thought, as opposed to simply using the language system to comprehend and produce sentences.

Described as “a burgeoning area of study”, Reader 1 discusses studies in metalinguistic awareness in four areas:

- word awareness
- phonological awareness
- sentence awareness
- semantic awareness

Word awareness

This aspect is further analysed in relation to (a) the awareness of word as a discrete unit and (b) the awareness of the arbitrariness of language.

(a) Awareness of word as a discrete unit

In relation to the first, Reading 1 refers to the often-mentioned studies of Bialystock (1987, 1988) involving Grade 1 monolingual English and bilingual French-English children which indicated a higher level of performance amongst the bilingual group in terms of the analysis of linguistic units. Whereas Yelland et al. (1993) also discovered the same superiority amongst children learning Italian as a second language, their study also suggested the additional advantage of acquiring higher reading skills at an earlier stage of development. Such benefits, obviously, have implications for the provision of early and primary education.

(b) Awareness of the arbitrariness of language

Since bilinguals and multilinguals (unlike monolinguals) use more than one word for the same object, one would expect them to have a greater awareness of the ‘symbolic’ nature of language and how the attaching of labels to various things is somewhat arbitrary (although perhaps not etymologically).

Research often referred to with regard to bilinguals’ awareness of the arbitrariness of language (as by Baker, 2017:144 and Chin & Wigglesworth, 2007: 63-64 in Reading 1) is that of Ianco-Worrall (1972) and Ben-Zeev (1977). Comparing a group of Afrikaans-English bilingual children aged 4-9 with monolinguals matched on IQ, socio-economic status, gender and age, Ianco-Worrall’s (1972) study illustrated a greater awareness of the arbitrary labelling of objects amongst bilinguals. Unlike, their monolingual counterparts, they found no reason, for example, why a dog could not be called ‘cat’ (and a cat ‘dog’), perceiving the name and the object as being separate and having a non-fixed relationship.

Using a similar test, a study by Cummins (1978) (see Reading 1 page 64) involving Irish-English bilingual children in Grades 3 and 6 showed that children’s responses to the possibility of exchanging ‘moon’ and ‘sun’, for example, divided into three groups:

1. empirical justifications: the words being interchangeable because the sun and the moon both shine

2. rigid conventional justifications: the labels seen as being the only ones possible
3. arbitrary assignment responses: recognising the arbitrary relationship between form and function, as shown in the response, “you could change the names because *it doesn't matter what things are called*”.

Bilinguals, however, were seen to relate significantly more to the third category, which was especially true of children in Grade 6.

Other tests exist in which individuals are asked, for example, to read the *names* of colours which are actually written in a different colour e.g. the word ‘blue’ written in red, as well as vice-versa, to name the *colour* of a word which names a different colour.

Baker (2011) refers to the Symbol Substitution Test adopted by Ben-Zeev (1977) with 5-8 year old Hebrew-English children in which they were asked to substitute a nonsense word in sentences, for example, ‘macaroni’ for ‘I’, thus having to say ‘Macaroni am warm’ instead of ‘I am warm’. Reader 1 (page 63) provides the example of exchanging the words ‘turtle’ and ‘plane’.

Again, the simultaneous use of two language systems seems to make bilingual children more analytical than monolinguals with regard to their awareness of language construction and the grammatical function of words.

Phonological awareness

Chin & Wigglesworth (2007: 65) define this as “the ability to recognise that speech is composed of distinct units of sound” and provide examples of tests which require children to isolate phonological units. Research, studies such as that of Davine et al. (1971) point to the superiority of bilinguals in distinguishing differences, Rubin & Turner (1989) also discovering additional advantages amongst French- English bilinguals in terms of reading and writing skills.

Sentence awareness

This reflects an ability to detect grammatical errors within *sentential* units and to correct and possibly explain them. Whereas research on monolingual children has indicated an inability to do this before the age of five and a half to six years old (despite being orally correct), this ability has been discovered among bilingual children as young as four and a half (Galambos & Goldin-Meadow, 1983). As Reading 1 points out: “While young monolingual children focused on the message conveyed, bilingual children readily focused on the structure”. Additional research by Bialystok (1987) seems to provide further proof of superior

early metalinguistic awareness amongst bilingual children. Pupils aged five to nine years showed an ability to assess the correctness of sentences on the basis of syntax, so that they could detect correct and incorrect grammar regardless of whether the sentence was meaningful or not. However, Galambos & Hakuta (1988) found that this ability correlated with levels of bilingual *proficiency*, the more proficient performing better, a finding which seems to corroborate the Thresholds Hypothesis of Cummins (1976) and Toukomma-Kangas (1977) (see below). Whereas a further study by Galambos & Goldin-Meadow (1990) of Spanish and English monolinguals and English-Spanish bilinguals confirmed the superiority of bilinguals at detecting and correcting errors, this did not apply to their ability to *explain* such errors. According to Chin & Wigglesworth (2007: 66) in Reader 1: “The results indicate that bilingualism accelerates metalinguistic awareness but does not change the awareness qualitatively”.

The definition of metalinguistic awareness as offered in Baker (2017:145), “upon the nature and functions of language” as well as the Tunmer & Herriman (1984: 12) definition quoted previously suggest a rather *conscious* and rational cognitive process which, arguably, may not be ascribed to bilinguals at so early a stage of linguistic development, such as the 5-8 year-old children used by Ben-Zeev (1977) and by Galambos & Goldin-Meadow (1990). However, is it reasonable to expect any transition from subconscious to conscious metalinguistic awareness to be anything other than a gradual process?

Semantic awareness

Chin & Wigglesworth (2007: 66) in Reading 1 maintain that studies carried out by researchers have used “an assortment of tasks which qualify as semantic awareness tasks” even though they were not labelled as such, naming Ianco-Worall (1972), Ben-Zeev (1977) and Cummins (1978) among them. Reference is made to the Semantic-Phonetic Preference task designed to assess to what degree children, given a series of words, focus on their *semantic* rather than *phonetic* similarity. In one study, Ianco-Worall (1972) showed that, unlike the monolingual group, bilinguals tended to pair words according to *meaning* (e.g. *cap* and *hat*) rather than their *sound* (*cap* and *can*). Although the difference between bilinguals and monolinguals at 4-6 years old was not so prevalent by the age of 7, the research illustrated that such semantic differentiation developed in bilinguals some two to three years earlier. Research by Ben Zeev (1977) reached similar conclusions. However, whereas in both studies semantic preference was interpreted as a positive indication of more advanced cognitive development characteristic of later

years, Chin & Wigglesworth (2007: 66) argue that phonetic preference could also be interpreted as “a sign of increased phonetic awareness”.

The separation of word *sound* from *meaning* and the ability to treat language analytically is related to the wider issue of bilingualism and metalinguistic awareness which, as Baker (2011: 153) points out, is part of the experience of bilinguals at early stages of their education:

Phonological awareness and the cognitive skills of symbolic representation are needed to read and write. Letters are symbols without inherent meaning and do not resemble the sounds they represent. Bilinguals may comprehend such symbolic representation earlier than monolinguals as they see words written in two different ways.

This aspect of metalinguistic awareness, therefore, has been considered an advantage in developing reading skills amongst young children, making bilinguals able to read and become literate at an earlier age. However, whereas the development of literacy can also extend to additional beneficial skills of a social, cognitive and linguistic nature, yet, maintaining that there is a direct causal relationship between bilingualism and literacy may over-simplify the cognitive process, thus ignoring the *possible* effects of other variables, such as the level of contrast in the writing system of each language or a child’s level of proficiency in both. Bialystok et al. (2003) also suggest that metalinguistic advantages can be stronger in bilinguals when the two languages spoken are more similar in phonology and sound structures (e.g. Spanish and English as opposed to Spanish and Chinese). According to Baker (2017:147-48), this may suggest that increased metalinguistic awareness may be due to speaking ‘specific combinations of languages with similar features’ rather than to bilingualism *per se*. This differentiation introduces a further variable into what is already a highly complex area of study.

Baker (2017: 144-46) discusses a wide range of research related to the connection between bilingualism and metalinguistic awareness, some of which is mentioned above, and summarises the general findings according to a review of the research by Bialystok (2001):

- that bilinguals do not have superior metalinguistic abilities in *all* respects
- that bilinguals who are relatively balanced however, (see the Thresholds Theory below) have increased

metalinguistic abilities in tasks which require ‘selective attention’ to information, emanating from: (a) their higher level of analysis in the knowledge of language and (b) greater control of attention in the processing of language.

The last bullet point, it seems, relates to a crucial matter which is that since *both* languages are active when one language is being spoken, a bilingual’s need to keep the two languages separate requires him / her to avoid or to minimise intrusion from the other i.e. code-mixing. Whether or not this implies a *conscious* or *subconscious* process on behalf of the speaker is not clear. Nevertheless, it is characteristic of many bilinguals who either make a *conscious* effort to keep their speech ‘pure’ and languages separate, or do so without thought. However, would the alleged superior metalinguistic trait also apply to bilinguals who regularly engage in code-switching? Presumably, an individual who code-switched for reasons of lexical deficiency could not be considered a ‘balanced’ bilingual, but what about one who deliberately code-switches for *rhetorical* effect, as discussed in the first module ECDA-7010: Introduction to Bilingualism? The answer would seem to be that the *rhetorical* use of code-switching (a *conscious* process) is *itself* a further indication of greater control in the processing of language.

Superior levels of attentional control amongst bilingual children have also been seen as advantageous in the development of numeracy. The use of symbols (numbers) to represent varying amounts demands a substantial level of concentration which young bilinguals gain at an early age by having to listen attentively to changes in languages being spoken (Bialystok & Codd, 1997).

The research which has involved comparisons of monolinguals and bilinguals across a wide variety of languages and provides evidence of the superiority of *balanced* bilinguals over *both* monolinguals and less balanced bilinguals in relation to divergent thinking and metalinguistic awareness seems to support the Thresholds Theory of Cummins (1976) and Toukomma-Kangas (1977). This maintains that, whereas monolinguals do not suffer any negative effects from having age-related competence in only one language, bilinguals who achieve a *balanced* level of linguistic proficiency *do* gain cognitive benefits.

The Thresholds Theory

Cummins (1976) discusses the cognitive benefits of bilingual education on three levels which are presented analogously in Figure 4 as three floors of a house. On the lower floor, children who have no age-related

mastery of either language may well suffer some cognitive defects and educational disadvantages, a stage of linguistic development which we can compare with *semilingualism* discussed in module ECDA-7010: Introduction to Bilingualism. Children who have age-related competence in one of the two languages may not suffer any cognitive defects or educational disadvantages but, however, are not likely to enjoy any benefits and advantages either. However, those children who reach a level of age-related competence in *both* languages are likely to reap cognitive benefits.

As mentioned earlier, evidence of the relevance of the Thresholds Theory is provided by Galambos & Hakuta (1988) who maintain that enhanced *metalinguistic* awareness correlates with the balanced development of *both* languages. In tests designed to examine the ability of pupils from a low socio-economic background in the United States to correct grammatical mistakes in Spanish sentences *read* to them, the level of correction seemed to correlate with the level of individual children's bilingual proficiency.

The bilingual experience requires that the form of the two languages being learned be attended to on a routine basis. Experience at attending to form would be predicted to facilitate any task that required the child to focus on form upon demand. (Galambos & Hakuta (1988: 153)

Also mentioned in Baker (2017:147) is research by Carlisle et al. (1999) which points in the same direction, concluding that metalinguistic performance in the early stages of bilingual development can be *enhanced and hindered according to the degree or level of bilingual proficiency* attained, such as adequate command of vocabulary in both languages.

The Thresholds Theory also seems to be supported by Ricciardelli (1992a) and his review of 24 studies (1992b). Whereas 20 studies reflected the superiority of bilinguals over monolinguals, the four which did not were based on samples of less proficient bilinguals.

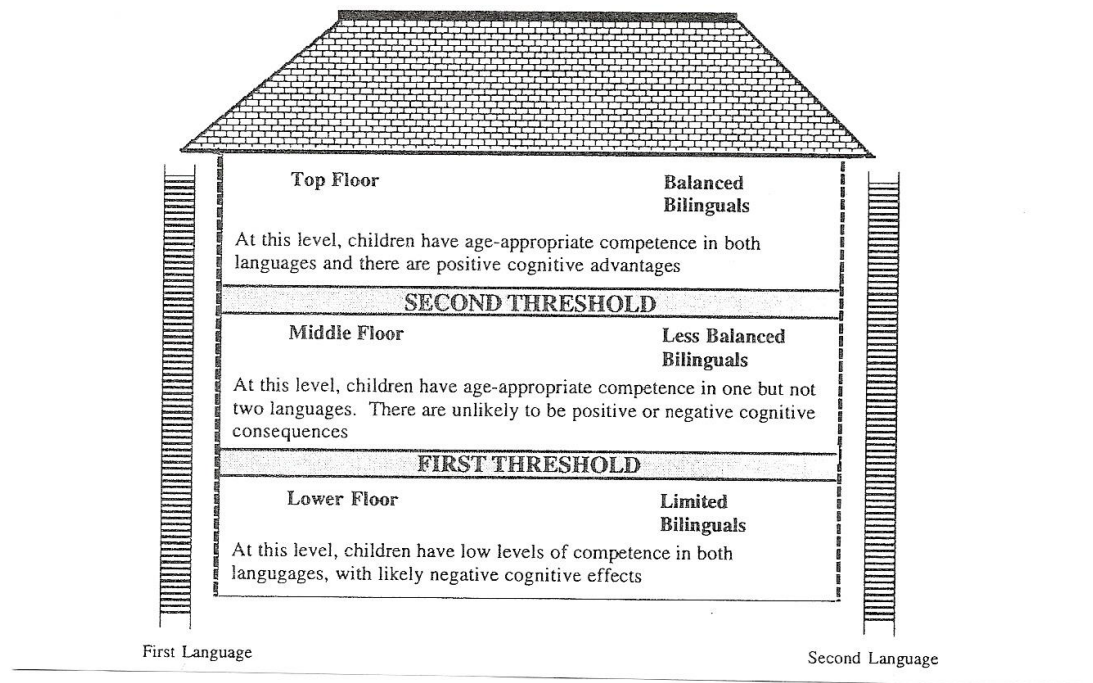
Cummins' (1976) Thresholds Theory, however, does not determine a *specific level* of bilingual proficiency required. Chin & Wigglesworth (2007: 67) highlight this issue very clearly:

The main problem with the Threshold Theory is the difficulty in establishing what these thresholds are in concrete terms. Assuming that an objective quantification

of a bilingual's linguistic competence is possible, it is still impossible to determine where one should draw a line for each threshold.

Chin & Wigglesworth (2007) note that Edelsky et al. (1983) refer to the hypothesis as “a post hoc explanation of the bilingual phenomenon [which] needs direct empirical investigation with rigorous replications across linguistic and cultural groups”.

Figure 4: Cummins' (1976) Thresholds Theory. (Source: Baker (1993: 136))



Bilingualism and ageing

Age is also a factor about which one can ask questions with regard to cognitive advantages *generally*. Are such alleged advantages permanent? Do they increase or diminish with age? This was an issue which concerned authorities in Wales in the 1950s as the provision of bilingual education and the establishment of bilingual schools began to flourish:

...we need a thorough study of the relation of bilingualism to the development of the entire personality of the child – how far the learning of two languages at various stages maybe an advantage or a disadvantage....., how far the disadvantages are temporary and in what sense they are

permanent. (Central Advisory Board (Wales), 1953)

For rather obvious reasons possibly, research in cognitive aspects of bilingualism tends to concentrate on children who are in the primary and secondary sectors of schooling and the early stages of life (4-18 years of age). The underlying rationale of such research seems to be the discovery of facts which can influence and improve the educational provision and lives of *future* generations. Although such research focuses on the present, nevertheless, like all research, it has an inevitable *future* orientation. Research in bilingualism in middle-aged or older people, therefore, tends to be ignored. However, as will be mentioned later, this is a field which also demands further attention and which, arguably, could have substantial social and political implications similar to those relating to younger generations.

Baker (2017: 148-49) provides evidence of research involving the older-age group and refers to the work of Bialystok et al. (2004), (2008) who adopted the Simon Task and the Stroop Task with younger and older bilinguals and ‘matched’ monolinguals. As described (Baker, 2017:148), despite being different, both tasks tested individuals’ response and reaction to ‘congruent’ and ‘incongruent’ situations. Reactions generally are deemed to be usually slower in response to the latter than to the former, especially with ageing. However, in both tasks, bilinguals were seen to be superior to ‘matched’ monolinguals in reaction times regardless of their age. The speed of bilinguals’ responses also indicated a significant improvement on the *age-related* lower performance expected. As Baker (2017:148-49) mentions, this research again points to the superiority of bilinguals in relation to the *selective attention* also found in bilingual *children*, therefore suggesting a life-lasting metalinguistic effect emanating from the need to keep languages separate in order to avoid intrusion whilst another is still active. In relation to this point, it is worth quoting Bialystock et al. (2004):

The joint activity of the two systems requires a mechanism for keeping the two languages separate so that fluent performance can be achieved without intrusions from the unwanted language. (Bialystok et al., 2004: 291)

The simple experience of bilingualism that relies on some aspect of these [cognitive] processes to control the production of the relevant language appears to yield widespread benefits across a range of complex cognitive tasks. (Bialystok et al., 2004: 302)

Again, using the Simon Task and adopting magnetoencephalography (MEG) for a comparative *neural* investigation of the brain of bilingual and monolingual young *adults*, further research by Bialystok et al. (2005) showed that bilinguals used more areas of the brain than monolinguals including the Broca's area associated with language processing. However, the research related to the benefits of bilingualism which, arguably, has gained most attention internationally of late is that which was also carried out by Bialystok et al. (2007) to compare the onset of dementia in bilinguals and monolinguals. Of the 184 individuals involved, half were bilingual and half monolingual. The results showed that, while the signs of dementia amongst monolinguals had a mean age of 71.4, the mean age of bilinguals was 75.5, suggesting the possibility that, on average, the likelihood of dementia occurring in bilinguals is delayed by four years. It seems that such a finding could have obvious implications not only in terms of the health and well-being of older generations, but also in *economic* terms for policy-planners in public welfare and health.

Ageing is acknowledged to be a contributory factor in an almost inevitable decrease in cognitive functioning and control which various tests such as the Simon and Stroop Tasks can detect by requiring individuals to react to various stimuli. Data from tests carried out on bilinguals, however, seem to suggest that the *decline* in cognitive control associated with normal ageing is delayed or slowed down. Whereas this research, obviously, has health implications for people as individuals, yet, in relation to society generally on a global scale, it can be seen to have much wider political, educational, social and economic implications also.

Educational issues

Educational research world-wide has produced results to which educationists and policy-makers generally should pay attention and which has significant educational, political, social and economic implications. Following on from the research of Peal & Lambert (1962), much has taken place within bilingual contexts in countries throughout the world. There is positive evidence of cognitive benefits relating to bilingualism / multilingualism from research carried out, for example, in Canada, the USA, the Basque Country, Catalonia and Wales which shows that bilingual children tend to perform better in tests and examinations as well as the curriculum generally.

Research carried out in early immersion-education in Canada (Swain & Lapkin, 1982) provided the following results:

- early-immersion education for second-language pupils was superior to the ‘drip-feed’ method used to teach a second language *as a subject* in mainstream schools
- the acquisition of the second language (L2) was not at the expense of development in the first (L1). First language development could even be superior to that of pupils in mainstream (L1) schools
- second language development was not at the expense of development in *other subjects*
- there were positive effects in terms of self-esteem, motivation and the ability to socialise with French-speakers.

Swain & Lapkin (1982) made the following observation on the early total-immersion provided to Canadian pupils in French-English bilingual education:

In sum, students in the early total-immersion program are able to master the content of such subjects as mathematics, history, geography and science to the extent that their peers in the regular program have. Furthermore, the total immersion experience seems to have sharpened their work-study skills and has left them with no sign of cognitive confusion. Indeed, the results suggest that the immersion students may be reaping positive benefits, not only in enhanced English-language skills..... but also in more specific intellectual skills.

In Wales, Standard Assessment Tests (SATs) were conducted at various stages of academic development across the primary and secondary sectors up until the middle of the 2000s. In SATs conducted at the end of Key-stage 1 for 7 year-old pupils who had received statutory education since the age of 5, the performance of fluent bilingual pupils was higher. Similarly, research conducted independently by Leeds University (Shorrocks, 1992) showed that pupils fluent in Welsh had higher results in Mathematics and Science than those who were not fluent. Research conducted by the National Federation for Educational Research (NFER, 1991) also showed that the performance of pupils in Welsh-medium schools was higher in Mathematics and Science.

With regard to the results of SATs conducted at Key-stage 3 in Welsh as a first language for pupils aged 14, NFER (1992) research showed that there was very little difference between the performance of pupils from Welsh-speaking homes and those from non-Welsh-speaking homes. In

other words, pupils from non-Welsh-speaking homes had suffered no disadvantage by following *first-language* programmes of study. Based on research data in the achievements of pupils in the English language from the Assessment of Performance Unit (APU) which the British government had established in the 1970s, Thornton (1986: 61) observed:

...the mean scores for second-language speakers (all but a handful of whom were native speakers of Welsh) were fractionally higher than those for monolingual English speakers.

One can ask to what extent are these results related to the Thresholds Theory of Cummins (1976) and Toukomma-Kangas, (1977), that *balanced* bilingualism creates positive cognitive advantages? Reference to this hypothesis has been made at various points in our discussion which were related to aspects of cognition, such as divergent thinking and metalinguistic benefits. As previously mentioned, Cummins' (1976) Thresholds Theory does not determine a *specific level* of bilingualism required. However, it *does* raise fundamental issues of a *methodological* nature with regard to developing pupils' bilingual *proficiency* which, in turn, has considerable implications for some educational systems.

Even during the early “period of detrimental effects”, the adoption of questionable methodology in ‘bilingual’ education was an issue highlighted by Smith (1923):

So far from bilingualism being an 'intellectual advantage', it seems to be exactly the reverse, *at least under the present organisation of schools in Wales*. (italics added)
(cited in Jones, 1966: 95)

The methodology currently adopted for teaching a second language within the vast majority of British schools is generally one of teaching the language concerned as a *subject* only, in the same way as Geography or Mathematics for example, rather than adopting it also as *a means of instruction* across either the whole or part of the curriculum. This “Mainstream with Foreign Language” method of teaching for short intermittent periods on a weekly or fortnightly cycle has been referred to as “drip-feeding” and is considered a ‘weak’ model resulting in very limited bilingual proficiency (Baker, 2017: 199). As this topic of discussion is a matter for a future module, ECDA-7005: Models for Bilingual Teaching, an example will suffice for clarification.

In Wales, Welsh is both taught as a first language and used as a medium of instruction to approximately 20% of all pupils in statutory education (5-16 years old) but is a second language *subject* only and not a medium of curricular instruction to approximately 80%. Furthermore, as it has also been available as a *short* course rather than a full course in external public examinations at the age of 16, it is effectively a *political* model of linguistic provision which enables the central government to be seen as providing what is alleged to be *compulsory* ‘bilingual’ education to all pupils of statutory age. Despite being acknowledged by academics, practitioners and the inspectorate as totally ineffective linguistic provision for the vast majority of children, the Welsh government has an official politico-linguistic agenda of creating a ‘bilingual’ Wales (Welsh Assembly Government, 2003). As in the case of teaching modern foreign languages in British schools generally, by not producing bilingually *balanced* and competent speakers, such linguistic educational provision is neither cost-effective in economic terms nor cognitively beneficial to pupils. According to Le Blanc (1992), this has also been the case in Canada:

We all know how much our country invests in second -language training. We are talking in terms of millions and millions of dollars...All these students are taking second-language courses and, once they have finished, should normally be able to function in the second language. But what happens in reality? (Le Blanc, 1992: 35)

However, research in the Basque region of Spain compared the linguistic effectiveness of three educational systems in terms of promoting bilingual proficiency:

- System A in which Basque was studied only as a subject
- System B in which the *curriculum* was studied bilingually
- System D (there is no C in Basque) where Spanish (being a major language) was studied as a subject and the remainder of the curriculum through the medium of Basque.

Whereas the arrangement for A was considered to be a total failure, pupils in systems Band D showed progress in *both* languages, thus indicating the superiority of these systems not only in making children bilingually proficient but also in *economic* terms by being more cost-effective than separate linguistic education.

At a time when education systems everywhere are experiencing financial restraint, economic aspects of language planning need to be taken into account. Immersion or bilingual programmes...need cost no more than [monolingual] programs but they produce dramatically better results. In other words, they are considerably more cost-effective. (E.I.F.E.2., 1989:17)

As well as not being economically cost-effective therefore, it can be argued that not providing children with an effective teaching *methodology* which enables them to become competently bilingual at a relatively early age also deprives them of the cognitive and educational benefits which bilingualism can provide.

Emanating from the Thresholds Theory are other issues related to the connection between bilingualism and cognition which have further educational implications. One cognitive factor is the transference of skills from one language to another which relates to the Common Underlying Proficiency concept or model (CUP) of bilingualism (i.e. both languages being generated by a *common* central processor system in the brain) as well as to the Thresholds Theory in relation to bilingual *development* which led to Cummins' (2000) Developmental Interdependence Hypothesis. This hypothesis suggests the greater one's proficiency in the first language, the greater the potential development of the second. Baker (2011:169-70) refers to various examples of twenty-first century research involving Catalan-Spanish and Spanish-English bilinguals which supports this view (see also Baker (2017:160-61). Moreover, also seemingly in accordance with the transference of skills and concepts expounded by the Developmental Interdependence Hypothesis, European research shows that proficiently bilingual people also tend to find it easier to learn other languages (Cenoz, 2003).

In module ECDA-7010, reference was made to Cummins' (1979) distinction between Basic Interpersonal Communication Skills (BICS) and Cognitive Academic Language Proficiency (CALP) and to "the very fine line which exists in this field of study between the *measurement of levels* of bilingual proficiency on the one hand and *the cognitive effects of those levels* of proficiency on the other" (ECDA-7010: 19-23). For a more detailed discussion of BICS and CALP, students are referred back to pages 19-24 of that module. For present purposes, the concept of BICS / CALP is discussed in relation to the *cognitive effects* of bilingualism rather than its *measurement*.

Baker (2017:160-63) shows that the cognitive development of bilinguals (as reflected in concepts such as BICS and CALP and the Developmental Interdependence Hypothesis) raises methodological issues with regard to *classroom instruction* due to the fact that proficiency at BICS level can be acquired in two years, whereas proficiency at CALP level can take between five and seven years or more (Cummins, 1979). This is a distinction, with slight variants, also highlighted by Hakuta et al. (2000) in relation to the development of English proficiency amongst Hispanics in California. As well as illustrating the difference between language proficiency at each of the two levels, Baker (2017:161) also provides examples in mathematics of the way a higher level of language proficiency (CALP) is demanded within the classroom in order to overcome both lexical and syntactical difficulties. As Baker (2011: 172) states, proficiency at BICS level can be deceptive:

Cummins' distinction between BICS and CALP explains why such children tend to fail when mainstreamed. Their cognitive academic language proficiency is not developed enough to cope with the demands of the curriculum. What Cummins regards as essential in the bilingual education of children is that the 'common underlying proficiency' is well developed. That is, a child's language-cognitive abilities need to be sufficiently well-developed to cope with the curriculum processes of the classroom. This underlying ability could be developed in the first or the second language, but also in both languages simultaneously.

The *linguistic* distinction between BICS and CALP can be further complicated by other *contextual* factors so that one can differentiate between:

- context-embedded proficiency
- context-reduced proficiency

Although they were discussed in module ECDA-7010, they are defined again for convenience:

- **Context-embedded proficiency** defines a level of communication and comprehension which is facilitated by contextual support, including the use of body language e.g. use of the hands, eyes, signs, inflection of the voice. In a classroom teaching situation, this could also involve the use of audio-visual aids or artefacts.
- **Context-reduced proficiency** reflects higher-order language skills where communication and comprehension are not dependent on

external physical support or signals, and where there is, for example, a need to analyse, synthesise, hypothesise and evaluate.

Baker (2011), perhaps in a slightly misleading way, seems to suggest initially that BICS *always* occurs in context-embedded situations and CALP in context-reduced situations. However, as was shown in the earlier module ECDA-7010, that is not always the case, which is why we can present each of these dimensions on different axes, thus forming four quadrants. Again, what was illustrated in the earlier module is presented here as Figure 5 to clarify comprehension. Baker (2011, 2017) uses the terms Cognitively Undemanding Communication and Cognitively Demanding Communication respectively for BICS and CALP to which we adhere for consistency.

Placing the four quadrants on one continuum would demonstrate the complexity of an individual child's language development and proficiency *within* the two extreme points:

1st Quadrant: Context-Embedded and Cognitively Undemanding Communication

2nd Quadrant: Context-Reduced and Cognitively Undemanding Communication

3rd Quadrant: Context-Embedded and Cognitively Demanding Communication

4th Quadrant: Context-Reduced and Cognitively Demanding Communication

One would agree that the lowest level of proficiency would be demonstrated in the 1st Quadrant where the language would be cognitively undemanding (BICS) and where the communication process would be assisted by external support signals i.e. context-embedded. Similarly, the 4th Quadrant would indicate high levels of proficiency with cognitively demanding language as well as the absence of any external support signals i.e. context-reduced. However, with regard to language development *within* those two extreme points of the continuum, in which order would we place the 2nd and 3rd quadrants? The continuum would demonstrate, for example, that cognitively demanding language can be assisted by being context-embedded in the same way that cognitively undemanding language can also, on occasions, afford to be context-reduced. This, therefore, demonstrates that language development does not necessarily happen in a *linear* fashion, and that there can be many variables at work in the process.

As Cummins (2000) states (ECDA-7010, Reading 1: 165):

While cognitive demands and contextual support are distinguished in the framework, it is not being suggested that these dimensions are independent of each other. In fact, as Frederickson and Cline (1990) point out, increasing contextual support will tend to lessen the cognitive demands- in other words, make tasks easier.

Although this was mentioned in module ECDA-7010, the *cognitive* significance of this is that L2 competence in Quadrant 1 (surface fluency) can develop independently of L1 but that Quadrant 4 competence develops *interdependently* and can be promoted through the medium of one language or the other, or both interactively.

The cognitive aspect of distinguishing between BICS and CALP and the contextual aspect of context-embedded and context-reduced proficiency have major implications for educational instruction within the classroom. These dimensions are relevant to the way children are *taught* with regard to the need to adopt purposeful teaching strategies i.e. the need to consider:

- the cognitive demands of the task
- how context-embedded or reduced is the presentation / teaching
- the language proficiency of individual children.

Such dimensions are also relevant with regard to adopting suitable methods of *assessing* knowledge and competencies.

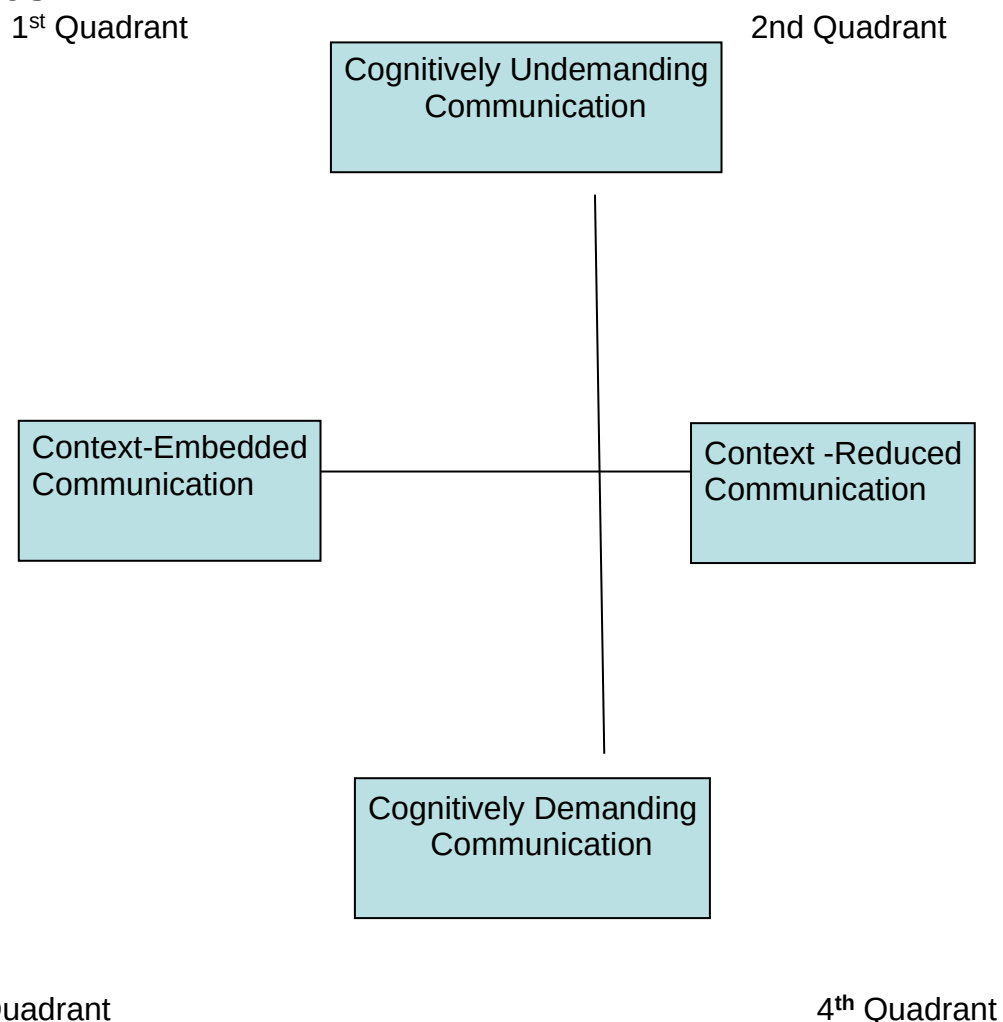
Baker (2011: 177-78) illustrates these two issues in relation to teaching measurement and the concept of height to children, also indicating how the adoption of *differentiated methods* (acknowledged as good practice) in both teaching and assessment can emanate from giving careful consideration to levels of *linguistic proficiency*. Children who perform well on the linguistic level of BICS (according to ‘fluency’) often appear, consequently, to be capable of being educated through the medium of their second language, which is helpful in explaining the results of some research:

1. Minority-language students underachieving academically after being transferred to mainstream lessons, but appearing to be capable on the basis of ‘fluency’ in their second language;
2. Some pupils in Canadian French-immersion education appearing to be behind their first-language contemporaries for a short while until their ability to deal with cognitively demanding issues allows them to catch up.
3. Research in Canada, the USA and Europe showing that, where minority-language pupils are allowed to partly use their first language for their early

education, no retardation is found in academic progress or in the development of the majority language (L2). After developing cognitive skills in their first language, these are transferred to their second language also.

Thus, the theory suggests that bilingual education will be successful when children have enough first or second language proficiency to work in the context-reduced, cognitively demanding situation of the classroom. For Cummins (1981) it often takes one or two years for a child to acquire context-embedded second language fluency, but five to seven years or more to acquire context-reduced fluency. (Baker, 1993: 140)

Figure 5



Whereas these issues have been taken on board by many practising teachers, teaching methods adopted by many educational systems which expect immigrants, for example, to learn English in a relatively short

period of time seem to set unattainable targets. Moreover, despite being presented in deceptively altruistic terms of securing educational advantages for such individuals, such linguistic programmes are often driven by political ideals and efforts to ensure cultural integration and assimilation which can prove to be educationally detrimental. These are issues which are discussed in Chapter 18 of Baker (2017) and to which students should refer.

Social issues

Benefits associated with bilingualism also have *social* advantages. The ground-breaking research carried out by Peal & Lambert (1962) in Montreal also found that bilinguals showed a more positive attitude towards French-speaking communities than their monolingual counterparts (Chin & Wigglesworth, 2007: 59). Baker (2017: 149-50) discusses the alleged connection between bilingualism and communicative sensitivity. However, such sensitivity covers many aspects, some of which have social and political implications. Reference is made to an often-mentioned piece of research by Genesee et al. (1975) involving a comparison of children in bilingual and monolingual education which (as quoted in Baker (2017:149:50)) showed that children in bilingual education “may have been better able than the control children to take the role of others experiencing communicational difficulties, to perceive their needs, and consequently to respond appropriately to these needs” (Genesee et al., 1975: 1013). In terms of social interaction, bilinguals are believed to be more sensitive to the needs of others than monolinguals, being able to know which language to speak to whom and when, and to ‘tailor’ their language to suit others as well as adapt it to various situations (which also partly relates to Sachdev & Giles’ (2006) Communication Accommodation Theory studied earlier in module ECDA-7010). As Baker (2017:150) states:

[Communicative sensitivity] links with *sociolinguistic* competence...and suggests a heightened social awareness among bilinguals of verbal and non-verbal message cues and clues in communication.

More research is needed to define precisely the characteristics and the extent of the sensitivity to communication that bilinguals may share. Research in this area is important because it connects cognition with interpersonal relationships.

It moves from questions about bilinguals’ cognitive skills to their social skills. (Baker, 2017: 150) (italics added)

Bilinguals are often said to have ‘two windows on the world’. Being able to speak two languages may, psychologically, enable them to switch and identify quite easily with an alternative ‘persona’ or to share a different perspective on a social situation. This has obvious social and political implications which, arguably, could include a less ethnocentric and more tolerant attitude towards other languages and cultures. According to Vygotsky (1962), monolinguals live in a conceptual ‘prison’ and cannot deal with cultural differences as sensitively as bilinguals. Because two languages give a person a wider cultural experience, it often leads to a greater tolerance of differences in other cultures, creeds and customs.

The educational, social, economic and political implications of the alleged cognitive benefits of bilingualism

In discussing and analysing various aspects of cognition related to bilingualism and multilingualism, references have already been made to some of the possible educational, social, political and economic implications of the research. Separating and disentangling these aspects from each other by allocating them to discrete categories is, of course, impossible since language is a dimension which cuts across each of them and binds them together.

The second assignment of this module, however, requires students to consider whether or not the findings of research into cognitive issues and the alleged consequential benefits have implications of various kinds. Whereas, some of these findings may well be considered to have implications on a world-wide scale and, therefore, are worthy of *universal* recognition and implementation, reference to more *localised contexts* also within a student’s experience might well enrich the discussion. This might also provide a more balanced and pragmatic perspective on what research can *realistically* effect and achieve within the confines of various political ideologies and language policies as discussed by Bourhis (2001) and Wiley (2002, 2015) respectively (see ECDA-7011: Societal Bilingualism).

Attempting to cover the inevitable wide spectrum of issues on a *global* scale is, obviously, an impossible task for the confines of this Guidance Handbook. However, providing a wide perspective by highlighting some additional issues to those previously mentioned in passing will allow students to ponder further on aspects which might have a particular personal relevance or which may be considered worthy of further application at their respective local and /or national levels. **Students are strongly recommended to read Chapters 9, 10, 17, 18 and 19 in the publication which accompanies this course, “Foundations of Bilingual Education and Bilingualism” (Baker, 2017) which relate cognitive aspects of bilingualism to a range of educational, social,**

political and economic dimensions and provide specific illustrative examples.

Bilingual education has been a source of conflict over time in many parts of the world which clearly illustrates that it has a fundamental *political* dimension. Baker (2017: 370) states:

...bilingualism and bilingual education, whatever form they take, cannot be properly understood unless connected to ideologies and politics in society...calls for and against bilingual education are surrounded and underpinned by basic beliefs about minority languages and cultures, linguistic and cultural diversity, immigration and immigrants, equality of opportunity and equality of outcomes, empowerment, affirmative action, the rights of individuals and the rights of language minority groups, assimilation and integration, desegregation and discrimination, pluralism and multiculturalism, diversity and discord,...social division and social cohesion.

Separating education from politics can be extremely difficult even in the most linguistically and culturally homogenous contexts. Bilingual education provision within *bicultural* contexts, however, can easily become embroiled in political and socio-cultural dimensions of the nature discussed in module ECDA-7011: Societal Bilingualism. Cognitive aspects in particular have generated widespread discussion and disagreement over the years which, as we have already seen, although based on methodologically deficient research and uninformed prejudice, nevertheless serves to remind us of the direct influence of the interaction between public *perception*, *attitudes* and *beliefs* and its consequential transformational power in terms of human *behaviour*.

What is often believed to be the right of parents to make a ‘free’, independent and *informed* judgement when choosing the ‘right’ model of education for their children is often subject to the influence of a range of unstable external political, social and economic contextual factors which can act as both driving-forces and restraining-forces (Lewin, 1951) *for* and *against* making certain decisions (see Module ECDA-7011: Societal Bilingualism). Rather than being ‘free’ to make choices, therefore, individuals can be unconsciously influenced by a multitude of factors, with the inevitable result that such a ‘choice’ can unknowingly be based on deeply entrenched attitudes and behaviours. With regard to languages,

Ruiz (1984) places public perception of bilingualism / multilingualism on three political dimensions:

- language as a problem
- language as a right
- language as a resource

Chapter 17 in Baker (2017), which students are advised to read, is structured on a discussion of these three dimensions which surround bilingual education and which, arguably, mirror the “force-field theory” of Lewin (1951) (‘driving forces’ and ‘restraining forces’ corresponding to ‘language as a right’ and ‘language as a problem’ respectively).

As was mentioned in module ECDA-7011, the first two dimensions are diametrically opposed, the rights of one linguistic group often being construed as creating a problem for another. However, a crucial and discerning statement in Baker (2017: 370) is that education can be “both part of the solution and part of the problem”, the reason being that:

Behind bilingual education are *varying and conflicting philosophies of what education is for*. Sociocultural, political and economic issues are ever present...
(Baker, 1993), (italics added)

All forms of education, arguably, are underpinned by some kind of basic philosophy. However, as in the case of religious denominational education for example, by virtue of being *non-mainstream*, bilingual education often sets itself apart in public perception. Unlike monolingual mainstream education, therefore, (especially in a major dominant language), bilingual education is often perceived as carrying additional ‘baggage’; bilingual schools being seen not as establishments which simply transmit knowledge as much as transmitting a particular *kind* of knowledge which may often be contrary to parents’ wishes or educational philosophy. Such ‘baggage’, therefore, is often perceived as being *political* in nature, and the instruction provided can be erroneously construed as having an ulterior politico-linguistic ‘raison d’être’ rather than purely ‘educational’ aims.

Various nations across the world currently strive to promote and revitalize their indigenous languages within their respective education systems. Positive research evidence of the benefits of bilingual education emanating from certain countries could be cynically construed by some as being part of a *politically* biased effort to secure the revitalisation of a minority or endangered language. Often being smaller nations or minority groups which exist within larger dominant nations and

hegemonic political contexts, the perception of bilingual education as being underpinned by an almost subversive political ideology can be inevitable. Valdes et al. (2006) refer to the connection which is made in the United States of America between the teaching of languages other than English and non-American ideas, a reaction summed up in the publication *At War with Diversity: US Language Policy in an Age of Anxiety* (Crawford, 2000). Chapter 9 of Baker (2017), *Historical Introduction to Bilingual Education: The United States* provides evidence of this kind of perception. However, the history of bilingual education in the USA also seems to illustrate all three of Ruiz's (1984) political dimensions. As Baker (2017: 382) states: "The political debate over the place of English in the US illustrates how languages can alternatively be seen as a problem, right or resource". Whereas the Bilingual Education Act (1968) and 'No Child Left Behind' (2001) legislation represent 'language as a right' and 'language as a problem' respectively, the words of Ovando (1990: 354) crystallize the 'language as a resource' concept of bilingualism which can provide a range of social and economic benefits:

On the one hand we encourage and promote the study of foreign languages for English monolinguals, at great cost and with great inefficiency. At the same time we destroy the linguistic gifts that children from non-English language backgrounds bring to our schools.

Ricento (2009) broadens the criticism to include the United Kingdom by referring to the irony of unsuccessfully attempting to teach the very languages which immigrant children are encouraged to forget. Stubbs (1991), however, accuses the UK of being Eurocentric in its choice of foreign languages within the education system and of adopting a 'caste system' with regard to many Asian languages already spoken at home by children of immigrant families. This ambivalent attitude towards promoting bilingualism and multilingualism within the education system is summed up in the title of Stubbs' (1991) critical article of language policy within the United Kingdom: *Educational language planning in England and Wales: Multicultural rhetoric and assimilationist assumptions*.

The 'melting-pot' assimilationist ideology of the United States, which is often couched in an altruistic doctrine of racial *equality* and *opportunity* for all, is equally prevalent in the United Kingdom. This was manifest in a well-known enquiry into the education of children from ethnic minority groups known as the Swann Report (1985) *Education for All: Report of*

the Committee of Enquiry into the Education of Children from Ethnic Minority Groups which concluded:

We believe that essential to equality of opportunity, to academic success and, more broadly, to participation on equal terms as a full member of society, is a good command of *English* and that first priority in language learning by all pupils must therefore be given to the learning of English. (Swann Report, 1985: Paragraph 3.16)

The linguistic, religious and cultural identities of ethnic minority communities should be fostered but we cannot support the arguments put forward for the introduction of programmes of bilingual education in maintained schools (Swann Report, 1985: Paragraph 3.15)

This enquiry was partly fuelled by a notorious speech made by Enoch Powell in his address to the General Meeting of the West Midlands Area Conservative Political Centre (commonly called the "Rivers of Blood" speech) on April 20th, 1968 criticising Commonwealth immigration, as well as proposed anti-discrimination legislation in the United Kingdom.

Chapter 15 of Baker (2017) entitled *Support and Assessment of Special Needs, Assessment and Exceptional Bilingual Students* discusses some assessment issues which are underpinned unashamedly by overt political ideologies and states clearly:

The root cause tends to be a bias against language minorities that is endemic in many societies and is substantiated by unfair tests... By being biased against bilinguals in a cultural and linguistic form, and by a failure to incorporate an understanding of the cognitive constitution of individuals, assessment confirms and perpetuates various discriminatory perceptions about language minority children. (Baker, 2017: 348)

Both the United States of America and the United Kingdom are referred to as examples where assessment provides evidence of discrimination and prejudice against linguistic minorities. However, rather than being the root cause of discrimination, it often reflects far more ingrained and entrenched ethnocentric cultural attitudes. The truth, of course, is that the problem is one of a *political* and *socio-cultural* nature rather than linguistic *per se*, where language is perceived as a source of potential social conflict, national or regional disunity and a threat to social cohesion.

Whereas ‘language as a right’ and ‘language as a problem’ represent diametrically opposed political dimensions surrounding bilingual education, Ruiz (1984), however, illustrates how perceiving and treating languages as a *resource* can act as a conciliatory and cohesive force which can provide educational, social and economic advantages, but which also requires a *political* change in approach and attitude. But how can such a change be brought about?

Changing public attitudes and perceptions

Needless to say, changing public perceptions of other languages hinges once more on deep-seated political ideologies regarding *what kind of society* the linguistic fabric should reflect and is, essentially, about attitudes and behaviour towards other *cultures*. In Chapter 18 of Baker (2017), Bourhis (2001) suggests that such attitudes and behaviour can reflect a typology of four political ideologies which he places on a continuum. Arguably, these ideologies can be coupled with varying language *policies* or linguistic orientations such as those described by Wiley (2015) also outlined in Chapter 18:

- pluralist ideology, as reflected in *promotion-oriented* language policies (Wiley, 2015)
- civic ideology, which adopts *tolerance-oriented* language policies
- assimilation ideology, facilitated by *restricted-oriented* language policies
- ethnist ideology, as demonstrated in *repression-oriented* language policies.

Whereas Bourhis (2001) extends the typology to include an ethnist ideology, in most contexts, however, political ‘propriety’ as well as legal requirements (both national and international) usually determine that a more socially ‘acceptable’ ideology falls somewhere between pluralist and assimilation.

However, changing human *behaviour*, (causally related to *attitude* as we saw in module ECDA-7011) furthermore involves changing what people *believe*, which, ultimately, depends on the provision of sound, reliable and valid information or evidence. Chin & Benne (1976) provide a model of change strategy which, arguably, is relevant to any attempt at dispelling any negative, prejudicial attitudes and ideas regarding bilingualism and bilingual education and, conversely, to promoting a positive process of normalisation.

Chin & Benne (1976) describe three strategies for effecting change:

- *empirical-rational* strategies: based on the premise that human beings are rational people and will change on the basis of self-interest and in reaction to what appears to be advantageous to them;
- *normative-re-educative* strategies: based on the assumption that the behaviour of most people conforms to social norms and that change can be created by changing those norms;
- *power-coercive* strategies: based on the assumption that change can be effected by forcing those with less power to comply with the wishes of those who have more.

The difference between the first two strategies is not as clear-cut as one would imagine. However, whereas normative-re-educative strategies still involve a degree of rational thought on behalf of individuals, individual behaviour is also affected by group dynamics and social norms. French & Bell (1990) provide an analogous illustration of the differences between these three strategies:

“Suppose that the Salk polio vaccine has just been invented, tested, and cleared for public use and that you are in charge of disseminating it to the public. Your procedure would depend upon which strategy of changing you believed in. If you espoused the empirical-rational theory of changing, then you would assume that all rational self-interested people (and that is everyone, just about) would use the vaccine if only they had information and knowledge about its availability and efficacy. *Your program, therefore, would be to disseminate the knowledge and information.* As a consequence, everyone would take the vaccine, since it would be in his or her best interests.

On the other hand, if you held a normative-re-educative belief about changing, you would do additional things. While you would not disbelieve or disregard people's intelligence, rationality, and self interest, you would also believe that many behaviours are rooted in socio-cultural norms, values and beliefs that must be changed for them to accept and use the vaccine. Some of these beliefs might be that 'all new drugs are dangerous until they have been on the market for 10 years. My neighbour, Mrs Jones, isn't going to use the vaccine, and neither am I since she's always right about these things; well, no one in my family has ever had polio, so I'm not afraid of getting it and don't need to be vaccinated'.

Holding to the second strategy of changing, you would assume that norms and values had to be changed, in addition to making the information available to the public. You would mount both an education

campaign about the new drug and a re-education campaign to change some norms and values.

If you held to a power-coercive strategy of changing, your task would be straightforward, you would pass a law stating that all persons must get vaccinated, and you would ensure and enforce compliance to the law. If you had the power to pass the law, and power to enforce the law, the people would take the vaccine.” (French and Bell, 1990: 85-6)

With the exception of power-coercive strategies which require the enforcement of legislation, for example, the other two, to varying degrees, are dependent on individuals’ reaction to rational thought, the provision of knowledge or evidence acting as a catalyst and a reason for a change in behaviour. However, as previously mentioned, human nature tends to react more favourably to that which is of *self-interest* so that the information provided must be of *personal advantage* if a successful change in behaviour is to be achieved.

Due to the fact that the more recent research on bilingualism seems to provide rather irrefutable evidence of its cognitive benefits, the issue seems to be partly one of eradicating the diametrically opposed political dimensions of ‘language as a right’ and ‘language as a problem’ from the public’s perception of bilingual education and to promote it as a resource. This involves presenting bilingual education as a *non-politically-oriented* means of transmitting knowledge and skills to children in the same way as the currently predominant monolingual method, but with an added value. The research-based evidence appears to be sufficiently strong and irrefutable for empirical-rational and normative re-educative strategies to be adopted for its promotion within education systems world-wide.

However, when discussing the cognitive benefits of being bilingual, one is, of course, reminded of the need to be realistic with regard to the amount of influence academic research can have on individual members of the public and the public generally. Such research, regrettably, often has a tendency to gather dust; at best, having been ignored by politicians and policy-makers for being politically too sensitive for consideration, let alone implementation; at worst, not having even reached the eyes and ears of those in authority and who have the power to ‘make things happen’. However, even when the results of such research reach the light of day in the public domain and are given general publicity by the media for instance, its influence on members of the public as *individuals* and *groups* is often minimal. One only has to consider what influence

research in the adverse effects of smoking (and over fifty years of constant publicity) has had on the general public world-wide.

Being realistic with regard to the tenuous interface between members of the public and the world of academic educational research therefore, it could be argued that much of the information on the cognitive benefits of being bilingual is unlikely to have any major effect. The comparison with world-wide anti-smoking campaigns, however, succeeds in highlighting one fundamental difference, namely, the element of *self-interest* which is crucial in bringing about the required change in human behaviour. Giving up the smoking habit, of course, does involve self-interest in terms of *health* but not *pleasure*, hence the duality in public response to such campaigning generally. However, ensuring cognitive benefits by the provision of effective models of bilingual education which results in *balanced* proficiency does not involve such a duality or personal self-sacrifice, which is why politicians and policy-makers should respond more energetically to the recent research evidence available and act accordingly for the benefit of society as a whole.

However, adopting appropriate rational-empirical and normative-re-educative strategies requires more than providing strong research-based evidence which, it is argued, is already available. It also requires *the political will to act*. This is easier said than done quite often since it can spell potential career disaster for some politicians. Whereas speaking *against* the influx of racial minorities into the UK (particularly England) resulted in the loss of Enoch Powell's office in the Shadow Cabinet in the 1960s, speaking *for* multiculturalism can be equally politically damaging. It is for this reason that any changes within the system is usually (if not always) accomplished by tweaking rather than by radical 'surgery'. Baker (2011: 402-3) contrasts two approaches to achieving change which he refers to as '*functional or conflict* (Paulston, 1992); the balanced 'clockwork mechanism' of functional theory being designed to maintain political equilibrium whilst conflict theory encourages a more radical, interventionist approach. As Baker (2011: 403) states:

...within the conflict perspective, bilingual education should attempt to remedy... inequality and injustice by positive affirmative action. Bilingual education should be interventionist, even clashing with dominant viewpoints. *Bilingual education can serve to encourage social, economic and educational change and cultural pluralism.* (Italics added)

With regard to power of persuasion and the crucial need for any evidence underpinning a rational-empirical strategy to be totally convincing and compelling in its appeal to both politicians and parents, some of the benefits which are often mentioned in efforts to promote bilingual education may well lack sufficient clout. For example, one must question the extent to which the following, despite their undisputed validity, would be perceived as meaningful *self-interest reasons* by most parents, since they are based on cultural values and social circumstances which would neither appeal nor apply to all concerned:

- Twice the enjoyment of reading and writing; the ability to read in two languages opening a door to two literatures, thus providing individuals with a better understanding of different traditions, ideas and ways of thinking and behaving, (but meaningless to those who only read a daily tabloid);
- Access to two cultures; bilingualism opening the door to a wealth of other historical traditions, literature and music (but inapplicable to those who are not culturally-oriented);
- Communication with the whole family and the community, so that where two parents speak different languages the bilingual child will be able to communicate in both languages, thus enabling a close and special relationship to develop with each parent and a bridge to be built across generations, as with grandparents, (but dependent on a wide range of linguistic, social and circumstantial variables);
- Security in identity, the use of the mother tongue being for many an integral part of their national identity, symbolising more than a means of communication and, therefore, a connecting link with their roots and their heritage, (but inapplicable to those whose identity needs are satisfied and fulfilled by *symbolic* national trappings rather than language).

Evidence related to the steady growth of bilingual education in Wales, however, shows that many of these factors *do* play a significant part in parents' choice of a bilingual education for their children (Campell & Packer, not dated), factors which broadly relate to *integrational motivation* as expounded by Gardner & Lambert (1972). Nevertheless, what Gardner & Lambert (1972) refer to as *instrumental motivation* also seems to be a significant driving force since there is also a widespread perception of Welsh-medium schools as establishments of high academic standards ensuring career success and social-mobility.

However, the wide ranging and complex reasons which exist within this integrational-instrumental motivation dichotomy are continually subject

to a range of *unstable* external political, social and economic contextual factors which, as mentioned previously, can act as both driving-forces *and* restraining-forces (Lewin, 1951) *for* and *against* further growth. Despite their unquestionable validity for many, such factors ignore the more rational, research-based, cognition-related evidence available which, arguably, should have a ‘self-interest’ appeal to *all* parents if provided with adequate knowledge and information. As in the case of medical research which continually adds to the store of knowledge available to professionals in the treatment of various physical conditions, rather than being a bone of contention and a source of heated debate on political dimensions, it would seem perfectly reasonable that anything which can be proved to be of *cognitive* benefit should be *systematically* incorporated in any educational provision and marketed as a beneficial resource.

Both education and medicine (as opposed to health) are, theoretically, domains which are the preserve of respective professionals; nevertheless, it seems that education can generate far more political fervour and debate than medicine, primarily due to the fact that in many countries education has increasingly become part of the *public* domain. Parental and public involvement in education in the United Kingdom, for example, has been increasingly reflected in legislation over past decades, illustrating a democratic right to contribute to educational debate. Such a process of *democratisation* has, possibly, diminished the public’s perception of education as a highly specialised academic field, so that the validity and reliability of academic educational *research* also is consequently perceived as being ‘open’ to public opinion. Unlike medical research, therefore, which attracts immediate publicity, yet is respectfully perceived as being the esoteric property of a ‘closed’ medical profession, educational research often tends to enter a wider and more ‘open’, democratic and public arena and is, consequently, subject to uninformed prejudice and unresolved political debate. As previously described, research in bilingualism and bilingual education has historically been an area of particular controversy, and currently remains so.

Conclusion

Political and public reaction to research-based evidence of the cognitive benefits of bilingual/ multilingual education will, inevitably, vary from country to country, depending on sociolinguistic issues discussed in module ECDA-7011: Societal Bilingualism but, crucially, is directly related to educational *policy-making* and specifically to the provision of bilingual or multilingual education. In fact, despite being studied as an independent module, the cognitive benefits of bilingualism can, arguably,

be said to underpin aspects covered in other modules of this MA course. This can be illustrated by a series of questions:

Bilingualism allegedly provides children with cognitive and intellectual advantages; therefore, should such advantages be made available to *all* children regardless of socio-economic and ethnic background?

If so how do we achieve this?

Which models of so-called ‘bilingual/ multilingual’ education can secure these advantages?

What will be the *economic* costs of adopting alternative models of education in order to ensure effective bilingual proficiency?

What will be the economic costs for *not* doing so?

What will be the medium to long-term *social* benefits *generally* from providing effective bilingual education?

What will be the medium to long-term *social and economic* benefits to *individual citizens* from receiving effective bilingual education?

What will be the medium to long-term *political, educational, social and economic* benefits to respective *governments* from providing effective bilingual education to their citizens?

What will be the *global* advantages to mankind from the provision of effective bilingual education to citizens by respective governments?

The evidence which supports the cognitive benefits of being bilingual is substantial and has been emphasised for many years. In 1978, Albert & Obler maintained that:

Bilinguals mature earlier than monolinguals both in terms of cerebral lateralisation for language and in acquiring skills for linguistic abstraction. Bilinguals have better developed auditory language skills.....
(Albert & Obler, 1978).

Grosjean (1982) expressed it quite comprehensively as follows:

Bilinguals are more sensitive to semantic relations between words, are more advanced in understanding the arbitrary assignment of names to referants, are better able to treat sentence structure analytically, are better at restructuring a perceptual situation, have greater social sensitivity and greater ability to react flexibly to cognitive feedback, are better at rule discovery tasks and have more divergent thinking. (Grosjean, 1982: 223)

Reference has already been made to the general lack of publicity afforded to research in the cognitive benefits of being bilingual / multilingual. Clearly, research evidence is contrary to a common perception and fallacy still widespread amongst the general public (especially in dominantly English-speaking countries) that the development of second language proficiency can only be obtained at the expense of the first. Such evidence is, therefore, available to dispel the fears of those reluctant to commit their children to anything other than monolingual education. Arguably, this evidence has been politically too sensitive for ‘general release’ up until now, its dissemination hampered by political ideology involving issues of racial assimilation and integration rather than cultural pluralism. Such an ideology has reflected a desire to maintain political equilibrium and to avoid conflict which, ironically, can often serve to feed the conflict which it seeks to avoid. In the British context, it has also led to the dearth of linguistic resources which can undermine economic prosperity, as highlighted by the two reports from the British Academy mentioned at the beginning. However, the recent positive evidence of the cognitive benefits of bilingualism deserves and requires far wider publicity in future. It is the lack of publicity given to such evidence which prevents the adoption of empirical-rational and normative-re-educative strategies to promote changes in attitudes towards bilingualism amongst the general public. It was factual ignorance which once prompted the comment: “What we don’t understand, we fear; what we fear, *we reject*. ”

Baker (2000: 66-67) quotes a question often asked by parents which suggests a continuing negative perception and an uncertainty about bilingual education amongst some:

“Will my child’s thinking be affected by being bilingual?”

The answer is “yes”, and probably for the better. The presence of two languages in the operating system of the brain is likely to produce a more richly-fed thinking engine.

References

- Albert, M.L. & Obler, L.K., 1978. *The Bilingual Brain*. New York: Academic Press
- Arthur, G., 1937. The predictive value of the Kuhlmann-Binet Scale for a partially Americanized school population. *Journal of Applied Psychology*, 21: 359-364
- Baker, C., 1993. *Foundations of Bilingual Education and Bilingualism*. Clevedon: Multilingual Matters
- Baker, C., 2000. *A Parents' and Teachers' Guide to Bilingualism*. Clevedon: Multilingual Matters
- Baker, C., 2011. *Foundations of Bilingual Education and Bilingualism*. Bristol: Multilingual Matters (5th edition)
- Baker, C., 2017. *Foundations of Bilingual Education and Bilingualism*. Bristol: Multilingual Matters (6th edition)
- Ben-Zeev, S., 1977a. The influence of bilingualism on cognitive strategy and cognitive development. *Child Development* 48, 1009-1018
- Ben-Zeev, S., 1977b. The effect of bilingualism in children from Spanish-English low economic neighborhoods on cognitive development strategy. *Working Papers on Bilingualism* 14, 83-122
- Bialystok, E., 1987. Influences of bilingualism on metalinguistic development. *Second Language Research* 3(2), 112-125
- Bialystok, E., 1988. Levels of bilingualism and levels of linguistic awareness. *Developmental Psychology* 24, 560-567
- Bialystok, E., 2001a. *Bilingualism in Development: Language, Literacy and Cognition*. Cambridge: Cambridge University Press
- Bialystok, E. 2001b. Metalinguistic aspects of bilingual processing. *Annual Review of Applied Linguistics* 21, 169-181
- Bialystok, E. & Codd, J., 1997. Cardinal limits: Evidence from language awareness and bilingualism for developing concepts of number. *Cognitive Development* 12 (1), 85-106
- Bialystok, E., Craik, F.I. & Freedman, M. 2007. Bilingualism as a protection against the onset of symptoms of dementia. *Neuropsychologia* 45, 459-464
- Bialystok, E., Craik, F.I., Grady, C., Chau, W., Ishii, R., Gunji, A. & Pantev, C., 2005. Effect of bilingualism on cognitive control in the Simon task. Evidence from MEG. *NeuroImage* 24, 40-49
- Bialystok, E., Craik, F.I., Klein, R. & Viswanathan, M., 2004. Bilingualism, aging and cognitive control: Evidence from the Simon task. *Psychology and aging* 19 (2), 290-303
- Bialystok, E., Craik, F.I. & Luk, G., 2008. Cognitive control and lexical access in younger and older bilinguals. *Journal of Experimental Psychology: Learning, Memory and Cognition* 34, 859-873

- Bialystok, E., Majumder, S. & Martin, M.M., 2003. Developing phonological awareness. Is there a bilingual advantage? *Applied Psycholinguistics* 24, 27-44
- Blauner, R., 1969. Internal colonisation and ghetto revolt. *Social Problems* 16, 393-408
- Bourhis, R.Y., 2001. Acculturation, language maintenance, and language shift. In J. Klatte-Folmer & P. Vanavermeir (eds). *Theories on Maintenance and Loss of Minority Languages*. Münster, New York: Waxmann
- British Academy, 2009. *Language Matters*. London: British Academy
- British Academy, 2011. *Language Matters More and More*. London: British Academy
- Campbell, C. & Packer, A. Cymhellion Rhieni di-Gymraeg dros ddewis Addysg Gymraeg i'w Plant. *Cylchgrawn Addysg Cymru* Cyfrol 3, Rhif 1
- Carlisle, J. F., Beeman, M., Davis, L.H. & Sphraim, G., 1999. Relationship of metalinguistic capabilities and reading achievement for children who are becoming bilingual. *Applied Psycholinguistics* 20 (4), 459-478
- Cenoz, J., 2003. The additive effect of bilingualism on third language acquisition: A review. *International Journal of Bilingualism* 7(1), 71-87
- Central Advisory Board (Wales), 1953. *The Place of Welsh and English in the Schools of Wales*. HMSO
- Chin, R. & Benne, K., 1976. General strategies for effecting changes in human systems. In Bennis, W.G., Benne, K.D., Chin, R. & Corey, K.E. (eds). *The Planning of Change*. New York : Holt, Rinehart & Wilson
- Chin, N. B. & Wigglesworth, G., 2007. *Bilingualism: an advanced resource book*. London: Routledge
- Chiswick, B. & Miller, P.W. A Test of the Critical Period Hypothesis for Language. *Journal of Multilingual and Multicultural Development* 29(1), 16
- Crawford, J., 2000. *At War with Diversity: US Language Policy in an Age of Anxiety*. Clevedon: Multilingual Matters
- Crutchley, A., Conti-Ramsden, G. & Botting, N., 1997. Bilingual children with SLI and standard assessments: preliminary findings from a study of children in language units. *International Journal of Bilingualism* 1 (2), 117-134
- Cummins, J., 1976. The influence of bilingualism on cognitive growth: a synthesis of research findings and explanatory hypotheses. *Working Papers on Bilingualism* 9, 1-43
- Cummins, J. 1977. Delaying native language reading instruction in immersion programs: a cautionary note. *Canadian Modern Language Review* 34, 46-49

- Cummins, J., 1978. Immersion programs: the Irish experience . *International Review of Education* 24, 273-282
- Cummins, J., 1979. Cognitive / academic language proficiency, linguistic interdependence, the optimum age question. *Working Papers on Bilingualism* 19, 121-129
- Cummins, J., 1980. The construct of language proficiency in bilingual education. In J.E. Alatis (ed.), *Georgetown University Round Table on Languages and Linguistics 1980*. Washington, DC: Georgetown University Press
- Cummins, J. 2000. *Language, Power and Pedagogy : Bilingual Children in the Crossfire*. Clevedon; Multilingual Matters
- Davine, M., Tucker, G.R . & Lambert, W.E., 1971. The perception of phoneme sequences by monolingual and bilingual elementary school children. *Canadian Journal of Behavioral Science* 3(1), 72-76
- De Bot, K., 2008. Review article: The imaging of what in the multilingual mind? *Second Language Research* 24, 111-133
- Edelsky, C., 1991. *With Literacy and Justice for All: Rethinking the Social in Language and Education*. London: Falmer
- Edelsky, C., Hudelson, S.J., Flores, B., Barkin, F., Altwerger, B. & Jilbert, K., 1983. Semilingualism and language deficit. *Applied Linguistics* 4 (1), 1-22
- French, W.L. & Bell, C.H., 1990. *Organization Development: behavioural science interventions for organization improvement*. Englewood Cliffs, NJ: Prentice-Hall
- Galambos, S.J. & Goldin-Meadow, S., 1983. Metalinguistic awareness and learning a second language. *Papers from the Chicago Linguistics Society* 19, 117-133
- Galambos, S.J. & Goldin-Meadow, S., 1990. The effects of learning two languages on levels of metalinguistic awareness. *Cognition* 34, 1-56
- Galambos, S.J. & Hakuta, K., 1988. Subject-specific and task-specific characteristics of metalinguistic awareness in bilingual children. *Applied Psycholinguistics* 9(2), 141-162
- Gardner, H., 2003. Multiple intelligences after 20 years. *Paper presented at the American Research Association*, Chicago, Illinois, April 21, 2003
- Gardner, R.C. & Lambert, W.E., 1972. *Attitudes and motivation: Second language learning*. Newbury House.
- Genesee, F., Tucker, G.R. & Lambert, W.E., 1975. Communication skills in bilingual children. *Child Development* 46, 1010-1014
- Goral, M., Levy, E.S. & Obler, L.K., 2002. Neurolinguistic aspects of bilingualism. *International Journal of Bilingualism* 6(4), 411-440
- Grosjean, F., 1982. *Life with Two Languages*. Cambridge, MA: Harvard University Press

- Hakuta, K., 1987. Degree of bilingualism and cognitive ability in mainland Puerto Rican children. *Child Development* 58, 1372-1388
- Hakuta, K., Butler, Y.G. & Witt, D., 2000. *How Long does it Take English Learners to Attain Proficiency?* University of California Linguistic Minority Research Institute Policy Report 2000-2001
- Hakuta, K. & Diaz, R.M., 1985. The relationship between degree of bilingualism and cognitive ability: a critical discussion and some new longitudinal data. In Nelson, K.E. (ed.) *Children's language* vol. V, 319-344. Hillsdale, NJ: Lawrence Erlbaum
- Hull, R. & Vaid, J., 2007. Bilingual language lateralisation: A meta-analytic tale of two hemispheres. *Neuropsychologia* 45, 1987-2008
- Ianco-Worrall, A., 1972. Bilingualism and cognitive development. *Child Development* 43, 1390-1400
- Jones, A. & Thomas, G. (eds), 1973. *Presenting Saunders Lewis*. Cardiff: University of Wales Press
- Jones, G.W., 1993. *Agweddau ar Ddysgu Iaith*. Bangor. Ysgol Addysg, Coleg Prifysgol Bangor
- Jones, J.R., 1966. *Prydeindod*. Llandybie: Gwasg y Dryw
- Jones, W.R., 1959. *Bilingualism and Intelligence*. Cardiff: University of Wales Press
- Jones, W.R., 1966. *Bilingualism in Welsh Education*. Cardiff: University of Wales Press
- Kharkhurin, A.V., 2008. The effect of linguistic proficiency, age of second language acquisition, and length of exposure to the new cultural environment on bilinguals' divergent thinking. *Bilingualism: Language and Cognition* 11(2), 225-243
- Kim, K., Relkin, N., Lee, K-M. & Hirsch, J., 1997. Distinct cortical areas associated with native and second languages. *Nature* Vol. 388, 10th July, 171-174
- Lapkin, S., Swain, M. & Shapson, S., 1990. French immersion research agenda for the 90s. *Canadian Modern Language Review* 46(4), 638-674
- Laurén, U., 1991. A creativity index for studying the free written production for bilinguals. *International Journal of Applied Linguistics* 1 (2), 198-208
- Laurie, S.S., 1890. *Lectures on Language and Linguistic Method in School*. Cambridge: Cambridge University Press
- Le Blanc, R., 1992. Second language retention. *Language and Society* 37, 35-36
- Leopold, W.E., 1939-1949. *Speech Development of a Bilingual Child. A Linguists' Record* (4 volumes). Evanston, IL: Northwestern University Press
- Lewin, K., 1951. *Field Theory in Social Science*. New York: Harper & Row

- Lewis, E.G., 1981. *Bilingualism and Bilingual Education*. Oxford: Pergamon
- McCarthy, D., 1930. *The language development of the pre-school child*. Minneapolis: University of Minnesota Press
- Mechelli, A., Crinion, J.T., Noppeney, U., O'Doherty, J., Ashburner, J., Frackowiak, R.S. & Price, C.J., 2004. Neurologistics: Structural plasticity in the bilingual brain. *Nature* 431, 757 (14 October 2004)
- NFER, 1992. Report on the 1992 Welsh KS3 Pilot. Swansea: NFER
- NFER/ BGD Consortium, 1991. An Evaluation of the 1991 National Curriculum Assessment: The Working of the SAT. Slough: NFER
- Nicoladis, E. (2008). Bilingualism and Language Cognitive Development. In J. Altarriba & R.R. Heredia (eds.) *An Introduction to Bilingualism: Principles and Processes*. London: Lawrence Erlbaum Associates
- Ovando, C.J., 1990. Essay review: Politics and pedagogy: The case of bilingual education. *Harvard Education Review* 60(3), 341-356
- Paulston, C.B., 1992. Sociolinguistic Perspectives on Bilingual Education. Clevedon: Multilingual Matters
- Peal, E. & Lambert, W.E. 1962. The relation of bilingualism to intelligence. *Psychological Monographs* 76 (27), 1-23
- Pinter, R. & Arsenian, S., 1937. The relation of bilingualism to verbal intelligence and school adjustment. *Journal of Education Research* 31, 255-263
- Ricciardelli, L.A. 1992a. Bilingualism and cognitive development in relation to threshold theory. *Journal of Psycholinguistic Research* 21, 301-316
- Ricciardelli, L.A. 1992b. Creativity and Bilingualism. *Journal of Creative Behavior* 26 (4), 242-254
- Ricento, T., 2009. Problems with the 'language-as-resource' discourse in the promotion of heritage languages in the US. In M.R. Salaberry(ed.). *Language Allegiances and Bilingualism in the US*. Bristol: Multilingual Matters
- Rubin, H. & Turner, A. 1989. Linguistic awareness skills in grade one children in a French immersion setting. *Reading and Writing: An Interdisciplinary Journal* 1, 73-86
- Ruiz, R., 1984. Orientations in language planning. *NABE Journal* 8(2), 15-34
- Sachdev, I. & Giles, H., 2006. Bilingual Accommodation. In T.K. Bhatia & W.C. Ritchie (eds) *The Handbook of Bilingualism*. Oxford: Blackwell
- Saer, D.J., 1922. An inquiry into the effect of bilingualism upon the intelligence of young children. *Journal of Experimental Pedagogy* 6, 232-240 and 266-274

- Saer, D.J., 1923. The effects of bilingualism on intelligence. *British Journal of Psychology* 14, 25-38
- Scott, S. 1973. *The relation of divergent thinking to bilingualism; cause or effect?* Unpublished research report. McGill University
- Shorrocks, D. et al. 1992. ENCA1 Project: The Evaluation of National Curriculum Assessment at Key Stage 1. Leeds: School of Education, University of Leeds
- Sierra, J. & Olaziregi, I., 1989. EIFE2: Influence of factors on the learning of Basque. Gasteiz, Spain: Central Publications Service of the Basque Government
- Stubbs, M. 1991. Educational language planning in England and Wales; Multicultural rhetoric and assimilationist assumptions. In F. Coulmas (ed.) *A Language Policy for the European Community*. New York: Mouton de Gruyter
- Swain, M. & Lapkin, S., 1982. *Evaluating Bilingual Education: A Canadian Case Study*. Clevedon: Multilingual Matters
- Swann Report, 1985. *Education for All. Report of the Committee of Enquiry into the Education of Children from Ethnic Minority Groups*. London: HMSO
- Thornton, G., 1986. A.P.U. *Language Testing 1979-1983: An Independent Appraisal of the Findings*. Cardiff: The Welsh Office
- Torrance, E.P., 1974a. *Torrance Tests of Creative Thinking: Directions Manual and Scoring Guide*. Lexington, MA: Ginn
- Torrance, E.P., 1974b. *Torrance Tests of Creative Thinking: Norms-Technical Manual*. Lexington, MA: Ginn
- Toukomaa, P. & Skutnabb-Kangas, T., 1977. *The Intensive Teaching of the Mother Tongue to Migrant Children of Pre-school Age* (Research Report No. 26). Department of Sociology and Social Psychology, University of Tampere.
- Tunmer, W.E. & Herriman, M.L., 1984. The development of metalinguistic awareness: A conceptual overview. In W.E. Tunmer, C. Pratt & M.L. Herriman (eds) *Metalinguistic Awareness in Children*. Berlin: Springer-Verlag
- Valdés, G., Fishman, J.A., Chávez, R. & Pérez, W., 2006. *Towards the Development of Minority Language Resources*. Clevedon: Multilingual Matters
- Vygotsky, L.S. 1962. *Thought and Language*. Cambridge, MA: MIT Press
- Welsh Assembly Government, 2003. *Iaith Pawb: A National Action Plan for a Bilingual Wales*. Cardiff: Welsh Assembly Government.
- Wiley, T.G., 2002. Assessing language rights in education: A brief history of the US context. In J.W. Tollefson (ed.) *Language Policies in Education: Critical Issues*. Mahwah, NJ: Erlbaum

Yelland, G.W., Pollard, J. & Mercuri, A., 1993. The metalinguistic benefits of limited contact with a second language. *Applied Psycholinguistics* 14: 423-444