

Unit A4

Bilingualism and cognitive ability

Is bilingualism likely to interfere with a child's general overall development?

Is bilingualism beneficial to a child's mental development?

Will learning two languages be confusing for a child?

Despite the fact that bilingualism is the way of life for the majority of the world's population, the question of whether or not bilingualism should be encouraged is often asked in countries where the population is predominantly monolingual. Where countries which are multilingual are concerned, the question is sometimes asked when the second or third languages involved are those that do not enjoy official patronage. The people who are most concerned with these questions are generally parents and educators who wish to raise their children in the best possible language environment.

Over the years, research has evolved from a predominantly pessimistic view of bilingualism to one of optimism as the beneficial effects of bilingualism on both the social and the cognitive abilities of bilinguals have become more widely documented. From a practical point of view, knowing two languages simply means gaining access to two different worlds and having twice the opportunities. The majority of people in the world in fact grow up bilingual in situations where two or more languages are constantly being used in both educational and social contexts. For this group of bilinguals, the benefits of bilingualism are plainly obvious and they hardly need to be convinced, as there is strong instrumental motivation to maintain their bilingualism. Unfortunately, the same cannot be said for bilinguals who live in societies with a single dominant language such as, for example, Britain, the United States and Australia, where the documented benefits have not filtered down to the general public. In such places, the fear that bilingualism or multilingualism may somehow contribute to cognitive deficits is a further disincentive and an enduring social and psychological obstacle to the growth of multilingualism.

The objective of this unit is to evaluate the cognitive ramifications for those who have embarked on a bilingual way of life. We will begin by tracing the historical development of attitudes and research on bilingualism and cognition, and address the assumptions embedded in these studies, particularly the earlier ones. Following that, we will examine 'cognitive flexibility' and 'metalinguistic awareness', two

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commonly reported positive effects of bilingualism on cognition. Finally, we will briefly summarize the implications of these findings for the social and educational experience of bilinguals and isolate the circumstances or situations which are conducive to promoting the positive effects of bilingualism.

**Task A4.1**

- If you were an Indonesian parent bringing up a child in a place where English was the dominant language used in schools and in other public domains, what concerns might you have about:
- not being able to give the child enough English input at home before the start of school?
 - encouraging your child to spend more time learning and using Indonesian?
 - the impact of your child's Indonesian on her/his English competence?

The questions posed in Task A4.1 are general but common concerns, which most parents have when choosing to bring up their children bilingually. As all parents want the best for their children, such concerns are understandable. To be able to address these concerns, however, we need to first know about the impact of speaking a second language on the child's general development. We will begin by tracking the main developments in this area of research and by reviewing the terms and concepts encountered. The vast literature in this area of study can be broadly divided into three main categories:

- studies which demonstrated detrimental effects of bilingualism
- studies which demonstrated no negative or positive effects of bilingualism
- studies which demonstrated enhancing effects of bilingualism.

The question 'Is bilingualism bad?' is one that has been around for a long time, and the many years of positive research reports on this topic have not been enough to dispel this notion among educators and lay people alike. Although it is encouraging to hear people espouse the idea of bilingualism, it is also common to hear doubts and reservations expressed about the potential harm of exposing a child to two or more languages. Parents who have chosen to bring up their children bilingually or trilingually are often asked the seemingly innocuous question 'Isn't it confusing for the child to learn so many languages?' When people ask this question, it is often because they are making assumptions about language and how language affects our minds. For example, a commonly held assumption is that speaking too many languages leads to speakers confusing one language with another, leading to the inability to learn any one language successfully. Another assumption is that it is impossible to be good at two languages, and that one is likely to suffer should children insist on retaining, for example, the home language. As Grosjean (1982) pointed out, while we never doubt that the study of mathematics or the pursuit of music is good for our general development, the learning or use of an additional language

– an innocent enough activity – seems to attract close scrutiny. Historically, bilingualism has been scrutinized, particularly in contexts where a bilingual is seen to be failing or floundering in academic contexts or is suffering from a language-related impairment such as stuttering or hearing loss. In such situations, it is understandable that learning a second language will be a low priority for parents already battling with other more serious issues. However, there is no research to indicate that bilingualism will adversely affect stuttering, or that a second language will be detrimental to those who are hearing-impaired. Although Crutchley et al. (1997) found that bilingual children with SLI (Specific Language Impairment) performed worse than their monolingual counterparts, their findings were contradicted when sampling variables were accounted for. Instead of classifying bilingual SLI children as one generic group, Paradis et al. (2003) isolated French–English bilinguals with SLI who acquired both languages simultaneously, and compared them to their French and English monolinguals who have SLI. When these careful sample selection procedures were put in place, they found no difference between the severity of language impairment in bilingual as compared to monolingual SLI children. This underscores the importance of adequately describing bilingual samples under study. Paradis et al.'s (2003) findings are indeed reassuring to parents whose bilingual children have some form of language disability. Up to now, there is no evidence to suggest that bilingualism is negatively associated with language impairment.

When it comes to children in special populations, the problems are manifold. One of the main problems is to do with measurement as, traditionally, these children are assessed only in one language, for a variety of reasons (see Unit B2). When Thordardottir et al. (1997) experimented with using both the languages of the bilingual children in their treatment, not only did they find that no adverse effects can be attributed to the use of bilingual intervention but they concluded that bilingual intervention is desirable as it avoids negative aspects that can result from using only one language from a child's bilingual environment.

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. Unfortunately, this myth is something that has been perpetuated by bilingual researchers themselves. Over the years, it has been claimed that in terms of vocabulary acquisition, bilinguals lag behind monolinguals but they catch up at a later age, an assumption that, as we have found in Unit A3, is negated when we cease to see bilinguals as two composite monolinguals. In the following sections, we will trace the various developments in this area of research and tease out the factors which have led to assumptions about bilingualism in both past and current practice.

THE EARLY YEARS: BILINGUALISM HAS DETRIMENTAL EFFECTS ON COGNITIVE FUNCTIONING

While bilingualism itself has a long history, it was not till the mid nineteenth century that possible harmful effects of speaking a second language were formally expressed by Humboldt (1767–1835), who argued that it is only through monolingualism that we can preserve the essence of each individual language. Though Humboldt's idealization of monolingualism did not help in affirming the status of bilingualism, it was the 'hard' evidence from social science that delivered the most damage.

The earliest documented empirical work on the detrimental effects of bilingualism came from three articles published by Saer and his colleagues between 1922 and 1924 (Saer 1923; Saer et al. 1924), which found mainly negative effects for bilingualism. These studies were crucial in influencing decades of subsequent research. In an extensive study, Saer (1923) compared 1400 seven- to eleven-year-old bilingual and monolingual children from Wales (Task C1.2 explores this article in more detail). Children were given a range of tests, including an IQ test, from which Saer concluded that bilingual children were significantly inferior to monolingual children, and that this difference became more pronounced with increasing age. However, there were significant methodological problems with Saer's research in both his sampling procedure and the type of measurements he took. First and foremost, he was comparing middle-class monolingual children with working-class bilingual children, and the reliability of the tasks he used in terms of what these tasks say about cognitive ability of bilinguals was also questionable. Saer also translated standard tests from English to Welsh, a practice (as we saw in Unit A2) which is known not to produce accurate results. Other studies in the same period echoed Saer's findings. Pintner and Keller (1922) compared the performance of English-speaking children and 'foreign' children on IQ scores and a series of other cognitive tests. Parentage was mainly used to categorize children as bilinguals or monolinguals in this study, and as a result the English-speaking groups consisted of Anglo-Celtic Americans, Afro-Americans and Americans of Jewish descent. The foreign group consisted mainly of children of Italian and Spanish parentage. Pintner and Keller found that foreign children scored poorly on IQ tests in comparison with other non-verbal tests of intelligence.

Despite severe methodological flaws, a whole series of studies confirmed the inferiority of bilinguals in both verbal and non-verbal tasks. In some studies, they were found to perform poorly only on tests of non-verbal intelligence (see Darcy 1953 for a comprehensive review). These studies spanned four continents and involved 26 different cultural groups including Chinese, Japanese and Hopi Indians. Though more than 50 per cent of the studies indicated weak levels of language competence in English for the bilingual population, English was the medium used for testing. There is no doubt that being tested in the weaker language is one of the reasons why the bilinguals performed poorly in the experimental tasks.

Task A4.2

- How do you ensure that your bilingual and monolingual samples are comparable? If you have to choose monolingual and bilingual children from the general population to investigate the effects of bilingualism on cognitive development, what guidelines would you choose to select your participants?
- Socio-economic status (SES), is an important variable in social science research. What do you think are some of the concrete effects of SES on the daily experience of bilingual and monolingual children?

Despite their methodological flaws, these studies had considerable influence, and by the middle of the twentieth century the opinion that bilingualism is detrimental to cognitive functioning was firmly established. This was so despite the fact that several contemporary studies had found no significant positive or negative impact of bilingualism on mental functioning.

For example, Bere (1924) found that the outcomes were affected by the home language of the children. Her tests also strongly indicated that children who spoke English at home did better in the tests. This confirmed the 'language handicap' hypothesis put forward by other researchers who had reported negative findings. This observation was further supported by the finding that foreign children's scores on the Kuhlmann-Binet Scale (a test of general cognitive ability) increased after receiving at least one year of exposure to English in school (Arthur 1937). More notably, in a carefully controlled but small study by Arsenian (1937) where bilingual children aged between nine and fourteen were carefully screened and matched with monolinguals for SES and age, no differences were found in measures of intelligence used. Other studies such as Jones and Stewart (1951) reported that lower scores for non-verbal skills in the bilingual population of their study could be due to SES rather than to linguistic background. The importance of SES in underscoring performance results was also highlighted by other researchers (cf. McCarthy 1930; James 1960).

Generally, the studies between 1922 and 1943 used an assortment of intelligence quotient (IQ) tests as standard tools to measure the cognitive abilities of bilinguals. Some of the tests used were language-based and some were not. These studies indicate that once the language component was factored out of the tests, bilinguals were not inferior to monolinguals in performance. It is obvious that the results of such tests are going to be only as reliable as the instrumentation or type of tasks used. As we noted above, several studies in this early period used translated tests, and, as we discussed in Unit A2, translated tests should never be considered as equivalents of the original tests.

Another issue of concern is whether the various IQ tests used were valid measures of intelligence. This is a contentious topic which is beyond the scope of the discussion here. It is widely recognized, however, that such tests do not measure

innate abilities; instead, they contain inherent cultural bias which may place bilingual children at a distinct disadvantage. Needless to say, using a culturally biased set of instruments on a bilingual and bicultural population is methodologically questionable. Furthermore, traditional IQ tests measure only *convergent thinking* – that is, arriving at a single solution after assessing a series of problems. This excludes *divergent thinking*, which has been linked with creative intelligence.



Task A4.3

- In studies where outcomes are related to the status of monolingualism or bilingualism, it is clearly important that the researchers are clear about how 'bilingualism' is defined and measured. This is a problem faced by most researchers working in the area of bilingualism, and there are no easy answers. However, if you were to do a study in which 'bilingualism' was a variable, how would you:
 - define your bilingual participants?
 - determine the degree of bilingualism in your participants?
- It may be helpful to think about a target bilingual sample that you might want to work with. You may also want to review some of the issues raised about measuring bilinguals in Unit A2.

The most severe criticism of studies from this early period concerns the inadequate definition of bilingualism and the confounding of SES and ethnicity variables. Most of the studies in this period fail to control adequately for the effects of SES, with bilingualism frequently being severely confounded with low SES. In a detailed analysis of preceding studies, McCarthy (1930) reported that more than half of the bilingual schoolchildren in such studies came from typical working-class backgrounds. In contrast, the English monolinguals were from educated middle-class homes. Furthermore, how bilingual proficiency was measured in the bulk of the early studies was problematic. As discussed in Unit A2, the measurement of bilingual proficiency is a highly complex process and unless it is done well, the findings drawn from such studies will always be questionable. After four decades of inconclusive findings, the turning point came in 1962, when Peal and Lambert published their ground-breaking paper on this topic.

BILINGUALISM ENHANCES COGNITIVE FUNCTIONING

Despite inconclusive evidence about the negative effects of bilingualism, up until the 1960s bilingualism was not a concept that was associated with anything positive. In the first documented case study of a bilingual, Leopold (1949a) cited his bilingual daughter Hildegard's metalinguistic awareness as evidence of the enhancing effects

of bilingualism. He noticed that she was precociously aware of rhymes and would deliberately destroy rhymes in word play. Leopold argued that bilinguals were able to detach sound from meaning because of the constant early exposure to two languages. So, from a very young age a bilingual child is constantly aware of two competing forms for one meaning. This, he stressed, puts a bilingual child in a position of advantage over a monolingual child.

Although Leopold is fondly cited by researchers these days, a single case study in the midst of a robust body of work pointing to the contrary was bound to have little impact. In this respect, Peal and Lambert's (1962) study, which re-examined the issue of the relationship of bilingualism to intelligence, marked a major watershed in the history of bilingual research. Although it will be given detailed attention in section Unit B4.2, we will briefly summarize it here.

Peal and Lambert (1962) strictly controlled the SES and language background of the 364 bilingual and monolingual participants in their Canadian study. They screened their sample with great care, matching the children on SES, sex, age, language, intelligence and attitude. Their study found that once SES and language competence variables were controlled, bilinguals outperformed monolinguals in IQ tests. Moreover, bilinguals were also found to have more positive attitudes towards French-speaking communities than their (English or French) monolingual counterparts had.

Another interesting question arose as bilinguals in Peal and Lambert's study were found to be not categorically better on all measures of non-verbal tasks. Such tasks can be divided into two subgroups, one requiring spatial and perceptual processes and the other requiring symbolic manipulation. In spatial and perceptual processes, the emphasis is on spatial acuity and perceptual speed, whereas symbol manipulation tasks require understanding of abstract relations, concepts and factual information. The Raven Progressive Matrices, developed by Raven (1998), are one example of this type of test which requires symbolic manipulation. In such tests, the participants must form a concept or discover relations between elements, which cannot be done without some level of cognitive reorganization. The test consist of 60 matrices or designs of varying complexity from which a part has been removed, and participants are required to choose the missing insert from a set of eight alternatives. These items are often seen in IQ tests and a very similar example can be found in Aiken and Groth-Marnat (2006: 137).

Task A4.4



- The issues of what constitutes general intelligence and how intelligence should be measured are widely debated. Try out one of the many IQ tests available online and see if you can identify the items that measure non-verbal intelligence and those that measure verbal intelligence.

Introduction

In Peal and Lambert's study, bilinguals were found to be better in the symbolic manipulation types of non-verbal tasks but performed the same as the monolinguals in the non-verbal tasks requiring spatial and perceptual processes. Peal and Lambert called this ability 'mental or cognitive flexibility' and proposed that bilinguals' early awareness of two different codes, and their ability to associate two words with one object, may have enhanced the development of an increased cognitive flexibility. 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.

BILINGUALISM AND INTELLIGENCE

On the surface, Peal and Lambert's landmark study laid to rest previous claims of monolingual superiority in IQ tests. However, the first challenge that Peal and Lambert faced was the criticism that their bilingual subjects were somehow more intelligent to start with, and that this was why they were so efficiently bilingual. By stringently controlling the level of bilingualism in their subjects, they might have in effect precluded those of lower intelligence from participating in their study. This is not an insignificant point as previous studies (e.g. Gardner and Lambert 1959) had shown a positive correlation between language aptitude and intelligence. One may ask whether the more intelligent children, as measured by non-verbal intelligence tests, are the ones who become bilingual, or whether bilingualism itself has a favourable effect on non-verbal intelligence.

Peal and Lambert's own exploratory analysis seemed to indicate that some level of intelligence is essential for bilingualism. However, this does not rule out the fact that bilingualism may in some ways be a positive influence on non-verbal abilities. This thorny 'chicken first or egg first' issue was finally resolved by Hakuta and Diaz (1985), who conducted a longitudinal study which tracked the relationship between cognition and bilingual proficiency. By assessing both the language proficiency and the cognitive level of bilinguals over time, Hakuta and Diaz presented findings which conclusively supported the hypothesis that it is bilingual proficiency that exerts an influence on cognitive functioning and not the other way round. By confirming the positive causal relationship between intelligence and bilingualism their study marks another key turning point. However, in a later study, Hakuta (1987) reanalysed the longitudinal data and argued that, while the degree of bilingualism was a better predictor of cognitive ability, the reverse was also true, although the effect was not quite as strong. He also reported another set of results, which indicated that there was no relationship between increased bilingual proficiency and the metalinguistic awareness for the bilingual sample, who were drawn mainly from lower socio-economic backgrounds. In his discussion, Hakuta argued that the context in which bilinguals function must be taken into account. In this case, the bilinguals were bilingual in a subtractive setting. As we discussed in Unit A1, the social environment of the bilingual often has important implications for the shaping of the bilingual experience.

Task A4.5



- Given that balanced bilinguals are not very common, what language should bilinguals be tested in? What are some of the practical problems which researchers have to overcome when working with bilingual samples in terms of:
- the language the test is designed in?
 - the language used by researchers when conducting these tests?

CURRENT VIEWS ON THE EFFECTS OF BILINGUALISM

The direction of research following Peal and Lambert's study took an about-turn. Since 1965, a stream of papers have highlighted the positive effects of bilingualism and marked a change in research focus. Instead of making a general search for IQ superiority, the new generation of researchers have been far more specific in their enquiry. Various researchers found that bilinguals were superior to monolinguals on tasks requiring *cognitive flexibility* and *metalinguistic awareness*, while others argued that special conditions have to exist before bilinguals can enjoy the cognitive benefits. These conditions are usually related to the level of proficiency attained in the two languages. As mentioned in Unit A2, it has been hypothesized that bilinguals have to achieve certain thresholds in their language competence before reaping the cognitive rewards. In the next few sections, we will review some of the literature in this area and try to draw out the common issues uncovered in the different studies.

Cognitive flexibility

Loosely defined, *cognitive flexibility* is used to mean creativity or ability to use divergent thinking, such as the ability to generate multiple associations from one concept, or the ability to mentally reorganize the elements of a problem or situation. How is cognitive flexibility measured? What type of tasks measure divergent thinking? The answer is varied. For example, in Scott's (1973) study, she asked her participants to generate as many possible uses for paper clips as they could. In a different study, Feldman and Shen (1971) used a Piagetian Object Constancy task in which pre-school children were presented with a paper plate which was destroyed in their presence. After this, they were presented with an identical plate and asked, 'Is this plate the same as the plate I showed you just now?' According to the study, bilinguals were more likely to answer 'no' in comparison to their monolingual counterparts. Feldman and Shen concluded that bilinguals arrived at an object constancy developmental stage earlier than monolinguals because of their exposure to two languages.

Landry (1974) and Cummins (1977) both reported that learning a second language in elementary school might increase divergent thinking. Using an Embedded Figure

Test – a specific task for measuring cognitive flexibility which involves detecting simple objects embedded in larger, more elaborate figures such as the search for multiple hidden objects in the *Where's Waldo?* picture book – bilingual children were found to perform significantly better than monolingual children (Balkan 1970; Cummins and Gulutsan 1973).

Metalinguistic awareness

As indicated by Leopold in 1949, bilinguals have an advantage when it comes to analysing language forms owing to their early exposure to two different linguistic codes, since such exposure promotes a more analytic orientation to linguistic operations. As a result, bilinguals are metalinguistically more aware than monolinguals, a trait which Cummins (1977) defined as the development of children's awareness of certain properties of language including their ability to analyse linguistic input.

Broadly defined, metalinguistic awareness is the ability to focus on different levels of linguistic structures such as words, phonemes and syntax. This ability to analyse language more intensely has been the subject of many studies (see Bialystok 2001b for a review). Metalinguistic awareness and bilingualism is a burgeoning area of study, with researchers working on a number of different aspects, some focused on the phoneme level, some on the word level and some on the sentence level. Generally, these studies have targeted the following aspects of linguistic structure:

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

In the following sections, we will briefly discuss metalinguistic awareness studies for each of these linguistic structures.

Word awareness

There are two interpretations of *word awareness*: the ability to recognize that the speech stream is composed of discrete units called words, and the awareness that the relationship between words and their meaning is arbitrary. Traditionally, researchers working on word awareness in bilingual populations have adapted word awareness tasks developed for the monolingual population. (See Bowey and Tunmer 1984 for a discussion of word awareness in the context of monolingual children.)

The awareness of word as a discrete unit

In a series of studies, Bialystok (1986a, 1986b, 1987a, 1987b, 1988) compared the performances of Grade 1 English monolingual and French-English bilingual children on tasks such as sentence segmentation (word count) and word judgments. The children were read sentences which were either intact or scrambled and asked to count the number of words in each utterance. The number of syllables and morphemes were also manipulated to further examine the child's concept of word. In these studies, bilinguals consistently outperformed monolinguals except in the case of sentences consisting entirely of monosyllabic words.

Yelland et al. (1993) found word awareness in Grade 1 children who were learning Italian as a second language to be higher than among those who were not receiving language classes. Even more interesting is their finding that higher word awareness was also correlated with heightened reading skills, though this advantage disappeared at the end of Grade 1. Their finding was supported by Campbell and Sais (1995), who compared the performance of 15 English monolingual and 15 English-Italian pre-schoolers on a range of word awareness tasks and found that the bilinguals performed better than the monolinguals. As word awareness is implicated in phoneme awareness, the authors concluded that exposure to a second language in the pre-literate stage can only serve to enhance the development of literacy. In a more generic study, Goncz and Kodžopeljić (1991) also reported that children with bilingual pre-school experience exhibited more developed reading skills such as concentration, synthesis and abstraction than monolingual children.

Task A4.6



- Yelland et al.'s (1993) study is intriguing as they found that even minimal exposure to a second language can have positive outcomes in terms of metalinguistic awareness. If exposure to a second language promotes word awareness and this has been found to be indicative of heightened reading skills, what implications does this research have for early and primary education?

The awareness of the arbitrariness of language

The very basis of metalinguistic awareness requires the understanding that language is essentially symbolic and that the relationship between form and function is completely arbitrary. In studies by Ianco-Worrall (1972) and Ben-Zeev (1977), children were asked to play a game involving some symbolic manipulation. One task required a simple symbol substitution that tested the children's acceptance of the arbitrariness of language. For example, they were asked if it was all right to switch names for 'turtle' and 'plane'. They were then asked to play a game where they had to say 'turtle' when they meant 'plane'.

This is named *plane*, right? (The experimenter holds up a toy aeroplane.)

In this game its name is *turtle*.

Can the *turtle* fly? (Correct answer: yes.)

How does the *turtle* fly? (Correct answer: with its wings.)

In other tasks, the substitution involved violating grammatical rules of the language. For example, children were told to replace 'the boy' with 'pencils' when given the sentence 'The boy sings loudly'.

Here, the bilingual children were first pre-tested with Berko's (1958) Wug Test. (The Wug Test is a morphological test which tries to find out if children are able to generalize simple morphological rules such as rules for forming the past tense, using novel words.) Only children who scored 70 per cent and above for the Wug Test were selected. (Information and jpeg versions of the Wug Test can be downloaded from *Wugs-Online* on <http://chilides.psy.cmu.edu/topics/>.) This was to ensure that violation of grammatical rules in the task was voluntary and not due to the children's lack of grammatical competence in the test language.

Bilinguals are expected to do better in such tasks as they are more aware of the arbitrariness of language. Hence, they are more likely to reject the notion that one object can only have one name. The Afrikaans-English children in Ianco-Worrall's study and the Hebrew-English children in Ben-Zeev's study both performed better than their monolingual comparison groups in this task. However, Ben-Zeev did not find a bilingual advantage in her Spanish-English bilinguals. She concluded, however, that the lower SES of her Spanish-English bilingual subjects in comparison to the monolingual group could be the reason for the failure of the bilingual group to perform better in such tasks.

In a slightly different task with Irish-English bilinguals, Cummins (1978) asked children drawn from Grades 3 and 6 of middle-class Dublin schools to justify their responses to questions. The children were asked, 'Suppose you were making up names for things, could you then call the sun "the moon" and the moon "the sun"?' and were then required to justify their response. The children's justifications fell into three categories:

- *empirical justifications*. For example, 'The names could be interchanged because both the sun and the moon shine.'
- *rigid conventional justifications*. For example, 'They are their right names so you couldn't change them.'
- *arbitrary assignment responses which recognized the arbitrary relationship between form and function*. For example, 'You could change the names because it doesn't matter what things are called.'

The findings indicate that bilinguals were significantly more likely to respond with an appeal to the arbitrariness of language and that this tendency was even more pronounced among the children in Grade 6.

Task A4.7

- These studies on arbitrariness require children to violate semantic and grammatical rules. The ability to violate rules is seen as an indication of metalinguistic flexibility. Can you think of possible arguments against this assumption?

Phonological awareness

Phonological awareness is the ability to recognize that speech is composed of distinct units of sound. In phonological awareness tasks, children are required to isolate relevant phonological segments as the basis of their analysis. For example, they may be asked to identify the 'odd one out' (e.g. in groups such as 'pat, pan, pal and pet') or they may be asked to provide minimal pairs (e.g. 'Give me another word that sounds like hat') or supply rhyming words etc. (e.g. 'Take away the first sound of pat by substituting the first sound of mop'). All such tasks test the children's ability to segment sounds into discrete phonological units.

Using an assortment of such tasks, Davine et al. (1971) found that bilingual children in elementary school in Canada performed better than monolingual children in distinguishing phonological differences. Rubin and Turner (1989) reported a similar advantage that extended into reading and writing skills in their cohort of French-English bilinguals. In an extensive and carefully controlled study by Bruck and Genesee (1995), French-English bilinguals were given a battery of phonological awareness tests in both kindergarten and first grade. Their performance was compared to that of age-matched monolingual English speakers. The findings indicated that bilinguals were better in certain phonological tasks such as syllable counting, while monolinguals were better at phoneme counting.

Sentence awareness

Sentence awareness is the ability to recognize utterances which are grammatically acceptable within the language. In sentence awareness tasks, the children are often asked to detect, correct and explain errors. Studies on monolingual children indicate that they have difficulty noting and correcting errors of this kind before the age of 5;6 to 6;0, even though such errors are not present in their speech. However, Galambos and Goldin-Meadow (1983) reported that Spanish-English bilingual children who were proficient in both languages picked out such errors more easily as young as 4;6 years of age. While young monolingual children focused on the message conveyed, bilingual children readily focused on the structure. For example, when provided with a grammatically correct but semantically anomalous sentence like 'Apples grow on noses', bilingual children were more likely to ignore the semantic distraction and focus on the structure. In a subsequent study, Galambos and Hakuta (1988) found that more proficient bilinguals performed better at the tasks than

bilinguals with lower levels of proficiency. These findings were again supported, but qualified by a different study by Galambos and Goldin-Meadow (1990), which examined the performance of English monolinguals, Spanish monolinguals and English-Spanish bilinguals who were required to correct, detect and explain a series of grammatical errors. In this study, bilinguals were better than monolinguals at noticing and correcting errors but showed no advantages when they had to explain the errors. The results indicate that bilingualism accelerates metalinguistic awareness but does not change the awareness qualitatively.



Task A4.8

- Studies on sentence awareness seem to indicate that language proficiency is a factor which may affect the outcome of the results. What implications does it hold for the general claim that bilingualism has positive influences on cognition?

Semantic awareness

There is an assortment of tasks which qualify as semantic awareness tasks even though the researchers who used these tasks did not label them as 'semantic awareness' tasks. The Semantic-Phonetic Preference tasks were used in several studies (Ianco-Worrall 1972; Ben-Zeev 1977; Cummins 1978), and bilingual and monolingual children's ability to focus on semantic similarity rather than phonetic similarity was compared. In the test trials, the children were given sets of words, such as *cap*, *can* and *hat*. They were then asked, 'Which is more like *cap*, *can* or *hat*?' The choice of *hat* indicated a semantic preference and the choice of *can* indicated a phonetic preference. The bilinguals in Ianco-Worrall and Ben-Zeev's studies were found to give more semantic responses than phonetic responses. In both studies, semantic preference is seen as a more 'sophisticated' choice as it is a preference which increases with age. Ianco-Worrall (1972) argued that this preference shows that the child is more able to focus on the meaning and is not tied to the form of the words. However, such an interpretation is curious given that a phonetic preference could also be interpreted as a sign of increased phonetic awareness. While the semantic-phonetic preference may be an inadequate measure of semantic awareness, it would be interesting to uncover the motivating principle behind the preference.

Other studies of semantic awareness look at the children's ability to form a semantic hierarchy and organize objects into superordinate or subordinate categories. There is some evidence (Cummins 1978) to show that bilinguals may have some advantage in this kind of mental organization.

Task A4.9

- Can monolingual children become metalinguistically more aware without exposure to another language?

Overview of studies on metalinguistic awareness

Overall, the studies on metalinguistic awareness have shown the general superiority of bilinguals in word awareness tasks, though some researchers have instead found that bilinguals do not outperform monolinguals in some specific metalinguistic tests. For example, in phonological awareness tasks, the effect is more task-specific. The various attempts to explain the discrepancy in the research have resulted in two strands of argument. The first is the Threshold hypothesis proposed by Cummins (1976) and the second is the Analysis and Control hypothesis proposed by Bialystok (2001a).

THE THRESHOLD HYPOTHESIS

Cummins attempted to resolve inconsistencies in this area by proposing that lower levels of proficiency attained could explain the lack of advantage found for some bilingual populations. He hypothesized that there are minimum levels of competency which have to be attained before the benefits of bilingualism can set in. In this hypothesis, Cummins proposed two thresholds of language competence. He argued that to avoid negative effects from bilingualism, the lower threshold must be attained and that children at this first threshold will not experience negative or positive benefits from bilingualism. In Cummins's framework, the cognitive growth of children who fail to reach the first threshold will be adversely affected. Those who attain the second threshold (high levels of bilingual competence) will enjoy all the enhancing effects of bilingualism.

The Threshold theory has found support from studies by Bialystok (1988), Dawe (1983), Galambos and Hakuta (1988), Ricciardelli (1992) and Clarkson and Galbraith (1992). All these researchers found that the performance of bilinguals improved with increased language proficiency. Bialystok (1988) and Galambos and Hakuta (1988) found that the proficiency levels of their subjects were crucial in determining the outcome of the findings.

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. Edelsky et al. (1983) aptly point out that the Threshold theory is a post hoc explanation of the bilingual phenomenon and it needs direct empirical investigation with rigorous replications across

linguistic and cultural groups. However, given the opaqueness of the concepts, the Threshold hypothesis cannot be clearly defined or empirically tested. This is the main reason why reactions to the Threshold hypothesis have been cautious (see Baker 2006: 144 for a detailed critique).

Furthermore, there are the additional social issues of the context in which one would find children who fail to achieve the lower threshold of competence. There is a strong overlap between situations leading to lower threshold competence and bilingualism in subtractive contexts. Hence, the threshold hypothesis is confounded with social variables, which have not been considered. Moreover, several studies, especially Yelland et al.'s (1993), indicate that high levels of competence are not necessary for the facilitating effects of bilingualism to take place. As evidenced in Yelland et al.'s study, minimal exposure to a second language was enough to give the children an edge in word awareness tasks and reading superiority even though the effect was short-lived.

ANALYSIS AND CONTROL HYPOTHESIS

In Unit A2, we saw that there is a need to take into account the different types of tasks when we are measuring language proficiency. By focusing on the difference in task demands, Bialystok (1988) proposed a model whereby bilinguals, irrespective of their degree of bilingualism, may be more advantaged at tasks which place greater demands on the *control of linguistic processing*. However, bilinguals who have attained high levels of proficiency in both languages are also advantaged at tasks that require more *analysed linguistic knowledge*. Drawing on theories from cognitive processing, Bialystok identified two cognitive processes, control of attention and analysis of representational structure, which she argues are able to explain the different demands in the tasks. In tasks requiring higher levels of analysis, participants have to use their knowledge to work out relationships between concepts and ideas, while in tasks requiring higher levels of control, participants are required to attend to some features while ignoring or inhibiting their response to other distracting features.

In Bialystok's model, examples of tasks which require control of linguistic processing are *word length* and *symbol substitution*, while tasks like *word discrimination*, *word print* and *word order corrections* require the analysis of linguistic knowledge. In the *word length* and *symbol substitution* tasks, the children have to ignore distractors and attend only to key elements, such as the length of the word, as opposed to the picture or the substitution and the violation of the grammar. The *word discrimination*, *word print* and *word order corrections* tasks all require the children to assess and evaluate their knowledge about that domain, and form judgements based on what they know. Analysis and control are not necessarily mutually exclusive as it is quite possible that tasks which are high in control are high in analysis as well.

The central thesis in Bialystok's (2001a) proposal is that the enhanced metalinguistic awareness effect operates differently for different linguistic structures. She argues that bilingualism does not have a general effect on a domain of knowledge such as metalinguistic awareness. Rather, the effect is on the underlying cognitive processes that are activated in the different tasks. More recently, the bilingual advantage in control of linguistic processing tasks has been found to disappear in young adulthood only to reappear again at a later stage (Bialystok et al. 2005). This framework presents a useful way of resolving the discrepancies in research findings.

So far, all the studies discussed have focused on a restricted set of Indo-European languages. More cross-linguistic studies focusing on languages with typologically different orthographies will allow us to better assess the relationship between phonological awareness and bilingualism. What is significant in these studies is the suggestion of the potential link between bilingualism and phonological and word awareness skills. The fact that both sets of skills are implicated in early literacy (cf. Tunmer and Myhill 1984) means that the role that bilingualism plays in enhancing literacy development in early childhood needs to be taken into account. In other words, if it could be conclusively shown that bilingualism is a crucial variable in promoting or accelerating early onset of literacy, it would have major implications for bilingual educational policies.

Apart from cognitive flexibility and metalinguistic awareness, bilingualism has also been found to enhance other types of cognitive skills (see Cummins 2000). It has been found to help in metaphor processing and has even been found to exert positive influences on the development of mathematical reasoning and logical deduction skills. In a Theory of Mind study which looks at young children's understanding of mental verbs such as 'think' and 'believe', Goetz (2003) found Mandarin-English bilinguals to be more advanced than monolinguals. There is also some evidence that bilingualism can have an enhancing effect on the learning of a third language, as various researchers such as Bild and Swain (1989) have reported that Grade 8 students from heritage (non-English immigrant) language backgrounds who were enrolled in a French-English bilingual programme performed better than an English-background group in the same programme. In a different study, Swain and Lapkin (1991) compared the French proficiency of four groups of students and found that children who had literacy skills in their heritage language performed better in their third language. Clyne et al. (2004) have similarly reported bilinguals to be more effective and persistent learners of a target language than monolingual learners. Apart from their general language learning abilities, bilingual children were also found to acquire pragmatic skills more efficiently in a third language (Jorda and Pilar 2003).

Summary

In sum, the evidence that bilingualism per se does not cause any harm has been firmly established. The literature in this area is far too robust for anyone still to maintain that bilingualism is detrimental to cognitive functioning. Most of the articles that reported negative findings were either methodologically or theoretically

flawed. Instead, there is substantial evidence to suggest that bilingualism may have cognitively enhancing effects. More specifically, bilinguals perform better in tasks requiring cognitive flexibility and are also superior in certain metalinguistic skills, though this last observation is not universally held, nor is it drawn from studies which are methodologically flawless.

Generally, armed with a more informed understanding of the phenomenon of bilingualism, the newer generation of students and researchers are more cautious in interpreting findings. This does not obviate the fact that often the tasks used to measure the same constructs under investigation vary widely. And although researchers are now more careful about measuring proficiency levels of bilinguals, different studies use very different measures. It is thus important that we extrapolate trends from these studies with careful consideration.

While we can confidently bury the 'bilingualism is bad' precept, we can only hypothesize that 'bilingualism is good' under certain conditions and in certain contexts. If bilingualism is positive, why are the effects not categorically visible across all bilingual groups? What are these specific conditions and what are the specific contexts which are necessary before we can consistently and confidently predict beneficial effects of bilingualism? These are some questions which we will continue to explore in Unit B4 through reading Peal and Lambert (1962), which ushered in a methodological rethink which saw a spurt of research illustrating positive effects as well as a refinement of explanations and justifications. The second article, by Bialystok (2001b), refined how we understand the relationship between cognition and bilingualism by focusing on the ways in which bilingualism affects different aspects of metalinguistic awareness. These articles are iconic papers from these two periods.