

『就実論叢』第45号 抜刷

就実大学・就実短期大学 2016年2月29日 発行

Recent Research Results and the Benefits of Bilingualism

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Introduction

As will be explained in more depth below, “bilingualism” is a somewhat difficult term to precisely define; however, the use of two or more languages is quite common in the world. For example, a European Commission report from 2006 revealed that approximately 56 percent of respondents from 25 European countries could hold a conversation in a second language. The percentages are much higher in several countries including Luxembourg at 99 percent, Sweden at 97 percent, and the Netherlands at 91 percent (Marian and Shook 1). Moreover, in North America, at least 35 percent of the population of Canada is bilingual. In the United States, with its recent history marked by an emphasis on “English-only” policies, the percentage is lower, at about 20 percent, but this still amounts to about 55 million people. Bilingualism is also very common in countries in Asia and Africa, in which people use several languages at home, in schools, and for daily business. For instance, there are 516 languages in Nigeria alone as well 427 in India (Grosjean and Li 6). Thus, bilingualism, or the use of at least two languages in daily life, is a widespread global phenomenon.

Before entering into a discussion of the benefits of bilingualism, it is important to provide a basic definition of the term. Various experts have provided and proposed several different definitions. It is a difficult word to accurately define because, contrary to common conception, a great majority of bilinguals are not equally proficient in two languages, they often have an accent, and many begin to acquire new languages when they are adolescents or even after they have become adults. These factors make it a difficult term to define, particularly for research purposes, along with differences in motivation and personal goals, languages of education, socioeconomic status and social views of bilingualism, which all affect perception and proficiency. However, for the sake of simplicity, and in consideration of the scope of this essay, bilingualism is defined as the consistent use of two or more languages, or

dialects, in everyday life (Grosjean and Li 5).

Social and historical contexts also affect perceptions and research regarding bilingualism. In regard to historical interpretations of this linguistic phenomenon, throughout most of the 20th century, bilingualism was consistently criticized for creating “mental confusion” and even for supposedly causing slower mental development (Saer, Smith). Concerning research, most scholars adopted a generally negative view of bilingualism before the 1960s. Although there were some differing opinions, a great majority of researchers concluded that bilingualism has a negative effect on cognitive development. There are several reasons for these consistently unfavorable findings. One primary reason is that researchers held biased views regarding certain groups of people. They often came to “conclusions” even before they began their studies. In other words, social beliefs and personal biases can affect research results, especially if the harmful effects of bilingualism are expected or assumed. Many researchers theorized that certain groups of people were intellectually inferior, while other scholars, who were trying to be more objective, sought to find a reason for seemingly low IQ test scores. Many concluded that bilingualism was the cause of negative results, namely that knowledge of two languages caused mental dysfunction and delayed cognitive development (Hakuta “The Mirror”).

Other reasons for negative views regarding bilingualism can be traced to methodological faults and inconsistencies in early research. To be fair, as stated above, it is quite difficult to define bilingualism. Researchers often tested subjects with greatly varying language abilities. In many cases, experimental subjects were not literate in any language or did not receive an adequate education in their own native language. Furthermore, IQ tests were often administered in the subjects’ weaker language, thus placing them at a clear disadvantage. Sometimes tests were administered through interpreters or translated and then administered, causing inconsistent or distorted results. Moreover, individuals of differing ages from various socioeconomic backgrounds were often tested together (Hakuta and Diaz 290). For the above reasons, the results of most early bilingual research must be regarded at least as unreliable sources of information about bilingualism.

More positive assessments of bilingualism did not consistently appear until the early 1960s. Peal and Lambert’s (1962) research represents an important turning point in the study of bilingualism. In brief, Peal and Lambert

studied 110 10-year-old children from six middle-class French schools in Montreal. Among the 46 variables on which data was gathered, 18 variables measured IQ. Of the 18 variables measuring IQ, 15 showed that bilinguals had statistically higher IQs than the monolinguals. These 15 variables included verbal and non-verbal aspects of IQ. A statistical analysis revealed that the bilinguals were superior to the monolinguals in concept formation and in tasks that required mental or symbolic flexibility. The authors also reported a positive transfer between languages, which benefited verbal IQ. Furthermore, this study is not only significant because it offered statistical proof of the positive aspects of bilingualism, but it also set precedents for later research. Although the number of subjects was relatively small, only balanced bilinguals were used in the study. They were also matched with monolinguals of the same age of the same socioeconomic class. Moreover, sophisticated methods of statistical analysis were utilized. These practices stand in sharp contrast to the methods of most earlier researchers, who often allowed too many variables and personal views to interfere with the reliability of their conclusions.

The Benefits of Bilingualism

Although the body of modern research has not always revealed the benefits of bilingualism, a majority of research does show benefits that accrue from being bilingual. Over the past 50 years, bilingualism has been more thoroughly researched, from various angles, including by researchers from such fields as linguistics, psycholinguistics, sociolinguistics, cognitive linguistics and neurolinguistics. A complete review of recent research is quite beyond the scope of this essay. However, an explanation of several relatively recent findings can serve as a basis for revealing the fundamental benefits of bilingualism.

One of the most significant differences between bilingual and monolingual individuals is that, particularly for fluent bilinguals, both languages are active even when only one language is being used (Bialystok 3, Marian and Shook 2). Thus, bilinguals must choose a word form that meets the linguistic criteria for form and meaning in the target language, not from the alternate linguistic system. This creates a need for targeted, enhanced attention to a particular system and the ability to relatively quickly make accurate judgments about form and meaning, which includes inhibiting features of a competing system. In order to maintain proper balance between at least two languages, the brain

relies on executive functions, which are part of the brain's regulatory system for general cognitive abilities. Studies have found that bilinguals perform better than monolinguals on tasks that require controlled attention, inhibition, conflict resolution and task switching (Grosjean and Li 202). In other words, they have certain advantages in the case of executive functions and cognition.

As an example, Bialystok (1986) found that although both monolingual and bilingual children are equally able to detect grammatical problems (e.g. "Apples grew on trees"), bilingual children were more successful at accepting anomalous sentences that were grammatically correct (e.g. "Apples grow on noses"). This more accurate judgment of grammaticality requires intense attention to form and the ability to ignore misleading elements related to meaning. The theory behind this advantage is that since bilinguals always have to judge between two competing systems, they develop the ability to attend to linguistic features and to inhibit distracting information more effectively than monolinguals. This is also an example of the "mental flexibility" mentioned by Peal and Lambert.

There is also consistent evidence that at an earlier age than monolinguals, bilingual children develop the ability to solve problems that involve conflicting or misleading information. For example, Zelazo, Frye and Rapus found that young bilinguals (up to 4 to 5 years old) have an advantage over monolingual children on tasks requiring them to switch criteria and to attend to and make decisions based on new criteria involving sorting tasks. Zelazo and his colleagues tested children on their performance on the Dimensional Change Card Sort (DCCS) task. They asked children to sort a set of bivalent stimuli according to one feature (e.g. color) and then to quickly resort them by another feature (e.g. shape). Despite being able to state the new rule, monolingual children had more trouble applying the new rule in the second round. The successful application of the new criteria and the simultaneous ability to inhibit inapplicable information shows an advantage for bilinguals regarding executive functions.

Moreover, Carlson and Meltzoff carried out a comprehensive study involving children who were asked to perform nine executive function tasks. The children in the study were in kindergarten and were chosen from three groups, monolinguals, bilinguals and English language learners. The most significant result was that bilinguals performed better on conflict tasks, namely

tasks that required the children to resolve a conflict between two competing options. Thus, again, an advantage regarding executive functions was revealed. This overall advantage regarding executive functions has also been revealed through other research (Bialystok “Bilingualism: The Good”, Barac and Bialystok).

Another benefit concerns the concept of “cognitive reserve”. This refers to the protective and other positive effects on the brain that result from stimulating social, intellectual and physical activity. These activities help to prevent cognitive decline (Grosjean and Li 209). In order to test the effects of bilingualism on the elderly, Bialystok, Craik, and Freedman conducted a study by using the hospital records of 91 monolingual and 93 bilingual patients who had been diagnosed with dementia, most of whom were suffering from Alzheimer’s disease. The monolinguals were more educated (12.4 years) than the bilinguals (10.8 years), a factor favoring the monolinguals. However, study results revealed a 4-year delay in the onset of dementia symptoms. Then, Craik, Bialystok and Freedman replicated this study with 100 monolingual and 100 bilingual subjects, who had been diagnosed with dementia, most likely Alzheimer’s disease. The monolingual subjects had, on average, greater advantages both in terms of education and former occupation. However, the bilingual group had their first clinic visit a little over 4 years later than their monolingual counterparts, and symptoms of dementia did not appear until over 5 years later. These studies reveal that the bilingual experience contributes to cognitive reserve and can help to prevent cognitive decline.

Finally, some very interesting research is being conducted regarding the human brain and bilingualism. Researchers now use brain imaging technology, such as functional magnetic resonance imaging (fMRI), to investigate brain function and activation. Researchers have found that bilinguals show increased activation in the dorsolateral prefrontal cortex (DLPFC), which is a region usually associated with cognitive functions like attention and inhibition, and also in other regions involved in cognitive control. This is not only consistent with the theory of enhanced executive control function, but also intimates the construction of unique networks in bilingual brains (Marian and Shook 5-6).

Other research has revealed better encoding of fundamental sound frequencies. In an experiment by Krizman, Marian, Shook, Skoe and Kraus, monolingual and bilingual adolescents listened to simple speech sounds without

any background noise, and then to the same sounds which were played along with background noise. Brain stem responses were the same in all subjects under the former condition, but the neural response of bilinguals was significantly larger in the presence of background noise. In other words, there was greater blood flow, a common marker of neural activity, in bilingual brains, which indicates a boost in sound encoding and advantages in auditory attention. This is also consistent with the executive function advantages explained above.

There is evidence that bilingualism affects the brain's structure as well. Researchers have found that high proficiency in a second language and early acquisition of another language results in higher gray matter volume in the left inferior parietal cortex. In addition, researchers have found white matter volume changes in both bilingual children and older adults. The research above not only reveals evidence that the bilingual experience affects how the human brain processes information but also that the neurological structure of the brain itself is altered (Marian and Shook 6).

Important Qualifications

Although the primary focus of this work is to explain the relative benefits of bilingualism, in the spirit of fairness and equanimity, a few cautionary notes are required. One significant problem is related to bilingualism and vocabulary. Several researchers have shown that bilingual children control a smaller vocabulary in each of their languages when compared with their monolingual counterparts (Mahon and Crutchley, Oller and Eilers). A related problem has also been found in bilingual adults, although vocabulary size is not the problem. Problems that arise involve access to vocabulary and lexical retrieval. For example, bilinguals tend to name pictures more slowly than monolinguals (Gollan, Montoya, Fennema-Notestine and Morris). They also have more trouble verbalizing words, namely, they have more tip-of-the-tongue (TOT) experiences than monolingual individuals (Gollan and Acenas). This appears to be the result of negative interference between two languages. It is important to point out that these effects do not appear in the case of working memory or nonverbal tasks (Bialystok, "Bilingualism: The Good" 7). However, difficulties with rapid, fluent language production can have a negative effect on communication, which generally represents a disadvantage.

Regarding vocabulary, it must also be mentioned that this is a complicated issue as well. While it is true that several researchers have revealed vocabulary related disadvantages for bilinguals, there is evidence that bilinguals do not suffer academically in their language of instruction. For example, in research carried out by Bialystok, Luk, Peets and Yang regarding receptive vocabulary, using the Mean Peabody Picture Vocabulary Test (PPVT), it was found that among a subset of 6-year-olds all children achieved comparable scores on words associated with schooling. However, bilinguals scored significantly lower scores on words associated with home and social contexts. This is logical because the subjects were Spanish-English bilinguals who received their education in English. Thus, when tested in English, they displayed a deficit regarding English vocabulary in contexts in which they usually use Spanish, namely in their home and local social environments. Furthermore, the deficit for “home” words in English is most certainly ameliorated by words in their non-English language. Thus, there is not only evidence that bilinguals do not suffer academically, but if the total vocabulary of bilinguals in both languages is taken in aggregate, they may have a total vocabulary that is greater than that of monolinguals (Grosjean and Li 1995). Although there is research that reveals lexical and production concerns, this complicated issue needs to be more thoroughly explored.

Another problem is the possible existence of a bias in favor of the assumed benefits of bilingualism. For example, de Bruin reviewed abstracts from 169 conferences held between 1999 and 2012 that were connected with bilingualism and executive control. De Bruin actually revealed two topics of concern. Firstly, at conferences, about half of all presenters provided results that either completely or partially supported bilingual advantages at certain tasks. However, about half of all presenters partially or completely refuted the idea of bilingual advantages. This alone is a cause for concern.

The second unfortunate revelation is that there seems to be a bias in regard to the publication of results. De Bruin found that 68 percent of the studies that professed a bilingual advantage were published in a scientific journal, while only 29 percent of the research results that showed either no difference or a monolingual edge were subsequently published in a comparable journal. The problem that there may be a disparity regarding the publication of research results in favor of the advantages of bilingualism must be

acknowledged. Furthermore, the probable existence of a bias in favor of the advantages of bilingualism could affect research results and public perceptions.

Conclusion

As has been explained above, there is substantial evidence that the bilingual experience produces various cognitive benefits. Advantages regarding executive control, such as more highly developed attentiveness and the ability to flexibly switch tasks, have been largely confirmed. Although some linguistic limitations have been revealed, they do not appear to hinder development, especially when students receive a good education. There is much more positive transference between languages than there are negative influences. There are also neurological benefits for bilinguals. Their brains process information more efficiently and the bilingual experience also prevents cognitive decline. Furthermore "...bilingualism has been associated with improved metalinguistic awareness (the ability to recognize language as a system that can be manipulated and explored), as well as with better memory, visual-spatial skills, and even creativity" (Marian and Shook 8). Thus, overall, there are several benefits that arise from the bilingual experience.

As a final point, the social benefits of bilingualism must also be mentioned. In an increasingly more interrelated world, the ability to speak another language can be invaluable. The bilingual experience, including biliteracy and biculturalism, can provide access to a huge amount of verbal and written information, which enhances social, economic and political capital. Moreover, in-depth knowledge of cultural characteristics and the collective wisdom of at least two cultures can lead to a more enriched, self-actualized life. Although it is not without costs, it is reasonable to say that many benefits arise from the bilingual or multilingual experience.

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