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Bilingual education for young children: review of the effects and consequences

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Abstract

Bilingual education has been an educational option in many countries for over 50 years but it remains controversial, especially in terms of its appropriateness for all children. The present review examines research evaluating the outcomes of bilingual education for language and literacy levels, academic achievement, and suitability for children with special challenges. The focus is on early education and the emphasis is on American contexts. Special attention is paid to factors such as socioeconomic status that are often confounded with the outcomes of bilingual education. The conclusion is that there is no evidence for harmful effects of bilingual education and much evidence for net benefits in many domains.

Keywords

Bilingual education; language proficiency; academic achievement; specific language impairment; socioeconomic status

In the US, bilingual education has been a controversial topic almost since the founding of the nation, and from the beginning, the discussions were imbued with political rhetoric (for reviews see Nieto 2009; Ovando 2003). The Bilingual Education Act of 1968 recognized the situation of minority children with limited proficiency in English and created funding for programs that would assist these children to succeed in American schools and develop their proficiency in both English and their home language. The act was largely focused on Spanish speakers, but subsequent groups, such as Chinese speakers, brought about amendments to the act to expand its scope (Lau vs. Nichols, 1974). Other countries have had a different experience with bilingual education and a different set of political and social associations with these programs. A prime example is Canada, where the social, demographic, and political situations were different from those in the US. Although Canada is officially a bilingual country, there is not a single language that defines most bilinguals as there is in the US, because the majority of bilinguals in Canada speak one of the official languages (English or French) and a heritage language. Surprisingly, few citizens are

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actually proficient in both official languages. In the 2011 census, about 17% of respondents stated they could conduct a conversation in both English and French, a considerable increase from the estimate of 12% who could achieve this in 1961 (Lepage and Corbeil 2013), although still below what would be expected in a bilingual society. One factor that may be responsible for the growth in French-English bilingualism over the 50-year period is the impact in the past generation of popular French immersion programs in which children who would otherwise have had little exposure to French became very proficient and in many cases, fully bilingual.

In Europe, attitudes to languages, educational systems, and bilingualism in general, to name a few factors, are very different from those in North America. Garcia (2011) makes a strong case for the widespread appropriateness of bilingual education globally, but the context in which education takes place is crucial; there is no universal prescription for bilingual education and no universal outcomes. As Baker (2011) points out, the perspective on bilingual education depends largely on the point of view, and studies conducted in one context may have little relevance for bilingual education in another context. Therefore, this review will focus primarily on North American contexts and address some of the central issues regarding the efficacy of bilingual education for that region, in particular for the US.

Finally, the review will focus on the early school years because they are the foundation for academic outcomes. Education is a long-term process and results continue to influence outcomes throughout life. However, the early years are crucial for establishing basic skills and attitudes toward education, so the examination of bilingual education in the present review will focus on the first three years of schooling. To summarize, the review is restricted in that it selectively reviews studies whose empirical properties are considered sufficiently reliable to form conclusions, with a focus on primary education in the context in the US, and addressing specific questions, namely, language outcomes, cognitive outcomes, and generalized appropriateness of the programs.

Bilingual education is an umbrella terms that encompasses a range of education programs that have been designed for an even wider range of children and a host of special circumstances. Essentially, bilingual education refers to any school program in which more than one language is used in the curriculum to teach non-language academic subject matter or the language of schooling does not match the language of the home or community, but the reasons for incorporating the languages, the specific languages chosen, the structure of the program, and the relation between the school languages and the community vary widely and influence educational outcomes. Over-riding all this is the distinction between ‘bilingual education’ and the ‘education of bilingual children’, concepts that are importantly different from each other. Consider the following two definitions for bilingual education. Genesee (2004, 548) defined bilingual education as ‘education that aims to promote bilingual (or multilingual) competence by using both (or all) languages as media of instruction for significant portions of the academic curriculum’. In contrast, Rossell and Baker (1996, 7) defined bilingual education as ‘teaching non-English-speaking students to read and write in their native tongue, teaching them content in their native tongue, and gradually transitioning them to English over a period of several years’. Clearly these definitions are describing different situations and carry different goals.

This distinction between bilingual education and the education of bilingual children is part of the historical difference between the development of bilingual education in the US and elsewhere. For bilingual education of minority language students in the US, the motivation was to create an educational program for children who were at-risk of academic failure because of low proficiency in English, the language of schooling, by engaging them in the education process through the use of their home language (e.g. including Spanish in the education of Hispanic children). The success of these programs was judged primarily by proficiency in English (the majority language), with the main criterion being English language literacy. For bilingual education in Canada, in contrast, the motivation was to offer an educational alternative designed to make majority language children (i.e. English speakers) bilingual. Thus, success of these programs was judged by the extent to which children mastered the minority language while maintaining proficiency in the majority language. Similar immersion programs were developed for children to gain proficiency in both national (e.g. children of Finnish immigrants in Sweden, Troike 1978) and heritage languages (e.g. Hawaiian programs in the US, McCarty and Watahomigie 1998; Navajo programs in the US, Rosier and Holm 1980; Maori programs in New Zealand; Durie 1998; May and Hill 2005). All these programs fall under the general rubric of bilingual education but are importantly different from each other. A more complete range of the diversity of bilingual education programs is described by Fishman (1976) and more recently by Mehisto and Genesee (2015).

In spite of substantial differences between them, the two goals of educating bilingual children and creating programs to make children bilingual are interrelated. In the US, there is large overlap between them because the largest number of bilingual education programs was developed to educate bilingual or limited English proficient (EP) students, primarily Spanish-speaking, who were otherwise at-risk for school failure. The present review will focus on bilingual education in general and not on the specific issues involved in the education of this particular group of children (for a detailed discussion of this issue, see August and Shanahan 2006). Ultimately, it is important to know if education through two languages is viable, if young children can learn in this kind of an environment, and if the outcomes of these programs meet the needs of all children. The present paper reviews evidence relevant for those judgments.

Development of language and literacy in bilingual education

Evaluation of the effectiveness of bilingual education on language and literacy outcomes requires well-controlled research. The clearest evidence for the unique contribution of bilingual education programs to these outcomes would come from randomized control trials, but such a design is almost impossible to achieve (but see Genesee and Lindholm-Leary 2012, for discussion). The closest design to this methodological ideal is in studies that investigate bilingual education programs for which spaces are allocated by lottery because of over-demand so that comparisons can be made between children who were admitted to the program and those who were not. Children in this latter group generally enter regular classrooms and may remain on a waiting list. Even here, however, there is the possibility of bias in terms of who enters the lottery. The results of the few studies that have had the opportunity to compare these populations (e.g. Barnett et al. 2007) are largely consistent

with the majority of the literature in which children in bilingual or single language programs are compared on critical outcome measures.

The primary goal of early schooling is to establish the foundational skills upon which children will build their educational futures. The most important of these abilities are language and literacy competence. Not surprisingly, therefore, the majority of research that has evaluated bilingual education programs has focused on children's development of these crucial linguistic abilities. The research is complicated because the type of education program is only one of many factors that shape these emerging abilities so clear evidence for the role of the education program as distinct from other sources of variance in the child's background requires carefully controlled designs. For example, children who are Hispanic but are native speakers of English have education outcomes in terms of dropout rates and academic failure that are similar to Hispanic children who are Spanish-speaking, ruling out English proficiency as the explanation (Forum for Education and Democracy 2008). Just as English proficiency alone cannot explain school outcomes, neither can the educational program.

In part for this reason, conclusions regarding the development of language and literacy through bilingual education in the US is complicated by the confounding of ethnicity and social class with Spanish proficiency and bilingualism (for discussion see Francis, Lesaux, and August 2006). Nonetheless, two studies by Lindholm-Leary and colleagues have provided reasonably clear results on these issues. In one study, Lindholm-Leary and Block (2010) assessed the English and mathematics achievement of 659 Hispanic students attending either mainstream English or various types of bilingual programs in California. In the bilingual schools, the proportion of instruction shifted from predominantly Spanish to predominantly English over the period from kindergarten to fourth grade. Students were classified as EP or English Language Learner (ELL) prior to the study. The main result was that standard scores on the English proficiency test were higher for both ELL and EP students who were in the bilingual programs than they were for children in the mainstream English programs. Similar results were found for scores on the mathematics test. Overall, students in the dual language program in this low socioeconomic status (SES) community achieved at least as well and in some cases better in both English and mathematics than did comparable students in a program in which all instruction was in English. Students in the bilingual programs also made more rapid progress across the grades in these tests than did students in the English program and, therefore, were more advanced in their trajectory to close the achievement gap with statewide norms for these tests.

In a similar study that included children in kindergarten through second grade, Lindholm-Leary (2014) assessed 283 low SES Hispanic children in either English or bilingual programs. Children entering the English kindergarten programs had higher language scores than those entering the bilingual programs, but these differences disappeared within one or two years and then reversed, with children in the bilingual program outperforming the English-only instruction group in both English and Spanish test scores by the end of second grade. Not surprisingly, children in the English program showed significant loss of Spanish proficiency, making them in fact less bilingual, a topic that will be discussed below.

Barnett et al. (2007) compared performance of low SES preschool children (3 and 4 years old) in bilingual or English-only programs, but importantly, children were assigned to these programs by lottery, thereby controlling to some extent for pre-existing differences among the children or their families. The programs were in a school district in which 76% of the children qualified for free or reduced-price lunch. The outcome measures were largely experimental tasks that assessed phonological awareness and language knowledge (primarily vocabulary), but the results were consistent with those reported in other studies. Specifically, children in both programs made comparable progress in skill development in English, but children in the bilingual program also developed these skills in Spanish, indicating that dual language instruction did not impede development of English, the L2.

In these examples, bilingual instruction had long-term benefits for children's language and literacy proficiency in both languages. In a review and meta-analysis of this literature, Francis, Lesaux, and August (2006) concluded that 'bilingual education has a positive effect on English reading outcomes that are small to moderate in size' (392). Thus, overall, bilingual education for Hispanic children in the US leads to English outcomes that are equivalent to those found for children in mainstream English programs, with better outcomes for Spanish.

These results are broadly consistent with those found for bilingual education programs serving other communities, with other languages, in other countries, where students are more likely to belong to majority language groups than minority language, as in the US. Thus, the outcomes obtained with children at risk for educational failure produce patterns of results similar to those found for children with entirely different linguistic and demographic backgrounds. The most studied of these programs is Canadian French immersion in which Anglophone children in Canada are educated through French. Results of studies over the past 50 years have shown that English outcomes are equivalent to or better than those found for children in English programs (even though most instruction is in French in the primary grades) and French outcomes are moderate to high, although below levels found for native-speaking French children (Genesee 1983, 2004; Hermanto, Moreno, and Bialystok 2012; Swain and Lapkin 1982).

Three further examples with similar results come from bilingual programs operating in Italian and English, Mandarin and English, and Hebrew and Russian. Assessment of the Italian-English program was a small-scale study in which 60 children attending this program in California were evaluated from first through third grades for language and literacy ability in English and Italian (Montanari 2013). Results showed that these children developed strong literacy skills in both Italian and English by first grade, even though instruction was exclusively in Italian. The second program, also implemented in California, provided instruction through Mandarin beginning in kindergarten to children who either had Mandarin exposure at home or were only English speaking (Padilla et al. 2013). Like the Italian-English program, this was a small-scale study. The results showed that all children gained proficiency in both English and Mandarin and importantly achieved at least equivalent and sometimes greater than state levels on standardized tests of English, math, and science in spite of being educated through Mandarin. Finally, two studies investigated language and literacy development in Russian-Hebrew bilingual 4-year-olds who were

attending either bilingual Hebrew-Russian or Hebrew schools in Israel, where Hebrew is the majority language. Again, the results showed that children in the bilingual programs developed language proficiency (Schwartz 2013) and narrative skills (Schwartz and Shaul 2013) in Hebrew, the majority language, at least as well as did children in the Hebrew only programs and at the same time maintained higher levels of Russian. Across all these studies, therefore, the majority language of the community was mastered whether or not it was the primary language of instruction, but the minority language required environmental support to reach high proficiency levels.

The studies that compared English-only and bilingual education in Hispanic children were generally conducted with low SES populations, but that is not the case for the non-Spanish programs: children in the Italian-English program were described as ‘middle class’; children in the Mandarin-English program were described as ‘upper middle class’; and children in the Hebrew-Russian program were described as ‘mid-level socioeconomic’. Thus, even though none of the students was at-risk in the manner generally understood for Hispanic children in Spanish-English bilingual programs, the patterns of language and literacy outcomes were similar, even if the absolute levels of achievement were different. Therefore, there is no evidence that education through two languages impedes progress in the development of language and literacy skills in the majority language and has the added benefit of developing and sustaining these skills in the minority language. This generalization about positive outcomes is confirmed by a study in which at-risk low performing children attending bilingual education or majority language English-only programs were compared for their English language and literacy performance (Lopez and Tashakkori 2004). There was no evidence of additional burden on the development of English skills for children in the bilingual program.

Other academic and cognitive achievements

However important language and literacy are for children’s development, they are not the only outcomes that need to be considered in evaluating educational options for children. The impact of education through a weak or non-proficient language on children’s academic success has long been a concern. Dire warnings about harmful effects of these programs were expressed by Macnamara (1967) in his evaluation of children attending an Irish immersion program in Ireland. He reported that children in the Irish program performed more poorly in mathematics than did children in regular English programs, but he neglected to point out that the differences were found only in mathematics ‘word’ problems and not in mathematical operations. Unsurprisingly, children’s knowledge of Irish at that point was weak and interfered with their comprehension of the test questions; in tests of arithmetic calculations, there were no differences between groups. These challenges have been known for a long time (e.g. Cummins and Macnamara 1977) but the research remained influential. More recent research demonstrates that even simple arithmetic calculation is faster and easier in the language in which it was taught (Spelke and Tsivkin 2001) and engages different parts of the brain than when the same calculations are performed in the non-school language (Mondt et al. 2011), but the Irish proficiency of the children in Macnamara’s (1967) study may have been too weak to show this effect.

Other studies have generally found no academic cost for children studying in a bilingual program. In the Mandarin-English bilingual education program described above (Padilla et al. 2013), for example, children in the dual language immersion and the English programs performed equivalently on standardized tests of mathematics until third grade, but immersion children began outperforming non-immersion children in fourth grade. Thus, these program effects sometimes take time to demonstrate. For tests of science achievement, there were no differences between children in the two programs.

There is evidence that bilingualism alone, aside from bilingual education, may be beneficial for aspects of academic achievement. Han (2012) conducted a longitudinal study in the US of a national cohort of over 16,000 children in kindergarten and followed their academic progress until fifth grade. Because of national education policies requiring standardized testing on English literacy and math scores, large data bases are available for such investigations. In the study by Han (2012), the children included in the analyses were Hispanic, Asian, or non-Hispanic native-born White and outcome variables were results on standardized reading and math achievement scores. Although the analyses did not explicitly control for the effect of education program, the quality of education was defined in terms of the resources and interventions for English support available in the school program, quality of the teachers, and other such factors and included in the analyses. The results were based on a complex classification of children according to their language abilities. Most relevant is a group called ‘mixed bilingual’, referring to children who spoke a non-English language at home to a high degree of fluency. Although these children entered kindergarten with limited English proficiency and obtained initial scores on both English and math tests that were lower than native English-speaking children, they fully closed the math gap by fifth grade, an achievement that the Han attributes to bilingualism. Nonetheless, English scores still lagged by fifth grade. The focus of the analyses were on quality of school programs, availability of resources, and quality of school personnel, all of which contributed significantly to children’s success. The study was not designed to evaluate the effectiveness of bilingual education but the results are consistent with the conclusion that children’s bilingualism can be a positive factor in school achievement.

Much of this research has focused on children in low SES environments, but Marian, Shook, and Schroeder (2013) extended the question to investigate whether these results would be similar for Spanish-speaking low SES children and monolingual English-speaking middle-class children who were in Spanish-English bilingual programs and were instructed through Spanish from kindergarten. The numbers of children in each of the relevant groups defined by language and social background, grade, and education program were vastly different (ranging from 6 to 624), so non-parametric analyses were used and results need to be interpreted cautiously. The analyses of children’s performance on standardized tests of reading and mathematics showed better outcomes for children in bilingual programs than monolingual programs for both minority Spanish and majority English-speaking children, although there were differences in the size and timing of these effects for children from the two language backgrounds. Thus, all children profited from the bilingual education program, although not surprisingly their progress depended as well on other factors known to affect education outcomes.

One explanation that Marian and colleagues offer for the better mathematics outcomes for children in the bilingual programs is that the bilingualism achieved in these programs led to higher levels of executive function and that better executive function was the mechanism for the improvement in math performance. Several studies of young children in the early grades have demonstrated a direct relationship between children's executive functioning and mathematics achievement (Blair and Razza 2007; Bull, Espy, and Wiebe 2008) and a large body of research has established that bilingualism promotes the development of executive function in young children (see Barac et al. 2014 for review; Adesope et al. 2010 for meta-analysis). Importantly, children's level of executive functioning predicts academic success (Best, Miller, and Naglieri 2011; McClelland, Morrison, and Holmes 2000), and academic success predicts long-term health and well-being (Duncan, Ziol-Guest, and Kalil 2010). Therefore, bilingual education may have a serendipitous effect in that it not only promotes bilingualism but also enhances a crucial aspect of cognitive performance.

There is a large and growing literature investigating the relation between bilingualism and executive functioning in young children, but three studies are particularly relevant. The first study is interesting because the results were unexpected. Mezzacappa (2004) used the children's Attention Network Task (Fan et al. 2002) to assess executive functioning in 6-year-old children who varied in SES (middle-class or low) and ethnicity (White, African-American, or Hispanic). In addition to expected effects of SES, he found that Hispanic children outperformed the other groups, particularly on the most difficult condition. Although he did not collect information about children's language proficiency or level of bilingualism, he noted that 69% of the Hispanic children spoke Spanish at home, making them at least somewhat bilingual. Mezzacappa proposed that this bilingualism was responsible for the superior executive function performance by children in that group.

The second study was a relatively small-scale study that examined children from low SES communities in which about 90% of children received free or reduced-price lunch. Esposito and Baker-Ward (2013) administered two executive function tasks to children in kindergarten, second grade and fourth grade who were in a bilingual education or English-only program. Their results showed that children in second and fourth grades in the bilingual program outperformed children in the English program on the trail-making task, an executive function task that has previously been shown to be performed better by bilingual than monolingual 8-year-olds (Bialystok 2010). There were no differences between children in the two kindergarten programs, but all these children found the task to be difficult. Because of the small sample size, the results need to be considered more suggestive than definitive, but they point to the possibility that even limited exposure to bilingual education improves children's executive function.

Another small-scale study conducted with a population of middle-class children from kindergarten through second grade produced somewhat different results. Kaushanskaya, Gross, and Buac (2014) examined the effects of classroom bilingualism on executive functioning as measured by task shifting as well as measures of verbal memory and word learning. For task switching, they used the Dimensional Change Card Sorting Task (Frye, Zelazo, and Palfai 1995), a task previously found to be performed better by bilingual than monolingual preschool children (Bialystok 1999). There were no performance differences

between children in the two programs on the executive function shifting task, but the task was arguably too easy for the children since it is typically used with younger children, or on a test of verbal short-term memory. However, tests of verbal working memory and word learning were performed better by the children in the bilingual education program.

In these three examples, children who were assigned to groups either because of ethnicity (Mezzacappa 2004) or education program (Esposito and Baker-Ward 2013; Kaushanskaya, Gross, and Buac 2014) were compared to controls for their performance on executive function tasks. A different approach is to use exposure to bilingual education as a scaled variable to determine if it is associated with executive function performance and thereby avoid between-groups comparisons. Two studies by Bialystok and Barac (2012) investigated the relation between the amount of time young children had spent in an immersion program and performance on executive function tasks. Children from monolingual English-speaking homes who were attending schools in which instruction was either in Hebrew (Study 1) or French (Study 2) were administered executive function and metalinguistic tasks. The tasks were different in both studies, but the results were the same: performance on the metalinguistic task was related to children's verbal ability and intelligence but performance on the executive function task was related to the length of time children had spent in the bilingual program and their degree of bilingualism. Similar results were reported in two studies by Nicolay and Poncelet (2013, 2015) showing better performance on executive function tasks for children in French immersion programs. In these studies, children were followed longitudinally, ruling out initial differences in ability. Thus, the results show that children's level of executive function performance is related to their degree of bilingualism and experience with bilingual education.

Is bilingual education for everyone?

There have always been questions about whether bilingual education programs were appropriate for all children or whether they were an exclusive option best suited for high-achieving students with strong family support (see review and discussion in Cummins and Swain 1986). Equally, some have argued that bilingualism itself is difficult and should be reserved as a 'privilege' for children who face no additional burdens from linguistic or other cognitive challenges, a position strongly disputed by Kohnert (2007). Unsurprisingly, the answer is not simple, but the evidence that exists supports Kohnert's view that bilingualism adds no further cost to children's achievement regardless of their initial levels of language and cognitive ability.

Consider first the role of intelligence, a variable on which all children differ. In one of the first studies on this issue, Genesee (1976) examined the role of IQ as measured by a standardized test on the development of French second-language abilities for children who were learning French either through immersion or foreign language instruction in school. The main result was that IQ was related to reading ability and language use for all children, but there was no association between IQ and overall communication ability; children at all levels of intelligence communicated with similar effectiveness. Importantly, there were no interactions with the type of program in which children were learning French: low IQ children in the immersion and foreign language program performed similarly to each other

on all language and cognitive measures, in both cases performing more poorly than children with higher IQ scores in both programs. Thus, there was no evidence of any negative effect of participation in an immersion program for children whose measured intelligence was below average.

More serious than low IQ, however, is the possible role that a learning disability, such as specific language impairment (SLI), might play in children's response to bilingual education. The limited evidence for this question is similar to that found for IQ, namely, that the deficit associated with SLI is not further exacerbated by bilingual education and has the additional consequence of imparting at least some measure of proficiency in another language. Few studies have investigated this question in the context of bilingual education, perhaps because children with language impairment are widely discouraged from attending bilingual education programs, but an early study by Bruck (1982) assessed language and cognitive outcomes for children in kindergarten and first grade in French immersion programs, some of whom had been diagnosed with language impairment. These were Anglophone children being educated through French, and linguistic measures for both French and English were included. The crucial comparison was the progress found for language-impaired children in the French immersion program and similar children in a mainstream English instruction program. There were no significant differences between these groups. Even though these children struggled, they did not struggle more than they would if they were in the bilingual program. This issue of selecting the appropriate comparison is central to the debate. Trites (1978), for example, argued against placing children with learning disabilities in French immersion programs, but his comparison was based on children without learning disabilities in those programs rather than children with learning disabilities in monolingual English programs.

Aside from the role of bilingual education in children's language development, it is difficult to compare skills in the two languages for children with SLI because the areas of linguistic difficulty associated with this disorder vary across languages (Kohnert, Windsor, and Ebert 2009). With this caveat in mind, a few studies have examined the effect of SLI on language development for children who grow up bilingually. Korkman et al. (2012) compared monolingual Swedish speakers and Swedish-Finnish bilingual children who were 5–7 years old on a range of language assessments in Swedish. About half of the children in each language group were typically developing and half had been diagnosed with SLI. As expected, children with SLI performed more poorly than typically developing children on these linguistic measures, an outcome required by definition, but there was no added burden from bilingualism and no interaction of bilingualism and language impairment. Bilingual children also obtained lower scores on some vocabulary measures, but this occurred equally for bilingual children in the typically developing and SLI groups and is consistent with large-scale studies comparing the vocabulary of monolingual and bilingual children (Bialystok et al. 2010).

Paradis et al. (2003) took a different approach to investigating syntactic proficiency in children with SLI. Rather than comparing children with SLI to typically developing children, they compared three groups of 7-year-old children, all of whom had been diagnosed with SLI: monolingual English speakers, monolingual French speakers, and

English-French bilinguals. The sample was small and consisted of only 8 bilingual children, 21 English monolingual children, and 10 French monolingual children, so data were analyzed with non-parametric tests and results must be interpreted cautiously. The results showed no significant differences between the three groups of children in their mastery of morphosyntax; in other words, no additional delay to language acquisition could be attributed to bilingualism for children with SLI.

The most salient risk factor generally considered in this literature is not individual differences in children's ability to become bilingual but rather low SES, a situation that applies to many bilingual Hispanic children in the US. Although it was discussed above in the context of testing outcomes of bilingual education, the issue is sufficiently important to warrant further consideration.

The main concern for Hispanic children from Spanish-speaking homes in the US is whether they will acquire adequate levels of English language proficiency and literacy to function in school and beyond. Although there is some controversy over this question, the majority of studies have shown improved outcomes with bilingual education (Genesee and Lindholm-Leary 2012). This conclusion is supported by two major reviews and meta-analyses conducted first by Willig (1985) and then by Rolstad, Mahoney, and Glass (2005) for papers published after the Willig review. In a later review and meta-analysis, Francis, Lesaux, and August (2006) came to a broader and more emphatic conclusion: 'there is no indication that bilingual instruction impedes academic achievement in either the native language or English, whether for language-minority students, students receiving heritage language instruction, or those enrolled in French immersion programs' (397). The most persuasive evidence on this point comes from the large-scale longitudinal study and review conducted by Collier and Thomas (2004) that included every variety of bilingual education; the authors decide unequivocally for the superiority of bilingual education in developing the skills and knowledge of Hispanic and other at-risk children.

Contrary to this conclusion, Rossell and Baker (1996) argued that the effectiveness of bilingual education is inconclusive. As stated earlier, Rossell and Baker defined bilingual education narrowly and considered only programs that provided instruction through the first language for limited EP children, in other words, Spanish-speaking children in the US (although curiously they included some studies of Canadian French immersion in their analyses). However, this is only one of the many incarnations of bilingual education so while an evaluation of its effectiveness is important, that evaluation does not necessarily generalize to the broader concept, a point that Rossell and Baker acknowledge. Their review began with a list of 300 studies and then excluded 228 of them for a variety of methodological reasons, so the final sample of 72 studies that entered the meta-analysis may not be representative of this literature. However, Greene (1997) conducted a follow-up study from the same database using different inclusion criteria and reported that a meta-analysis found positive outcomes for bilingual education. The decision about inclusion or exclusion of specific studies is obviously crucial to the outcome; Rossell and Baker acknowledge that Willig's (1985) positive conclusion can be traced to her choices on this important decision. However, it is impossible to adjudicate between these two conclusions regarding whether bilingual education is the most effective way to promote English language skills in limited English

proficiency children (Willig 1985) or not (Rossell and Baker 1996) because the conclusions were based on different evidence. Yet, whether or not there are advantages, the evidence is clear that there is no cost to the development of English language skills in bilingual programs. What is completely uncontroversial is that bilingual education additionally maintains and develops Spanish skills in these children, an outcome that Rossell and Baker note but dismiss as irrelevant.

A different way of considering the impact of bilingual education on school outcomes for low SES Hispanic children in the US is to use data on the reclassification of children from ELL to EP, a decision made on the basis of English language and literacy test scores. In that sense, reclassification is an indication that adequate levels of English proficiency have been achieved. Lindholm-Leary and Block (2010) note that the probability of these children being designated as EP after 10 years of essentially mainstream English classrooms is only 40%, so the standard is low. However, Umansky and Reardon (2014) compared this reclassification rate for Hispanic students enrolled in either bilingual or English-only classrooms and found that these rates were lower in elementary school for children in bilingual programs than in English classrooms, but that the pattern reversed by the end of high school at which time children in bilingual programs had an overall higher rate of reclassification and better academic outcomes. As with some of the studies based on test scores, English proficiency takes several years to develop, but according to the reclassification data, it developed sooner in the bilingual programs.

In a review of studies that have examined the effect of various risk factors on children's response to bilingual education, Genesee and Fortune (2014) found no case in which the bilingual education program contributed to lower academic outcomes for these children than for similar children in monolingual programs. Children with language disability, for example, will always find language tasks to be difficult; the important outcome of this research is that they do not find such tasks to be any more difficult in two languages than they are in one.

Evaluation of bilingual education for young children

In most evaluation research for educational programs, the conclusion tends to converge on a binary answer in which the program is considered to be either effective or not, or more or less effective than a control or alternative program. Given the complexity of bilingual education, such binary conclusions are inadequate. One reason is that independently of the quality of the program, bilingual education to some extent will almost inevitably help children to become bilingual or maintain bilingualism, an outcome that in itself is valuable but rarely considered in strict program evaluations. Some research has shown that even at early stages of bilingual education the cognitive advantages of bilingualism can be detected. Therefore, beyond the possible cognitive benefits of bilingualism described above are the intangible benefits of bilingual education such as potential to connect to extended family, increased opportunity for employment in a global economy, facilitation of travel and broadening of social spheres, and enrichment from widened horizons from language, arts, and culture. When successful, bilingual education offers a unique opportunity to impart the resources to sustain a valuable lifestyle asset. As one example, recent research has shown

that lifelong bilingualism contributes to cognitive reserve and delays the onset of symptoms of dementia (reviews in Bak and Alladi 2014; Bialystok et al. 2016).

These consequences of bilingualism, however, should not bias the interpretation of the evidence regarding the educational efficacy of bilingual education. To undertake that assessment, it is necessary to return to the distinction between bilingual education and the education of bilingual children. The first is a general question about the feasibility of educating children through a language in which they may not be fully proficient; the second is a specific question about the appropriateness of this option for children whose circumstances and abilities may mitigate those educational outcomes.

Both questions can be considered in terms of two factors that permeate many of these studies: the type of outcome measured and the demographic profile of the children in the program. Regarding the first, the main distinction is whether the studies assessed language proficiency or some other cognitive or academic outcome. Most studies included an evaluation of language proficiency in the majority language (English for Hispanic children in the US, French immersion children in Canada, community language for indigenous language programs in the US and elsewhere) and some included assessments of proficiency in the minority language, which is often the language of instruction (e.g. Spanish in the US, French in Canada, Maori in New Zealand). Fewer studies examined assessments of other educational outcomes, such as mathematics, subject curricula, cognitive ability, retention rates, attitudes, or enrollment in higher education. The second factor is whether the children assessed in these studies were at risk of academic failure for any number of reasons, such as low SES, poor language proficiency, or individual difficulty from learning, language, or social challenges. This combination of factors creates four categories for which there are three possible outcomes: (a) no measurable difference between bilingual and standard programs, (b) some advantage for participation in a bilingual program, or (c) hardship for students in bilingual programs that leads to poorer outcomes than would be obtained in traditional programs. If we consider that all bilingual programs additionally support some degree of bilingualism, then the only negative outcome would be (c).

Regarding language assessments, most studies show that proficiency in the majority language is comparable for children in bilingual and mainstream classes, providing that an appropriate comparison group is used and sufficient time is allowed. Children in Canadian French immersion programs develop English language skills that are at least comparable to those of other middle-class children in English programs (and sometimes higher but there may be other factors involved because of the selectivity of French immersion, see Hutchins 2015), and Hispanic children in US bilingual education programs *eventually* develop English language skills that are comparable to those of similar Hispanic children in English programs, although it takes several years to reach that level. Proficiency in the minority language is inevitably lower than is found for a native speaker of those languages, even when it is the language of instruction, but is invariably higher than levels obtained by children in English programs who have had little exposure to that language. For language proficiency, therefore, there is no evidence of a cost to the development of either language, although it may take several years to establish desired levels.

For other subject material, outcomes depend in part on the language of testing. As Macnamara (1967) showed long ago, the extent to which a weak language is used to conduct achievement tests can make the test equally a test of language proficiency, impeding children's demonstration of proficiency in the tested content. In many cases, studies that assess academic achievement provide inadequate information about the potential involvement of language proficiency so the test results are sometimes indeterminate. At the same time, Mondt and colleagues (2011) demonstrated that simply by teaching a subject through a particular language makes proficiency in that subject more fluent when tested in the language of schooling. Thus, there are reciprocal relationships between academic achievement and the language of school instruction, and these relationships are flexible.

The second factor is the characteristics of the children themselves. Children entering school with any learning or language disability or social disadvantage will struggle to succeed, so an evaluation of bilingual education needs to hold constant these abilities and select the appropriate comparison group. Thus, the relevant question is whether children struggle *disproportionately more* if they are in a bilingual education program. Here, too, the evidence seems clear: there is no additional burden for children with specific challenges in bilingual programs than in single language programs if the appropriate comparison is made. But even if there were additional effort required by bilingual education, it needs to be evaluated in terms of the potential benefits for that child – the possibility of acquiring a heritage language, the opportunity to develop at least some proficiency in another language, and the potential for attaining the cognitive benefits of bilingualism.

Bilingual education is not perfect and it is not one thing. At the same time, the quality of the research is uneven and it is difficult to determine how much weight should be assigned to contradictory outcomes. The research generally pays inadequate attention to the social context in which these complex processes play out, such as home literacy, parental education, children's levels of language proficiency, ability of parents to support children's education in that language, and numerous other factors. Rossell and Baker (1996) claim that the research is inconclusive, and although there is still much to be learned, the weight of evidence is firmly on the side of bilingual education. In this brief review of a small portion of bilingual education programs in different countries and aimed at educating different kinds of children, there is no evidence that it creates measurable obstacles to children's school achievement. Some studies show no advantage of bilingual education over other programs, but those need to be interpreted in terms of the benefits of learning another language and gaining access to the cognitive advantages of bilingualism. Ultimately, a proper evaluation of bilingual education requires detailed description of the structure of the program, the quality of the teaching, and the match between children's needs and abilities and the specific educational program being offered.

There is no single factor that can override the deep complexity of children's development and prescribe a solution for an individual child, let alone a solution for all children. For both gifted children who are certain to excel and children who face challenges, the education program they follow, including participation in a bilingual program, may not fundamentally change their school experience. There is no credible evidence that bilingual education adds or creates burden for children, yet it is incontrovertible that it provides the advantage of

learning another language and possibly the cognitive benefits of bilingualism. The over-riding conclusion from the available evidence is that bilingual education is a net benefit for all children in the early school years.

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