

language acquisition process. A good source of information on the brain and second language learning is the website created by Kenneth of the University of Idaho at [www.teresaakennedy.com/research/rl.htm](http://www.teresaakennedy.com/research/rl.htm). Hall (2007) has examined the concept of multiple intelligences as it relates to diverse second language learners. Brain researchers note connections between problem-solving activity and the development of creases in the grey matter of the human brain. If second language acquisition in children is considered to be a problem solving activity, it makes sense that we tend to see measurable differences in achievement between those children pursuing the study of a second language at an early age in long-term programs (Taylor-Ward, 2003; Blanchard & Nelson, 2007) and those children who do not study a second language.

### Language and Cognitive Development

Vygotsky (1986) theorized that learning a second language requires higher-order thinking skills, whereas the development of first language skills is a more of a rote process. He noted that as soon as children know one language, learning another language invites them to compare and contrast the two systems. According to Bloom's Taxonomy (1956), rote learning falls into the lowest category of intellectual behavior, called *knowledge*. Comparing and contrasting, on the other hand, fall into the fourth category on the upward scale, called *analysis*. Vygotsky's observation may indeed account for the fact that researchers such as Bialystok (2001) have found that the cognitive skills that seem to be the most enhanced by learning a second language is critical thinking, or problem-solving. If vocabulary skill development is considered to be an exercise in problem-solving (figuring out word meanings), then it stands to reason that becoming a better problem-solver would not solely benefit mathematical skill development, but would assist in overall vocabulary development as well.

### Phonological Skill Development

Research on early literacy (Clard & Dickson, 1999) indicates the importance of phonological skills to the overall acquisition of literacy skills in children. It is now assumed that global phonological knowledge, not just specific phonetic knowledge, leads to better literacy skills in children. Since children are "bathed" in the sound and syllables of their native language from the very day they are born, they become very familiar with the pronunciation and intonation patterns of that language. Research on phonological skill development has also shown that children who hear to the sounds and intonation patterns of other languages during this pre-school language development period actually learn to segment words in their native language more easily. This ability to detect foreign words and phrases leads to increased attention to the sounds of their own language, and therefore greater overall phonological awareness. Greater phonological awareness leads to better literacy skill development in one's native language in the early years of formal reading instruction.

### Summary

A review of the literature on early second language learning indicates that bilingual children and monolingual children who begin the study of a second language at an early age and are enrolled

in continuous, long-term programs can benefit in measurable ways in terms of both mathematical and literacy skill development. Although many research studies indicate that second language instruction results in higher achievement in both literacy and mathematics, it is important to remember that researchers find the highest correlation between second language development and critical thinking, or problem solving skills. While the application of better problem solving skills may result in increased language arts achievement, this correlation may not be entirely direct, and may be the secondary result of increased cognitive ability.

As research in second language acquisition has grown in its complexity, some underlying aspects of long-held beliefs have become clearer in their relative importance to the second language acquisition process in children. As with any field related to human development, our knowledge and beliefs continue to grow and change. The process of foreign language learning in native English-speaking children is an area in which there is a paucity of research. Quantitative and qualitative studies in this domain will continue to elucidate the process and benefits of early language learning. The National Network for Early Language Learning (NNELE) is an organization dedicated to the promotion of quality second language learning on the part of all children, Pre-K to grade eight.

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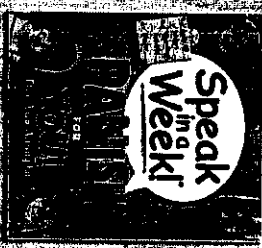
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