

Research Notes: Language Learning and the Developing Brain

"Gray Matters: The Developing Brain" is a public radio program that was broadcast by Public Radio International and produced in association with the Dana Alliance for Brain Initiatives, an independent, non-profit organization made up of over 140 of the nation's leading brain scientists. The content of the program, which focused on how the young brain develops into a "reading, writing, and rollerblading 10-year-old," and which addressed early language learning, is reported here.

The child's brain is different from the adult brain in that it is a very dynamic structure that is evolving. A two-year-old child has twice as many synapses (connections) in the brain as an adult. The young brain must use these connections or lose them. Thus, failure to learn a skill during a critical or sensitive period has important significance. According to Dr. Michael Phelps, Chairman of the Department of Molecular and Medical Pharmacology of the UCLA School of Medicine, the learning experiences of the child determine which connections are developed and which will no longer function.

Dr. Patricia Kuhl, a Speech Scientist at the University of Washington, reports that babies are born "citizens of the world" in that they can distinguish differences among sounds (temporal, spectral, and duration cues) borrowed from all languages. They are ready to learn any language they hear, but by six months of age, they start to specialize in their native language.

Dr. Susan Curtiss, Professor of Linguistics at UCLA, who studies the way children learn languages, notes that in language development there is a window of opportunity in which the child learns that first language normally. After this period, the brain becomes slowly less plastic and by the time the child reaches adolescence, the brain cannot develop "richly and normally any real cognitive system, including language."

The four- or five-year old learning a second language is a "perfect model for the idea of the critical period." According to Dr. Curtiss:

...the power to learn language is so great in the young child that it doesn't seem to matter how many languages you seem to throw their way...They can learn as many spoken languages as you can allow them to hear systematically and regularly at the same time. Children just have this capacity. Their brain is just ripe to do this...there doesn't seem to be any detriment to...develop(ing) several languages at the same time.

When children wait until high school to start studying a foreign language, the job is much harder. The task now involves learning the rules of grammar, translating, reading, and trying to develop language learning strategies. The task is a different one than it was for the young child in the sensitive period for language learning. Brain plasticity has been lost, the number of synapses has greatly reduced, and the brain no longer has the same facility to restructure itself that it had when the child was young.

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Research notes: Language learning and the developing brain. (1996, winter). *Learning Languages*, 1 (2), 17.