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**Krashen S D.** Lateralization, language learning, and the critical period: some new evidence. *Lang. Learn.* 23:63-74, 1973.  
[University of California, Los Angeles, CA]

New evidence is presented that modifies Eric Lenneberg's proposed critical period of language acquisition. The development of lateralization is complete much earlier than puberty and is thus not a barrier to accent-free second-language learning by adults. Rather, the development of lateralization may correspond to normal first-language acquisition. Also, the case of Genie, a girl who endured 11 years of enforced isolation, shows that some first-language acquisition is possible after the critical period, although mechanisms outside of the left hemisphere may be involved. Genie's slow but steady progress also implies that adult achievement in learning second languages should not be prejudged. [The *Science Citation Index*® (SCI®) and the *Social Sciences Citation Index*® (SSCI®) indicate that this paper has been cited in over 125 publications. It is the most-cited paper for this journal.]

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The research in the cited paper began as an attempt to confirm Lenneberg's hypothesis that children reach the adult level of cerebral asymmetry by around age 12.<sup>1</sup> I was excited by Lenneberg's hypothesis and his suggestion that the completion of the development of cerebral dominance was connected to the close of a "critical period" for language acquisition. My goal was simply to confirm the "lateralization-by-puberty" hypothesis using the dichotic listening procedure. Lenneberg's hypothesis was based on clinical cases of brain damage reported by Basser;<sup>2</sup> a central part of his evidence was the finding that injury to the right hemisphere caused more language disturbance in children than in adults. I decided to examine Basser's case histories before doing my experiment, simply to be thorough. I did not suspect that Lenneberg's hypothesis was incorrect; I was only curious to see the original reports for myself.

After reviewing perhaps a dozen case histories at the UCLA Biomedical Library, I noticed that in all cases of injury to the right hemisphere resulting in language disturbance, the lesion was incurred before age five. Lenneberg's hypothesis that the development of cerebral dominance was accom-

plished by puberty was consistent with a stronger hypothesis, that it was done even earlier, by five. I then found data that pointed only to age five, data showing that the effects of right-brain damage in children older than five are similar to the effects of right-brain damage in adults—this indicated that the involvement of the right hemisphere in older children is the same as during adulthood and strongly suggested that the development of cerebral dominance was accomplished by age five.

I never even began the dichotic listening experiment. Instead, I examined dichotic listening data produced in other studies. Using a scoring technique developed by my colleague, Richard Harshman, which allowed us to measure degree of lateralization unbiased by accuracy variations, we came to the exciting conclusion that no change in degree of lateralization was present after age five.

Richard and I then began to think about what "lateralization-by-five" might mean; we speculated that it correlated with the growth of the mental abilities underlying language, rather than with the loss of the ability to acquire language.

The paper also contains a brief discussion of Genie, a child who began first-language acquisition as an adolescent.<sup>3</sup>

I remained in lateralization research for only a few more years, writing just a few more papers on this topic. My 1975 paper summarizes the evidence for lateralization-by-five, presents Harshman's ideas for reconciling our data with research suggesting that the infant is "born lateralized," and includes my attempt to come to terms with data gathered since 1973 apparently supporting lateralization-by-puberty.<sup>4,5</sup>

The 1973 paper had immediate impact on the field of second-language acquisition. Scholars now looked for other explanations for child-adult differences in second-language acquisition and no longer assumed that a biological barrier existed for the adult second-language acquirer.

My work since 1975 has been in the field of language acquisition, and I have developed a general theory that is consistent with the 1973 lateralization results. The central hypothesis of the theory is the claim that both children and adults acquire language in the same way, by understanding messages (comprehensible input). The language acquisition device does not disintegrate at puberty, nor is it damaged. The child's superiority in ultimate attainment in second-language acquisition is due to the fact that the adult has a strong "affective filter" (a device suggested by Dulay and Burt), a mental block that keeps input from reaching the language acquisition device.<sup>6,7</sup>

The cited paper had a major effect on my personal research style—I learned that the library can, at times, be more effective than the laboratory.

1. Lenneberg E H. *Biological foundations of language*. New York: Wiley, 1967. 489 p. (Cited 1,150 times.)
2. Basser I S. Hemiplegia of early onset and the faculty of speech with special reference to effects of hemispherectomy. *Brain* 85:427-60, 1962. (Cited 140 times.)
3. Curtiss S. *Genie: a psycho-linguistic study of a modern-day "wild child."* New York: Academic Press, 1977. 288 p.
4. Krashen S D. The development of cerebral dominance and language learning: more new evidence. (Dato D, ed.) *Georgetown University Round Table on Languages and Linguistics* 1975. Washington, DC: Georgetown University Press, 1975. p. 179-92.
5. .... *Second language acquisition and second language learning*. New York: Pergamon Press, 1981. 176 p.
6. .... *Principles and practice in second language acquisition*. New York: Pergamon Press, 1982. 202 p.
7. .... *The input hypothesis: issues and implications*. London: Longman, 1985. 120 p.