

The importance of age in language acquisition

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The concept of a 'critical age' in language acquisition has elicited a great deal of controversy among psychologists and linguists since Lenneberg (1967, cited in Hurford, 1991) first published his important work on the subject. Since that time a considerable number of studies with conflicting viewpoints have been published, such that the debate remains very much unresolved today. If a critical period does exist, when is it? In early childhood? In late childhood? During or after puberty? Fundamental to the argument is whether the theories that apply to first language acquisition also apply to second language acquisition. This question should be asked from the outset, since, as this paper will argue, if the processes are indeed found to be different, then an important distinction would need to be made between theories governing first language acquisition and those governing second language acquisition.

The left hemisphere of the brain is said to be responsible for language. Marcotte and Morere (1990) approached the study of a critical period in L1 acquisition by studying the effects of lateralisation in the left hemisphere of the brain of young children (up to the age of three). They specifically looked at the effects of myelinization of the cerebral cortex and compared adolescents who had become deaf after the age of three with adolescents with normal hearing. Although they did tentatively claim "the presence of a sensitive period in the first 3 years of life that parallels the

myelinization of Broca's area" (Marcotte & Morere, 1990, p. 150) they had to admit that their "limited sample" was "preliminary in nature" and that the brain development of individuals who had incurred deafness later in life also needed to be studied in order to prove that there was indeed a critical period in L1 acquisition (Marcotte & Morere, 1990).

Mayberry and Eichen studied the effects of age in language acquisition on a population of deaf signers who had all been using sign language for at least 20 years and who had begun learning it at different ages - from 0 up to 13 years of age (Mayberry & Eichen, 1991). Thus, they were able to set up a situation whereby they could test L1 acquisition of sign language against L2 acquisition of sign language. They found that those who had learned to speak English before becoming deaf performed much better than congenital deaf subjects whose acquisition of sign language only began in adolescence. In fact, in many areas, these post-lingual deaf signers performed at a similar level to very early learners of sign language (Mayberry & Eichen). Their findings led them to conclude "that the timing of language acquisition more completely predicts the outcome of first than second language acquisition" (Mayberry & Eichen, p. 509). This is a vital distinction and their results provided more definite evidence of a critical period for L1 acquisition than for L2 acquisition.

Mayberry followed up these results in her 1993 study. As in the Mayberry and Eichen study, the 36 subjects had all been using sign language for 20 years or more (Mayberry, 1993). Likewise, the subjects were tested on a range of language performance areas, including sentence recall and various lexical, morphological and syntactic tests. The results of the congenitally deaf "native learners" were compared with the "late-second

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language learners”- those who had learned English in infancy before becoming deaf after their early childhood, and the congenitally deaf “late-first language learners”- those who started learning sign language between 9 and 13 years of age (Mayberry, 1993). It was found that the late-second language learners performed almost as well as the native learners and much better than the late-first learners. Mayberry (1993, p. 1268) went on to suggest that “the late-first language learners has at least four major difficulties in language processing but the late-second language learner has only one.” The only difficulty that the latter shared with the former was in the area of “lexical identification” (Mayberry, 1993, p. 1268). Even so, the late-second language learner could “partially remedy” this “via grammatical expectations (from the native language)” (Mayberry, 1993, p. 1268). Thus the late-second language learner could draw on and utilise certain grammatical resources acquired earlier from another language whereas, of course, the late-first language learner was unable.

These findings thus suggested that the critical period for first language learning is not the same as for second language learning: in first language learning it appeared to occur in early childhood. It was therefore crucial to learn a first language at that time, but far less crucial for second language learning: an L2 start in later childhood, it seemed, could duplicate the results of an L2 start in early childhood.

Other evidence in support of a critical age for L1 learning comes from studies of children who grew up in a state of total isolation (Curtiss, 1980, cited in Long, 1990) and children who were the victims of extreme social deprivation. “Genie” (Curtiss, 1977, cited in Long, 1990, p. 257) is the most famous case. Her passive knowledge was better than her active knowl-

edge. Her attainment in vocabulary was considerable, though in the domains of morphology and syntax it was low. Of course, there are not many cases on record like Genie's, but whenever they have been documented they have shown in favour of a critical age for first language acquisition (Long, 1990).

Mayberry's results, while providing strong evidence for a critical age in L1 learning, contradicted the findings of Johnson & Newport, concerning a critical age in L2 learning. In their 1991 study, they suggested that the critical or "sensitive" period in L2 is in early childhood. Success in second language learning, they suggested, depended on an ability to access the universal principle of subadjacency and an understanding of the 'parameters' that apply to a particular language. (Johnson & Newport, 1991). They further noted that "the subadjacency principle...states that movement of a word from its deep structure position in a sentence may not occur over more than one *bounding node* within a cycle" (Johnson & Newport, p. 224). In other words, there was a restriction on wh- movement across a sentence. Chinese subjects were therefore chosen for their experiments due to the lack of subadjacency in wh-question formation in the Chinese language (Johnson & Newport, 1991).

The first study included 23 subjects who were first immersed in the English language after the age of 17 (Johnson & Newport, 1991). Their results suggested that mature L2 learners could not fully access subadjacency (Johnson & Newport, 1991). Accordingly, the subjects were not able to approach the level of a native speaker.

A second study was conducted on another group of Chinese who

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began their immersion in the English language between the ages of 4-7, 8-13 and 14-16 respectively, and compared with native speakers. They wanted to see if there was a gradual decline in the ability to access subadjacency due to maturation, as in the case of language-specific details (Johnson & Newport, 1991). They found that there was, and on the basis of their results even claimed that subadjacency became less of a factor in learning as early as from the ages of 4-7 (Johnson & Newport, 1991, p. 253).

Even if Johnson & Newport claimed the existence of a critical age for second language acquisition, it is apparent that their findings did not pinpoint exactly when this age was, since the decline in ability was only 'gradual' and this was only on a strictly grammatical basis. What of other language areas?

Birdsong (1992) attempted to ascertain the ultimate attainment achieved by 'near-native' L2 French speakers whose first language was English. He gave them three tasks: interpreting ambiguous sentences out of context; choosing the most appropriate meaning of the adverb *bien in* sentences where the context was unclear; and finally, an acceptability test (Birdsong, 1992, p. 716). Birdsong found "that the results of the three tasks converged on the conclusion that non-natives can attain native-like norms" (Birdsong, 1992, p. 741-42). However, he cautioned: "the results represent a small fraction of presumed linguistic knowledge; they are of little generality because the near-native subjects represent a single L1 background...interpretation of the data on ultimate attainment must be tempered with acknowledgments of the constraints imposed by the methods" (Birdsong, 1992, p. 742). Such candid and considered criticism could equally apply to the Johnson & Newport study mentioned above. Birdsong further suggested

that, in the light of the achievement by exceptional learners, there was now evidence for making the biological critical period much later than puberty (Birdsong, 1992).

Bongaerts, Van Summeren, Planken & Schils (1997), who also carried out experiments on ultimate attainment, supported this view. They tested the results of exceptional Dutch learners of English, none of whom had had any significant exposure to English before the age of 18. As a prelude to their study they noted Klein's (1995, cited in Bongaerts et al., 1997) observation that there existed no evidence proving significant biological deterioration of the "language processor" in early adulthood. Furthermore, they stated, "If learners have sufficient access to L2 input and if it is of vital importance to them to sound like a native speaker of the language they are learning, it is possible that they will attain a native-like accent, in spite of a late start" (Bongaerts et al., 1997, p. 449). The subjects in their study indeed related that, in their profession (nearly all of them were English teachers), this requirement was a strong motivating factor in their quest for English without an accent. The results were outstanding with several of the subjects scoring in the range of the native speaker control group (Bongaerts et. al., 1997).

Such an achievement in terms of ultimate attainment certainly defies many earlier conclusions concerning a critical period in L2 learning. These findings led Bongaerts et al. (1997, p. 463) to call for a closer examination of "the psychological and contextual correlates" which, it would appear, are very influential in L2 settings.

Another study by Ioup, Boustagui, El Tigi and Moselle (1994) also

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cast some doubt on a critical age for second language learning. This study chronicled the remarkable success of two English speaking adult learners of Egyptian Arabic - Julie and Laura. The case of the former is especially striking since she was untutored. She first moved to Cairo when she was 21 and in less than 3 years had achieved native-like fluency (Ioup et al., 1994). Amongst many impressive attainments in different language domains, she spoke with no discernible accent (Ioup et al., 1994, p. 79), and that in a very difficult language. Julie and Laura could also distinguish among various Arabic dialects, scoring 100% in this particular test, and even beating two of the judges, who were all native speakers. Julie was also able to match the level of most of the judges in the ability to recognise different regional Egyptian accents (Ioup et al., 1994, p. 81). Although only a case study these findings are in contrast to the findings of Scovel (1981, cited in Long, 1990, pp. 268-69) which suggest that, for the ability to recognise accents in L2 learning, there is also a critical period.

Long's (1990, p. 265) overall views on L2 learning were quite uncompromising: "Learners starting later than age 6 often become communicatively fluent, but also often finish with measurable accents in phonology and, with progressively later starts (e.g., after age 15 for morphology and syntax), with "accents" in other linguistic domains, too". In the light of studies such as the ones reported above, these conclusions require re-assessment. It is true that they are exceptional cases, but they are suggestive. What special methods do such L2 learners employ in order to achieve such results? Can they be adopted and cultivated by other less successful L2 learners? Such studies need to be carried out on larger test groups. As Ioup et al. (1994, p. 93) remarked, "how the talented brain acquires language in comparison with the normal brain remains a mystery."

It is evident that many researchers who examine the question of whether or not there is a critical period in L2 learning do so from the perspective of observing what happens when subjects begin their learning during or after an hypothesized critical period, with the ultimate intention of proving, or alternatively, disproving, or at least casting doubt upon, the 'critical period'. An analysis of the question, though, would not be complete without investigating the critical period hypothesis from the reverse perspective: what about L2 learners who begin the second language before the onset of the earliest speculated critical period, and who nevertheless, still fail to attain native speaker levels of performance? Such evidence would suggest that some factors in the L2 learning process have been overlooked, and if so, necessitate a considered reappraisal about the ways in which a second language really is acquired.

Thompson (1991, cited in Ellis, 1994) in a study of Russian immigrants in the U.S.A. found that although most of the children in the study who had arrived before the age of 10 eventually succeeded in attaining a native-like accent, there were two children in the study who, despite having been immersed in the L2 from the age of 4 (that is to say, before any L2 critical period), maintained traces of a Russian accent. In fact, these subjects remained fluent speakers of Russian. This brings up the subject of "L1 maintenance": part of the reason for not acquiring a native accent in the L2 is that some learners might not have any desire to do so (Thompson, 1991, cited in Ellis, 1994). This contrasts with the situations described above, where Julie (Ioup et al., 1994) and the Dutch learners (Bongaerts et al., 1997) had a great desire to sound like native speakers, and indeed, were successful, despite the 'disadvantage' of starting late.

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In conclusion, the answer to the question asked at the beginning of this essay should be offered tentatively. There is plenty of evidence to date and much of it is of a conflicting nature. However, the evidence compiled thus far has shown very clearly the question cannot be answered without first making a fundamental distinction between two different phenomena - first language acquisition and second language acquisition. Certainly, the processes involved are not the same. It will suffice to say that at this stage the literature does indeed support a critical period for first language acquisition. There is evidence from cases like Genie's. The best evidence to date, though, in support of a critical age for first language acquisition comes from the results of studies such as the ones conducted by Mayberry and Eichen (1991) and Mayberry (1993), on deaf signers. The evidence in support of a critical age for second language acquisition is less convincing. As documented in the body of this essay, there are many examples of outstanding success stories which run counter to claims that adults must necessarily begin the learning of a second language as early as possible in order to avoid the deterioration in ability associated with maturation. In the light of successful native-like attainments by some adults in second language acquisition, assertions that there is a critical period in second language are open to refutation. All the more so, when considering examples of subjects who failed to attain a second language without traces of a foreign language despite the 'advantage' of beginning before the 'critical period'. This is most suggestive of the need for a broader based view and the need for further work to be done on uncovering more of the methods and factors involved in successful acquisition of a second language.

REFERENCES

- Birdsong, D. (1992). 'Ultimate attainment in second language acquisition'. *Language*, 68, 706-755.
- Bongaerts, T., van Summeren, C., Planken, B., & Schils, E. (1997). 'Age and ultimate attainment in the pronunciation of a foreign language'. *Studies in Second Language Acquisition*, 19, 447-465.
- Ellis, R. (1994). *The Study of Second Language Acquisition*. Oxford: Oxford University Press.
- Hurford, J. R. (1991). 'The evolution of the critical period for language acquisition'. *Cognition*, 40, 159-201.
- Ioup, G., Boustagui, E., El Tigi, M., Moselle, M. (1994). 'Reexamining the critical period hypothesis: A case study of successful adult SLA in a naturalistic environment'. *Studies in Second Language Acquisition*, 16, 73-98.
- Johnson, J. S., & Newport, E. L. (1991). 'Critical period effects on universal properties of language: The status of subjacency in the acquisition of a second language'. *Cognition*, 39, 215-258.
- Long, M. H. (1990). 'Maturational constraints on language development'. *Studies in Second Language Acquisition*, 12, 251-285.
- Marcotte, A. C., & Morere, D. A., (1990). 'Speech lateralisation in deaf populations: Evidence for a developmental critical period'. *Brain and Language*, 39, 134-152.
- Mayberry, R. I. (1993). 'First-language acquisition after childhood differs from second-language acquisition: The case of American Sign Language'. *Journal of Speech and Hearing Research*, 36, 1258-1270.
- Mayberry, R. I. & Eichen, E. B. (1991). 'The long-lasting advantage of

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learning sign language in childhood: Another look at the critical period for language acquisition'. *Journal of Memory and Language*, 30, 486-512.